

# Designing and exploring student-led online learning environments



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This dissertation is submitted for the degree of  
*Doctor of Philosophy*

October 2020



## **Abstract**

The recent surge in the popularity of massive open online courses (MOOCs) has demonstrated both the demand for, and potential of, self-directed online learning. Despite this success, prominent online learning platforms, such as Coursera, offer limited opportunities for learners to form lasting social networks. On the other hand, connectivist courses have enabled free flowing, learner centric interactions through a mix of mainstream social networking and communications tools, but have been criticised for creating a chaotic learner experience. Additionally, MOOCs have only recently started engaging with their potential for advancement in social skills (such as collaboration, bond-creation, negotiation) or offering the opportunity to study civic-minded content.

This thesis aims to explore learner-led online environments that offer a well-organised learner experience as well as support the formation of diverse, impact-focused online learning communities. The research approach used is action research, in collaboration with an international organisation of high schools (United World Colleges). The research is based on a series of international, extra-curricular and civic focused 5 week online courses for high school students. Three different technological configurations are explored: mainstream social media, a custom built learning platform and a hybrid of the two approaches. The course data (including participation metrics, class forum discussions and post-course surveys) is analysed using a combination of quantitative and qualitative methods. The research uses a theory-based approach to propose a framework for the analysis of course discussion content, in order to build understanding of both cognitive and social learning. This framework is first used to highlight different aspects of the configurations of learning environments that can be used to support the building of learning communities. Then, a more refined version is applied in order to discuss pedagogical contributions of both learners and facilitators within the courses.

Experiments with different sized courses in loosely-coupled social media environments found that while it is possible to build a sufficiently-structured, impact-focused student-led course using such an approach, learner experience becomes increasingly chaotic when the number of participants exceeds 100. Social media channels, whilst helpful for driving engagement, lack important features for community building and project development. These findings drove the design of a learning management system, LearningCircle.io. The system was designed so that course participants could be subdivided into smaller groups (classes of 100 and groups of 10), as well as to provide a setting favourable to project discussions and feedback. In early experiments where only LearningCircle.io was used for courses, learners faced challenges relating to communication. This led to designing a hybrid environment (using a mix of bespoke platform and

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social media). When comparing interactions in loosely-coupled, platform and hybrid courses I found that there are two kinds of trade-offs that designers have to consider when thinking about structuring a learning environment. Firstly, there is a compromise between supporting contribution to course co-creation (favouring loosely-coupled media) and higher learner satisfaction with course experience (favouring more structured, platform-based approaches). Secondly, there exists a compromise between an increased risk of low learner interaction (significant in platform-only environment) and an increased challenge associated with the layering and scaffolding of interactions (significant in social media only environments). In addition to this developed understanding of the trade-offs of the different online learning configurations, and to the analytical framework developed alongside this understanding, this research also contributes a set of design recommendations for learning platform and course designers.

To my husband Jonathan and daughter Maïa Sophie



## Publications

The research presented in this thesis has been published in the following peer reviewed conferences:

- Celina, H., Kharrufa, A., Preston, A., Comber, R. and Olivier, P., 2016, June. SOLE meets MOOC: designing infrastructure for online self-organised learning with a social mission. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems* (pp. 484-496). ACM.
- Celina, H., Lee, C., Olivier, P. and Kharrufa, A., 2018, June. LearningCircle. io: Lessons Learned from Organising Courses with and without a Dedicated Platform. In *EdMedia+ Innovate Learning* (pp. 76-81). Association for the Advancement of Computing in Education (AACE).

Additionally, the research presented in this thesis is awaiting publication in the following peer reviewed conference:

- Celina, H., Lambton-Howard, D., Lee, C. and Kharrufa, A., 2020, October. Supporting Pedagogy Through Automation and Social Structures in Student-Led Online Learning Environments. In *Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society (NordiCHI '20)*. ACM.

Finally, this research has contributed to the following analysis, authored by Daniel Lambton-Howard:

- Lambton-Howard, D., Vlachokyriakos, V., Olivier, P., Celina, H., and Kharrufa, A., 2020, April. Unplatformed Design: A Model for Coordinated Participation with Social Media Technologies. In *Proceedings of the 2020 ACM Conference on Designing Interactive Systems* (pp. 1-13). ACM.





## **Acknowledgements**

I would like to wholeheartedly thank my advisor Ahmed Kharrufa for his relentless help, and to Prof. Peter Wright for his support in the final year of this research. I would also like to acknowledge Prof. Patrick Olivier for his inspiration and guidance during the early stages of this project, and Prof. Sugata Mitra for his now famous TED talk that got me interested in the concept of self-organisation and student-led learning environments.

I would also like to thank my husband Jonathan Teyssandier for the patience and support without which I would have never managed to complete the enormous undertaking that is a PhD. It is through our conversations that this project really came to life. I would also like to thank my 2 year old daughter Maïa Sophie Teyssandier for the incredible editing services she has provided (sometimes accidentally).

I will never forget phenomenal experience of Online UWC courses and I would like to thank all the facilitators, speakers and learners for teaching me more about learning than I ever thought possible.

Special call out to Robin Tyne, whose hard work made the initial stages of Online UWC possible; also thank you for introducing me to Prof. Patrick Olivier. Special thank yous also to Victoria Alleyne and Marta Sobor - you are the best. I am eternally grateful for how you have been able to step into whatever role was required (guest lecturer, facilitators, course organiser) and make the project work when needed. I would also like to acknowledge the help and support of Polly Akhurst and Mia Eskelund Padersen for all your help coordinating with the United World Colleges International Office - without your continuous support the project would have never taken off. Thank you to Mudit Tyagi, Siphamandla Simelane, Vishal Bharam and Rahul Patle for helping build the tools supporting Online UWC and to Michal Zacher and Agnieszka Zacher from Vazco.eu for making the final platform design work.

Finally, thank you to each and every learner, each and every facilitator and each and every guest lecturer of the Online UWC courses. Meeting you during the courses reminded me about the incredible energy and creativity that exists in the world, across continents and generations. I have been so impressed to see all the social impact initiatives kicked off by people who have participated in this project. I have continued drawing inspiration for persevering on this research project from the passion, enthusiasm and dynamism that I have experienced during the Online UWC courses.



## Table of Contents

<b>List of Figures</b>	<b>xix</b>
<b>List of Tables</b>	<b>xxi</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Knowledge is a Social Construct . . . . .	2
1.2 Effective Collaboration and Social Skills . . . . .	3
1.3 Online Learning Presents New Opportunities . . . . .	6
1.4 Online learning for social impact . . . . .	7
1.5 Learner-led online learning environment design . . . . .	9
1.6 Research questions and objectives . . . . .	11
1.7 Research approach . . . . .	12
1.8 Summary of contributions . . . . .	13
1.9 Thesis structure . . . . .	14
<b>2 Learning, Collaboration and Activism</b>	<b>17</b>
2.1 Introduction . . . . .	17
2.2 Learning Theories: From Behaviorism to Sociocultural Constructivism . . . . .	17
2.2.1 Empiricism . . . . .	18
2.2.2 Constructivism . . . . .	18
2.2.3 Sociocultural Constructivism . . . . .	20
2.3 Approaches to Collaborative Learning . . . . .	20
2.3.1 Collaborative Learning as Participation . . . . .	21
2.3.2 Problem-Based Collaborative Learning . . . . .	23
2.3.3 Knowledge Creation Through Collaborative Learning . . . . .	24
2.3.4 Ensuring Effectiveness of Collaborative Learning . . . . .	25
2.4 Massive Open Online Courses as Environments for Learning and Collaboration	26
2.4.1 CMOOCs: Scaling Through the Power of Social Network . . . . .	27
2.4.2 XMOOCs: Scaling Through Content and Learning Platforms . . . . .	28
2.4.3 Other Approaches to Online Learning . . . . .	29
2.4.4 Learning Digital Civics Online . . . . .	30
2.5 Approaches to Supporting Learning with Technology . . . . .	32
2.5.1 Adapting Mainstream Social Media for Learning . . . . .	32
2.5.2 Content Focused Learning Platforms . . . . .	33

## Table of Contents

---

2.5.3	Learning Platforms Aiming to Support Social Aspects of Learning . . . . .	34
2.5.4	Technology for Supporting Civic Engagement . . . . .	34
2.6	Summary of Research Opportunities . . . . .	35
<b>3</b>	<b>Methodology</b>	<b>37</b>
3.1	Online UWC Project Overview . . . . .	37
3.1.1	Course Structure . . . . .	38
3.1.2	Course Participants . . . . .	39
3.2	Data Collected . . . . .	40
3.3	Action Research: Practical Approach to Research . . . . .	41
3.3.1	Iterative Research Design . . . . .	43
3.3.2	Iterative Learning Environment Design . . . . .	45
3.3.3	Iterative Data Analysis Methods . . . . .	47
3.3.4	Iterative Selection of Measures . . . . .	50
3.3.5	Ethical Considerations . . . . .	51
3.3.6	Closing the project . . . . .	52
3.4	Discussion of methodological considerations . . . . .	53
<b>4</b>	<b>Online UWC organized with Loosely-Coupled Media</b>	<b>57</b>
4.1	Introduction . . . . .	57
4.2	Learner-Led and Self-Organized Learning Environments . . . . .	57
4.3	Design Goals . . . . .	58
4.4	Methodology . . . . .	59
4.4.1	Participants . . . . .	60
4.4.2	Methods . . . . .	61
4.4.3	Measures . . . . .	61
4.5	Online UWC: From Idea to Implementation . . . . .	62
4.5.1	The First Edition . . . . .	62
4.5.2	The Second Edition . . . . .	65
4.5.3	The Third Edition . . . . .	67
4.6	Findings . . . . .	68
4.6.1	Promoting Activist Involvement . . . . .	68
4.6.2	Promoting Community Creation . . . . .	70
4.6.3	Promoting Learner Course Co-Creation . . . . .	70
4.7	Design Implications . . . . .	72
4.7.1	Logistics and Mechanics of Activist Learning . . . . .	73
4.7.2	Community Building and Reinforcing Community Layers . . . . .	74
4.7.3	Self organisation: focus on central skills . . . . .	75
4.8	Conclusions . . . . .	75

<b>5</b>	<b>Designing and Implementing the LearningCircle.io Platform</b>	<b>77</b>
5.1	Introduction . . . . .	77
5.2	The LearningCircle.io Platform: from Idea to Implementation . . . . .	78
5.2.1	Technological design of the learning platform . . . . .	80
5.2.2	Making Logistics Easy to Enable Activism . . . . .	81
5.2.3	Community Building Features . . . . .	83
5.2.4	Promotion of Constrained Self-Organization and Peer Feedback . . . . .	85
5.3	LearningCircle.io Testing Study Design . . . . .	85
5.4	UX Testing . . . . .	86
5.5	Platform - Social Entrepreneurship . . . . .	86
5.6	Hybrid - Global Citizenship . . . . .	87
5.7	Methodology . . . . .	88
5.7.1	Participants . . . . .	88
5.7.2	Methods . . . . .	88
5.7.3	Measures . . . . .	89
5.8	Evaluation . . . . .	89
5.8.1	UX testing recommendations . . . . .	89
5.8.2	Platform course engagement and learning environment usability review	90
5.8.3	Hybrid course engagement and learning environment usability review .	92
5.8.4	Design Goal 1: Enabling Activism . . . . .	94
5.8.5	Design Goal 2: Promoting Community . . . . .	96
5.8.6	Design Goal 3: Self-Organisation . . . . .	99
5.9	Discussion . . . . .	101
5.9.1	Organising Logistics . . . . .	101
5.9.2	Activist Reinforcement . . . . .	101
5.9.3	Community Reinforcement . . . . .	102
5.9.4	Self-Organisation Reinforcement . . . . .	103
5.10	Conclusions . . . . .	103
<b>6</b>	<b>Learning Trade-Offs</b>	<b>107</b>
6.1	Introduction . . . . .	107
6.2	Designing for Civic Engagement . . . . .	107
6.3	Methodology . . . . .	108
6.3.1	Participants . . . . .	108
6.3.2	Methods . . . . .	108
6.3.3	Measures . . . . .	110
6.4	Evaluation Framework . . . . .	110
6.4.1	Bloom's Cognitive Framework . . . . .	111
6.4.2	Soller's Collaborative Learning Framework . . . . .	112
6.4.3	Combining Approach . . . . .	112
6.5	Results . . . . .	114

## Table of Contents

---

6.5.1	Cognitive domain: spontaneity vs. structure . . . . .	114
6.5.2	Social domain: learner collaboration on and off platforms . . . . .	116
6.6	Discussion . . . . .	118
6.6.1	Contributions to course co-creation vs. higher learner satisfaction with course structure . . . . .	118
6.6.2	Risk of low interaction vs. ease of layering and scaffolding interaction .	119
6.6.3	Navigating Learning Trade-Offs . . . . .	120
6.7	Conclusion . . . . .	121
<b>7</b>	<b>Student-Led Teaching</b>	<b>123</b>
7.1	Introduction . . . . .	123
7.2	Exploring the Dynamics of Interaction in Student-led Environments . . . . .	123
7.2.1	Preliminary Social-Cognitive Framework . . . . .	125
7.3	Teaching Behaviours in Learner-Led Courses . . . . .	126
7.3.1	Study Overview . . . . .	127
7.3.2	Study results . . . . .	131
7.3.3	Cognitive Teaching Behaviours . . . . .	133
7.3.4	Social Teaching Behaviours . . . . .	135
7.3.5	Discussion . . . . .	137
7.3.6	Conclusions . . . . .	139
<b>8</b>	<b>Discussion and Conclusions</b>	<b>141</b>
8.1	Introduction . . . . .	141
8.2	Overview . . . . .	143
8.3	Impact of Technological Environment on Student-Led Learning . . . . .	145
8.4	Evaluating learning in student-led learning environments . . . . .	147
8.5	Pedagogy in Student-Led Learning Environments . . . . .	149
8.6	Design Recommendations . . . . .	150
8.6.1	DR1: Organise Resources . . . . .	151
8.6.2	DR2: Ensure Technology is Set Up for Course Co-Creation . . . . .	151
8.6.3	DR3: Promote Helpful Learner Cognitive Inputs . . . . .	152
8.6.4	DR4: Automate Organisational Tasks . . . . .	152
8.6.5	DR5: Layer Community Interactions . . . . .	152
8.6.6	DR6: Show Learners How to Contribute to Social Area . . . . .	153
8.6.7	DR7: Surface Participant Activity . . . . .	153
8.6.8	DR8: Focus on Facilitator Community Building . . . . .	154
8.6.9	Applying the Design Guidelines: Online UWC in Retrospect . . . . .	154
8.7	Limitations of the Thesis . . . . .	156
8.8	Future Research . . . . .	158
8.8.1	Unplatformed design . . . . .	158
8.8.2	Data mining for rich social learning analytics . . . . .	159

8.8.3	Other approaches to organising courses with volunteers . . . . .	159
8.9	Conclusions . . . . .	159
<b>References</b>		<b>161</b>
<b>Appendix A Code book for Social and Cognitive comment categories</b>		<b>173</b>
A.1	Cognitive - knowledge acquisition . . . . .	173
A.1.1	Remembering . . . . .	174
A.1.2	Understanding . . . . .	174
A.1.3	Applying . . . . .	175
A.1.4	Analyzing . . . . .	175
A.1.5	Evaluating . . . . .	176
A.1.6	Creating . . . . .	176
A.2	Affective - Collaborating . . . . .	176
A.2.1	Socialising (Receiving Phenomena) . . . . .	177
A.2.2	Bonding (*added) . . . . .	177
A.2.3	Contributing (Responds to Phenomena) . . . . .	178
A.2.4	Participating (Valuing) . . . . .	178
A.2.5	Coordinating (Organisation) . . . . .	179
A.2.6	Leading (Internalises Values) . . . . .	179
<b>Appendix B Course Organizer Handbook</b>		<b>181</b>
B.1	Introduction . . . . .	181
B.2	Course organiser checklist . . . . .	181
B.2.1	Before the course . . . . .	181
B.2.2	During the course . . . . .	182
B.2.3	After the course . . . . .	183
B.3	Who to contact in case of any issues? . . . . .	183
B.4	Technical guide . . . . .	183
B.5	Ideas for student assignments . . . . .	185
B.6	Ideas for driving student participation . . . . .	185
<b>Appendix C Online UWC Mentor Handbook</b>		<b>187</b>
C.1	What is the structure of an Online UWC short course? . . . . .	187
C.2	What is a role of an Online UWC mentor? . . . . .	187
C.3	How to do Online Icebreakers . . . . .	188
C.4	How to Run a Productive Group Discussion . . . . .	188
C.5	How to Troubleshoot Technical Issues Running Hangouts . . . . .	189
C.6	Do mentors have to keep track of student attendance and assignment completion? . . . . .	190
C.7	What happens if students want to reschedule their group meeting or cannot attend a group session? . . . . .	190

<b>Appendix D Online UWC Sustainable Development - Example curriculum</b>	<b>191</b>
D.1 Learning objectives . . . . .	191
D.2 Community guidelines . . . . .	191
D.3 Week 1: Introduction to Online UWC, key concepts of design thinking and circular economy . . . . .	192
D.3.1 Introduction . . . . .	192
D.3.2 Assignments . . . . .	192
D.3.3 Mentor briefing . . . . .	193
D.4 Week 2: Is sustainable economic growth possible? . . . . .	194
D.4.1 Introduction . . . . .	194
D.4.2 Assignments . . . . .	195
D.4.3 Mentor briefing . . . . .	196
D.5 Week 3: Sustainable agriculture . . . . .	197
D.5.1 Introduction . . . . .	197
D.5.2 Assignments . . . . .	198
D.5.3 Mentor briefing . . . . .	199
D.6 Week 4: Sustainable energy sources . . . . .	200
D.6.1 Introduction . . . . .	200
D.6.2 Assignments . . . . .	200
D.6.3 Mentor briefing . . . . .	202
D.7 Week 5: What it takes to kick start a community project . . . . .	202
D.7.1 Introduction . . . . .	202
D.7.2 Assignments . . . . .	203
D.7.3 Mentor briefing . . . . .	203
<b>Appendix E Online UWC Global Citizenship - Example curriculum</b>	<b>205</b>
E.1 Introduction . . . . .	205
E.2 Learning objectives . . . . .	205
E.3 Programme structure . . . . .	206
E.4 Community guidelines . . . . .	206
E.5 Who can participate? . . . . .	207
E.6 Week 1: Challenges to Global Citizenship. Identity, Divisions and Conflict . . . . .	207
E.6.1 Introduction . . . . .	207
E.6.2 Blog assignment - Introduce yourself to the course . . . . .	207
E.6.3 Read, watch & question . . . . .	208
E.6.4 Lecture . . . . .	208
E.6.5 Discussion . . . . .	208
E.7 Week 2: Challenging Notions of Identity. . . . .	209
E.7.1 Introduction . . . . .	209
E.7.2 Read, watch & question . . . . .	210
E.7.3 Lecture . . . . .	211



E.7.4	Discussion . . . . .	211
E.7.5	Assignment . . . . .	211
E.8	Week 3: Challenges of Being Informed. Media, Power and Critical Thought . .	212
E.8.1	Introduction . . . . .	212
E.8.2	Read, watch & question . . . . .	212
E.8.3	Lecture . . . . .	213
E.8.4	Discussion . . . . .	213
E.8.5	Assignment . . . . .	214
E.9	Week 4: Consumption and Consumerism in the Global Context. . . . .	215
E.9.1	Introduction . . . . .	215
E.9.2	Read, watch & question . . . . .	216
E.9.3	Lecture . . . . .	216
E.9.4	Discussion . . . . .	216
E.9.5	Blog assignment . . . . .	217
E.10	Week 5: Options for Action. Politics, Participation and Civil Society . . . . .	217
E.10.1	Introduction . . . . .	217
E.10.2	Read, watch & question . . . . .	218
E.10.3	Lecture . . . . .	218
E.10.4	Discussion . . . . .	218
E.10.5	Assignment . . . . .	219
 <b>Appendix F Online UWC Social Entrepreneurship – Example curriculum</b>		 <b>221</b>
F.1	Introduction . . . . .	221
F.2	Learning objectives . . . . .	221
F.3	Programme structure . . . . .	222
F.4	Community guidelines . . . . .	223
F.5	Pre-course: What is your social enterprise idea? . . . . .	223
F.6	Week 1: What is a social enterprise? What is your social enterprise? . . . . .	223
F.6.1	Introduction . . . . .	223
F.6.2	Task (blog) . . . . .	223
F.6.3	Read and watch . . . . .	223
F.6.4	Lecture . . . . .	224
F.6.5	Take action . . . . .	224
F.7	Week 2: Developing your idea . . . . .	224
F.7.1	Introduction . . . . .	224
F.7.2	Read and watch . . . . .	225
F.7.3	Lecture . . . . .	225
F.7.4	Assignments . . . . .	225
F.8	Week 3: How will you explain your idea to others? / How will you promote your idea? . . . . .	225
F.8.1	Introduction . . . . .	225

## Table of Contents

---

F.8.2	Assignments . . . . .	226
F.8.3	Lecture . . . . .	227
F.9	Week 4: How are you going to finance your idea? . . . . .	227
F.9.1	Introduction . . . . .	227
F.9.2	Assignments . . . . .	227
F.9.3	Lecture . . . . .	228
F.10	Week 5: How will you pitch your idea? . . . . .	228
F.10.1	Introduction . . . . .	228
F.10.2	Assignments . . . . .	228
F.10.3	Lecture . . . . .	229
F.11	Recommended books about entrepreneurship . . . . .	229
<b>Appendix G Course organizer feedback form</b>		<b>231</b>
<b>Appendix H Online UWC - Facilitator feedback form</b>		<b>233</b>
<b>Appendix I Online UWC - Participant feedback form</b>		<b>235</b>
I.1	Pre-course . . . . .	235
I.2	During the course . . . . .	235
I.3	General questions about the course . . . . .	235
<b>Appendix J Ethics Approval</b>		<b>239</b>

## List of Figures

3.1	Three stages of the Online UWC learning environment design . . . . .	45
4.1	LC2: Map of Prospective Learners Based on Approved Applications . . . . .	60
4.2	LC1: Example Hangout with Guest Lecturer . . . . .	63
4.3	LC2: Example Student Projects Set up on Course Website . . . . .	66
4.4	LC2: Example Social Impact Evidence . . . . .	69
4.5	LC2: Example of Playful Community Building . . . . .	71
5.1	LearningCircle.io Simplified Design . . . . .	77
5.2	LearningCircle.io Functions and Content . . . . .	80
5.3	LearningCircle.io Learner Dashboard . . . . .	81
5.4	LearningCircle.io Course Schedule . . . . .	82
5.5	LearningCircle.io Group View . . . . .	84
5.6	LearningCircle.io Filter Feature . . . . .	85
5.7	UX Testing Feedback Example: Formatting Issues . . . . .	90
5.8	Participant Contributions in the Platform Course . . . . .	91
5.9	Summary participation for Hybrid course . . . . .	93
5.10	Social Network Created in Platform Course . . . . .	96
5.11	Social Network Created in Hybrid course . . . . .	97
5.12	Threads by Topic in Platform and Hybrid Courses . . . . .	98
6.1	Bloom’s Cognitive Taxonomy and Bloom’s Revised Cognitive Taxonomy . . .	111
6.2	Krathwohl’s revision of Bloom’s Affective Taxonomy . . . . .	112
6.3	Soller’s Collaborative Learning Skills Taxonomy . . . . .	113
6.4	Comparison of Learner Effort in Loosely-Coupled and Hybrid Course . . . . .	115
6.5	Course Design Criteria and Constraints . . . . .	120
7.1	Learning Environment Affordances by Learner Type . . . . .	127
7.2	Taxonomy of social and cognitive learning areas . . . . .	129
7.3	Social and cognitive scores by participant type . . . . .	132
7.4	Share of participants with scores >3 . . . . .	132
7.5	Share of words in cognitive comments by category . . . . .	133
7.6	Share of words in social comments by category . . . . .	135
8.1	Five short courses have taken place online since project was handed over . . . .	142

**List of Figures**

---

J.1 Ethics Approval . . . . . 240

## List of Tables

2.1	Existing Learning Environments Feature Comparison . . . . .	35
3.1	Description of 5 Online UWC courses . . . . .	38
3.2	Approximate course schedule and interaction modes . . . . .	39
3.3	Participation Statistics for All Five Online UWC Courses . . . . .	40
3.4	Data Collected During the Research . . . . .	41
4.1	Loosely-Coupled Courses Participation . . . . .	60
4.2	Loosely-Coupled Courses Participation Summary . . . . .	68
4.3	Loosely-Coupled Courses Threads by Topic . . . . .	71
5.1	Participants in UX Testing, Platform and Hybrid Courses . . . . .	88
5.2	Course Engagement for Platform and Hybrid Courses . . . . .	91
6.1	Participation in Loosely-Coupled and Hybrid Courses. . . . .	109
6.2	Comment Categories for Cognitive and Social Aspects of Learning . . . . .	114
6.3	Engagement Measures for Loosely-Coupled and Hybrid Courses. . . . .	115
7.1	Summary Participation Statistics . . . . .	128
7.2	Summary of Course Data and Sample Selected . . . . .	130



## Chapter 1. Introduction

John Locke claimed that “*No man’s knowledge here can go beyond his experience*” (Locke, 1689). Competing philosophical perspectives have influenced discussions about knowledge and the process of learning. According to behaviourist theory, inspired by Locke and David Hume’s empiricism, learning is a purely cognitive process, where learner acquires information when presented with stimuli and that humans come to the world as *tabula rasa*, a blank slate onto which experiences are imprinted. This view of the world assumes that objective truth and knowledge exist. In the beginning of 20th century, pragmatists Richard Rorty and John Dewey and constructivists Piaget and Vygotsky provided an alternative to this view, exploring knowledge as a subjective construct resulting from both pre-existing developmental facilities (Piaget, 1937, 1964) and combination of structures imposed by deeply-rooted cultural influences (Vygotski, 2012).

While industrial scale education was foreseen by Richard Buckminster Fuller in 1962 (Fuller, 1962) it only became possible with democratization of internet access, as new models of massive open online courses were developed and popularized in the first decade of the new millennium. With ubiquity of digital connectivity and access to learning resources, online courses have made it possible to connect people globally to each other and with the best learning providers in a cost-effective way. With this, there is the potential to leverage design to extend the best of educational opportunities to a much larger audience, which was not previously feasible given cost and operational constraints. While this scaled online revolution has taken off, there is no clear consensus what "best" means in the context of pedagogy and learning environment design.

Cognitive theories aside, also in 1962 a German educationist Kurt Hahn succeeded in founding Atlantic College (for youth aged 16 to 18 years old) with the aim to build a bridge between European countries divided by the Cold War. The aim of the schools was idealistic in addition to being educational; to bring together young people from different countries to become champions of peace through shared learning, collaboration and understanding. The education program was based on promoting diversity, empathy and community service. The approach proved popular and successful enough for an organisation called United World Colleges (UWC) to grow and thrive. When this research started, the United World Colleges had over 60,000 alumni globally, but has not yet ventured into online course offering, possibly limiting the impact that it could have on promoting these goals.

This research was inspired by the social mission of UWC schools, of which the author is an alumna. There is great potential for online connections to bring people together at a fraction of the cost and a constructivist approach to education, which posits that differences between how

others view the world are rich stimuli for learning. While the project is built for international, social impact focused learning, the findings are transferable to a variety of contexts where student-led learning and community discussion-based curricula are relevant. Student-led learning is defined as educational activities where learners are invited to actively co-create their learning experience along course organisers. The Human-Computer Interaction (HCI) design space for such student-led, digital civics courses presents exciting opportunities for exploratory research and has been flagged as an important area for interaction design research (Vlachokyriakos et al., 2016).

This research explores the impact of technological course setups on course interactions and learning outcomes. These interactions and outcomes consider both social and cognitive aspects of learning. Cognitive aspects of learning are defined in terms of Bloom's taxonomy of educational objectives (ranging from simple actions such as remembering information to complex ones such as creation of learning content) Bloom et al. (1956). Social aspects of learning are defined as the participatory aspects of learning in a community setting (both as they link to development of identity at an individual level and behaviours needed to interact with others in a group) Wenger (1999). The introduction will begin by discussing the three academic motivations for the research, and present the key theoretical assumptions underlying the work. The first is that, as proposed by constructivists and sociocultural constructivists, knowledge is a social construct. The second is that collaboration is a social skill worth learning in its own right and not only as a means to cognitive ends. The third one is that near-ubiquitous internet access presents exciting opportunities to bring people together to further their learning, including for social mission or community impact driven learning objectives. Then, I share my personal motivations for the research project. Following the motivations section, research questions and objectives are presented. Finally, action research, the research approach selected to fit the iterative and impact driven nature of the project, will be presented as means to address the research questions. After discussion of contributions of this thesis, its structure will be presented.

### **1.1. Knowledge is a Social Construct**

Jean Piaget was one of the first to critique the empiricist definitions of truth and knowledge as objective and universal (Piaget, 1923). Instead, Piaget's constructivist theory of learning argued that individuals make sense of learning stimuli through the pre-existing mental structures that allow them to make sense of their environment, structures which develop as the individual matures. Piaget's theory focused on individual developmental processes more than on the impact that the society has on learning and development. For example, Piaget saw play and exploration as crucial to a child's development and built his views upon a strong foundation of experimental evidence.

Separately from Piaget, Lev Vygotsky reached similar conclusions and founded socio-constructivist theory of learning, which emphasizes the importance of broader cultural interactions on knowledge development (Vygotski, 2012; Vygotsky, 1997). According to Vygotsky, it is the child's sociocultural learning environment that impacts learning through interactions with



adults and more knowledgeable peers (Vygotski, 2012). In this framework, learning happens in the zone of proximal development – an area where the learner has not yet gained mastery but where he has some adjacent skills which help him make sense of new information (Vygotski, 2012).

Jean Lave and Etienne Wenger's work on communities of practice demonstrated how learning happens in informal contexts and how it is a socially situated process. Social learning has been a key focus of Etienne Wenger, who positions learning at the centre of human existence and posits it is thus a fundamentally a social phenomenon. Learning is considered as a social process of becoming (strongly linked to identity). It is social not only because it can be a group process, but because of this transformative power of an individual, which is part of the social aspect of human nature (Wenger, 1999). Due to the situated nature of learning, the learning environment is extremely important and should closely resemble the application context and culture (Lave et al., 1991).

Social constructivism and sociocultural constructivism philosophies impact how one is to think about the process of supporting learning, both through pedagogy and learning environment design. The most important one is the importance of learner being an active part of the learning process (Von Glasersfeld, 1989) and supporting the individuality and uniqueness of each learner (Vygotsky, 1997). Completing tasks in this zone of proximal development is associated with the gaining of increased confidence. The pleasurable experience of gaining confidence is perceived by this approach as the biggest motivation for learning, as opposed to external acknowledgements of acquired knowledge such as exams (Von Glasersfeld, 1989; Vygotski, 2012). In practice sociocognitive approaches encourage learners to pick their own topic of investigations, which should then be followed where the argument leads, which in turn means an interdisciplinary approach, as many investigations often span across several areas of knowledge (Dewey, 1938; Lipman, 2003; Mitra and Rana, 2001). A collaborative nature of interactions is promoted given that others are the most frequent source of stimuli that leads to revision of existing schemas (Piaget, 1923).

### 1.2. Effective Collaboration and Social Skills

In the following section I will discuss the collaborative and student-led learning approaches. Learning collaboratively is seen as a way to foster deep understanding of concepts and enhance learners' cognitive performance (Resta and Laferrière, 2007).

Collaboration is notoriously difficult to define (Dillenbourg, 1999; Johnson and Johnson, 1999), as the term can be applied to describe very different situations "in which two or more people learn or attempt to learn something together" (Dillenbourg, 1999). Dillenbourg (Dillenbourg, 1999) lists three main axes of difference in collaborative activities depending on group size (from pairs to large groups), learning objectives (from specific to open inquiry based and from cognitive to social) and the context of collaboration (online or offline, synchronous or asynchronous, formal schooling or informal learning communities etc.). Many collaboration experts (including Dillenbourg and his team of collaborators from Learning in the Humans and

Machines workshops), focus on understanding collaboration as a learning mechanism towards achievement of cognitive outcomes, while others (Bielaczyc et al., 2013) see collaboration as an interesting skill in and of itself, which helps learners navigate the social structures of their communities (Lave et al., 1991). Throughout the work I will focus on this second, broader view of collaboration and consider it as a crucial part of broader social skills.

Supporting collaboration through technology is such an important topic within HCI that it has its own communities – CSCW and CSCL, where research into different areas of digital learning, both through informal online communities and initiatives (Campbell et al., 2016; Evans et al., 2017; Lambton-Howard et al., 2019) and courses (Coetzee et al., 2015; Kulkarni et al., 2015a; Zhao and Sullivan, 2017; Zheng et al., 2015) is considered. However, there are two main challenges of supporting collaboration in a technology support context: one is about the pedagogy (Mackness and Bell, 2015; Mackness et al., 2010; Zhao and Sullivan, 2017) and the resulting technological affordances design, and the other is a problem of assessment (Van Aalst, 2013). In general, the less structured the collaboration, the more challenging it is to measure it fairly and consistently (Van Aalst, 2013). I will first discuss structuring computer supported collaboration as a means to cognitive ends and then move on to supporting collaboration as a part of broader social skills, which are especially useful if they can be transferred to other contexts.

The view of collaboration as a mechanism for promoting cognitive learning is the consequence of constructivist approach to learning, which postulates that cognitive frameworks are reviewed and revised thanks to interactions with others (Piaget, 1923; Vygotski, 2012). One critique of these approach is that, given situated nature of learning, the skills acquired through such collaboration are not easily transferable to real-life contexts. Another is that collaboration is not necessarily the most effective ways to get these cognitive results, with traditional approaches based on knowledge transfer from lecturer to learners delivering similar results with less time spent, especially for novices (Kirschner, 2001; Kirschner et al., 2006). Additionally, most experiments are conducted with classes that are in the same physical location in formal school setting (Dillenbourg, 1999). There is an opportunity to explore these approaches further within the context of online environments in courses between geographically dispersed learners (Stahl, 2013).

Assessment of collaboration's cognitive outcomes relies on individually administered pre-post test scores. Bloom's taxonomy (Bloom et al., 1956) is perhaps the most widely used framework used to describe cognitive learning and measure the complexity of cognitive achievement from least to most complex. The advantage of this approach is that it is a methodology which makes results intercomparable with other teaching methods. However, given evaluation of collaboration is reduced to understanding its cognitive outcomes, it fails to recognise other benefits achieved through this mode of learning, such as ability to better apply learnings in settings outside of the learning contexts (Hmelo-Silver, 2004).

This broader view of benefits collaboration is especially important in today's globalised and digitally connected world, which relies more and more heavily on collaboration, frequently across borders and asynchronous. Consequently, the need for strong social knowledge is even more

pronounced. Collaboration and ability to effectively work with others opens up opportunities to learn about different cultures, travel and open up interesting professional opportunities. Collaboration has been increasingly recognised as an important learning objective, especially as interconnectedness of people has increased with innovations in the telecommunications industry (Resta and Laferrière, 2007). More recently, also a broader range of 21st century social skills, such as confidence, grit, ability to interact with others have been added to the list of desirable learning outcomes which can help train people how to become active contributors to the global, internet-connected and inter-dependent society (Schleicher, 2007).

There are several approaches that help train learners in these wider skills. One classroom-based approach includes problem-based learning applied in collaborative settings (Hmelo-Silver, 2004; Steele et al., 2000), which has been principally applied for teaching advanced (university level) or gifted learners. Other approaches have focused on knowledge building (Scardamalia and Bereiter, 2006) and originated from a foundational CSCW project called CSILE (Scardamalia, 2002). In the knowledge forum framework, learners work together to answer questions using semi-structured responses (Scardamalia and Bereiter, 2006). Learners intrinsic motivation and lifelong learning and collaboration skills are promoted by replicating the conditions of work in which the academic research community operates (Scardamalia, 2002). This is also an approach used in Sugata Mitra's self-organising learning environment approach, frequently also called SOLE Mitra (2014); Mitra et al. (2005); Mitra and Rana (2001). An even less structured approach to supporting collaboration through technology is through learning communities such as communities of practice or communities of inquiry. Instead of focusing on the process of collaborating, learning communities focus on providing the environment of learning, especially social cohesion of the group.

Measuring collaboration as a skill in and of itself is more complex. Interestingly, the same commission led by Bloom to propose cognitive framework for organising learning objectives (and consequently, to guide assessment strategies) has also worked together, this time led by Krathwohl, on another framework for organising learning objectives Krathwohl et al. (1964). This affective framework relates to personal interests and feelings about learning and focuses on development of an individual's affinity towards learning Krathwohl et al. (1964). However, assessing progress made by learners in the affective domain is challenging, given that value development is subjective, complex and varied (Birbeck and Andre, 2009). One way suggested by Birbeck Birbeck and Andre (2009) to tackle this complexity is to evaluate affective domain through the lens of an individual's contributions to group work, with collaborative settings as a context where one more accurately discloses their ethics and contributions to self and group. Additionally, Amy Soller's framework is useful (Soller, 2001) for evaluating collaborative learning skills in large group discussions, with three main skills categories: conversation, active learning and creative conflict. However, the proposed model's granularity (28 attributes), without any specified level of complexity to help organise a learner's progression, make it difficult to use for discussion of results and high-level comparisons (eg. between different courses or between

different course participants). There is a clear need and potential for learning frameworks that help recognise both cognitive and affective aspects of collaborative online course interaction.

This research will consider collaboration within a relatively large classroom (up to 100 learners), working asynchronously to gather information and discuss opinions on topics both shared in the initial curriculum and provided by learners themselves. It also explores a flexible evaluation method which can be applied to a variety of technological contexts and explore both cognitive and social aspects of learning.

### **1.3. Online Learning Presents New Opportunities**

With the increased popularity of the Internet, research into collaborative learning has increasingly moved online, has started to be conducted at a truly massive scale (1000+ learners) and has opened new unique opportunities for design. Massive Open Online Courses (MOOCs) originated based on socio-constructivist, community-based view of learning. The term MOOC was introduced in 2008 by David Cormier to describe open access large-scale online courses (Cormier, 2008a), inspired at that time by the connectivist theory of learning proposed by Siemens (Siemens, 2004). Connectivism is a set of principles for learning made possible by the digital technology, described as a nonlinear process where learners tap into the knowledge network (Mackness et al., 2010). The key features of connectivist massive open online courses (cMOOCs) are autonomy (learner's choice of learning pathways and materials to be studied), diversity (of learners in a course), openness (understood as open access) and connectedness/interactivity (the processes which enable learning) (Siemens, 2004).

Connectivist education has signaled the potential of online education to reach the global community at scale while democratically involving participants in co-creating content (Mackness et al., 2010). Connectivist MOOCs have operated largely without a centralised platform (Cormier, 2008b; Siemens, 2004), citing the need to democratically engage learners in the co-creation of the course (Cormier, 2008a,b; Siemens, 2004). Courses are conducted across a wide array of public online platforms, set up by course participants (including organisers). Learners can select their preferred learning channels and organisers sometimes provide tools, feeds and communications streams that describe the key development across a learning network (Kop et al., 2011; Mackness et al., 2010). However, challenges of such approach are the chaotic experience and the potential for participants to feel overwhelmed (Kop and Carroll, 2011; Mackness and Bell, 2015; Mackness et al., 2010), which limits the application of this approach when working with younger or less experienced learners.

Today, the term MOOC is used to describe a vast variety of course offerings made by a plethora of organisers ranging from newly created EdTech start-ups to well-established universities. This new generation of behavioural-cognitive MOOCs (xMOOCs) were inspired by behavioural cognitivism Kesim and Altunpulluk (2015), and focused on acquisition of information pre-defined in a linear curriculum and communicated to learners by means of online videos and articles, and are assessed through both online quizzes and assignments reviewed automatically or by peers (Ho et al., 2014; Kesim and Altunpulluk, 2015). These courses rely

heavily on platforms which organise the course content. These platforms have been designed to promote ease of access, with fixed learning outcomes, pre-defined learning paths and low level of engagement of learners as course co-creators.

However, given that the philosophical background of online courses ranges from entirely student-led connectivist courses to heavily structured behaviourist based courses, it is difficult to isolate the impact of technology on ability to co-create the course. In order to explore the range of impacts of learning technology on learners' ability to contribute to course co-creation it is necessary that they interact in a less constrained and less structured and less content heavy platform that was designed with such courses in mind. However, given the rejection of learning management systems by early connectivism pioneers (Cormier, 2008b; Siemens, 2004), the research has not focused on constructing such a platform to enable such a side-by-side comparison.

### 1.4. Online learning for social impact

Digital civics agenda has seen an increase in popularity (Vlachokyriakos et al., 2016). Social impact is a big topic in HCI, but it has not necessarily connected to learning or training for activism and/or more general self-efficacy. Since the 1990s, the HCI community has *“experienced a dramatic upsurge in work that seeks to heal societal ills, that engages deeply with community partners, and that necessitates getting out from behind one’s desk and into the field”* (Hayes, 2011). However, the analytical lens was to focus on social movement creation and not on the potential of education platforms to disperse knowledge in a course format adequate for beginners (Mackness and Bell, 2015).

Within the online learning HCI literature, the topic of generating social impact through online learning has only been considered from a point of view of enabling access for developing world population to high-quality and low-cost education offered by the world’s top providers. To date, however, not much attention in MOOC literature has been given for a transformation potential of MOOCs if principles of building communities of practice with activist objectives were combined with the scale and diversity of participants in a MOOC.

Recently, non-governmental organisations (NGOs) are also looking into organising MOOCs; for example, Amnesty International started running online course on EdX, recognizing the potential for raising awareness among students and enabling their engagement as activists. While civic engagement courses have been run by NGOs, they were organised in xMOOC format, not fully leveraging the diversity of participants or emphasising learner autonomy. There are also sustainable development and digital civic focused online courses organised by higher education institutions on several commercial MOOC platforms, though predominantly in xMOOC format Delgado-Algarra et al. (2019).

The Online UWC project on which the research is based is about the impact of technology on learning. It was built as an online self-organised learning environment which in part returns to many of the ideas of cMOOCs (focusing on interaction, diversity and high levels of learner autonomy), but also incorporating structural elements inspired by literature on building online

communities (including defining progression paths for community members, establishing a clear common purpose for the community, paying special behaviour to reinforcing high standards of communication and interaction).

The project emerged from my two personal motivations. One was a need to engage in a project with impact on my community, combining both my upbringing and values instilled in me by my education in United World Colleges. Another was a long-standing interest in educational approaches, driven my mother being a teacher and her frequent discussions of her practice with me, and the fact that I have had numerous learning experiences throughout my life, in a variety of approaches and international contexts. Even before being selected to attend United World Colleges as part of a three-stage national competition in Poland, I have had an interest in serving my community. Throughout my primary and secondary education I was involved in co-organising cultural events in my town in Poland, and raised money through the Polish NGO Wielka Orkiestra Swiatecznej Pomocy<sup>1</sup>. This interest in community service deepened in my last two years of high school when I attended United World Colleges. Having met representatives of 93 different countries, I have learnt first-hand about the challenges faced in less privileged parts of the globe. Additionally, the UWC ethos that education is a force to unite people, nations and cultures for peace and a sustainable future has inspired me long after my graduation. This project was created as a means for me to give back to the UWC community by spreading its mission among a wider audience, and also in turn inspiring them to make impact in their own communities. Collaborating with the UWC community gave me access to an immense energy of fellow graduates who inspired, shaped and made this project possible as course co-organisers, guest lecturers and facilitators. I have a long standing interest in education. Additionally, over more than two decades I have admired the impact and commitment of my mother who is an English high school teacher. This drove my interest in education, and then in turn to write my undergraduate thesis in political sciences about the comparison of higher educational reform in France and United States.

This research emerged as an effort to deepen the understanding of civic minded, student-led online learning project conducted in partnership with United World Colleges (UWC) – an organisation of international high schools with a mission to inspire youth to build a more peaceful and sustainable world, of which the author is an alumni. Entrance to these schools is highly competitive: participants are recruited based on both there academic track record and evidence of commitment to the mission of these schools, and is conducted by alumni-ran national committees: in some countries the acceptance rate is less than 5%. The research was inspired and motivated by the example of SOLEs (Mitra, 2013; Mitra et al., 2005; Mitra and Rana, 2001) and builds upon the experiences of early connectivist MOOCs and student-centric learning approaches (Cormier, 2008b; Mackness et al., 2010; Siemens, 2004).

At the same time, massive open online courses (MOOCs) are exponentially gaining popularity. Thus, inspired by the ideas of student-centricity and scalability of online education an idea emerged to bring the opportunity to join the UWC community to a wider group of young learners

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<sup>1</sup><https://www.wosp.org.pl/>

based all around the world, through a 5 week online short course. The length of 5 weeks was agreed with the partner organisation as a time that would both be long enough to help learners get to know each other and short enough to still fit within the framework of short courses at United World Colleges (normally these are 1 or 2 weeks long when organised in person). The learning design of the course was organised in partnership with UWC. The Online UWC courses were based on several high level principles: (1) student-centricity, (2) focus on real life impact instead of grades, (3) cherishing diversity in discussions and (4) inclusivity. The organising team wanted students to take responsibility for their own learning and did not want a detailed curriculum to allow for maximum flexibility. The organising team, composed of the researcher and other alumni of the UWC schools, decided against giving grades as we felt they would instill a fear of failure. Instead the team kept track of class participation, completion of assignments and articles that were shared as it is important to have some objective evaluation of students' engagement, as well as evidence of conducting real life community impact projects. Diversity was promoted both through opening the application process to learners from all over the world, and cherished in discussions happening on the student platform. Inclusivity was achieved by opening the course to everyone who has shown the motivation to fully fill out the application (which included boxes for two short essays).

As discussed in the sections above, a vast body of existing research (Mackness and Bell, 2015; Mackness et al., 2010) has focused on understanding the learning process, motivations and outcomes of MOOCs (Zheng et al., 2015). A further body of research also considers the topic of the development of online communities (Preece, 2000; Ren et al., 2012) and coordinating online activism (Juris, 2016; Khondker, 2011). This research connects the threads between supporting online education and collaboration and social action through technology. Based on the variety of approaches to structuring collaboration there is a hypothesis that technological online environment setup impact learners' ability to contribute to course co-creation. In order to enable such comparison, one objective of this research was to develop a platform designed specifically for student-led courses, where learners are easily able to join and co-create courses on topics that are of interest to them. Existence of such a platform would enable the exploration of impact of different technological setups on the students' ability and willingness to drive their own learning agenda. Additionally, with learners being actively involved in decisions regarding their learning methods and outcomes, and interacting actively with others playing such a role, such a platform could also present an opportunity to explore a wider set of learning objectives, in particular social learning in addition to cognitive. In the next section I will discuss different design approaches that have been drawn from this research on how to best support learner-led online learning environment design.

### **1.5. Learner-led online learning environment design**

There are a number of available approaches to support both social and cognitive learning objectives through online technologies, which can be broadly grouped into three categories: loosely-coupled social media only, dedicated learning platforms, and the hybrid of both ap-

proaches. Learning environment refers to both a set of pedagogical choices and selection of technologies used to facilitate learning. Choice of learning environment is heavily influenced by the underlying approach to setting educational objectives and beliefs about the nature of learning. Three approaches to structuring online learning management will be discussed: (1) inspired by behaviourist approaches to learning, (2) inspired by connectivism, (3) inspired by view of learning as a social process. Design goals for student-led online courses, which are at the cross roads of these three approaches, are influenced by all three of them.

Behaviourist inspired MOOCs, which bought the concept of online learning to a broad audience, make available a large amount of learning content, organised in order of complexity, to learners through learning management systems (Ho et al., 2015, 2014). Their learning environments are structured with a fixed curriculum and learning outcomes in mind. Some examples of these are Coursera or Udacity. They are a directory of weekly learning units, including video lectures, written notes, quizzes and assignments designed to test the knowledge in each unit. Social interaction between learners is limited to the questions asked and answered in group forums. HCI research of such learning environments focused primarily on understanding learner engagement with content and increased course completion rates (Onah et al., 2014). Such xMOOCs and their platforms have been critiqued for insufficiently engaging the social capital of their learners and providing only a limiting view of the topic considered (Baggaley, 2013).

Using such a closed platform is seen as a challenge to the open and autonomous conditions for a truly connectivist MOOC. Using a platform for connectivist inspired education is subject to the same challenges faced by many xMOOCs: low spontaneity and a one-size-fits-all model of education (Siemens, 2004). Therefore, there is no ready-made platform or curriculum that can be used to support such open-ended, student-led learning. Existing connectivist MOOCs courses have used loose groupings of different social media technologies, without a system provided by course organisers to help learners make sense of the data. However, there are clear reasons why a set of integrating technologies would assist some participants, especially those unfamiliar with connectivist approaches and with fully self-directed learning strategies (Kop, 2011; Mackness et al., 2010). Research into the effectiveness of such platforms was predominantly focused on explaining learner experience (Kop, 2011; Kop et al., 2011). It has been demonstrated through participants' accounts that connectivist learning embodies a paradox: the more the learning environment conforms to the connectivists' ideals of autonomy, diversity, openness and interactivity, the more likely it is that the learning is limited by the lack of structure and support and the more participants lean towards working in smaller groups (Kop et al., 2011; Mackness et al., 2010). Given the debate about whether or not a platform limits the objectives of connectivist education (Cormier, 2008b; Siemens, 2004), it is perhaps surprising that no comparison of connectivist courses run with and without a central platform exist, as this would allow us to consider the trade-offs of both approaches.

On the other end of the spectrum, another approach to supporting social learning is offered by non-course based resources, such as online communities. Here technology helps connect like-minded individuals in a regular conversation on a topic of interest, with an aim to improve



their practice (Preece, 2000; Ren et al., 2012). Such communities of practice can range from fan-fiction communities sharing their work Campbell et al. (2016); Evans et al. (2017) to communities of international teachers sharing their experiences, and they are only the "tip of an iceberg" of a research area concerned with informal learning Livingstone (1999). The HCI, CSCL and L@S literature provides a rich overview of design guidelines of how to promote interaction and sociability in online communities (Campbell et al., 2016; Evans et al., 2017; Preece, 2000). A similar approach to support learning online has been done using the Communities of Inquiry (CoI) framework (Garrison, 2015; Garrison et al., 1999), which relies on creating three interdependent components of the learning environment: cognitive, social and teaching presence.

The online learning infrastructure for an online student-led course must respond to several design objectives: allow the learners to engage with course materials in an easy to use way both synchronously and asynchronously (videos, articles, content created and shared by other course participants), enable learners to get to know one another and share their unique experiences (through asynchronous communication via messaging, social media and synchronous discussion in small groups), and empower learners to begin their own social mission driven initiatives (with the support of the learning community created).

This research explores the different technology setups to support online learning in the context of courses specifically tailored to the needs of young people with high levels of self-efficacy and digital literacy, as well as access to social capital, expertise and experience.

### 1.6. Research questions and objectives

The research questions of this thesis were motivated by the desire to hone in on the future research topics recognised by the online education and digital civics research community. The first one is to compare the impact of a platformed approach on connectivist inspired online learning community and the extent to which it impacts the participants' ability to co-create the learning experience and interact with others. The second is to evaluate the use of different technologies through a lens that would consider a collaborative learning processes through both cognitive and social lens, in such a way that would enable to evaluate all course participants and all technological configurations side by side. The final motivation is to answer to the design challenge of building a platform for budding activists, which tries to combine great learning outcomes with tangible and lasting social impact by building on inspiration from both online learning and digital civics projects.

The research considered in this thesis explores the topic of supporting online, student-led, mission oriented courses through three main research questions and nine associated research objectives. 1. How do different learning environments (loosely-coupled social media, platform, hybrid) affect the social and cognitive elements of learning in a student-led context?

- O1: Identify different types of interactions involved in student-led online learning courses based on literature and propose design guidelines for a loosely-coupled media learning environment

- O2: Explore interaction in a student-led loosely-coupled course based on multiple empirical studies and identify the functionalities for a connectivist inspired learning platform
- O3: Build a learning platform inspired by connectivist learning
- O4: Explore interaction in using a platform-only approach based on an empirical study and propose design recommendations for a hybrid approach
- O5: Explore interaction in a hybrid course based on empirical study

2. What design trade-offs exist when supporting social and cognitive aspects of student-led learning?

- O6: Identify different frameworks that are relevant to investigating learning in online student-led settings based on literature
- O7: Develop an analytical framework for investigating both cognitive and social aspects of learning in online student-led settings
- O8: Use the framework to recognize the trade-offs between the different scenarios

3. How to design learning environment and pedagogy in a way that promotes social and cognitive learning?

- O9: Based on evidence across all empirical studies, propose design recommendations and design trade-offs that help improve social and cognitive aspects of learning

The research started off with only the first question, but questions 2 and 3 emerged during the iterative design process, to address the challenges related to describing the learning process and pedagogy in student-led online courses with open-ended curriculum. The hybrid configuration (including using the learning platform in tandem with social media) was identified as an important configuration to investigate based on work initial experiments with the learning platform.

### **1.7. Research approach**

Given the social impact motivation of this work, as well as the unique positioning of the author of this research as the designer of the learning infrastructure, educational content and research methods, this project naturally fits in the frame of action research (Hayes, 2014; Rogers, 2012). The research has been conducted through three different learning environment configurations, and a total of 5 courses, including 3 in the first exploratory stage. In the first stage, loosely-coupled media was used to identify design gaps and practice which informed both the next iteration of the course and the initial build of the LearningCircle.io platform. The second experimental configuration was done during one course using only the LearningCircle.io platform, after extensive minimum viable product (MVP) platform has already been completed. Based on difficult learner experiences in the platform only context, the final technological setup, including

the LearningCircle.io platform combined with social media (principally a Facebook group) was explored.

The research was conducted using a mix of quantitative methods (engagement statistics) and qualitative methods (thematic analysis of surveys and course discussions). The research methods were refined throughout the project, aiming to bring more trustworthiness to the project. This was achieved through triangulation of findings between different methods of analysis. Additionally, other researchers were invited to collaborate on designing and applying the proposed theory based thematic framework for understanding cognitive and social components of learning in the courses. Research approach and methodology is discussed in more detail in Chapter 3, and then in each of the empirical chapters: on design experiment in loosely-coupled environments in Chapter 4, on platform usage evaluation in Chapter 5, on exploring learning dynamics in different learning environments in Chapter 6 and exploring pedagogical dynamics in different learning environments in Chapter 7.

This research project focused on exploring design trade-offs for a student-led learning environment. In student-led learning environments, students are responsible for selecting their own preferred learning outcomes, defining which materials and methods will be used to achieve these objectives and course organisers / experts are only there to provide a scaffold framework (Hmelo-Silver et al., 2007) (such as schedule, key themes for initial discussions) as well as encouragement and learning strategies support (Hmelo-Silver, 2004; Hmelo-Silver and Barrows, 2006).

The research was conducted around a 5 week Online UWC course for high school students which would both introduce civic focused themes (sustainable development, social entrepreneurship and global citizenship) and encourages the students to take action in their local communities. The course design would invite learners to join course organisers as co-creators of both content and course structure, actively encouraged to invite expert speakers, feedback on the work of others and coordinate learning and logistical activities. Finally, participants' recommendations from both course feedback surveys and comments on early research findings drafts would not only involve the participants as co-designers of the learning environment, but also as co-researchers of the topic. While the thesis will primarily use the pronoun "I", sometimes "we" will be applied to specifically refer to decisions which were made collectively by the Online UWC community.

### **1.8. Summary of contributions**

This research builds on a strong foundations of existing work in the domain of online learning and digital civics design. There are three main contributions of this research:

- Understanding the trade-offs between different learning environments (mainstream social media, learning platform only or hybrid) in student-led context
- Theoretical framework to help analyse cognitive and social contributions in a student-led course

- Empirical design guidelines for how learning environment and pedagogy can be best configured to support social and cognitive elements of learning in student-led learning environments

### 1.9. Thesis structure

This thesis comprises of eight chapters which reflect upon 3 configurations of the Online UWC course and explores the design and application of different technology setups to support civic-minded student-led online courses. Trade-offs between the different learning environment setups on social and cognitive aspects of learning are explored using a theory-based framework to help identify design guidelines for both course and learning platform designers.

Chapter 2 starts by grounding the research in constructivist and sociocultural constructivist theory of cognition. It goes on to discuss different approaches to supporting collaboration through technology, including within communities (of practice and inquiry), problem based and knowledge creation based. Finally, relevant online learning literature, including supporting digital civics online and informal learning, are discussed before proposing different approaches to online learning design. Drawing on this vast literature I explore different ways to deliver learner-led courses which aims to achieve broad educational objectives, including ensuring transferable collaboration and problem-solving skills, affinity for the learning process and intrinsic motivation. Approaches to and challenges of pedagogy and evaluation are highlighted in the discussion of each relevant approach.

Chapter 3 explains the methodology of this action research. It starts by contextualising this research project as action research. A discussion of theoretical and practical issues relating to data collection follows, complimented with a detailed review of all the data along with the description of the collection process. Approach to data analysis, and its evolution throughout the course of the project is discussed. Ethical considerations of this research methods are then presented. Finally, strengths and benefits of this research method are explored.

Chapter 4 reviews the first loosely-coupled media configuration, studied over three courses, varying from small to large. The analysis of these case studies presents the design, deployment and evaluation of an online learning activity for would-be social innovators and activists, with the aim of understanding the factors that are critical to the design of an infrastructure to support such communities of learners. This first configuration was used to deliver courses on the topic of sustainable development. The work puts focus on civic engagement and the autonomy of student learners throughout the course. The primary design goals for the learning infrastructure created were to enable activist empowerment, self-organized learning, and the creation social bonds to facilitate a lasting and self-sufficient international activist community. The analysis is based on a sample of 114 active learners and 33 facilitators; including data from 223 applications, 657 Facebook posts, 59 participant survey responses and variety of quantitative metrics.

Chapter 4 discusses experiences with running the first configuration using a loosely-coupled social media informed design of a specialised platform, and early experiments with the platform during an online course. First, the theory driven design features are explored, especially the

design objectives of connectivist MOOCs (high levels of autonomy, high levels of interaction among participants, and diversity) as well as those for building effective online communities (community building tools and activities).

Chapter 5 evaluates the experiments with using this platform both with and without additionally layering social media to support interactions are discussed. The analysis in this chapter is based on a sample of 73 active learners and 15 facilitators; including data from 351 Learning Circle and Facebook posts, 22 participant survey responses and variety of quantitative metrics. Additionally UX testing is based on feedback from 15 participants, including 13 surveys and 15 long form responses. While early iterations with loosely-coupled resources identified the need for a light platform to support learning experiences, preliminary review of data from platform based experiments, and attempt to compare them to a loosely-coupled implementations, showed the need for a framework for data analysis (with focus on social learning across the three technological contexts).

Chapter 6 explores approaches to evaluation of participant engagement in connectivist MOOC inspired online courses. I propose a theory-based framework to help some of the evaluation challenges for exploring interaction in online courses: (1) simultaneously at individual and group level, (2) simultaneously for social and cognitive aspects of learning, (3) providing a quantitative summary with ability to explore qualitative richness of data. A hierarchical framework is proposed by drawing on and combining two theoretical approaches frameworks: Bloom's taxonomy and Soller's collaborative learning attributes. This first iteration of the framework, results in three high level categories for social and cognitive aspects of learning. Then, the framework is used to investigate dynamics of interactions through analysis of learner written posts threads and comments on the key learning forums (including Facebook group and LearningCircle.io class platform). The platform-based course is compared to a course organised using the same structure but with a loosely-coupled media approach. I base the analysis on a sample of 126 active learners and 32 facilitators across 2 courses. The central contribution of this chapter is the analysis of trade-offs for using a central custom platform vs. loosely-coupled resources in online learning on both cognitive and social aspects of learning.

Chapter 7 goes over the limitations of the original sociocognitive framework and continues building on relevant literature to propose further improvements. This second iteration of the framework is used to explore teaching in student-led courses. Learner-led online courses present exciting learning and engagement opportunities compared to traditional teacher-led online courses. Student-led courses require distinct pedagogical and technological considerations, with teaching behaviours that emerge from learners being a major contributor to their success. Teaching behaviours manifested by the learners and facilitators of such courses are explored, with focus on how these are affected by, and can consequently be supported through, different online infrastructures. I examine data from three student-led courses supported by different online infrastructures (a) mainstream loosely-coupled social media, (b) a custom-built learning platform and (c) a combination of both. I based the analysis on a 11% sample from three courses,

including 88 posts and 327 comments, complemented with 25 survey responses from learners and 39 responses from facilitators.

Chapter 8 concludes with a discussion of implications for technology design, learning and teaching in light of evidence gathered through research within the context of research questions. This chapter builds design recommendations for course designers to best utilise the affordances of selected infrastructures in supporting teaching behaviours. It also proposes direction for future research.

## **Chapter 2. Learning, Collaboration and Activism**

### **2.1. Introduction**

Supporting learner-led, social impact focused collaborative learning requires review of several relevant topics: learning, collaboration and activism. The chapter will start in reviewing theoretical grounding for learner-led collaborative learning, as a rejection of behavioral cognitive view of learning. Constructivism (Dewey, 1910, 1938; Piaget, 1923) provides theoretical grounding of learning as a student-led process, while sociocultural constructivism positions it as a social and collaborative process - both foundations key to design of this action research project. The discussion of different approaches to organising collaborative learning activities will follow, based on: community participation (Garrison, 2015; Garrison et al., 1999; Lave et al., 1991; Wenger, 1999), solving problems (Hmelo-Silver, 2004; Hmelo-Silver and Barrows, 2006) and building knowledge (Scardamalia, 2002; Scardamalia and Bereiter, 2006). The challenge of evaluating learning in student-led collaborative setting will also be presented.

Then the review will shift to specific application area of online learning (including as it relates to civic minded content). Online learning is not a new concept, pioneered by distance education institutions such as the Open University in the 1960s. In the last decade, online learning has seen increased growth of users and high level innovation in learning platforms associated with some of the most prestigious higher education institutions (through courses delivered on edX and Coursera in the US and FutureLearn in Europe). The chapter will review different approaches to building learning experiences online: ranging from highly structured learning activities organised on specialised learning platforms to informal small scale experiments in connected learning. Variety of learning environments, from learning management systems, through social add-ons to approaches using social media will be reviewed. Digital civics, activism and social action focused learning experiments, as well as approaches to support the work of volunteers will be discussed as part of this section. This review of learning theory, approaches to collaborative and online learning as well as approaches to support online learning through technology will help identify opportunities for further research and how research questions fit within this framework.

### **2.2. Learning Theories: From Behaviorism to Sociocultural Constructivism**

Prior to foundational work of constructivist, an empirical view of both knowledge and learning dominated, grounded in works of John Locke and David Hume – viewing knowledge as based on indisputable facts and learning as an individual, cognitive process (Locke, 1689). We will consider early roots of constructivism, before exploring sociocultural constructivism and learning

communities (communities of practice and communities of inquiry). In this way I will review learning from a constructivist point of view using two metaphors, first as an individual process, where knowledge is viewed as a property of an individual mind before exploring it from a participation metaphor point of view (as a process of growing up and socializing with others within a community), as proposed by Sfard (Sfard, 1998).

### 2.2.1. *Empiricism*

Empiricism, spearheaded in the modern era by Francis Bacon, can be seen as the bedrock of the scientific method. John Locke, who proposed that all justified belief be based on prior experience, also made it a guiding principle of his epistemology (Locke, 1689). Locke's *Essay Concerning Human Understanding* has deeply impacted the view of knowledge and the process of learning, with an emphasis on experiments and evidence-based inference. Its conclusions were the basis of another essay, *Thoughts on Education*. Locke rejected the concept of inborn ideas and compared a child's mind to a *tabula rasa* upon which the experience of the external world would be impressed.

William James and Charles Sanders Peirce, the founders of pragmatism in the late 19th century, drew on and re-framed Locke's classical empiricism. But it is John Dewey who would turn pragmatism's inquiry into meaning and the nature of truth towards important contributions to pedagogy. Dewey's educational theory confronted his philosophical reflections on experience, knowledge and psychology with his own observation of real-life schools, resulting in a more nuanced analysis which focused on personal and social aspects of learning.

### 2.2.2. *Constructivism*

Constructivism is frequently associated with Piaget (Piaget, 1923), however, there are important precursors that need to be introduced (Vico, 1725). The work of pragmatists such as Rorty and Dewey is also aligned with constructivists views and provides important contributions especially relating to proposed pedagogy (Dewey, 1910, 1938; Rorty, 1982).

Giambattista Vico is one of the forerunners to the constructivist cognitive theory of development (Vico, 1725; Von Glasersfeld, 1989). One of Vico's most important contributions, achieved already in 18th century, was to recognise that one does not know anything else than what has been understood through cognitive structures that they have constructed themselves: "to know" means to "know how to make" (Vico, 1725). However, Vico's writings were not widely known.

The notion of cognitive construction only gained in popularity and importance when it was explored first by James Mark Baldwin (whose main contribution was to propose a stepwise theory of cognitive development) and then extensively discussed by Jean Piaget. Piaget saw the importance of external circumstances on development: "the human being is immersed right from birth in a social environment which affects him as much as his physical environment" (Piaget, 1964). His theory of constructivism was built based on his observation of children, which did not align with the view of knowledge and learning proposed by behavioural cognitivism. Piaget was puzzled by the fact that children that took part in his experiments made different kinds of



mistakes, depending on their age (Piaget, 1923). Piaget proposed that cognitive change and learning happen when a learner's schema, instead of producing the expected result, leads to perturbation, which, when resolved, leads to accommodation of new information into the schema or creation of a separate one (Piaget, 1923, 1964). Piaget argued about the importance of social interactions in cognitive development and interactions with others as key to changing one's understanding of concepts.

Maria Montessori's work with children resulted in similar conclusions about the developmental stages reached by children. However, the main difference in her work v. Piaget was that there are no fixed periods where children reach certain developmental thresholds and that instead they should be stimulated from an early age to encourage the development of their senses (Montessori, 1959). Montessori's exploration of early age learning impacted thinking about importance to let the child decide what they want to learn (Montessori, 1959).

Pragmatists such as Rorty and Dewey also had a lot in common with Piaget's thinking, for example that knowledge is not a representation of the real world, but of the cognitive structures created based on each individual's unique experiences. Rorty stipulated that "*He (the pragmatist) drops the notion of truth as correspondence of reality altogether, and says that modern science does not enable us to cope because it corresponds, it just enables us to cope.*" (Rorty, 1982). John Dewey saw education as an inquiry and thought that learners should interact with "*raw subject matter*" as opposed to "*end products*" of inquiry, claiming that interest drives motivation (Dewey, 1938). The interest in inquiry based education arises from perturbation of existing conceptual structures that exist in one's mind when faced with new situations.

If knowledge is not viewed as an objective representation of what exists, but a mapping of what is feasible in light of human experience, it presents exciting opportunities for changing the practice of education (Von Glasersfeld, 1989). Piaget's theory proposed focusing on child-initiated approaches (Piaget, 1964). Constructivists view learning as a product of self-organisation, as per Piaget's dictum "intelligence organises the world by organising itself" (Piaget, 1937). Learning comes from re-setting of schemas following assimilation of new information following perturbations. These perturbations of existing schemas are most frequently caused by interactions with others, who have slightly different schemas. This impact of this view is that group work (in dyads or triads) promotes fuller understanding of concepts (Piaget, 1964). The role of the teacher in this environment is to explore the structures that lead learner to arrive at their own conclusions and clarify and build understanding from that place (Piaget, 1923, 1964).

One interpretation of Piaget's developmental view of learning is that while you can accelerate the developmental process a bit, by providing favourable conditions for learning, you cannot jump through stages. It has, unfortunately, been used as an excuse to not teach young children about abstract thinking because they will misunderstand the concepts as they are not developmentally capable to process them (Lipman, 2003). The main difference between constructivists and pragmatists is that constructivism has higher level of interest in the process that leads to development of knowledge (Von Glasersfeld, 1989). Dewey proposes that through following the process of scientific inquiry and reflective thinking learners acquire deep understanding

of new concepts (Dewey, 1938). While showing the importance of group work to cognition, constructivists view cognition as an individual process.

### 2.2.3. *Sociocultural Constructivism*

Sociocultural constructivism is a theory proposed by Lev Vygotsky, inspired by Spinoza's and Hegel's philosophy, which implied that few phenomena can be understood as individual processes, and that they should instead be analyzed at society level. Vygotsky created his theory in part by drawing connections between the experiments conducted by Piaget (Vygotski, 2012). Vygotsky, however, proposed a more dynamic view of the human mind as evolving together with society. His work showcased the importance of language and culture in learning (Vygotski, 2012). He proposed that individual development can only be understood with reference to the social and cultural context and that social processes lead to development of higher mental processes (Vygotsky, 1997).

He proposed that learning happens in one's zone of proximal development. Zone of proximal development is defined as a difference between what the learner can do on their own and what they can do when they are supported by others (teachers or peers): *"With assistance, every child can do more than he can by himself - though only within the limits set by the state of his development"* (Vygotski, 2012). The consequences of this theoretical approach on pedagogy are quite similar to those of constructivist view, recommending interactions with others to broaden the zone of proximal development in order to improve school performance (Vygotski, 2012). However, Vygotsky assigned much more importance to the role of adults as key actors helping children learn new skills (Vygotski, 2012). Communities of practice drew inspiration from this approach and focused much more on understanding how learning processes happen in socially situated contexts.

Constructivist and sociocultural constructivist approaches view cognition as a set of interconnected cognitive and social processes. Learners have to become active in the learning process both to deepen their cognitive understanding and to actively develop their social skills and internal motivation towards learning. From this rich theoretical background stem a plethora for different methods for supporting learning with technology and a variety of approaches to evaluation, measured both at individual and group level.

### 2.3. **Approaches to Collaborative Learning**

Vygotsky's work has inspired several different approaches to teaching collaboration in technology empowered contexts. There are three different approaches which see collaborative learning as (1) participation in a community of learning (Brown et al., 1989; Lave et al., 1991) (2) a process through which problems are solved (Hmelo-Silver, 2004) and (3) a process through which knowledge is created (Paavola et al., 2004; Scardamalia and Bereiter, 2006; Stahl, 2006). Some knowledge based approaches further emphasize the creation of material artifacts through the process of collaboration (described as dialogical learning) (Hakkarainen and Paavola, 2009).

The diversity of approaches to collaborative learning flags the diversity of definitions. I define collaborative learning after Dillenbourg, starting with a broad definition of “a situation in which two or more people learn or attempt to learn something together” (Dillenbourg, 1999). Each of these terms should be clarified to explain the context of the learning situation. Additionally Kirschner proposes a number of conditions that many collaborative (or cooperative) situations share: learning is active, the teacher is a facilitator instead of “sage on the stage”, teaching and learning are intertwined, there are small-group activities, learners have active responsibility for their learning, learning is reflective (conscious of its own assumptions and thought processes), team and social skills are developed through the process of consensus building (Kirschner et al., 2006). In this research I primarily take a macro lens considering both synchronous and asynchronous interaction of a group of learners and facilitators who participate in online courses.

### *2.3.1. Collaborative Learning as Participation*

Advances in technology, especially in the field of automation and communication, have had a profound impact on how learning and work have been considered as research. Zuboff, who studied the impact of technology on learning in different organisations highlights the importance of promoting skill building through real work: ‘Learning is not something that requires time out from being engaged in productive activity; learning is the heart of productive activity. To put it simply, learning is the new form of labor’” Zuboff (1988). Such learning on the job is one of the aspects of informal learning, which considers learning outside of its academic and accreditation bearing context, situated in other contexts (home, family, work, community organisations etc.) Lave et al. (1991); Livingstone (1999, 2001); Wenger (1999); Zuboff (1988). While informal learning can be individual, many researchers have considered it as a process of participating in a community.

Informal learning can be defined as “any activity involving the pursuit of understanding, knowledge or skill which occurs without the presence of externally imposed curricular criteria” Livingstone (2001), is “unstructured, experiential, and noninstitutional” Marsick and Volpe (1999) and “spontaneous, experiential, and unplanned” Greenhow and Robelia (2009). Livingstone’s foundational study based on Canada-wide phone survey found that up to 80% of adult learning happened informally, outside of organised education courses, accounting for 15 of total of 19 hours per week devoted on average to all forms of learning Livingstone (1999). The main types of informal learning uncovered by the study were associated with: (1) related to learning in professional contexts (with most frequent ways including keeping up with new general knowledge in job/career, technical skills, including working with computers or other technologies), (2) volunteering (which supported learners’ development of interpersonal, communication and managerial skills and learning about social issues), and (3) household and hobbies, such as gardening, cooking or DIY as well as pursuing hobbies (health and fitness, arts and crafts, public speaking etc.). Subsequent research looked into identifying conditions which can help promote informal learning. Marsick highlights the importance of collaboration in trust to promote informal learning in professional context, and highlights the importance of proactive identification of

challenges ahead (organisational level) and the importance of self-reflection and learning mindset (individual level) to recognise opportunities for learning Marsick and Volpe (1999). Eraut discussed the importance of learning factors (confidence and commitment, challenge and value of the work, feedback and support) as well as context factors "allocation and structuring of work, expectations of each person's role, performance and progress, encounters and relationships with people at work" Eraut (2004).

Lave and Wagner's work on building communities of practice explored learning as situated in the process of legitimate peripheral participation (Lave et al., 1991). Situated learning extended the unit of analysis from a group, including its learning artifacts, and the tutor to a much larger community of practice. Social practices are a key component in communities of practice and learning is viewed based on the model of apprenticeship where individual adopts the social practices of a learning community as they negotiate their participation (Lave et al., 1991). Wenger's later work on learning, meaning and identity creation further explored the dynamics of this interaction (Wenger, 1999). He stipulates that given the situated nature of learning, remembering and understanding, human minds develop in social situations, education achievement fails to translate into effective use of knowledge. He calls for educational practice to become more responsive to this, which is especially relevant as information technology reshapes the borders between individual and social action, and enable more negotiative and participative means of designing learning and teaching contexts (Wenger, 1999). Other research Boud and Middleton (2003) has found that also more loosely-coupled networks of individuals can also lead to informal learning, even though they do not meet Wenger's indicators Wenger (1999), recognising that there is a diverse range of people from whom one learns at work, especially at increased level of seniority, but many of these communities of practice do not strongly build identity and meaning Boud and Middleton (2003).

Communities of Inquiry (CoI) have similar origins to communities of practice in the work of constructivist, pragmatists and sociocultural constructivists discussed in previous sections. CoIs differ from communities of practice in the focus on the process of inquiry, as opposed to moving through roles in community participation – from novice to full member of a community. Main theoretical grounding for communities of inquiry was provided by Garrison and Anderson Garrison et al. (2010). The CoI framework proposes that learning experience is created by the interaction of three interdependent factors: cognitive, social and teaching presence (Garrison et al., 1999). CoI framework puts emphasis on conversational approach to learning (Lipman, 2003). The conversation is seen as a dynamic and forward moving, implying that an argument needs to be followed where it leads, and should always aim to push knowledge forward or identify gaps in existing understanding (Dewey, 1938). Community is another important element of the framework, as friendship leads to creating a safe space which promotes open exchange of ideas and collaboration. Managing emotions and developing affective qualities towards learning are emphasized as important and are explored by many researchers (Garrison, 2015; Garrison et al., 1999).

The Community of Inquiry framework (CoI) (Garrison, 2015; Garrison et al., 1999) also emphasises the importance of teaching for the creation of positive learning outcomes, and identifies that teaching roles can be distributed among wider course participants. CoI points to the importance of designing environments, facilitating discourse and providing direct instruction (Akyol and Garrison, 2008; Garrison et al., 1999). Design and organisation tasks involve planning, administration, evaluation and certification; facilitating discourse involves co-creation of a social environment; and direct instruction includes providing expertise both in subject matter as well as pedagogy (Anderson et al., 2001b). Facilitating discourse is especially important; the discussion of discourse ethics by Habermas highlights a set of criteria for valid discourse that have an impact on instructional design and power relations within a group Habermas (1981). The main presuppositions to be sufficiently met are for all participants: to be included and equally able to contribute, to sincerely mean what they say, and to motivate their assent or dissent based on reason or persuasion, rather than coercion or inducement Habermas (1981). More recently CoI framework has been applied to study of online learning experiences (Akyol and Garrison, 2008; Shea and Bidjerano, 2009; Stodel et al., 2006).

Affinity groups, less formal and interest-based participatory communities, have also been studied as spaces for teaching and learning. Especially work by Gee (2003, 2005b, 2018) and Jenkins (2009) has recognised affinity spaces as relevant design inspirations for formal learning (Gee (2003)). Affinity groups share many qualities with communities of practice: they are informal learning and identity formation where novices become experts as they are guided by more knowledgeable participants in the social structure of the community (Gee (2004, 2005b)). However, the mentoring model is a distributed one - instead of a clear and formal progression from learners to expert set by hierarchical structures, learners can be both learners and teachers at the same time, depending on their unique expertise (Campbell et al. (2016); Evans et al. (2017); Gee (2004, 2005b)).

### ***2.3.2. Problem-Based Collaborative Learning***

One method advocating experiential learning is problem-based learning, where students work through complex problems, which do not have a single correct answer, with the help of facilitators. In most applications of the method, students work as part of collaborative groups in order to frame the problem, request additional information from their facilitator in order to propose potential solutions, before reflecting collectively on their experience. Collaboration is a key strategy used to limit cognitive load on learners facing complex problems, allowing the learners to respond to collectively solve problems which would be beyond their individual skills level (Salomon, 1993). Small group discussions are extremely important for the process as they enhance higher order thinking and promote collaborative construction of knowledge (Barrows, 1996). The method relies heavily on self-directed learning on the part of the students, consistently with other constructivist inspired approaches.

Learning objectives defined by teachers using problem based learning are usually much broader than in instruction based classrooms and include helping students develop transferable

knowledge, problem-solving strategies, self-directed learning skills, team work skills as well as affinity for learning expressed through intrinsic motivation. Many of these skills are important in the context of transferability and life long learning skills and attitudes (Hmelo-Silver and Barrows, 2006).

Teachers play a very important role as facilitators of the experience. The first is because on the outset learners are only given limited information about the problem. Learners must question facilitators to acquire the information needed to get started and then continue gathering additional facts through either research or experimentation (Hmelo-Silver and Barrows, 2006). Throughout the process the teacher helps learners define good strategies to learn and reason, providing coaching as opposed to subject matter training. As learners become more confident, facilitators remove their scaffolding provided in the form of questioning strategies and shift their responsibility to monitoring that the group process is moving along the way (Barrows, 1996; Hmelo-Silver and Barrows, 2006).

### ***2.3.3. Knowledge Creation Through Collaborative Learning***

Computer Supported Intentional Learning Environments (CSILE) (Scardamalia and Bereiter, 2006) was one of the foundational projects for research in computer-supported collaborative learning (CSCL). It was the first project of its kind, designed to engage learners with the kind of learning process elaborated by Dewey at the turn of the 20th century, which involved learners in a process of inquiry using the same advanced methods as are used by the scientific community, supported with an online technology where artifacts could be created and where learners could collaborate and discuss their ideas (Scardamalia, 2002). The project eventually evolved to Knowledge Forum (Scardamalia, 2002).

The focus of CSILE was to present knowledge as collaboratively constructed by distributed knowledge building discourse, and undergoing constant review and refinement (Scardamalia and Bereiter, 2006). The idea of importance of interactional space like the Knowledge Forum is also central to Stahl's group cognition theory (Stahl, 2006), which proposes that in groups which are collaborating very closely the group discourse or the knowledge can no longer be attributed to any single individual or be even reduced as a sequence of contributions from individual mind, but instead have to be viewed in terms of a group. This theory also emphasized the role of mediation and presentational artifacts that are used by the group as key to the group learning processes (Stahl, 2006).

Sugata Mitra's work is situated on the extreme end of inquiry based learning with his early research focused on understanding the dynamics of unsupervised children learning using computers through the "hole in the wall experiments", where children with no computer literacy learned to use different programs and taught each other about their discoveries (Mitra and Rana, 2001). This work evolved to include more formal learning settings including student collaboration in school classrooms (Mitra and Dangwal, 2010). In its most recent configuration, a SOLE (self-organised learning environment) involves children using the Internet, in a classroom setting to answer "big questions" by decoding meaning through working in small groups; children

explore a variety of resources (not constrained to those created with children in mind) (Dolan et al., 2013; Mitra, 2013). The principle of self-organisation (a term borrowed from physics) describes a system of local interactions void of centralised control that emerges spontaneously and which, in its application to education, Mitra calls “learning at the edge of chaos” (Mitra, 2013).

### ***2.3.4. Ensuring Effectiveness of Collaborative Learning***

The value of collaborative learning has driven a major ideological divide between education academics. Some are strong believers in instruction based learning, which have a proven track record of generating measurable outcomes (Kirschner et al., 2006), others are proponents of benefits of problem-based learning (PBL) and inquiry learning (IL) theories which highlight multifaceted learning outcomes achieved with these methods (including development of critical and flexible thinking skills, epistemic domain practice and adaptability in addition to conceptual and procedural knowledge) (Hmelo-Silver, 2004; Hmelo-Silver and Barrows, 2006; Hmelo-Silver et al., 2007).

### ***Limitations of Pre and Post Testing***

Instruction based learning is able to provide robust and easy to interpret results of learning, based on pre and post testing of taught material. However, pre and post measures present an incomplete picture of collaborative learning, referring only to cognitive gains (Stahl, 2013). Such measures ignore a vast array of ancillary social skills acquired through collaborative learning processes (Hmelo-Silver, 2004). Additionally, it is very difficult to compare between experiments at high level as there is no unified evaluation framework which could be used to look at individual, small group, large group and different kinds of learning experiences or experiences that combine different parts of community learning, problem based learning and knowledge creation approaches (Stahl, 2013), though some initial framework such as Group Spinner have been proposed (Kharrufa et al., 2017). Further, pre and post measures can only evaluate learning that is complete, not help diagnose and solve problems relating to knowledge construction (to understand where the zone of proximal development is). Finally, pre and post testing, while valuable in specific learning contexts where specific knowledge can be evaluated, is not as helpful in learner-led flexible curriculum environments, where participants co-create the course on the go. Broad set of benefits to measure focus on different kinds of impact of collaborative learning – a much broader set of outcomes as it has a very different set of benefits. Additional challenges arise as it is difficult to control for the novelty factor in some experimental implementations Clark (2013). The broad nature of expected learning outcomes makes it difficult to quantify the impact of learning and compare with traditional modes of learning (Clark, 2013; Hmelo-Silver, 2004).

### *Difficult to Evaluate Individual and Group Simultaneously*

An important methodological challenge evaluating collaboration is related to its mode. In collaborative environments, what frequently is assessed is either individual performance or task completion. However, these are always products of the collaborative process and therefore a valid assessment would look beyond the individual and into group performance (Dillenbourg, 1999). Dillenbourg proposes that *"This 'validity' can be understood in practical terms: more and more professionals have to collaborate and it is an important goal for any educational institution to improve the students performance in collaborative situations"* (Dillenbourg, 1999). Empirical research on the effectiveness of collaborative learning tends to focus on the small scale regarding time (1h of interaction) and group size (two to five individuals), which reduces generalizability of insights derived from such studies across other contexts (Dillenbourg, 1999). Stahl proposes that CSCL requires multiple theories as it is not possible to build a unifying theory which is actually going beyond the concept of using mixed methods as a methodology because in CSCL there are distinct phenomena happening at very different levels of description that interact in complex ways (Stahl, 2013). Qualitative methods are especially useful when we are interested in studying both learning at an individual and group level and how the two interrelate (Stahl, 2013). Other research recommends studying social and cognitive learning together *"research paradigms built on supposedly clear distinctions between what is social and what is cognitive will have an inherent weakness, because the causality of social and cognitive processes is, at the very least, circular and is perhaps even more complex"* (Perret-Clermont et al., 1991).

These problems evaluating learning were already present when collaborative learning happened in classrooms where learners were situated in the same physical and temporal space. When collaborative learning moved from a physical classroom online, these problems were additionally amplified by asynchronicity of learning and spacial dispersion of participants (Dillenbourg, 1999). Online learning research thus presents both a unique set of challenges and a unique set of opportunities in terms of evaluating collaborative learning.

### **2.4. Massive Open Online Courses as Environments for Learning and Collaboration**

MOOCs are seen as having the potential to bring world class education to the masses, connect them together and allow them to learn 21st century skills, all while bringing global perspectives to the connected learning community (Rhoads et al., 2013). The concept of MOOCs was founded in experiments in Canadian universities at the turn of the new millennium, and they proposed learning at scale with strong component of collaboration and course co-creation by learners. Since the inception of the term MOOC in 2008, two main types of online courses emerged: xMOOCs and cMOOCs (Kennedy, 2014). Connectivist MOOCs, which focus on enabling self-organisation of learners in connected and open environments, where learners co-create and co-design both the learning curriculum and the learning environment are more relevant to the research than xMOOCs where fixed curriculum is delivered at scale by leveraging the power of automation. CMOOCs allow learners to participate in unique experiences, stretch their creativity



and grow their network in the other (Kop, 2011). The rhizomatic learning courses proposed by David Cormier are a radical expression of connected learning (Cormier, 2008b).

### *2.4.1. CMOOCs: Scaling Through the Power of Social Network*

Connectivism was proposed by George Siemens as a new theory explaining learning which happens in a world where people are connected to each other and resources via technology (Siemens, 2004, 2005, 2006). Connectivism explains knowledge as a set of connections that are formed either inside an individual's mind or in a society, and that form a network which adapts as experiences are built (Siemens, 2004). Learning is described as a nonlinear process whereby learners tap into the knowledge network (Siemens, 2004). CMOOCs emphasize connected learning, an approach that requires openness (open access), autonomy (choice of learning pathways), diversity (of learners) and connectedness (the process which enables learning) (Siemens, 2004). Engagement and learning motivation were the key questions considered in the scholarship about these first MOOCs (Kop and Carroll, 2011). Other research investigated how to best design the learning environment to allow for transformative learning to take place and which of the several off-the-shelf online applications were preferred by learners (Kop, 2011).

Connectivism emphasizes the importance of networks between learners and instructors, established through modern communication technology, for creating meaning (Siemens, 2004). It stipulates that in a fast-changing world it is essential to amplify the velocity of idea generation through large-scale, open and diverse learning networks (Siemens, 2004, 2005). Learners are invited to self-organise and to join course organisers in co-creating, sharing and remixing course materials (Kop, 2011; Siemens, 2005). In the most extreme iteration of rhizomatic learning, learners' contributions are the only curriculum there is (Cormier, 2008b). The results of this type of learner self-organisation have been mixed to date. Positives included transformational and exciting learner experiences (Mackness and Bell, 2015; Mackness et al., 2010) and productive impact on learning due to the multiplicity of learner perspectives throughout the course (Ferguson and Sharples, 2014).

Several vocal critiques rejected connectivism as a learning theory (Rhoads et al., 2013) and then as a "naive and damaging blip in the educational media's long and carefully grounded history" (Arora, 2010). such approaches still face the criticism that they do not resolve the scaling challenge, that is, the support of a higher ratio of learners to experts while maintaining a good learning experience for all (Mackness and Bell, 2015). Negative experiences included reports of demotivating and disturbing learner experiences (Mackness and Bell, 2015; Mackness et al., 2010) or learners being distracted with logistical and technological challenges (Kop, 2011). Learners reported feeling confused and overwhelmed when faced with the high frequency of communication (Ferguson and Sharples, 2014; Kop, 2011). Their way of teaching has been critiqued as predominantly appropriate for confident expert learners (Mackness and Bell, 2015). In addition, they have been shown to lead to learners self-organising into echo chambers of like-minded individuals (Kop and Carroll, 2011; Mackness et al., 2010; Rhoads et al., 2013),

which is in line with previous research of blogosphere as a space where individuals operate within their own belief groups (Adamic and Glance, 2005).

Connectivist courses are only the beginning of a journey to design pedagogy enabling students to effectively co-create courses that deliver a fulfilling learning experience. Related literature does provide helpful recommendations to make the best use of peer learning including supporting less experienced learners, especially in early socialization, focusing on well-suited instructional design, limiting learner exposure to class communication through dividing learners into smaller groups, or hiding it through platform functionality (Ferguson et al., 2016; Ferguson and Sharples, 2014; Kop et al., 2011).

### ***2.4.2. XMOOCs: Scaling Through Content and Learning Platforms***

CMOOCs inspired the second wave of courses (xMOOCs) which stood in contrast in both pedagogy and philosophical foundation. The scale of courses increased, with some reaching more than 100,000 registered students. This new generation of xMOOCs were inspired by behavioural cognitivism Kesim and Altinpulluk (2015), and focused on acquisition of information predefined in a linear curriculum and communicated to learners by means of online videos, articles and assessed through online quizzes and automatically or peer reviewed assignments Ho et al. (2014). Where in cMOOCs knowledge was generative, in xMOOCs it was declarative. Furthermore, in xMOOCs the relationship between teacher and her students is limited, and the knowledge “transmitted” to students. Interaction in xMOOCs is mediated by (mostly) proprietary platforms, with course content typically protected by restrictive licenses that do not allow sharing.

Scholarly discourse on xMOOCs focuses on learning analytics (learners’ unique learning paths through course content in a constrained and predefined platform environment), optimisation of user experience to minimise attrition, and assessment (in the context of MOOCs as substitute for brick-and-mortar based delivery. The lack of innovation in MOOC pedagogy is the predominant axis of critique, with MOOCs’ unidirectional structure seen as failing to capture the transformational potential of education.

Research of xMOOCs focused on completion, student attainment, and modes of assessment (Ho et al., 2015, 2014). While different iterations, including SMOCS, GMOOCS (Cusack, 2014), have emerged as universities have started to experiment with smaller scale MOOCs, some of them with a team of tutors to help guide the students through complex content, in general xMOOCs work best to deliver courses based on a set curriculum and are less appropriate to promote a learner agency based flexible curriculum courses. Recently efforts have been invested to enable collaboration and feedback between learners in xMOOC courses, such as for example the TalkAbout and PeerStudio systems (Kotturi et al., 2015). Research has shown that deep integration into core course curriculum helps drive engagement in peer learning, that it is important to emphasize co-dependence between learners and community norms and that teacher training can help improve scaffolding offered to learners which in turns helps establish a healthy peer learning ecosystem (Kotturi et al., 2015).

In most xMOOCs learners interact with fully automated websites where they can engage with pre-recorded content (Baggaley, 2013; Ferguson and Sharples, 2014). The teaching presence is provided by experts and instructional designers who set learning pathways, prepare and organise course content, ensure community standards and assessing learner work. In this way, it is not dissimilar to how distance education has typically functioned (Anderson et al., 2001b; Baggaley, 2013; Ferguson et al., 2016). However, interaction between learners and teaching staff is limited at best (Baggaley, 2013; Rhoads et al., 2013). xMOOCs have also been criticised for inadequate pedagogy resulting from low instructor to learner ratio (Baggaley, 2013; Kulkarni et al., 2015a). Distance education research provides a model for effective teaching support, suggesting a five-stage engagement model with facilitators becoming progressively less active in late learning stage when students acquire the confidence to learn independently (Salmon, 2012).

Additionally, also in more teacher and curriculum centric learning environments such as xMOOC, some level of contribution to teaching by learners is possible, for example deep integration of peer tools like TalkAbout and PeerStudio into core course curriculum (Kotturi et al., 2015; Kulkarni et al., 2015a,b). Finally, the potential of integrating social media in online education has been demonstrated by several research studies (Greenhow and Lewin, 2016); it allows learners to interact using familiar tools and foster creation of personal bonds (Greenhow and Lewin, 2016).

### 2.4.3. *Other Approaches to Online Learning*

Since 2013 ('the year of the MOOC') the landscape of MOOCs has seen innovation in approaches to tackle the challenge of learner engagement, assessment and feedback. New takes on developing online interactions between learners and course organisers included DOCCs (distributed online collaborative courses), BOOCs (big open online courses), SMOCs (synchronous massive online courses), SPOCs (small private online courses) and corporate MOOCs (Cuesta et al., 2016). In particular, experiments with SPOCs have shown promise. Harvard Business School launched HBX, a proprietary platform for executive business courses that demonstrated high engagement of learners in the course (by facilitating more interaction between students and between about 60 students in the class and organisers). Other edX courses have demonstrated a positive improvement on the quality of student assignment quality when a smaller group (132 students) is given assistance from a higher number (15) of teaching fellows. Similar positive experiences in terms of student engagement and higher quality instruction were noted also in Harvard's CopyrightX course, where a pre-selected group of students engaged in group discussion, managed by a group of TFs, using videoconferencing.

A unique approach to running MOOCs is presented by FutureLearn, an online learning platform founded and co-owned by the Open University. It is distinct from xMOOC and cMOOC approaches, as it attempts to both provide high quality guided course content (like an xMOOC) but also puts high emphasis on social and conversation aspects of learning, encouraging its students to engage in deep online discussions on course topic ran on its platform (like a cMOOC). Literature shows that, despite being a more social-focused platform, many learners opt in to learn

individually and draw value from that (de Waard et al., 2015) or that less than 1% of conversations in the course exceed more than 10 turns (Chua et al., 2017).

### ***2.4.4. Learning Digital Civics Online***

A primary objective of digital civics is to support citizens in their technology-facilitated interaction with public institutions that can support the actualising of the public will Vlachokyriakos et al. (2016). One of the major application of digital civics is in exploring how might technologies support communities in their co-creation of knowledge and resources in dialogue with an array of different stakeholders (including governments, NGOs, companies, communities), with the aim to driving social impact (including provision of services) Vlachokyriakos et al. (2016).

Learning digital civics online encompasses a variety of online activities, including awareness/advocacy, organisation/mobilisation and action/reaction (McCaughey and Ayers, 2013) and much of the existing research base addresses the role of social media in driving awareness about issues and the mobilization of populations to act in response to these issues. Digital civics has been proposed as an important area for HCI inquiry (Vlachokyriakos et al., 2016).

HCI and social computing into online activism has explored a broad range of issues, including awareness and advocacy efforts, organisation and mobilisation, as well as action and reaction dynamics (McCaughey and Ayers, 2013), with much focus on the role of social media and mobile technologies in both driving awareness and mobilising for action (Richardson et al., 2017). Much work has been devoted to understanding the process of organising the work and efforts of volunteers online, as well as civic engagement in general (understood as engagement in initiatives with public benefit, not limited to campaigning). Research focus has been on the coordination of crowd-sourced work in online activist communities (Liaw, 2008), for example, in the creation of online encyclopaedias (Forte et al., 2012). The role of social media in creating political movements has been a topic of inquiry (Harlow and Harp, 2012; Howard et al., 2011), with the Arab Spring being the most prominent example (Howard et al., 2011), as well as understanding potential of digital civic education to drive offline impact (Harlow and Harp, 2012; McCaughey and Ayers, 2013). Social media has also been shown as a means to enable volunteers to self-organise in times of crisis (Starbird and Palen, 2011) and shape political debates, the diffusion of political ideas across national borders, and its use in the coordination of offline mobilization. As well as its use in protests during the Arab Spring (Howard et al., 2011; Khondker, 2011), several such studies explored the role of social media for spreading political ideas and sustaining decentralised movements (Hara and Huang, 2011) such as Occupy Wall Street (Juris, 2016).

### ***Learning Through Civic Focused Activities***

A recent survey has demonstrated that 161 MOOCs specifically across different platforms specifically related to topics of civics and sustainability Delgado-Algarra et al. (2019). Other research has shown that online discussions can lead to lasting civic impact Brinker et al. (2015);

Eudey (2012), further highlighting the relevance of discussion based online learning experiences to the field of digital civics.

However, learning does not always happen through the format of courses. Interesting examples of learning initiatives are more focused around knowledge building on topic of interest. Connected Learning Research Network is an umbrella of initiatives supported by the work of academic community led by Mimi Ito. Some projects, focused on social mission goals in addition to educational goals include Connected Camps (moderated online learning in gaming, coding and design for kids), YOUMedia (an innovative learning space housed in Chicago Public Library) or Quest to Learn (a public school in New York where curriculum is based on game design and technology is core to interaction). Additionally, learning and engagement initiatives have been organised in a form of collaborative games, such as WhatFutures, conducted in partnership with International Federation of Red Cross and Red Crescent Societies, where participants jointly forecasted the future by collaborating through WhatsApp discussions (Lambton-Howard et al., 2019).

### *Organising Work of Volunteers Online*

The most researched online community is Wikipedia, which has been analysed from several points of view as knowledge crowdsourcing experiment, as an example of an altruistic community and as a social movement. Studies of endeavors such as Wikipedia (Forte et al., 2012) have yielded design principles for effective online communities, including strong sociability features (clearly defining community members' roles and responsibilities, codes of conduct, expectations) (Preece, 2000), usability designs that allow both novices and experienced users to effectively participate in the community (Preece, 2000) and community building principles to achieve group identity and group cohesiveness through reinforcing the "mission" (Preece, 2000; Ren et al., 2012). In relation to online activists communities, the definition of a sense of 'I' and others has also been seen to be a key element of vibrancy and sustainability (Preece, 2000). However, other researchers show the difficult reality for online communities to achieve civic impact and the undermining of their democratic efficacy that can result from the demands of commercialization (Harness, 2011).

Civic focused online communities have empowered young people to learn about volunteering opportunities in their communities (DoSomething.org, PublicLab.org) but these do not prioritise course-based education, offering instead self-guided access to educational materials and it does not go beyond providing a motivational context for self-guided learning (Liaw, 2008). Other approaches include organisations such as Ashoka Changemakers or Global Youth Connect, which promote role models for would-be do-gooders.

In summary, a variety of approaches, both course based community based have been studied to engage learners in online learning activities and in civic minded agenda. However, given inconsistent learner experiences, and the richness of options, the area still requires further investigation (Garrison, 2015; Kop et al., 2011).

### *Role of Technology and Social Media in Creating Political Movements*

A primary focus of digital activism research is the role of technology and social media in creating political movements (Hara and Huang, 2011), and in particular, the development of an understanding of how activist organisations can drive offline action in offline communities (Harlow and Harp, 2012). For example, a number of studies explored the dynamics of the role of social media in shaping political debates (reinforced by absence of free media), affecting events on the ground and spreading democratic ideas across national borders during the Arab Spring (Howard et al., 2011; Khondker, 2011). Other work has not only showed the importance of social media for spreading political ideas, but also the importance of assuring the sustainability of movements such as Occupy Wall Street by decentralisation (Juris, 2016).

Analysis of youth online civic engagement revealed the changing nature of citizenship in the digital age – from dutiful citizen (who sees voting as a core responsibility of a citizen) to an actualising citizen (who typically distrust government and do not view voting as core citizen responsibility and instead focuses on importance of loosely networked community actions). Several online communities exist which aim to empower young people to learn about volunteering opportunities and how to make an impact in their communities (DoSomething.org, PublicLab.org) or programs organised by leading global educational institutions (such as MIT's Center for Civic Media and Harvard's Berkman Center). Other approaches seek to promote young activist role models through their fellowship programs, such as Global Youth Connect. Studies of activist website design (Montgomery et al., 2008) highlight that such sites do not focus on course-based education, but instead offer self-guided asynchronous access to educational and promotional materials. Where courses on digital civics do exist, they are primarily organised in xMOOC format, without specific attention being given to community development and social skills improvement Delgado-Algarra et al. (2019).

## **2.5. Approaches to Supporting Learning with Technology**

Learning can be supported with technology in a variety of ways, both online and offline. This section will mirror the previous one in its structure. The section will start with approaches to use social media to facilitate learning and contrast this approach to usage of specialised platforms.

### *2.5.1. Adapting Mainstream Social Media for Learning*

Connectivist courses operated using a combination of social media platforms. Learners were encouraged by course organisers to bring in the resources that they were the most comfortable using, in order to create personal learning environments. Course leaders established course presence on some platforms such as Moodle forums, P2PU, Ustream, Elluminate and a Wiki page (Mackness and Bell, 2015; Mackness et al., 2010). Learners created their own spaces such as blogs, Wikis, Ning, and also mainstream social media presences such as Facebook, Google and Diigo groups (Mackness et al., 2010). In some connectivist courses, social media feeds

were aggregated through RSS feeds or mailing lists (Kop and Carroll, 2011; Mackness and Bell, 2015).

Online communities and affinity groups have also worked to adapt mainstream social media or simple social features of websites for learning purposes. Research on learning and teaching in fan fiction communities has found that participants show mentoring behaviours through comments, providing feedback and guidance to other writers using the comment features of these online communities (Campbell et al., 2016; Evans et al., 2017). Additionally, some research flags that while they only studied publicly available online discussions, they found evidence of other means of communication between participants in these communities, including Skype Campbell et al. (2016), private messaging and phone calling between the writers Evans et al. (2017). I will come back to the topic of online communities in my discussion of supporting civic action oriented online communities.

Another pedagogical approach to supporting both individual and social informal learning is Personal Learning Environment (PLE), which proposes the use of social media to promote self-regulated learning in higher education contexts Dabbagh and Kitsantas (2012). The goal of the PLE framework is to support educators in engaging students in transformative self-regulated learning through a three layer approach: level 1 - starting in creating a personal learning space in social media such as blogs and wikis, level 2 - engaging in social interaction and collaboration on these social media and level 3 - aggregate and manage the information to support reflection on the learning process Dabbagh and Kitsantas (2012). Some of the most important components of self-directed learning communities proposed by researchers have included access to information, the ability to communicate with others, and the ability to acquire and share knowledge. Clark (2005); Dabbagh and Kitsantas (2012); Quintana and Morales (2015). Additionally, search and discovery friendliness of the design (such as segmentation, tagging, clear titling) have been recognised as important for promoting informal learning Ally et al. (2006).

### 2.5.2. *Content Focused Learning Platforms*

Most frequently used online courseware was built with a fixed curriculum and fixed learning outcomes in mind and not with the connectivist approach in mind. Such LMS systems inspired by behaviourist approaches to education (such as Coursera, Udacity) are inappropriate for self-organised courses due to their rigidity and low level of peer interaction. However some efforts have been invested to enable collaboration and feedback between learners in xMOOC setting, such as for example the TalkAbout and PeerStudio systems (Kotturi et al., 2015). Deep integration of peer collaboration tools such as TalkAbout and PeerStudio into core course curriculum helps drive engagement in peer learning, but it is also important to emphasise co-dependence between learners and community norms; teacher training can further help improve scaffolding offered to learners which in turns helps establish a healthy peer learning ecosystem (Greenhow and Lewin, 2016).

Additionally, the potential of integrating social media in online education has been shown by several research studies (DiVall and Kirwin, 2012; Greenhow and Lewin, 2016). Integration

with social media allows learners interact using familiar tools and foster creation of personal bonds (DiVall and Kirwin, 2012; Greenhow and Lewin, 2016).

### ***2.5.3. Learning Platforms Aiming to Support Social Aspects of Learning***

Alternative learning platforms (Moodle, Blackboard, Piazza, etc.) support sharing content well, but do not help solve the many organisational challenges faced by facilitators in highly interactive course designed for retention and high learner engagement (such as processing participant applications, automatically creating work groups, integration with video conferencing software etc.). Additionally, these platforms, despite providing support for communities of practice through some social features (eg. discussion forums) instilled concerns regarding the success of these features for driving learner interaction, communication and creation of lasting social connections given their perceived academic and formal nature (Al-Ajlan and Zedan, 2008; Deng and Tavares, 2013).

### ***2.5.4. Technology for Supporting Civic Engagement***

Modes of online civic participation by young people has been explored in the context of the changing nature of citizenship in the digital age; from dutiful citizen (for whom voting is as a core duty of a citizen) to an actualising citizen (who is likely to distrust the government and for whom loosely networked community actions are a more important reflection of citizen duty than voting) (Montgomery et al., 2008).

Several online communities exist today to seek to empower young people to learn about volunteering opportunities and making an impact in their communities (DoSomething.org, PublicLab.org). Other approaches include organisations such as Ashoka Changemakers or Global Youth Connect, which promote role models for would-be do-gooders. These approaches do not focus on course-based education, offering instead self-guided access to educational materials and it does not go beyond providing a motivational context for self-guided learning (Montgomery et al., 2008). These approaches provide an opportunity to teach about how to make a positive civic impact – both in theory and in practice.

The technology support provided by these initiatives is usually a website, with information about projects or approaches to be taken. Providing content in a clean and usable format is the priority for this approach. Many civic driven initiatives rely on public social media in order to coordinate their efforts. Literature draws attention especially to the use of Twitter (Howard et al., 2011; Khondker, 2011) and Facebook (Juris, 2016). Other research has also identified the potential of listservs to facilitate communication and knowledge sharing among informal learners, which can empower them and subsequently lead to social change Quintana and Morales (2015).



## 2.6. Summary of Research Opportunities

In summary, constructivism stipulates that we learn best if the process of learning is self-directed, and sociocultural constructivism adds that we learn best if we learn with others, who help us extend our zones of proximal development. Pedagogy in collaborative learning differs depending on technological setup, but even in the most student-oriented environments (e.g. Communities of Inquiry), teaching presence is seen as separate from social and cognitive interaction. This implicitly draws a line between learners learning and teachers teaching. In a fully student-led environment it should be possible to evaluate both learning and teaching using the same framework. Civic engagement is a concept whose importance is broadly recognised in HCI literature, but in terms of supporting learning others how to become actualising citizens, there is ample opportunity to experiment with design (ranging from course based approaches to game like activities).

There is a need to deliver a systemic analysis of trade-offs relating to organising a connectivist inspired course both with and without a central management structure. There is also an opportunity to explore the potential of such a learning approach to drive cognitive and social learning and lead to civic engagement outcomes. This is especially useful to explore in the context of an evaluation framework which would be possible to summarise both individual and group contributions to collaboration, and social and cognitive aspects of learning, in a learning context of learner-led flexible curriculum (the details of literature related to evaluation framework will be presented in detail in Chapter 6 and Chapter 7).

<i>Learning Environment</i>	<i>Set Up Cost</i>	<i>Flexibility</i>	<i>Social Features</i>
Coursera	High	Low	Low
edX	High	Low	Low
FutureLearn	High	Low	High
Moodle	Low	Medium	Medium
Blackboard	Low	Low	Medium
Piazza	Low	High	Medium
Loosely-coupled social media	Low	High	High

**Table 2.1** Existing Learning Environments Feature Comparison

Several course building platforms already exist (Table 2.1) and are endorsed by the world's most prestigious educational institutions. However, they have been geared towards content focused linear learning pathways, initial set up costs are very high, and most do not have sufficiently robust community building features. While other tools, such as Moodle, Blackboard and Piazza focus more on empowering learners to collaborate, most are also less flexible than a combination of loosely-coupled social media. Loosely-mixed social media was thus selected, in line with the connectivist inspiration, as the base test learning environment to help guide design process of a learning environment for student-led civic impact focused courses. Literature provides examples of design guidelines for such a learning environment design, drawing on

both critiques of connectivist courses and design recommendations of online communities and technology supported civil engagement initiatives.

## **Chapter 3. Methodology**

The research area of online learning and collaboration is important, as are the benefits of further exploring learner-led collaborative learning, as highlighted in Chapter 1. Specific areas of interest identified were supporting learners as course co-creators and exploring collaboration in contexts where the curriculum is open and focused around ambiguous and difficult to tackle questions. Chapter 1 also presented the research questions and objectives, expected contributions and proposed action research as the learning approach. Chapter 2 contextualized the work in the existing research space, as stemming from constructivist and socio-constructivist approaches to learning, as well as sharing approaches to supporting learner-led and collaborative learning both in technology supported contexts (problem-based learning, communities of learning, knowledge forum) and online learning contexts (through course based approaches, communities and digital civics activities).

Given the motivation of this research and its theoretical grounding, action research approach (AR) has been identified as the preferred research method. Action research fits well given the ontological, epistemological and methodological aspects of this work. Action research is “a class of methods and approaches for conducting socially relevant, collaborative and engaged research” (Hayes, 2011, 2014; Rogers, 2012). I was involved in the research project as the learning methods and infrastructure designer, as well as key investigator on the Online UWC project. I also helped organize and run the courses themselves. The project involved running five courses in three distinct technological set ups – with loosely coupled resources (loosely-coupled), with the Learning Circle platform only (platform), and with the Learning Circle platform complimented with the use of social media (hybrid). Throughout this chapter I will argue that given the nature of the project, action research was an appropriate choice. The iterative design methodology, including initial conception and changes implemented during the project will be discussed, before diving into potential limitation of this research method and what steps I took to address them.

### **3.1. Online UWC Project Overview**

The Online UWC project included a total of five online short courses, lasting 5 weeks each. The duration of 5 weeks was chosen to ensure that courses were both sufficiently long to give participants the opportunity to establish social bonds with others, but short enough that the courses were manageable to be led by a group of volunteers. The courses were organised in partnership with UWC. UWC schools put emphasis on their mission statement to build a more

peaceful and sustainable world, to which all of its educational activities must adhere. Participants in the course were recruited directly (not going through UWC schools).

<i>Code</i>	<i>Learning environment</i>	<i>Topic</i>	<i>Size</i>	<i>Participants</i>
LC1	Loosely coupled	Sustainable development	Small (<10)	Youth 14-18 years old
LC2	Loosely coupled	Sustainable development	Large (>100)	Youth 14-18 years old
LC3	Loosely coupled	Sustainable development	Medium ( 50)	Youth 14-18 years old
P	Platform	Social entrepreneurship	>100 in terms of sign up, between 10 and 50 in terms of participants	UWC alumni, including previous Online UWC alumni (14+)
H	Hybrid	Global citizenship	Medium	Youth 14-18 years old

**Table 3.1** Description of 5 Online UWC courses

All five Online UWC courses had a similar target audience, topics and structure. In this section I will describe the course participants and course structure in more details.

**3.1.1. Course Structure**

I designed the study to allow for comparability of results between the different learning environments (loosely-coupled media, platform and hybrid), within the limitations enforced upon us by real-life nature of the deployment. Participants completed an application for the course and were admitted upon meeting admission criteria: sufficient knowledge of English, motivation aligned with UWC mission statement, payment of a £20 fee or receiving financial aid (except the course targeting UWC alumni).

The five online short courses had similar basic structure, laid out as starting point of the course. Table 3.2 shows approximate schedule of events. Students received an email with briefing on their readings, assignments and live activities’ schedule on Sundays, attended live Hangouts on Air with expert speakers (activists, academics, social entrepreneurs) on Tuesdays, and group discussions via Hangout on Fridays. In the expert Hangouts, students did not dial directly into the call but watched it as a broadcast and could ask questions via a moderator. Group sessions were guided either by student chairs or facilitators. The focus was on developing an activist know-how – not just topic related knowledge, but also practical skills such as communication, teamwork and project management, and assignments were designed to promote this.

Both learners and facilitators were then invited to actively negotiate this initial structure to reach their own learning objectives. During the courses learners interacted with lecturers and classmates live through Google Hangouts and whenever they wanted on Facebook, voted on the topics they most wanted to study, recommend and invited guest lecturers they found exciting, and were continuously challenged to co-create the curriculum through discussion with their classmates and us the organisers. Learners were typically given assignments to be completed by the following week (often in pairs or groups of three). The learners were informed that they were not expected to hand in a traditional paper as a response to questions, but an output in a format which they preferred, be it audio files, videos, animations, drawings, Powerpoint presentations,

<i>Metric</i>	<i>When</i>	<i>Scale</i>	<i>Learner Leadership</i>
Weekly email	Sun/Mon	All	No
Hangout on Air	Tue/Wed	All	Yes
Hangout	Thu	3-10	Yes
Assignment	Fri	All	Yes
Big FB group	Continuous	All	Yes
Small FB group	Continuous	3-10	Yes

**Table 3.2** Approximate course schedule and interaction modes

Prezis etc. Their imagination and technical skills were the only limit for how they choose to work together and present their results. Students were also encouraged to find more materials that were relevant to the topic of the week and share them with others. Learners took turn chairing or facilitating a discussion on the week's topic and the lecture which took place the day before. The weekly chairs received a short briefing over email to propose some ideas or structure that they can use in class. In this way the work in the online classroom was really student led.

Communication in both editions of the course followed a similar pattern. On Sunday or Monday the weekly agenda was sent out to students via email. On Wednesdays designated student chairs additionally received a briefing document detailing the proceeds for the weekly discussion session. Facebook group was used for additional communications and assignment sharing.

### 3.1.2. *Course Participants*

There were four main types of course participants: learners, facilitators, organisers and guest lecturers. Learners were predominantly aged 14-18 years old (except in the platform course where learners were predominantly 18+ alumni of UWCs). The course was supported by facilitators who as volunteers from the pre-existing UWC alumni community were well positioned to provide general support, guidance and counsel to the learners throughout course, in addition to completing course administration tasks (Kop et al., 2011; Onah et al., 2014). Facilitators were aged 15-30 and came from a variety of backgrounds (previous online course alumni, business, academia, NGOs). The role of facilitators was to animate online discussions, provide answers to questions and feedback on assignment and help run live video hangouts. Organisers (who also acted as facilitators) were 2-3 alumni who had similar background as facilitators, but who were willing to make a larger time commitment to the course and thus had additional administrative and organisational responsibilities (such as recruiting and selecting learners and facilitators and lecturers). Guest lecturers were practitioners in the field of sustainable development (activists, entrepreneurs, academics). Neither the facilitators nor the experts were specialized high school teachers. What the students, facilitators and experts had in common was their passion for the overarching theme that unites the different Online UWC courses - building a more peaceful and sustainable world.

<i>Metric</i>	<i>LC1</i>	<i>LC2</i>	<i>LC3</i>	<i>P</i>	<i>H</i>	<i>Overall</i>
Registrations	15	169	39	178	104	505
Active learners (week 1))	8	66	17	33	26	150
Active learners (week 1-5)	10	86	18	33	40	187
Countries represented	7	24	14	20	25	58
% Active Female Learner	70%	64%	61%	58%	60%	62%
Facilitators (inc. organisers)	3	20	10	3	12	48
Learner / Facilitator	3.3	4.3	1.8	11.0	3.3	3.9

**Table 3.3** Participation Statistics for All Five Online UWC Courses

The participants in study were 187 learners and 48 facilitators in three editions of the online courses (Table 3.3). Learners came from 48 different countries including Syria, Venezuela and Australia to name a few, and were recruited from an United World Colleges (UWC) alumni community (an organisation of international high schools). While there was some overlap between learners and facilitators in these five courses (eg. learner in course LC2 became a mentor in H course), we are treating each instance of participation as a unique one in the table above.

In all courses, facilitators were assigned to each group (with a ratio ranging from one facilitator to 10-50 applicants, which in practice meant a ratio between 1:3 to 1:10 active learners). These were volunteers from the pre-existing UWC alumni community. There were no teachers in any of the three courses and I also consider course designers and administrators as facilitators in the study.

**3.2. Data Collected**

The data from the experimental applications in the different technology set ups helped frame questions relevant to evaluation methodologies and helped answer research questions relating to learning and teaching in student-led online learning environments. A variety of quantitative and qualitative data has been collected (details can be seen in Table 3.4 below).

Quantitative data collected included summary course statistics (such as participation and assignment completion) were recorded. Given the manual nature of recording the quality of the data varied between courses and between different groups in courses (depending on facilitator diligence). Also, activity on Facebook group and LearningCircle.io platform included summary statistics of participants likes, posts and comments. Metadata from the YouTube channel was additionally collected.

A variety of qualitative data was collected. Data for the course was collected before the course (application forms), during the course (interviews, attendance, project completion) and after the course (interviews and feedback surveys). Additionally, each week facilitators submitted a survey of their observations and feedback from the weekly discussions. Course organisers were also asked to provide a post course participation survey. Data from facilitator and course

### 3.3 Action Research: Practical Approach to Research

	<i>LC1</i>	<i>LC2</i>	<i>LC3</i>	<i>P</i>	<i>H</i>
Learner application forms	Yes	Yes	Yes	Yes	Yes
Facilitator application forms	Yes	Yes	Yes	No	Yes
Learner / participant feedback	Yes	Yes	Yes	Yes	Yes
Course organiser reflections	Yes	Yes		Yes	Yes
Course participation statistics	Yes	Yes	Yes		Yes
Learner coursework repository	Incomplete	Incomplete	Incomplete	Yes	Yes
Video lecture repository	Yes	Yes	Yes	Yes	Yes
Project repository		Yes	Yes	Yes	Yes
Facilitator feedback	Yes	Yes			Yes
Facebook interaction logs	Yes	Yes	Yes		Yes
Facebook interaction details	Yes	Yes	Yes		Yes
YouTube activity logs	Yes	Yes	Yes	Yes	Yes
Google+ activity logs	Yes	Yes	Yes	Yes	Yes
Website interaction logs				Yes	Yes
Website interaction details				Yes	Yes

**Table 3.4** Data Collected During the Research

organizing team (including weekly feedback forms and post course individual written interviews) was also considered. In the end of the class, learners were asked to fill out a survey about their level of satisfaction with the course and asked for additional insights about the course.

The five iteration of the course have enabled collection of vast experimental data. The next sections will discuss in more detail how the research design has evolved, including the changes in direction of learning environment and pedagogy design, as well as adjustments in data analysis methods and measures. These changes in direction were done as the project prioritised the experiences of the learners in the Online UWC courses and reacted to feedback received both on the go and after each course iteration.

### 3.3. Action Research: Practical Approach to Research

“Cognition in the Wild” (Hutchins, 1995) proposed a new approach to study cognitive and social phenomena – in their context, rather than in the lab, to fully understand their dynamics and environmental factors. Action research is a branch of participatory research design methods (Hayes, 2014; Rogers, 2012). It is closely related to in-the-wild study methodologies (Johnson et al., 2012). In-the-wild research deploys technology in real worlds and real-use situations to study how they are used in that context in order to propose design improvements (Johnson et al., 2012). This methodology emphasizes that context, both physical and social, have a critical impact on usage (Johnson et al., 2012) and as such it seems a well placed method to study learning from socially situated perspectives.

Action research (Hayes, 2011; Kock Jr et al., 1997; Reason and Bradbury, 2001; Rogers, 2012) offers a rigorous methodology to conduct research that is socially relevant, collaborative and engaged in community issues (Stringer, 2007). Action research has its theoretical roots in pragmatist, postmodern and democratic ideals, and is based on work of Dewey, followed by Lewin and more recently Rorty. The democratic roots result in AR's advocacy for sustainable social change (Koshy, 2005; Pine, 2008; Rogers, 2012). Its pragmatic and postmodern roots are reflected in its problem solving focus - Kurt Lewin thought that trying to create change is the best way to understand the phenomenon that one is trying to change. AR is a process in which new technology or method is introduced, and studied in detail through a process of iterative interventions, which involves the researcher actively intervening in the situation (for instance by co-organising the project or being part of constituent organisation) (Hayes, 2011; Rogers, 2012). Given the social impact objectives of this work, the expected iterative nature of the project and willingness of the researcher to play an active part in the project also as organizer and facilitator, action research was considered as a research method.

Action research is very different from other approaches to research because of its ontological, epistemological and methodological commitments (Whitehead and McNiff, 2006). However, it is these specific differences that make it a good fit for this research project.

Ontologically (describing how researchers see themselves in relation to the subjects of their work), researchers are not value neutral, as they are closely embedded in their research. Unlike other research methods which aspire to scientific research the way action research does (Rogers, 2012), it does not attempt to be objective (Kock Jr et al., 1997). Objectivity is not desirable given researchers are also frequently practitioners, who are heavily involved in organising the project (Walker, 1993). Action research is explicitly "value laden and morally committed" as well as "democratic, collaborative and interdisciplinary" (Hayes, 2011). In this framework, the researchers should review their own role in the process and recognize and embrace their own role in the research. Instead of striving for generalizability of results, action research emphasizes the local and situated nature of findings, and the cross-contextual transfer of research findings (Hayes, 2011). Given that in this research the researcher is also the course and platform designer, and the overall project leader, and that therefore an attempt at objectivity would be both difficult and undesirable, action research was a natural ontological fit. This both enabled the author to keep personal biases in check and clearly disclosed, and allow for the personal perspectives to contribute to analysis.

Epistemologically, researchers are committed to the idea that knowledge is not fixed, and is studied through a series of cycles of design. It is a postmodern perspective that knowledge is situated in the social context, and as such no objective truths can be inferred (Vygotski, 2012). The implication of this cyclical design process is that the solution to the problem should be understood in a much broader sense as "learning through doing", with greater understanding of the problem's setting through the process of change and iterative production of solutions (Stolterman, 2008). In this way, action research is different from participatory design and user-centered design because the end goal is knowledge and sustainable change in the community, and



not the design artifact. Online UWC course design, with emphasis on social aspects of learning, and lack of fixed fact based learning outcome evaluation also showed that the research project fit within this view of knowledge. Thus it was an epistemologically appropriate method.

From methodological point of view, methods of action research are iterative and open on cycles of planning, design and reflection (Rogers, 2012; Schmuck, 2006). The research process starts with formulating research problems, intervening through design, deployment (the “action”), observing the impact, reflection and re-formulating the problem to start off another cycle. Cycle after cycle, a solution to the problem(s) identified is refined, building on the previous approaches, and with support and feedback of all of those who partake in the project (Rogers, 2012).

It is acceptable to adapt and change the methodology of design to best suit the research context during these iterative cycles (Cooke and Wolfram Cox, 2005). Action research can incorporate multiple methods, and invite the use of both qualitative and quantitative tools. The evolving nature of this project through design phases, with commitment to experimentation and creativity (both from course organisers and learners who signed up for such an experience) also made action research a natural fit for this research. Additionally, the variety of data gathered, and the open academic debate about how to best evaluate collaborative learning made assessment far from obvious. Therefore, it was desirable to choose a research method open to innovative, flexible, creative and mixed methods research approaches. First, I will present the overall project before clarifying the changes in research direction throughout its course. Then, I will discuss in turn the iterative nature of research design, learning environment design, pedagogy design, data analysis methodology and measures used.

#### **3.3.1. Iterative Research Design**

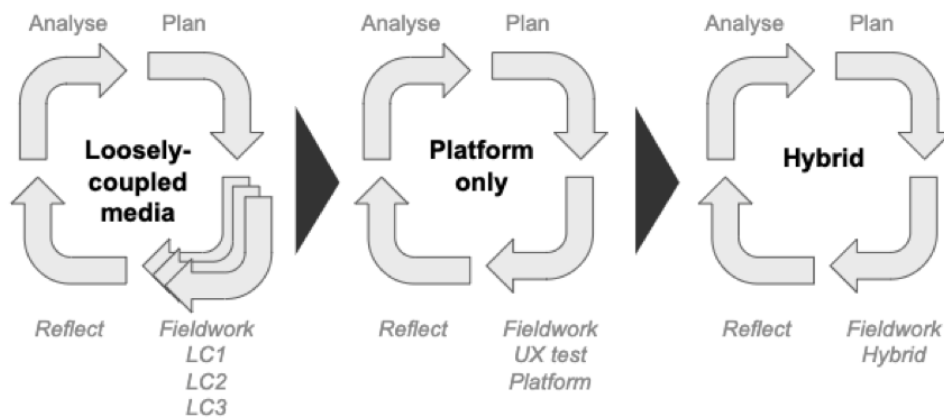
Action research does not have a specific methodology – it is an iterative process of design iterations, followed by analysis and change of approach. Action research uses “a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action” (Lewin, 1946). Before starting the project, the research design foresaw several stages of research and planned to collect a variety of qualitative and quantitative data. Based on previous research in the field of online education it was clear that quantitative participation data would be summarized to indicate course engagements. However, in terms of direction of research, the project underwent important changes of direction over the course of this research. In the initial phases, the research was interested in improving the online course experience in line with connectivist goals of leveraging the power of learners’ creativity and pre-existing experience towards course co-creation, and facilitating the learner interaction both with content and each other. Connectivism proponents stipulate that social learning is best served by loosely-coupled social media, and connectivist courses have chosen to rely on such a set up and therefore have not invested the effort to design a connectivist platform (Cormier, 2008b; Siemens, 2004, 2005). This research proposed exploring the hypothesis of prevailing effectiveness of loosely-coupled social media through direct comparison of learning experiences using loosely-coupled media and a connectivist-inspired learning platform.

The first stage included the design of the learning environment using loosely-coupled resources and experimental trials of the set up. In these pilot courses, loosely coupled mainstream social media were used instead of a learning management platform. These loosely-coupled media included Hangouts on Air, Facebook and a simple static website grouping course materials and a process of informing students about course assignments and key weekly events via a weekly newsletter. This first stage course experiments would result in design implications that would drive the guidelines for a learning platform for the student-led courses.

In the second stage, I explored learner-led online courses using a custom built platform, First, an MVP of the learning platform was built, including features identified as mission critical in the prior exploratory stage as well as literature based research would be deployed to similar experimental courses. This MVP was then tried through UX testing day, which helped identify bugs and missing features. Consequently, after fixes to the platform, it was used in a real life deployment in subsequent Online UWC course.

Originally the idea for next steps was to build and design the learning platform and test it first with a similar course scale as the original loosely-coupled media, and then, after additional improvements, test it during a large-scale (>500 course implementation). However, after designing and using the LearningCircle.io platform during both user testing and subsequent course implementation, and even before the in depth analysis of the data it became clear that the risk and shortcomings of using only a platform outweigh the benefits for the learning community. Therefore, the last technological set up, hybrid of the two approaches, was designed and deployed instead.

To start with, there was no clear and suitable existing method for qualitative analysis and the plan has been to develop one as part of the research. It was planned in advance that all findings would be shared with the community – both as ‘fresh off the press’ course organizer reflections, and later as formalized research papers. Problems which emerged during the course were flagged by the organising team, but also facilitators and learners through feedback provided during and after the course. Solutions were collaboratively developed with course participants, facilitators and organisers. Early analysis of survey results were used to organise each following iteration of the course, before being studied in depth for the purpose of the research. One complication of this was that courses were not exactly the same – however, given that action research sets high the commitment to the community it was important to use partial findings to continuously improve course experience. Qualitative analysis methods were developed during the duration of the research. First a high level inductive analysis of the data (post threads, as presented in Chapter 4 and comments in survey results, as presented in Chapters 6 and 7). Parts of these empirical chapters underwent a review process from the academic community (DIS, CHI, EdMedia, CSCW) and reviewers shared helpful guidelines about the need to systematically describe learning in these learner-led courses. The question that kept coming back from reviewers was: how can you show there was learning happening? Because of the open-ended and flexible nature of the course it was difficult to apply any traditional methods of evaluation (eg. pre and post testing). While student feedback suggested that learners drew learning from the experience,



**Figure 3.1** Three stages of the Online UWC learning environment design Lewin (1946)

even as the researcher and organiser it was difficult for me to see where was more learning happening – in loosely-coupled, platform or hybrid approach. This push towards understanding the nature and level of interaction led to creation of initial then improved framework which helped organise course data based on learning type (social or cognitive) and complexity (organised into six hierarchical level for each of the categories). The first category was about evaluation of learning experience (as presented in Chapter 6). This initial approach was then pursued further and led to an even more detailed theory-driven deductive analysis of participant comments as presented in Chapters 6 and 7. The action research methodology is visualised in Figure 3.1.

Moreover, this in-depth analysis of interaction (including both social and cognitive aspects of conversational learning) and community impact (through the community projects evidenced after the course) has shown that there are significant trade-offs for using a learning platform for the courses between providing more structure and more freedom. As the course organiser I struggled to come up with the right methods to empower learners as co-creators of engaging and interesting courses, while also ensuring that learners were interacting in a sufficiently structured and guided environment. While a few strategies seemed to exist for specific classroom implementation (eg. knowledge forum, problem-based learning), there seem to be little guidance how to support learners in less structured, open and exploratory contexts. In fact, literature confirmed that more research is needed on the topic of collaboration in context that try to address open ended questions that do not have a specific solutions (Stahl, 2006; Van Aalst, 2013). Consequently, in Chapter 6 I will discuss the analysis of the course learning data and the trade-offs identified.

### 3.3.2. *Iterative Learning Environment Design*

The previous section focused on the iterative nature of the research process design and now I will turn to show how also the learning environment design has evolved during this action research process. The learning environment design had several iterations during the course. In the first stage of research, the learning environment was conducted using loosely-coupled social media channels, drawing design inspiration from similar design set ups used in early connectivist online courses (Siemens, 2004, Siemens 2005, Cormier 2008). This configuration was tried over

three courses. Though these first three courses also had a central static website to present the initial schedule of events, the central piece of all course activity was on a closed Facebook group, uniting all course participants. In the second and third stages of research a custom build platform LearningCircle.io was used as the central course space. The design of this platform was guided by experiences from the first iteration (including the first three courses) as well as literature.

The first Online UWC course used mainstream social media (YouTube, Facebook, Google Hangouts, Twitter) together with Google Course Builder website (used primarily for course recruitment and sharing the proposed course structure). Most of course communications happened on custom groups and pages set up for the purpose of the course, including email, Facebook group, Facebook page, Google+ group and YouTube channel, Hangouts and Hangouts on Air (for live broadcasting). During the second loosely-coupled course there were no changes to the social media set up of the course, apart from small changes to the simple website. In this second course, a more attractive website was set up to facilitate recruitment of candidates for the course. Functionality was added that allowed learners to create accounts and set up community projects that others could like and comment on. The third loosely-coupled course, used a simpler project set up format which limited friction at project set up and encouraged students to update their entries regularly throughout the course via Google Slides.

The need for a custom build course management platform was evidenced by logistical challenges faced by learners and workload faced by facilitators explored in Chapter 4. I created a design brief defining the general look and feel of the website, wrote out key user stories that defined user roles and key website functionalities, created a set of mock-ups that visualised the graphical structure of the key views. Over the next several weeks I worked with a development team Vazco.eu, commissioned by Newcastle University as part of the research project, to refine the design specifications and improve website functionalities. An original MVP, including basic user roles and page structures was created ahead of the first UX testing session organised as a course on website design. Following the feedback from the testing, additional features were integrated ahead of the formal UX review. Additional features such as community creation and enriched filtering, viewing and sharing functionalities were added ahead of the formal UX review.

The LearningCircle.io platform went live during the platform Social Entrepreneurship course, which had over 170 registrations. During the course, several more bugs were reported and fixed, and additional functionalities were amended or added. Early results from the platform course suggested that more important than developing specific new features for the learning platform, it was essential to think of the improvement of the wider course environments – including additional communication platforms and helpful resources. While the website functionalities remained largely unchanged for the third iteration of the course, the communication challenges faced by learners in the platform course led to continuing the use of Facebook as an important communication platform, thus leading to the final hybrid iteration. Additionally, extensive website FAQ and blog posts were created for learners and facilitators. They intended to help with

most frequently encountered problems and included step by step walk-throughs (for instance one about setting up video conferencing).

Several forms of social media presence were created between the first and fifth course and used for recruitment and user engagement. These included among others the Online UWC Facebook page, now with more than 3,500 followers, Online UWC Google+ page used mainly for scheduling Hangouts on Air and YouTube channel used for storage and sharing expert video lectures with students who could not attend the lives events. For each course, a curriculum document was drafted, which was shared with students and facilitators for feedback and new ideas proposals. Additionally, email templates for weekly emails, acceptance, course completion and request for feedback were created.

The iterative nature of action research was well suited to the iterative nature of platform development and allowed for a legitimate change of direction from focus on scale to focus on learner experience enabled through a hybrid environment. It also allowed for a shift in focus to deepening the analysis of pedagogy provided by both learners and facilitators in the course.

#### ***3.3.3. Iterative Data Analysis Methods***

To ensure rigour of analysis through action research it is important to focus on trustworthiness of methodology, which can be achieved through a combination of: credibility, transferability, dependability, and confirmability (Stringer, 2008). One approach to do this is to triangulate or use of multiple research methods at once in order to re-affirm credibility of findings (Mackay and Fayard, 1997). In this research I used a mixed methods approach, combining quantitative and qualitative data analysis. Before being aggregated and analysed for the purpose of this research project, data was anonymized and coded (with each participant receiving a unique identifier). This data was then quantitatively analysed at class level to provide summary statistics for the course.

I did not use statistical methods such as null hypothesis significant testing because they do not fit with the ontological and epistemological nature of the action research methodology. Ontologically, given the cyclical nature of the design process, none of the three courses can be considered as the benchmark in the null hypothesis. The different categories were not specified initially in the design of the research, and were created after observing the dynamics of the students. Therefore, it is not appropriate to carry out significant tests based on a hypothesis formed after observing the data. Epistemologically, action research does not have an ambition to produce objective results, which is the main reason to test the null hypothesis to build a case for objective presence or absence of correlation. The post-modern roots of action research actually deny that reaching objective truths is possible, which is the very essence of null hypothesis testing.

#### ***Inductive analysis of surveys and posts***

The first stage included coming up with summary engagement metrics, conducting an inductive analysis of participant survey results and building a high level inductive analysis of discussion

post threads. Interaction data sets across different systems had to be studied in greater detail. Notably for the interactions on social media (YouTube, Facebook and Google+) consistent data points were grouped for each course. A unified database of all course participants and their interactions was created, and its content visualized in synthetic charts. This visual processing of quantitative data helped bring to light several descriptive facts about the course participation and different student classes (age and gender composition, link between geographic localisation and participation). To gain insights into participants' reflections of the two courses I conducted learner and facilitator survey analysis. Surveys asked for quantitative and qualitative feedback about the course, its structure and effectiveness of communication channels used. The results were analysed using inductive thematic analysis of learner, facilitator and course organiser surveys (Braun and Clarke, 2006) to account for learning experience also from course organizer perspective. For surveys, Likert scale responses and Yes/No responses complete the qualitative responses. In the first stage of the thematic analysis, described in Chapter 4, the data was analysed inductively as posts were classified into thematic categories. Thematic data analysis of qualitative data sources had been conducted to provide a robust picture of level and type of interaction observed during the different courses.

### *Preliminary deductive analysis of comments*

The second stage included a preliminary theory based deductive analysis of comments. The two courses compared in this analysis are the loosely-coupled and hybrid iteration. The platform course was excluded because it was different in its structure from the Loosely-Coupled and Hybrid course (it had a different set of learners and a much higher ratio of learners to facilitators). Given these differences I decided to exclude it from the analysis of learning analysis, to show trade-offs in learning in courses that were more comparable. Next, as described in Chapter 6, the data was analyzed in more detail. Specifically, time was invested to interpret the data in learning forums. I conducted a thematic analysis of comments produced across all learning platforms and summarized by course (for the platform course this includes both Facebook and platform content). Thematic analysis is rarely either purely inductive or purely deductive (Braun and Clarke, 2006). My starting point for comment analysis was deductive. Comments were classified into 28 indicators, which were then rolled up into six categories defined using a combination of Bloom's Digital Taxonomy (Anderson et al., 2001a) and collaborative activity classifications from (Soller, 2001). There was a low, high and medium category for each two broad areas: cognitive and social. I limited the analysis of comments in this analysis to those of learners, to better account for their learning and community building interactions (and not skew the data with facilitator contributions). The unit of analysis in the study was an individual message (comment), which is the most fitting given "it's the unit on which the interpretation of study will focus" (Boyatzis, 1998). Course interaction was analysed by looking at a matrix of inductive post categories (as shown in Chapter 4) and deductive comments categories.

#### *Iterative deductive analysis of course comments based on an 10% sample*

The final stage of the analysis included refining the above theory based deductive analysis through discussion and alignment with other academics. There were several main differences between the analysis presented in Chapter 6 and the one presented in Chapter 7. While analysis of learning in Chapter 6 focused on comparing loosely-coupled and hybrid course, the final comparison included also the platform course, which allowed this research to test the usefulness of the framework in all three configurations. Additionally, while Chapter 6 only considered learner contributions, the analysis in Chapter 7 looked at contributions of all course participants. Due to large amount of data collected during the study, the in depth analysis in Chapter 7 was based on a representative sample of 10% of comments and 20% of words in comments. The analysis did not consider post classifications, as their themes became redundant when a more detailed comment classification was used. These initial posts were instead classified as comments.

Based on experiences applying the socio-cognitive framework presented in Chapter 6, I realised that there were two main challenges. First, it was very difficult to reliably classify the actions, given the high number of indicators. Second, the three high level categories (low, medium and high) into which both social and cognitive actions were classified were not sufficiently detailed to reflect useful summary of interaction in courses. I therefore have made several modifications to the original framework. Instead of low, medium and high, I built a more detailed and ordinal classification with 6 levels for each cognitive and social areas, to provide more fine-grained detail to the understanding of participants' interactions. Such a more detailed view also ties more closely to Bloom's cognitive taxonomy Bloom et al. (1956) and Bloom and Krathwohl's affective taxonomy Krathwohl et al. (1964), which is well respected as an evaluation method across a variety of applications within education research (Schneider, 2014). The resulting detailed and hierarchical classification for cognitive and social areas make it possible to separate the simple behaviours from the complex, and evaluate affective attributes of learners through the lens of group collaboration.

Action research traditionally shies away from methods that try to establish objectivity (such as for example establishing inter-rater agreement). However, after initial exploration of the data and categories while crafting the new iteration of the framework, I realised that the task at hand was challenging and that the work could benefit from the very same process of social discussion that drove the learning during the courses. Establishing inter-rater reliability was used primarily to test the definitions used for cognitive and social categories constructed, as well as to ensure that grading books created in this research were sufficiently clear to be transferable to other projects. Therefore, two researchers, with varied backgrounds (one with background in social action HCI and another with statistics focus) contributed to discuss, debate and strengthen the definitions of final categories. The amended methodology of comment review and study results have both been presented in Chapter 7. This review also helped ensure trustworthiness of methods by ensuring that materials outlining the procedures and categories were clear and transparent. The data sample was additionally analysed by the two researchers (the sample was not further split among researchers). Given the methodology intended to combine quantitative

and qualitative analysis of the data, it was necessary to ensure data validity through inter-rater agreement (Boyatzis, 1998). To establish code validity, codes were discussed in a meeting and a full guide to code grading was produced as recommended by research best practice (Boyatzis, 1998). Inter-rater agreement was calculated using Fleiss' kappa (Fleiss and Cohen, 1973). For each level, the Codebook (Appendix A) provides description, examples, key words, technologies and sentence opener examples.

### 3.3.4. *Iterative Selection of Measures*

In the initial stages of the project I relied on simple measures, which were consistent with existing literature on the topic of online interactions. Engagement measures such as course completion, actives per week, weekly discussion section attendance and engagement with content (YouTube minutes watched) and content contributions (likes, posts, comments and projects submitted). This was consistent with how studies on MOOCs considered course interaction. The inductive thematic analysis aimed to provide an overview of activity in the course. To provide a measure of theme frequency, a measure of count of posts and count of themes in survey responses were used. Additional measures were added in subsequent stages of analysis.

In Chapter 6, the analysis shifted to exploring learning in the course. The measure of words in comments was selected as a proxy of time and effort spent by learners on course activities (as opposed to using the comment count metric). It provided a more helpful means to interpret the results (Boyatzis, 1998) given the wide distribution of comment lengths (from 1 word to 2,193 words). The disadvantage of this method is that longer comments have stronger impact on average score, but this risk was mediated by careful discussion of results. I also changed the way in which some measures of engagement (counts of posts and comments) were calculated, and changed how I referred to them. In Chapter 4 posts referred to the first comment in any threaded discussion (to approximate the theme of the entire discussion), and comments to all comments following the first one. This allowed me to analyse course data using a matrix of post and comments, as presented in Chapter 6. This led to comments which were the first in the sequence to be excluded from the initial counts of comments. After reflection, I decided that a much clearer solution would be to classify first posts using the same category as other comments in the threaded discussions. I thus changed the language to refer to them: from Chapter 7 *comments* mean all the comments in threaded discussions and *posts* are referred to as *threads* instead, to reflect the fact that they constitute a set of comments.

In Chapter 7, measures that would help explore pedagogical contributions of course participants were required. The measure of summary score was calculated separately for each of the two areas: cognitive and social. A score per post is derived by assigning a numerical score (1-6) to each of the ordinal subcategories in social and cognitive areas. This then makes it possible to calculate summary social and cognitive scores. The summary score is as weighted average of comments by level of social or cognitive participation is calculated separately for social and cognitive areas (detailed calculation methodology is presented in Chapter 7. The detailed hierarchical categorisation of learner utterances helped to reflect on their cognitive and



social complexity and produce a more meaningful analysis of interactions that happen on the spectrum between learning and teaching, as presented in Chapter 7.

In the initial stages of the research project, simple methods of analysis and measures were used to help explore course interaction and identify design requirements for course learning environment. In the later stages, based on initial analysis, additional insights into how interaction was happening in different learning environments helped design more complex modes of evaluation and summary metrics. This chapter only presented a high level overview of analytical methods and measures, with focus on changes to methodology over the course of the project. A detailed discussion of methodological choices will be included in Chapters 4, 5, 6 and 7.

#### 3.3.5. *Ethical Considerations*

An approval was sought to organise the courses, supported by the Polish National Committee (I come from Poland and was nominated to the UWC by the Polish National Committee), which was then approved by the International Office. The approval was granted after a series of discussions with short course liaison and alumni engagement officers at the International Office of UWC around the structure and mode of support for the proposed courses. It was agreed that each separate course would be individually approved in advance by the International Office of UWC. Additionally, an ethics approval for research was obtained from Newcastle University (see Appendix J). There were two primary ethical challenges of the project: working with vulnerable population of minors and actively including study participants as active research partners (as opposed to passive subjects).

The course was working with a vulnerable population of minors and it was especially important to provide a safe learning environment (free of inappropriate and abusive behaviour). The age of participants was 14 and up in order to comply with the most stringent requirements for learners to be able to join social media websites (international standards of data ownership by young adults is 14 years old on Gmail, 13 years old on Facebook, 13 years old on both Coursera and FutureLearn). DBS checks of adults working with children on the platform were not requested by either the ethics board or the gatekeepers. Additionally, in order to ensure safe learning environment, there was an application process (with candidates being carefully selected based on detailed applications) to become a part of the learning platform. This process can be understood to be a “gatekeeper”. There were also clear community guidelines (included in the three course curricula in Appendices D-F), so there is a screening process to make sure that all interactions happen in a space where all participants are expected to exhibit respectful behaviour towards one another. Any inappropriate content was quickly flagged and removed by course organizers. The students were informed that the course is a part of PhD research and were asked to confirm reading terms and conditions when they sign up for the class. Learners were asked whether they wished to participate in the research as part of the course (and could participate in the course even if they did not wish to have their data be used as part of research). The students who wish to no longer take part in the study will be excluded from the analysis.

Action research requires the study to consider those who take part as participants, not subjects (Hayes, 2011). During the project the researcher provided detailed reports to the community via social media channels<sup>1</sup>. Prior to complete data analysis, the researcher published reflection on the courses through a blog<sup>2</sup>. Academic papers published throughout this research were also shared with the community through social media (mostly through the private Facebook group). Learner, facilitator and course organiser feedback was collected not only as research material, but as contributions of community members towards co-design of the learning platform and community. Of course also the learner-led nature of the experience meant that learners and facilitators alike were actively involved in the design process, and they contributed in a variety of ways described in detail in Chapter 7.

### 3.3.6. *Closing the project*

A key focus of action research is on ensuring sustainability of solution. “In AR, the goal is ultimately to create sustainable change.” (Hayes, 2011, 2014; Rogers, 2012). This action research project was unique as the researcher was at the same time they key member of the community responsible for the project. It was necessary to test whether the project could work with another course organiser and if the community was able to conduct an Online UWC course on their own. This is also why the final iteration was not organised by the researcher, but instead another member of the community. This change in methodology was to ensure that course organisation process was reviewed and further improved.

The final phase of the research was not conducted as close to the community partners as in the beginning. This was also a result of changing priorities within the UWC organisation: the United World Colleges staff who were main points of contact have moved on, first to a new project within the United World Colleges, then on to new jobs. Likewise, there was not a consistent group of facilitators, who changed between the different courses. At the start of the project the main aim was to build a scalable platform to engage alumni and extend the reach of United World Colleges. However, over time the focus of the organisation has changed to push for a commercially made alumni engagement technology (Vine). This meant that the resources that were helping with this project originally had been redeployed to this project.

To close off the project I have shared several resources and tools with the community. The Learning Circle platform is uploaded to GitHub as an open source project of the Open Lab<sup>3</sup>. The repository of public content video interviews with activists has so far attracted over 11,000 unique views and remains available on the Online UWCs public YouTube channel<sup>4</sup>.

Also the course curricula and course organiser handbooks have been shared both publicly and with the UWC community (they are also included in Appendices B and C for handbooks and Appendices D-F for curricula). I have used these materials to train other volunteers which consequently led to them delivering five civic focused online short courses, leading to the full

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<sup>1</sup>for example the public Online UWC Facebook page <https://www.facebook.com/onlineuwc>

<sup>2</sup>All posts can be found at <https://onlineuwc.wordpress.com/page/1/>

<sup>3</sup>[https://github.com/digitalinteraction/learning\\_circle](https://github.com/digitalinteraction/learning_circle)

<sup>4</sup><https://www.youtube.com/channel/UC0uvvvnUly2dQVesT2pBu8Q>

transition of the project to its host organisation the United World Colleges International Office. The design recommendations for running online short courses came right in time to prepare the organisation ahead of the lockdown caused by the Covid-19 pandemic and allow for several courses, originally planned to take place in person, to happen online instead. I have also presented the findings of this research to the leadership of United World Colleges, which consequently resulted in jointly pitching for resources from a major foundation to support the delivery of international learning for civic-minded youth, with a strong contribution of online learning in the proposed program.

The Online UWC project has additionally opened up an entire new array of technology focused initiatives. For example, alumni of the course and individuals who had contributed as facilitators have since led several projects, related in spirit to the mission of Online UWC (bringing education, inspiration and opportunity to drive real world impact). One example was Amala Education<sup>5</sup>, a school for refugees which has been set up by the two partners who had since left the United World Colleges International Office (and who were the most supportive of the original Online UWC project). Another is United Youth Journalists<sup>6</sup>, an online media organisation set up by several of Online UWC alumni who met during the course and then ran it independently over several years after the finish of the course. This shows that the learner community and personal connections established during the course have outlived the course.

#### 3.4. Discussion of methodological considerations

Action research is a powerful method as it has the potential to develop feasible solutions to real-world problems as it involves building deep relationships with the relevant communities. This means that the solutions are developed with specific stakeholders at heart as they set their priorities and preferences as the top imperatives of the project. This means that any proposals have strong buy in from the specific community.

Action research is a method that helps both organizers do their projects in a meaningful way but also extend the learnings from projects to a community. It offers a good combination of ability to focus on community specific solutions, while affording for building generalizable strategies and insights. Given that community partners are closely engaged with, action research as a method is strong in terms of providing credibility and integrity. It ensures that deep emotional responses of study participants are brought to light through careful analysis. This is not possible while using a lighter touch method (interviews where subjects are met once). The fact that the data is gathered directly in the field means that participants language and perspectives are emphasized (Hayes, 2011). However, on the flip side, the close embeddedness in a specific context means that results generated cannot be easily generalized and reproduced. This places heavy requirements for trustworthiness, which can be managed by detailed documentation of the research context, including the values and biases of the researcher.

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<sup>5</sup><https://amalaeducation.org/ourstory>

<sup>6</sup><https://unitedyouthjournalists.wordpress.com/>

In this work I document my research motivations and perspectives in Chapter 1 and then come back to how they have impacted my work in Chapter 5. As a value based method, action research is more permissive of subjectivity, but it is important to fully document and present the researcher perspective. I wrote up my reflections after each course implementation to record my live impressions of the course. These self-reflective pieces of writing summarised my learnings after each deployment of the course and reflections following UX testing. These were then compared to the results of more formal analysis of course data to ensure that my personal biases were kept in check. In order to contribute to establishing trustworthiness, a diversity of perspectives must be collected from research participants. In this research I have tried to increase the generalizability of findings by inviting other researchers to help review the categorization. It has not only helped me understand my own thought process but has also helped me communicate the socio-cognitive framework in a much more transferable way.

One of the main advantages of action research is that it allows to consider solutions to pressing problems through a process of cycles of design. Its critics point out that because of this iterative approach, action research is messy, time consuming and unlikely to generate products and tools through these cycle of research that can rival commercial products. The action research process is described as “fuzzy methodology” producing “fuzzy answers” (Walker, 1993), where cycles of design can take time, as the research can theoretically last for a long time, until the problem has been solved (Rogers, 2012). Action research can be a messy process (Cook, 1998), where the changing methods can change to emerging ethical dilemmas (Frauenberger et al., 2017), and therefore difficult to compare to traditional science and epistemology paradigms (Kock Jr et al., 1997). Action research shares the same epistemological underpinning as participatory research, but its methods are “*even more radically opposed to positivism as it fully embraces relativism and constructionism*” (Frauenberger et al., 2015). Other research shows that many action research projects insufficiently do justice to the inherent messiness of the project and instead try to present a clean narrative about what happened in the process (Cook, 1998). Some researchers point out that due to the nature of deployments and resource constraints it is difficult for researcher to create, test and hand over technologies that can rival commercial products (Taylor et al., 2013). This can mean severe usage issues for research partners after the research project is over and handover has been completed, as these prototype products frequently face technical failure and are unlikely to have sufficient level of technical support (Taylor et al., 2013). However, in this research, the problem statement was concerned both with practical application during online courses, but also creating design guidelines and recommendations. Therefore, there was reasonable freedom about the depth in which the question had to be considered in order to answer the community’s need. Additionally, the focus was less on creating a tool or technology and more on approach for how to create learning environments using a mix of commercially available platforms and social and technological structures. As such, the findings are not related to the specific technology created during the course. Embracing the very relativistic and constructionist approach of action research helps deliver learning environment agnostic design recommendations.

Action research enables the researcher to have unique position in the center of the project as both its organizer and researcher. However, action research's credibility and integrity depends on the commitment of the researcher to documenting his possible biases and experiences (Dombrowski et al., 2016; Vines et al., 2013). Results of action research can be laden with subjectivity and personal biases impacting analyses, which are especially problematic if they are not identified for consumers of the research through the process of appropriate self-reflection (Kock Jr et al., 1997). Roedl (Roedl et al., 2015) also proposes to be very conscious about the role of designers as makers, who impact how products and tools are designed and used, and advocates for HCI designer's role to be considered in its socio-technical context. Research suggests the importance for designers to address the challenges and potential biases of their configuring forms of participation in participatory research (Vines et al., 2013). Some design strategies that can help make researchers sensitive of their assumptions are: transparency in documentation, exploration of preconceptions, configuring multiple forms of participation, and supporting participants in reconfiguring the process (Vines et al., 2013). Other researchers propose to consider improving internal rigour of action research methods and surfacing researcher potential biases by focusing critical reflection on epistemology, values, stakeholders and outcomes of the research effort (Frauenberger et al., 2015). Dombrowski (Dombrowski et al., 2016) highlight key strategies and commitments in designing for social justice, which resonate well with principles of action research. Design strategies include building for transformation, recognition, reciprocity, enablement, distribution, and accountability (Dombrowski et al., 2016). Further, three design commitments are proposed: to conflict, to reflexivity and personal ethics and politics (Dombrowski et al., 2016).

Another important strength is that action research's focus on the learning process encourages researchers to take some well managed risks: *“an attitude that focuses on the outcome of learning something, regardless of the “success” of the design or intervention, can free up the team to attempt interventions that may be risky or underdetermined.”* (Hayes, 2011). However, these risks have to be managed very carefully within the ethical constraints. Additionally, action research brings with it an array of ethical challenges, as it is difficult to specify on the onset all the research aims and objectives, and provide a detailed overview of research process to research participants. This means it is especially important to manage these ethical considerations by committing in the onset to the process of communication of changes to methods and objectives of the research and giving participants the option to opt out at all stages of the research. However, this approach, which enables the researcher to try out innovative approaches to solving the problem was well suited to the Online UWC project, given the very community's willingness to take part in a unique, transformative and creative experience.

The ambition of an action research project is both to try to solve socially relevant issues and provide useful theoretical frameworks. However, there is a certain level of unease within the HCI community about the ability of action research methods to both try to make the world a better place through concrete projects and need to collect ethnographic materials in order to contribute to publications and development of theoretical frameworks, as sometimes the interests

of constituent communities and the academic community may find themselves at odds (Rogers, 2012). For instance, researchers may alter findings under pressure from partnering organisations, in which they can be subordinates (Somekh, 2005). However, in this project the researcher was not employed by the partner organisation, but instead was working as a volunteer and coordinating the work of other volunteers. This set up helped manage the potential conflict of interest as the researcher was uniquely positioned both as strongly embedded in the organisation and with reasonable level of independence regarding freedom of publishing results outside of the agenda of the organisation.

Action research is not an easy design method and the researcher has to be on guard vis a vis their own biases, perspectives and position within the project. However, given the nature of this research project and its theoretical grounding it has been identified as a useful method to answer its research aims. Several strategies have been defined to address some of its shortcomings. They have included documenting researcher bias through reflective pieces and comparing these to more formal research work, and including other researchers as well as existing body of theoretical work in order to classify conversation materials that constituted an important body of research data gathered; these will be discussed in more detail in the discussion sections of Chapters 5 and 6. The details of the methodology of each piece of analysis will also be discussed in more detail in Chapters 4, 6 and 7. As the first step, Chapter 4 will explore learner-led interactions in loosely-coupled learning environments.

## **Chapter 4. Online UWC organized with Loosely-Coupled Media**

### **4.1. Introduction**

Chapter 1 presented the overall context for the research and Chapter 2 positioned the topic of learner-led online courses within larger research context of computer supported collaborative learning and online learning. This is the first empirical chapter, which will discuss the design, deployment and evaluation of three configurations of an online learning activity for would-be social innovators and activists, with the aim of understanding the factors that are critical to the design of an infrastructure to support such communities of learners. This loosely-coupled approach was inspired and motivated by the example of SOLEs (self-organized learning environments) and builds upon the experiences of early connectivist MOOCs. The three configurations were used to deliver three pilot courses on the topic of Sustainable Development, in partnership with UWC. This work puts a focus on civic engagement and the autonomy of student learners throughout the course. The primary design goals were to enable activist empowerment, self-organized learning, and the creation of social bonds to facilitate a lasting and self-sufficient international activist community. The findings of this chapter have been published in a peer reviewed paper “*SOLE meets MOOC: designing infrastructure for online self-organised learning with a social mission*”, co-authored with Dr. Ahmed Kharrufa, Dr. Anne Preson, Dr. Robert Comber and Prof. Patrick Olivier (Celina et al., 2016). This research has also contributed to a peer reviewed paper “*Unplatformed Design: A Model for Coordinated Participation with Social Media Technologies*”, authored by Daniel Lambton-Howard and co-authored by me, Dr. Vasilis Vlachokyriakos, Prof. Patrick Olivier and Dr. Ahmed Kharrufa Lambton-Howard et al. (2020).

### **4.2. Learner-Led and Self-Organized Learning Environments**

Sugata Mitra’s “hole in the wall” experiment explored whether children could learn effectively when exposed with technology and allowed to follow their natural curiosity (Mitra and Rana, 2001). Mitra’s idea of self-organised learning environments (SOLEs) postulates that when learners are empowered to take responsibility of their learning and are given access to technology, they will learn at least as effectively as in formal school environments. One motivation of our research was to explore and apply this learner-agency based model where learners actively construct and even co-create the knowledge during the learning process. Industrial-scale education, already foreseen by Fuller in 1962 (Fuller, 1962), has become a reality with near ubiquitous Internet access and new models of massive open online courses were developed and popularized in the first decade of the new millennium, primarily by universities: first with MOOCs inspired by

connectivist theories of learning, then with behavioural cognitivist inspired MOOCs (that place a stronger emphasis learning analytics and assessment).

Non-governmental organisations have also been exploring the use of MOOCs; for example, Amnesty International conducted its first online course on edX in November 2015, recognizing the potential for raising awareness among learners and enabling their engagement as activists. To date, the generation of social impact through online learning has primarily been considered from a point of view of enabling access to citizens of developing world countries to high-quality and low-cost education (offered by the world's top providers). The Open University has, of course, been a pioneer in providing social impact through online education, a commitment which was further reinvigorated with entering the field of open educational resources with the launch of OpenLearn in 2006 Gourley and Lane (2009). However, the focus of the Open University is focused on providing general education, not education specifically targeted at would-be activists.

The topic of activism itself, and the process of organising the work and efforts of volunteers online, has received significant attention in literature. Much work has focused on understanding the role of social media in creating political movements (Hara and Huang, 2011), on specific examples such as Occupy Wall Street (Juris, 2016) or the Arab Spring (Howard et al., 2011; Khondker, 2011), and the potential of digital civic education to drive offline impact. Other familiar areas of concern include the coordination of crowd-sourced work in online activist communities – with the creation of online encyclopaedias, including both successful (Forte et al., 2012) and unsuccessful implementations (Hill, 2013).

While both activism (including digital youth civic education) and online learning have been thoroughly researched, little attention has been paid to the transformational potential of online education design that combines the principles of developing and supporting communities of practice, with the scale and diversity of MOOC-scale learning. The contribution of this work is twofold: (1) to show the potential of online courses as a way to facilitate creation of online learning communities for social innovation and activism; (2) to establish a set of best practices, based on the three design configurations, for infrastructures to support collaborative learning communities of would-be social innovators and activities. The term 'infrastructure' is used here instead of the term 'platform', conventionally used in education technology research, in order to highlight the importance of the entire suite of internet tools and organizational processes that are normally used in preparing and running an online course, including the course website, any social media presence as well as the structure of communication between course organisers and learners.

### 4.3. Design Goals

The goal was to establish the characteristics of an infrastructure to support online learning for would-be activists through the design, deployment and evaluation of actual courses. Our work in part returned to many of the ideas of cMOOCs (peer-to-peer interaction, diversity and high levels of learner autonomy), but also includes structural elements of successful online communities.



This required us to address the inadequacies of existing platforms for building activist learning communities: both online learning platforms and targeted civic education social platforms.

However, although inspired by cMOOCs, which operated without a formal learning management systems, I decided against the cMOOC approach in its purest form (given some cMOOC learners' reports of chaotic experiences and feelings of being overwhelmed (Kop and Carroll, 2011; Kop et al., 2011; Mackness et al., 2010) and instead included elements of structure that I believed would appeal to the younger, less experienced, learners I were working with. On the other hand, I did not want to use an LMS inspired by mastery learning approaches to education (such as Coursera) and while alternative LMSs, such as Moodle (see also Blackboard, Piazza, etc.), place some emphasis on user generated content and provides support for the creation of communities of practice (through its social features such as forums), I were concerned that student engagement and the creation of lasting social connections would be made difficult if I relied on custom infrastructure.

Given that this work is informed by connectivist and learner-agency and community-based theories, and the potential of integrating social media in education has been shown by several research studies (Cuesta et al., 2016; Greenhow and Lewin, 2016), I instead utilised a simple custom designed website and a range of existing social media applications and utilities (Facebook, Google+, YouTube, Twitter, etc.). Task design included course materials such as syllabus, training materials for course organisers, facilitators, learners, communication templates, etc. Additional design considerations concerned the methodology of learning and teaching, selection of interaction modes with expert lecturers, structure of weekly discussion sessions and type of assignments to be given out.

The online learning infrastructure had to respond to several design objectives: (1) to empower learners to begin their own social mission driven initiatives (with the support of the created learning community and through careful scaffolding); (2) to enable learners to get to know one another and share their unique experiences (through asynchronous communication via messaging and social media and synchronous discussion in small groups); and (3) to facilitate self-organisation of learners, who both are able to effectively follow unique learning paths and effectively follow course schedules and materials in an easy-to-use way both synchronously and asynchronously (videos, articles, content created and shared by others). Our approach was specifically tailored to the needs of people with high levels of self-efficacy and digital literacy, as well as access to social capital and access to expertise and experience.

### **4.4. Methodology**

Three cycles of design, deployment and evaluation were ran through three configurations of an extracurricular online course (i.e. three "editions" of the course) focused on the topic of sustainable development. Each revision of the configuration responded to identified limitations of the earlier edition(s). The young learners (14-20 year-olds) were pre-selected into the course based on their written applications. I gathered participant applications and participant and



**Figure 4.1** LC2: Map of prospective learners created by one of course facilitators, based on approved applications

facilitator feedback for each edition of the course, as well as a set of quantitative metrics such as group sessions participation or live and on-demand views of video lectures.

**4.4.1. Participants**

Online UWC participants (both learners and facilitators) were recruited to the course via UWC social connections (both through the alumni network and through official organisation social media and communication channels). Participants could then specify whether or not they wanted to take part in the study, and they could also opt out at any point during or after the course. Participants in the course represented a variety of different backgrounds as shown in Table 4.1. One of the course facilitator in LC2 create a map visualising the diversity of prospective course participants based on approved course applications (Figure 4.1. The course had slightly more female than male participants.

<i>Metric</i>	<i>LC1-</i>	<i>LC2</i>	<i>LC3</i>
Registrations	15	169	39
Active learners (week 1)	8	66	17
Active learners (week 1-5)	10	86	18
Countries represented by active learners	17%	12%	8%
% Active Female Learner	7	24	14
Facilitators (inc. Organisers)	3	20	10
Learner / Facilitators	3.3	4.3	1.8

**Table 4.1** Loosely-Coupled Courses Participation

#### 4.4.2. *Methods*

The study used a mixed methods approach, which has been identified as a useful means for interpreting data from action research projects (Hayes, 2011, 2014; Rogers, 2012). Quantitative methods were used to measure engagement across social media tools used for learning (YouTube, Facebook and Google+). Data points were downloaded from the social media tools, aggregated and anonymized for each course. Using this unified database of all course participants and their interactions, its content was visualized in synthetic charts. The process of visualisation was used to identify insights about the course participation and different student classes (age and gender composition, link between geographic localisation and participation).

Qualitative analysis was used to gain insights into participants' reflections of the courses expressed in learner, facilitator and course organizer survey analysis (see Appendices G, H and I). Surveys asked for both quantitative and qualitative feedback about the course, its structure and effectiveness of communication channels used. The results of these surveys were analysed using inductive thematic analysis (Braun and Clarke, 2006) to account for course experience across all course participants. Theme occurrences were then counted across survey results. The analysis of surveys relied both on the count of mentions per each theme and qualitative examples of these responses.

Further, posts made by course participants on the course Facebook group were analyzed inductively by being classified into thematic categories. Posts are defined as the first comment that starts a threaded discussion. These initial posts were used as an approximation for the theme of resulting discussions. Thematic data analysis of qualitative data sources had been conducted to provide an overview of how course participants spent their efforts during the course, in addition to their participation in group Hangouts and interacting with course video content.

#### 4.4.3. *Measures*

Quantitative engagement metrics included measures of learner retention, which is consistent with analysis of MOOCs (Ho et al., 2015, 2014). They also included the frequency of learner interactions and of social impact.

Measures of learner retention included active learners and % active learners who graduated. Two measures of active learners are shown - learners active in the first week and learners active in weeks 1-5. Given some learners joined only from the second or third week, the second measure for active learners is more representative of active learners, but the first one helps understand the drop between registered applicants and the start of the course and has been used in prior research (Ho et al., 2014; Onah et al., 2014).

Measures of course engagement included WatchTime minutes / Learner. Conversational learning measures included Posts / Active Participant (including learners actives in weeks 1-5 and facilitators). Measures of social impact included numbers of projects set up and social impact evidenced.

Additionally, for surveys analysis Likert scale responses and Yes/No responses have been counted and presented in the analysis.

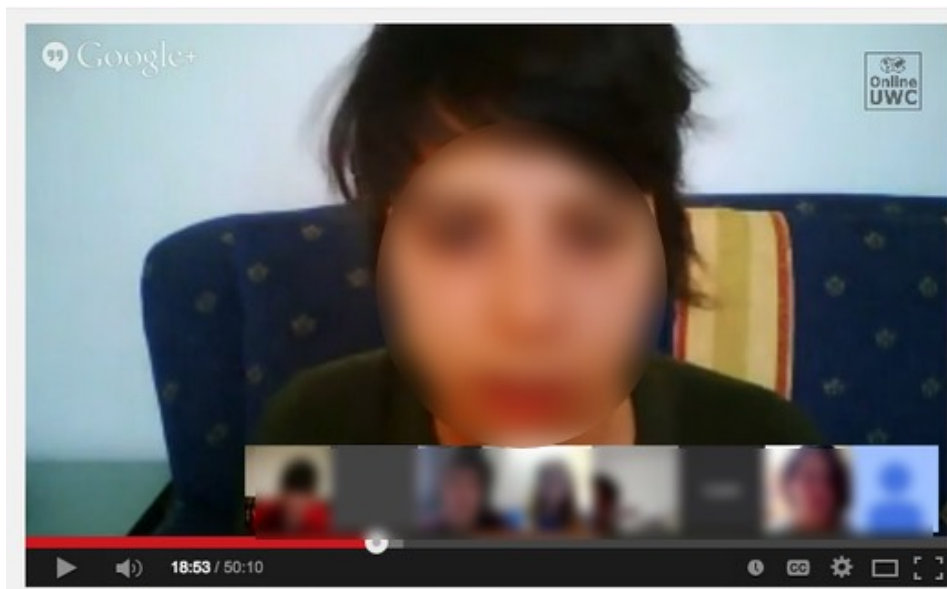
### 4.5. Online UWC: From Idea to Implementation

Some elements of course design were changed in each edition to compare results in the final stage. The goal of the first edition was to test the learning approach with a small pilot group of 10 learners before rolling out to a larger audience. The second edition focused specifically on learner engagement and mastering logistics, by working with 86 learners in three different time zones (London, Hong Kong and New York). The third edition had 18 learners and focused on understanding the scaffolding process for projects and the role of facilitators in the success of future courses. I conducted a detailed analysis at the end of all three editions to provide grounds for design recommendations with the aim to answer the design question: what design elements help facilitate activism through collaborative learning while allowing the learners to have more control over their own learning. For each edition, I will provide an overview of course and learning environment features followed by a short evaluation section. Afterwards, I will turn to jointly summarise the findings from all three courses, organised by the three design goals: enabling civic impact initiatives, creation of social bonds among course participants and learner contributions to course co-creation.

#### 4.5.1. *The First Edition*

The initial Online UWC infrastructure design was guided by theoretical best practices presented in online education literature (Adamopoulos, 2013; Bali, 2014; Guàrdia et al., 2013; Khondker, 2011; Kop, 2011). Google Course Builder was used to create the website in order to present course schedule and materials given the simplicity of deployment as well as the ability to heavily customize the website in the future. Social media communication channels were included to provide sociability tools for the participants required for the creation of social bonds (Preece, 2000), which were not part of Google Course Builder's design. The use of social media would also create an easy way for learners to share both resources and their projects across different formats in a way that would be visible to others, in order to get to know each other and help learners build social bonds, which has been shown as an important factor to promote learning and collaboration in affinity groups such as gamer communities Gee (2003, 2004).

The course was designed to support user engagement, inspired by prior research findings (Adamopoulos, 2013; Bali, 2014; Guàrdia et al., 2013; Khondker, 2011; Kop, 2011). Learners had to complete an application form prior to admission for the course as well as commit to paying a small fee, which served to promote commitment to the course (Onah et al., 2014). Learners unable to pay the fee were asked to apply for financial aid, which was granted if candidates met (lenient) eligibility criteria. A key element of our design was the inclusion of facilitators to help run the course whose presence has been shown on driving higher level of engagement in online courses (Onah et al., 2014). The facilitators came from a variety of backgrounds (business, academia, NGOs) and were all alumni of United World Colleges. The main role of facilitators was to be the point of contact for learners: helping learners troubleshoot technical difficulties and clarify any confusion about the course schedule, as well being responsible for



*Maria from Fruta Feia explains why her cooperative distributes "ugly fruit" directly to consumers.*

**Figure 4.2** LC1: Example Hangout with Guest Lecturer

sharing communications via email, the website and on the Facebook group (DiVall and Kirwin, 2012).

Additionally, the application process, which was open to candidates from all over the world, helped to assure that the admitted candidates shared a set of common values, a condition that helps create effective online communities (Preece, 2000). The screening conditions included adhering to community values and a basic working knowledge of English (both evidenced by written responses to application questions). What the learners, facilitators and experts had in common was their passion for the overarching theme that unites the different Online UWC course, framed as building a more peaceful and sustainable world.

The course was designed to introduce enough structure to keep the learners oriented, while offering enough flexibility to help them negotiate their learning objectives, problem-solve and explore different areas of knowledge in real life conditions (as per SOLEs). The course schedule (including a communications calendar) followed a simple weekly structure in order to introduce a routine which would help orient the learners, especially in early stages of the course, as recommended by previous research (Guàrdia et al., 2013). Learners were given their weekly assignments on Sunday, which typically consisted of links to assigned videos and readings (newspaper articles, TED talks). Each Wednesday, an expert lecturer would talk about the week's sustainability topic (via Hangout on Air, later shared on a YouTube channel). An example of a Hangout with guest lecturer is shown in Figure 4.2. On Thursday, the learners took turn chairing or facilitating a discussion on the week's topic and the lecture which took place the day before (i.e. the work in the online classroom aimed to be learner-led). The weekly chairs received a short briefing over email to propose some ideas or structure that they should use in class. After the discussion, learners were typically given assignments to be completed by the following week (often in pairs or small groups).

Learning tasks were designed to resemble the work of activists (e.g. working together in small groups to create written, rich media and video materials, discussions about means to solve environmental issues). Learners were challenged with real world problems, which were relevant to their communities. I aimed to ensure that learners knew that they were not expected to hand in a traditional “paper” as a response to assignment prompts, but an output in a format of their own choosing, such as audio files, videos, animations, drawings, PowerPoint presentations, Prezis etc. Thus their imagination and technical skills were the only limit for how they chose to work together and present their results. I thus used the hidden curriculum of the course and how each task was framed to teach a specific skill or reinforce a quality.

Additionally, the importance of experts having activist background was emphasized, to serve as role models for the learners and inspire them. The experts were practitioners in areas of sustainable development and included activists, entrepreneurs and academics. They presented their career experiences as well as an overview of the topic grounded in their own experience during the weekly expert Hangouts. Throughout the course learners were encouraged as much as possible to become course co-creators, to both increase their own sense self-sufficiency, and to meet the design goal of self-organisation. Learners were encouraged to find more materials that were relevant to the topic of the week and share them with others. They interacted with lecturers and classmates live through Google Hangouts, and synchronously/asynchronously on Facebook, voted on the topics they most wanted to study, recommended and invited guest lecturers they found exciting, and were continuously challenged to co-create the curriculum through discussion with their classmates and the organisers.

### *Evaluation of the First Course*

Ahead of the second course, two rounds of feedback were conducted (one mid- and one post-first course) to inquire about learners’ satisfaction with the model provided and to establish which design elements to be further explored in the second course configuration. Learners reported enjoying communicating with others in different countries and wished for even more opportunities to make personal connections (either via private chat or more frequent group discussion sessions). Out of 6 responses to the end-of-course survey, 1 learner said that the course did not give them the opportunity to meet others, and even of the 4 learners who answered “Yes, but. . .” the learners explained that the course did not give them a chance to get to know each other as they wished: “*I thought I could use more time getting to know each other. There are students I never got to know.*” (LC1-R5)<sup>1</sup>

Additionally, based on feedback questionnaires, several students were confused about the different modes of communication and were not clear about using technology needed to participate in the course (6 out of 11 responses to question about improvement ideas mention learner confusion).

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<sup>1</sup>For LCx-Sy: “x” is the course edition, “Sy” a student; Cx-Fy: “Fy” a facilitator, and Cx-SFy: “SFy” is a student facilitator, survey responses are referred to as Cx-Ry

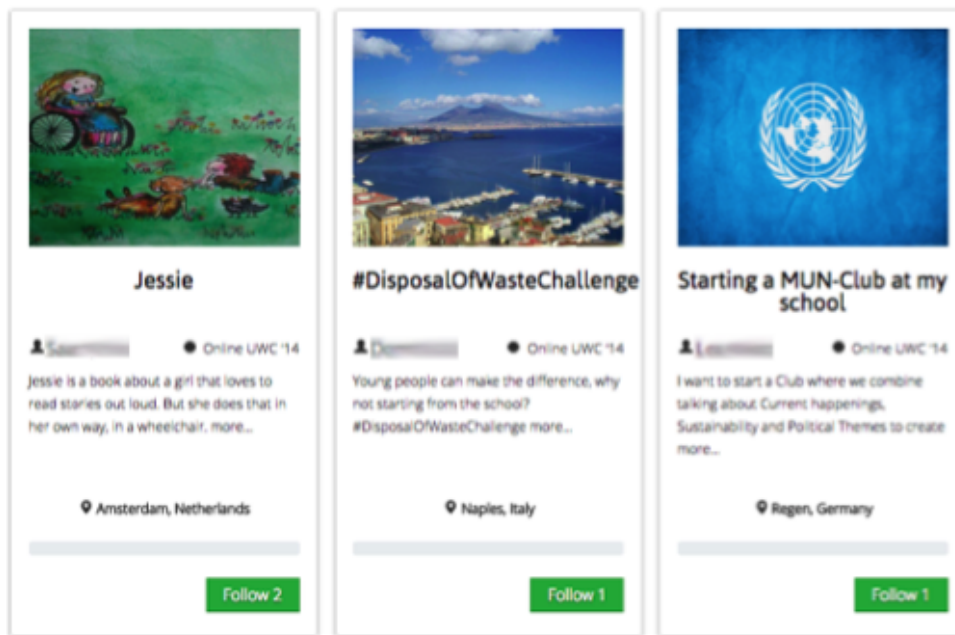
Applications for the next course also begun to be accepted, which gave the organising team more insight into student motivation. Based on a review of applications for the second course, I established that making a difference in communities was a primary driver for participation: 55 of 189 of the approved explicitly mentioned themes relating to concern for their communities (local:27 and global:28), for example as participant LC2S150 explained: *“I would like to learn more about sustainability because it is a way to make the world better, not just being worried about the social, climate and economic problems: learning about sustainability gives you instruments to use in your city, country and all over the world in order to take care of the planet and making it last for future generations.”*

### 4.5.2. *The Second Edition*

Recognising the importance of community impact to applicants, the second edition was refocused around community projects – students were asked to consider ideas from the first week and were guided into implementation of their ideas throughout the course. Ahead of the October course, a new website was set up. In the first edition of the course I did not have a formal scaffolding process to create and discuss projects. Consequently, no community projects had been created in the course. The key feature of the new website was that it allowed users to create user profiles and set up projects. Students could share links to their projects, share them on Facebook, and like, follow and comment on their peers’ projects.

The need to strengthen bonds between students was addressed by attempting to reinforce the sense of community. For example, a suggestion offered by LC1-S4 was implemented: *“I would suggest you to make people write a brief presentation including not just why do participate in course... But whatever they want to share and send the presentations to all participants before the course starts, it could help to know a bit more one other.”* Thus the first task was used as an opportunity to present oneself in the Facebook group and gave an example with custom creative videos I made. The organising team also spent more time making sure that everyone had a chance to introduce themselves and felt comfortable in an online Hangout before diving straight into the class content (a message that was reinforced both through facilitator training and student chair briefing notes). More structure was provided to the welcoming of newcomers. For example, a clear explanation was provided about how this class is different from other classes in a prominent space on the course website to assure that students, used to a traditional learning structure, would not be surprised by self-organised elements of the course.

Ahead of the course I also sought to create a community of facilitators through repeated communications by emails and Hangouts, in which best practices were shared as well as help solicited in course material creation. I also gave the opportunity for one alumnus of the first course (familiar with its methods) to become the first student-facilitator, and to investigate learner attachment to facilitators, I swapped facilitators half way through the course. Finally, I strengthened the structure of the course through clearly defining a communication schedule for the courses, providing a schedule ahead of the courses and empowering facilitators as intermediaries between students and course organisers. I had noticed that communication about



**Figure 4.3** LC2: Example Student Projects Set up on Course Website

course logistics took too much of the students' attention in the first course (54% of posts and comments related to discussing logistics).

### *Evaluation of the Second Course*

Throughout the course 41 projects were set up (for 86 active students). Projects comprised an image, a short description, and next steps needed for implementation (see 4.3). Students had to create a profile on the course website in order to create new projects, or to follow or like other projects. Projects created on the website were generally well thought out and many included user created graphics. Ideas included education-related projects (creating a green contest or Model United Nations club at local school), environment related projects (reducing water usage, creating a recycling project), and social welfare projects (refugee inclusion project, homelessness).

A refreshed, more attractive website paired with a social media marketing campaign resulted in a ten-fold increase in applicants. This larger scale deployment required us to consider design elements necessary to manage a larger user base. The course required significant time investment from course organisers (including administrative tasks such as splitting students and facilitators into groups, coordinating scheduling and setting up calendar invitations for all groups, tracking attendance and assignment completion, answering questions from a much larger number of students etc.). Live lectures had to be organised in three different time zones. The 20 facilitators who joined the learning community had to be inducted into the community. As course organisers I noticed that the time commitment required to run the course per week almost doubled vs. the first edition.

Facilitators helped prepare class materials ahead of the course and they also helped recruit a number of experts, which significantly helped organising team. The student facilitator (LC2-SF1) who participated in the course enjoyed the experience and did not report specific problems



relating to their being an alumnus. Facilitators also took on leadership roles as needed: *“In the second session it was the chair having difficulties with the tec[h]nical part. That is why I had to take over”* (LC2-F4). Swapping facilitators half-way through the course did not have a positive impact on class. As student LC2-R3 observed: *“Switching facilitators was more confusing than “rewarding”.*” Facilitator LC2-F5 confirmed this: *“I don’t think changing the facilitators was a good idea because I just started building a relationship of trust and fun together that was ended very abruptly.”*

Facilitators provided detailed feedback about interactions inside the small Hangouts. 13 out of 30 (43%) responses mentioned low attendance as a problem. Facilitator LC2-F5 commented that an emergency plan for low number of participants would be needed: *“What could be improved is to have a better “emergency plan” in case only a limited amount of students shows up and the planned discussion is not possible.”* Many students could not make it to class because of technical issues: *“I had 14 students assigned, out of which 5 made it. Some were having tech difficulties with microphone and one was having a server error her call kept cutting.”* (LC2-F1). Other groups had the opposite problem: *“The hangouts are only designed for up to 10 people. As I have 14 in the group this meant some people couldn’t join.”* (LC2-F4).

Facilitator responses shed light on the different sources of technical issues faced by the students, including power shortages in their towns, slow internet connection, social media being blocked at school, and issues with unmuting microphone or unlocking the camera. Additionally, background noise created by students who did not mute when they were not speaking disturbed discussion sessions. 68% of facilitator responses mentioned presence of technical difficulties for one or more participant.

### 4.5.3. *The Third Edition*

The third edition aimed to explore is a simpler interface to set up project ideas (without the need to create a user profile and fill out numerous description fields) would help increase number and quality of projects set up by students. I also further experimented with the role of the facilitator. While in the first edition of the course I had assigned two facilitators to each class, in this edition I assigned one facilitator to half the groups. Additionally, I increased the number of student facilitators, a third of facilitators were alumni of previous courses.

### *Evaluation of the Third Course*

A simple Google Slides template was used to limit friction at project set-up and encouraged students to update their entries regularly throughout the course. While the overall number of projects per active student set up increased from 48% to 67%, the number of projects for which completion evidence emerged in the following 12 months decreased from 21% to 17%. The implications of not having facilitator back up became apparent when one of the experienced facilitators forgot about his session in the first week of the course, which resulted in several messages on the Facebook group from confused students. Similar events happened the following week (explaining why the proportion of logistics posts and comments increased between the

second and third edition of the course). However, student facilitators met expectations and were able to effectively run group sessions. Indeed, they were the only ones who provided feedback after the end of the course. Experiences of this edition highlighted the crucial role that facilitators play for the effectiveness of an online community of young learners.

### 4.6. Findings

By reflecting across the three editions of the course I am able to revisit our three primary objectives: (1) empowering students to begin their own social mission driven initiatives (2) enabling students to get to know one another and share their unique experiences; and (3) to facilitate self-organisation of students. Table 4.2<sup>2</sup> presents summary statistics for the three editions of the course.

<i>Metric</i>	<i>LC1</i>	<i>LC2</i>	<i>LC3</i>
Active Learners (week 1-5)	10	86	18
Percent Graduated	70%	77%	72%
Active Learners per Facilitator	3.3	4.3	1.8
WatchTime minutes per Active Learner	58	173	161
Posts per Participant	5.8	6.0	8.1
Projects Set Up	0	41	12
Social Impact Evidenced	3	18	3

**Table 4.2** Loosely-Coupled Courses Participation Summary

#### 4.6.1. Promoting Activist Involvement

Both the primary and secondary effects of creating this activist community through the three editions of the online course are considered. The primary effect was that students learned about different ways in which they can get involved in their community and created 52 community projects throughout the three editions of the course. In participant surveys 76% of student respondents mentioned that the course helped them think about creating their own project, with the highest proportion (83% in the October 2014 course, and the lowest in the June 2014 course where projects were not emphasized or scaffolded throughout the course). In feedback respondents clarified that project-focused lectures and feedback from peers in their class showed them the importance of iteration and community research before setting out to build a project (12 of 23 responses mentioned the importance of peers or expert lectures). Additionally, 2 of 23 students who responded positively mentioned they already had been involved in volunteering projects when they started the course.

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<sup>2</sup>Summary statistics for the three editions of the course. Number of active students measured as students who attended at least one group discussion session. Watch Time (WT) denoted in minutes. Impact evidenced calculated as projects in which an individual took part (can be more than one per individual).



**Figure 4.4 LC2:** Online UWC students present what they learned in the course in their school.

Over a period of 12 months following the courses, evidence emerged of at least 24 instances of student involvement in activist endeavours. In the second course, United Youth Journalists projects emerged one month after the course. The initial post by LC2-S46 (below I present only its beginning) shared details of a simple idea, which was discussed and iterated in 58 comments by other group members: *“Hi guys! How are you? I had this idea, I know in some ways it already exists but I was thinking about creating a website in English with who is interested in writing articles about his country.”* This eventually led to the creation of a separate online community called United Youth Journalists and consequently, an online magazine that has since published more than 110 articles <sup>3</sup>. What was striking about this example is that the project emerged not as a formal classroom assignment, but as an idea that was floated within the group after the course has ended and happened on the private discussion group. Students wanted to engage as equal partners – did not want help from course organisers – wanted to do their own project, which they would manage on their own. At the same time, this example evidenced the existence of a community that does not cease to exist after the class is over, and the benefit of using Facebook instead of a custom software as a means of building and sustaining engagement in the learning community.

The secondary effect was that many of the projects were promoted outside of the direct online classroom and involved the creation of outside learning communities. The example above resulted in the creation of a Facebook page <sup>4</sup> (which at the time of writing has over 3,500 followers) where members share their articles with their friends network, further expanding its reach. Other students provided evidence for conducting presentations about sustainable

<sup>3</sup><https://unitedyouthjournalists.wordpress.com/>

<sup>4</sup><https://www.facebook.com/unitedyouthjournalists/>

development issues in their schools, further increasing the impact of their online participation to real world communities (see Figure 4.4).

### 4.6.2. *Promoting Community Creation*

As I adapted design elements to reinforce community building, I saw positive impact both on social aspects of the community and on the activist outcomes. Increasing time spent upfront on providing students opportunities to make representations of their identity through creative “introduction assignments” had a positive impact on future interactions between students. The second and third edition of the courses, where I put a large emphasis on creating a community of learners, saw a larger number of posts on the course’s Facebook group per student (vs. 2 per student in the first edition of the course). The second course, which had the highest number of participants, also saw the highest number of comments per participant (15 per student vs. 11 per student in the third edition and 2 in the first edition). As one student explained, getting to know others helped him share ideas: *“I weren’t very comfortable around each other at first and it took us a while to actually be more comfortable and have good discussions”* (C2S6).

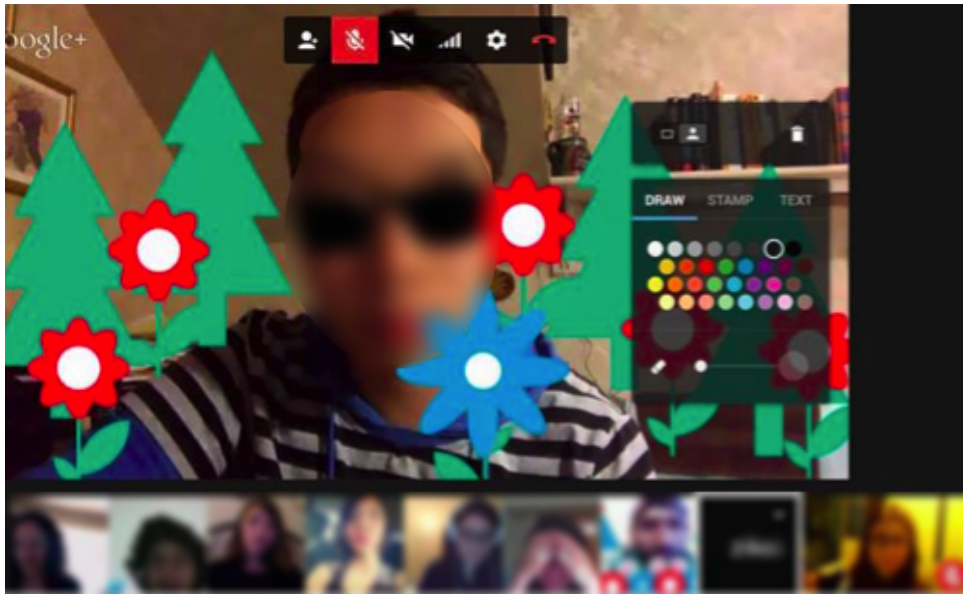
In the second course, I also observed that students wanted to go to a smaller subset of their group where they found interaction more manageable (an example of playful learner interaction can be seen in 4.5). When asked about their preferred mode of communication (multiple preferences were allowed), 100% of respondents in the first and third editions of the course (both had less than 20 participants) identified the overall course Facebook group, as compared to only 40% in the second course; 70% identified small discussion groups, 60% Hangouts and 50% email. By contrast, students in the third edition of the course (which was smaller than the second but where I gave the students more opportunity to introduce themselves at the beginning of the course than I did in the first edition) were the most satisfied with the degree to which they got to know each other throughout the course (3.3 average score out of 4, with first course at 2.8 and second at 3.0).

At the same time, many students mentioned in their responses to survey questions that they enjoyed meeting others from different countries, for example, in response to a question about experiences of working in a smaller group, a student mentions: *“It was very interesting to find out new things about other countries. I also realized things about my country that I didn’t know before.”* (C2R10). Other evidence of the strength of bonds formed was the fact that students were not only meeting in real life when they travelled to other countries, but they also shared these news in photo updates with the rest of the communities.

### 4.6.3. *Promoting Learner Course Co-Creation*

There were two ways in which evidence of self-organisation emerged throughout the courses: participants helping each other solve logistical and communication issues, and sharing external materials (articles, videos, or personal stories) to propose new discussion topics.

Students self-organised to troubleshoot problems that related to both scheduling and technology (see Figure 4.3). They also came up with ideas to better share course materials: one example



**Figure 4.5** LC2: Example of playful community building during one of group Hangouts.

from the first edition of the course included a suggestion to write up summary notes for group discussions so that those who were not able to participate can catch up. Taking live notes became a suggestion, which I shared with student chairs in future editions of the course.

<i>Share of All Posts</i>	<i>LC1</i>	<i>LC2</i>	<i>LC3</i>
Assignments	12%	23%	40%
Relationships	4%	37%	16%
Logistics	54%	13%	27%
Content Sharing	17%	12%	8%
Technical Issues	7%	7%	8%
Self Help	5%	4%	0%
Connection Invites	0%	3%	0%
Other projects	1%	1%	1%

**Table 4.3** Loosely-Coupled Courses Threads by Topic

Students also shared contact information to get in touch on external platforms (including WhatsApp, Instagram). Many individually connected as friends on Facebook to students, facilitators and course organisers. Three posts on the topic elicited 52 responses from others wanting to share their contact details across other social media tools. Students contributed to co-creating course materials in several ways. They shared resources on Facebook and proposed discussion topics ( 10% of posts and comments in all courses related to students sharing resources and discussion topics). In the first course one of the students proposed to get in touch with an expert they wanted to meet, approach them to arrange the Hangout (which was rated 4.3 out of 5 by course participants). 73% of the students who responded to the survey enjoyed the group discussion facilitated by the student chair.

Students contributed questions to drive discussion with lecturers (who only spoke for the first 15-20 minutes with the rest of the time devoted to answering student questions). A great example of interactivity in Hangout on Air lecture was Week 2 Video lecture in the topic of Inclusive Cities, which attracted a total of 40 comments. Several provided feedback to the lecturer in case things were not clear or if internet connection was breaking off. Students were making connections between the case studies presented by lecturers and their own contexts: “*What would you do for pass the ideas of Curitiba and Waterloo to a big city like Mexico City, for have a really impact considering the population size?*” (C2S142) or “*What do you suggest leaders like Stephen Harper (Canada’s prime minister for those of you who don’t know) do to act on climate change?*” (C2S87). Students also provided live comments o question some of the materials presented by expert lecturers: “*I live in a Tropical country! And I don’t have sidewalks. Use the bicycle as transportation to distant places is impossible because it’s hot out there!*” (C2S153).

Facilitator survey results showed that 60% of responses about group discussions mentioned student chair performance as good: for example “*the student chair was very strong*” (C2F15), “*the student chairing went well*” (C2F5). At the same time, it should be noted that only 35% of discussion sessions were chaired by students, due to the small number of students (usually 3 or 4 per discussion session instead of 10 in a group). Facilitators also referred to the under-preparation of some student chairs or technical difficulties that they faced, which led to facilitators taking over.

As another element of self-organisation, I allowed students to find project partners from other countries and set-up working with them on joint projects. Students in all three courses reported enjoying the experience (81% of students who responded to this survey question), but while students valued the interactions, many voiced concerns and frustration about having to find other active students without the help of the platform (30% of the students who responded). The following response is representative of many students’ frustrations: “*I don’t understand how you expected us to work with students from other regions through the web. I did, but it was complicated to get together, there was a platform missing.*” (C2S14)

As course organising processes improved (I launched a full weekly curriculum plan ahead of the March 2015 course) some elements of student organisation decreased but the content sharing element of self-organisation increased. This is evidenced by the fact that participants engaged in longer discussions, with content sharing posts made by students attracting 1 comment each on average in the first edition of the course, 2 in the second edition and 7 in the third. Students also posted longer comments (with some of them as long as 500+ word opinion papers).

### 4.7. Design Implications

Our three editions of the course correspond to three configurations of infrastructure for supporting learning, and in summary demonstrated that it is possible to realise the characteristics I set as objectives using a loosely coupled set of media. However, this became increasingly difficult when number of participants exceeded 100. In particular, while social media channels used were clearly valuable for engaging students, they lacked several features necessary to foster

community building and early stage project feedback processes. As a result I have identified several implications for the design of a learning infrastructure that will better meets our three objectives. Below, DR stands for Design Recommendation.

### ***4.7.1. Logistics and Mechanics of Activist Learning***

Learning infrastructure should aim to minimize distractions that do not directly support our design objectives. An important way to enable this is to ensure the seamlessness of the logistics of the course and the mechanics of its operation for course organisers, facilitators and students (especially as scale of the course increases).

#### ***DR1: Organize the Resources***

Infrastructure must clearly lay out the rhythm, pacing and expectations of learning activities, as well as allow the students to interact with others, in a space that is dedicated to learning. It must allow the course organisers to drive dynamic communications and social media re-engagement. Infrastructure needs to provide an access point for students to course resources, schedules of key events, and assignments. Key features are likely to include access to the syllabus, recommended resources and links to live video lectures, and ways for students to find each other on social media and submit assignments and project ideas.

#### ***DR2: Enable Creative Expression in Tasks***

The creation of community projects (and any other assignments) should allow students to express themselves creatively, including allowing them to upload and embed pictures and video files. Students should not only have the capacity to like or comment a project, but also to search for projects that are of interest to them. Finally, task design should reinforce the importance of providing feedback.

#### ***DR3: Automate mundane tasks***

From the course organiser's point of view infrastructure must make it possible to recruit the students into the course, plan course interactions (such as weekly Hangout sessions and expert lectures, assignments and weekly emails), execute course interactions during the course (e.g. send out the weekly reminder emails) and establish participation achievements after the course (e.g. participation and assignment completion data).

#### ***DR4: Supporting Scale and Sustainability***

Several design components can support scale. Especially the complex task of setting up schedules and reschedules of group sessions needs to be devised for a large-scale deployment (i.e. more than 100 students). Students should be put into groups based on preferred time availability and maximum diversity within a group. Our three deployments, demonstrate the positive impact of facilitators on learning, and mechanisms are required for recruiting facilitators, both from

previous course alumni and separately, ahead of the course. In particular, infrastructure must support the potential for students to transition from the role of student to facilitator. Designing for scale also has implications across (as well as within) courses, as infrastructure must allow new organisers to create their own communities and courses, and include commissioning tools to help organisers sample interest before significant resources are devoted to curriculum development

### ***DR5: Focus on Learning***

The focus of the learning infrastructure should be the organisation of courses, and while it should allow for students to remain part of the community, as alumni and potential future student-facilitators or experts, it should encourage members to only use the platform for brainstorming before moving to external platforms (such as custom built websites or Facebook communities) to continue building their projects and stay in touch with others as best suits their respective needs.

#### ***4.7.2. Community Building and Reinforcing Community Layers***

Learning infrastructure should be structured around the community itself, rather than the content, and focus on the development of lasting collaborations between students and enablement of impact through activism.

### ***DR6: Layer Community Engagement***

All layers of community engagement are important for effective activist classes. Interaction in larger groups allows for students to get to know others from different countries and feel they are participating in a vibrant and lively community that allows for the spontaneous sharing of ideas and a diversity of perspectives in learner initiated online discussions. At the same time, smaller groups promote more in-depth conversations and give the opportunity to provide higher quality feedback as students become more familiar with each other, and more willing to share their thoughts. A key requirement is that students should be able to easily navigate between the different layers of the community, from big course groups to smaller discussion groups, as well as be able to find and communicate with individual students (e.g. pair up for group projects).

### ***DR7: Surface Learner Presence***

Allowing students to know who is in their group and be able to connect with them easily is a fundamental requirement. When students can easily identify who else has been active in the course, they can connect with more ease to complete assignments together. When students and facilitators know who is planning to attend a group Hangout discussion, they can adjust schedule if needed ahead of time to assure that the required number of participants and create a new events in the rare case that all 12 participants assigned to the discussion session plan to attend. The students should also have the opportunity to negotiate the time of their attendance every week to suit their personal circumstances.



***DR8: Reinforce Facilitators***

Facilitators are a key component of the community, helping guide newcomers to the community and escalating more difficult questions to course organisers. In order for self-organisation to work in an online context, clear schedule and strong social bonds need to exist. While the student-chair model works well with groups that have full participation, an alternative should be used for smaller groups, and mechanisms to easily merge or reschedule groups should be offered to student. Visibility of active vs. inactive students, as well as who is in which group, and who is interested in which topic, should be provided to students to allow to support communication.

***4.7.3. Self organisation: focus on central skills***

Two types of self-organisation during the course were observed: one that was driven by frustration of inefficiency of tools used, and one that involved students sharing their opinions and thoughts with others.

***DR9: Tackle Technology Problems Upfront***

Technology issues have consistently been an issue for several participants – despite almost ubiquitous access to the Internet, both the connection strength and hardware used for connecting to class materials will likely cause challenges. Learning infrastructure must be capable of coordinating between tools that are familiar to the students (i.e. social media, video conferencing tools). It is also necessary to provide resources for learners to refer to, in the event of problems arising, and to encourage them to set up and test their technology ahead key activities (e.g. the group Hangout).

***DR10: Make Negotiation of Learning a Habit***

Course organizers should be able to provide a clear structure to a course but also allow students to negotiate the modes of their participation (e.g. by inviting additional expert speakers or submitting assignments on a personally selected topic). While many students and facilitators may still choose the default, the platform should readily surface and reward innovation and customisation with a view of inspiring others to experiment.

**4.8. Conclusions**

The study involved the design and deployment of three different set ups of social media and communication technologies to deliver online learning, followed by the evaluation and analysis of, and reflection on, student and facilitator behaviour and outcomes. The design recommendations comprise several principles for creating infrastructure to support online learning targeted specifically at communities of would-be social innovators and activists. I see widespread application for such activist-oriented learning infrastructure, from NGOs (for many of whom education activities are central to their mission) and companies (aiming to increase international knowledge

sharing among employees), to traditional educational institutions seeking to re-engage their alumni communities.

Chapter 5 will apply these design recommendations to drive design of a connectivism inspired learning platform LearningCircle.io. In this way, it will be possible to compare which learning environment configuration (loosely-coupled or platform based) is more effective at meeting the design goals for supporting mission driven learning.

## Chapter 5. Designing and Implementing the LearningCircle.io Platform

### 5.1. Introduction

Chapter 4 explored the potential of online education design to address the challenges of scaling and securing positive learner experience and pedagogical excellence in activist learning communities and proposed ten design recommendations (DR1-DR10) for designing student-led online learning environments (both instruction and interaction). Loosely-coupled media approach, inspired by connectivist approach to online learning, was used to organise a series of three Online UWC courses. The courses were supported using a combination of email, Facebook, Hangouts and YouTube. Based on the experiences organising the three courses in such a technological environment, several design guidelines for building platforms to support self-organising online learning communities of young adult activists were proposed. First, logistics and website interaction mechanics need to be as simple as possible to give students the opportunity to spend more time on creative tasks. Second, community building is important and different layers of the community (small groups, class) should be exposed and easily navigated by learners. Third, self-organisation is desired and helpful to learner experience when it focuses on central tasks such as spontaneous resource sharing or planning a project together.

The design of a connectivist inspired learning platform LearningCircle.io (Figure 5.1) is driven by the theoretical and empirical prior research, including the work using loosely-coupled media presented in Chapter 4. For learners, this platform integrates and organises course materials, including the use of external means of communication. More specifically, its key features for learners include the ability to browse course materials including syllabus and recommended resources, find links to live video lectures organised on Hangouts on Air, and to

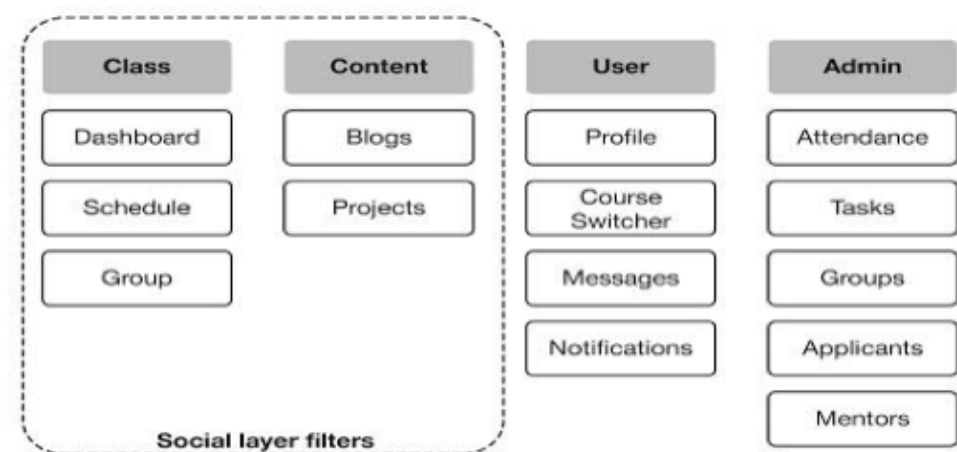


Figure 5.1 LearningCircle.io simplified design

find other course participants on social media. The platform makes it possible for the course organiser to recruit the students into the course, plan course interactions (such as weekly Hangout sessions and expert lectures, assignments and weekly emails), execute course interactions during the course (for example send out the weekly reminder emails) and establish participation achievements after the course (such as see participation and assignment completion data).

This chapter will first revisit the theoretical and empirical inspirations for LearningCircle.io's design, building on relevant prior research presented in Chapter 2 and experiences running Online UWC courses using loosely-coupled social media discussed in Chapter 4. Then, key social and cognitive features of the platform are presented; these features are justified based on recommendations from prior research and from DR1-DR10 from Chapter 4. Finally, the cycle of design and improvement of the platform is explained, using similar methodology as was used to review the loosely-coupled media courses. This evaluation includes analysis of engagement and overview of course participant surveys. Three instances of the uses of the platform will be evaluated: first UX testing with a group of volunteers from Newcastle University (UX), then the platform used as a sole means to run an Online UWC course for UWC alumni (P) and finally the experiences running a hybrid configuration where the learning platform was used in tandem with social media (H).

### **5.2. The LearningCircle.io Platform: from Idea to Implementation**

The LearningCircle.io website was developed as a dedicated learning management system (LMS) that would centralise the course activity and give learners a clear starting point for their individual explorations. It adopts several design principles of connectivist MOOCs (high levels of autonomy, high levels of interaction among participants, and diversity) (Siemens, 2004) as well as those for building effective online communities (Forte et al., 2012; Gee, 2003, 2005a; Lave et al., 1991; Preece, 2000; Wenger, 1999). It also builds upon recommendations from Chapter 4, where the first three Online UWC courses were organised without a dedicated platform, relying solely on pre-existing media available such as YouTube, Google Hangouts, email and Facebook. The course used volunteer facilitators, who were shown to help build better experience for learners in prior research (Kop and Carroll, 2011; Rhoads et al., 2013). The role of facilitators was to participate in weekly meet-ups, as well as answer learners' comments and animate discussions; they were also responsible for co-create the course alongside learners.

Chapter 4 established the need to create a custom based infrastructure to support online learning for would-be activists through its design. The analysis pointed out the inadequacies of existing platforms for building activist learning communities: both online learning platforms and targeted civic education social platforms. Based on accounts of some cMOOC of chaotic experiences and feelings of being overwhelmed (Juris, 2016; Kop, 2011; Kop et al., 2011; Mackness et al., 2010), the next step was to try using a formal learning management system, especially given the fact that participants of Online UWC are younger and less experienced than learners in an average MOOC. Such an LMS would be designed specifically with connectivism inspired courses in mind and even for cMOOC inspired courses.

## 5.2 The LearningCircle.io Platform: from Idea to Implementation

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Based on the review of features presented in Chapter 2, existing LMS tools have been deemed insufficient to meet the needs of a learner-led civic impact focused learning community. The ones inspired by behaviourist approaches to education (such as Coursera) were deemed inappropriate for self-organised courses due to their rigidity. Alternative systems (Moodle, Blackboard, Piazza, etc.), were also deemed inadequate given they do not place sufficient emphasis on user generated content. Additionally, these platforms, despite providing support for communities of practice through social features such as forums, instilled concerns regarding the success of these features for driving student engagement and creation of lasting social connections with reliance on custom infrastructure for this purpose. Given that the potential of integrating social media in education has been shown by several research studies (Cuesta et al., 2016; Greenhow and Lewin, 2016), integration of existing social media applications and utilities was recommended (Facebook, Google+, YouTube, Twitter, etc.). While the loosely-coupled courses implementations of Online UWC used a simple website, they relied heavily on social media and manual processes conducted by course administrators to complete the tasks relating to organising the course. The design recommendations clearly point out that the custom platform needs to provide support for these non-learning centric but time consuming course tasks as well as recommended a deep integration of other tools to create a unified technology interface for the learner to limit their confusion.

Consequently, the design goals for the LearningCircle.io platform are informed by best practices in literature across online community and online learning environments design as discussed in Chapter 2, and the needs of a civic-minded learner community, explored in Chapter 4. The online learning infrastructure sought to fulfil three principal design objectives, in line with the design objectives of loosely-coupled learning environment discussed in Chapter 4: (1) to enable and inspire learners to commence their civic-minded initiatives; (2) to allow the learners to create social bonds with others in the course; and (3) to facilitate self-organisation of learners and to engage them in their own learning pathways throughout the course. I additionally wanted to explore solutions that could enable the platform and the class structure to scale (potentially to much larger groups). Both the first course, Platform (on Social Entrepreneurship), and the second course, Hybrid (on Global Citizenship), were designed especially for learners with high levels of self-efficacy, whose communication skills and motivations were reviewed through application forms.

As shown in Figure 5.2 the course infrastructure consisted of a custom made LearningCircle.io website, built as a focal point, where learners could easily find both course materials (including readings and schedules of events) and each other and was a place where participants (both facilitators and learners) could exchange ideas and share feedback on their work.

LearningCircle.io users were encouraged to use a mix of social media platforms in their own capacity to complete assignments and interact with one another (including YouTube, Google+ and Twitter) with varying degree of scaffolding of the social connections formed in both courses; this independent usage of which has been shown to promote learner-agency based learning and community building (Cuesta et al., 2016; DiVall and Kirwin, 2012; Greenhow and Lewin,

LC 1,2,3	P	H	Tool	Features	Purpose & Application	Integration with LearningCircle.io
	Y	Y	<i>LearningCircle.io website</i>	Course administration Scheduling Content sharing Discussion and social	Course management All learning interactions Accessing content	-
Y	Y	Y	<i>Email</i>	Email scheduling Mailing list management	Weekly schedule emails Weekly assignments emails Emails to mentors	Platform became the email management tool
Y	Y	Y	<i>Hangouts</i>	Video conversations Playful art features Side chat features	Weekly hangouts Student led discussions Outside of sessions private videos	Automated scheduling of group Hangouts Links to Hangouts shown in class schedule
Y	Y	Y	<i>Hangouts on Air</i>	Ability to broadcast to wide audience Side chat feature to ask questions to speakers	Interviews with experts Learners ask questions through comments	Links to Hangouts on Air integrated in class schedule
Y		Y	<i>Facebook</i>	Status indicator Private group	Pre-course socialising Emergency contact during course Post course socialising	Not integrated

**Figure 5.2** LearningCircle.io functions and content

2016). Learners were encouraged to interact with other members of their learning community to individually deepen their learning as well as share interesting resources with one another.

The three design requirements of learning environment and course design features, civic-impact support, community building support and learner course co-creation support, will now be discussed in more detail.

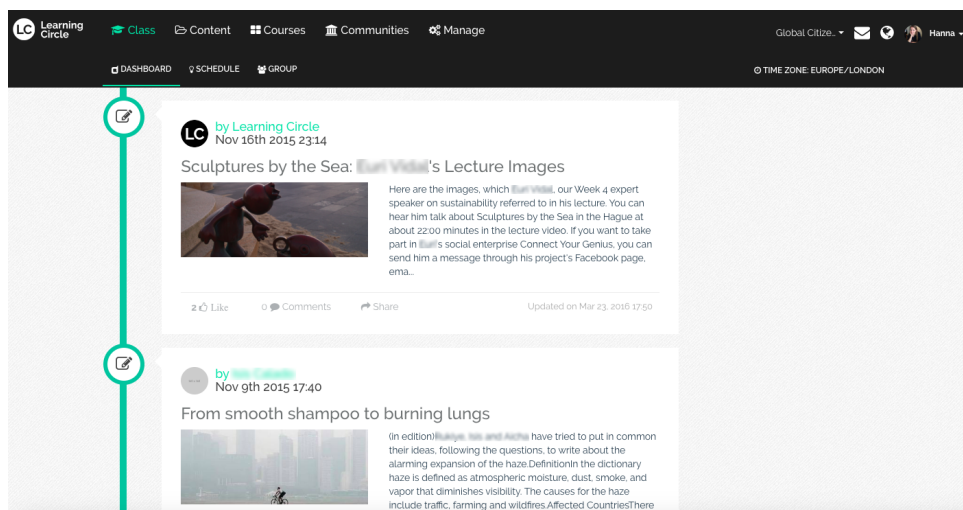
### 5.2.1. *Technological design of the learning platform*

While I have designed the platform based on design recommendations both from prior research and from experience running the project using the loosely-coupled social media approach, the platform was built by a team of developers from Vazco.co.

The platform was written in Meteor. Meteor, is an open-source JavaScript framework written in Node.js. Meteor allows for rapid prototyping and produces cross-platform code. Meteor was selected as the main technology given the pace of website development in enabled: it was great for rapid prototyping and it benefited both from several public packages developed by the Meteor community as well as the code base developed for joint use for the client community managed by Vazco.co. The code was stored on the open source repository of the Open Lab <sup>1</sup>.

The platform development project had a project manager from the Vazco.eu team, with whom I have liaised to communicate designs, align on delivery timelines and check progress. I was responsible for building the website interaction wireframes, user stories and design prototypes. I designed the product development roadmap and tracked progress against its delivery against both timelines and budget. I was also responsible for testing usability of all the features launched and sending bug reports to the development team. The Vazco.eu team was responsible for writing and testing the code. The project manager helped break down and cost the deliverable and assign to the appropriate developer on the team.

<sup>1</sup>[https://github.com/digitalinteraction/learning\\_circle](https://github.com/digitalinteraction/learning_circle)



**Figure 5.3** Learning Circle learner dashboard showing learner post, liking and commenting as well as the filtering icon

### 5.2.2. *Making Logistics Easy to Enable Activism*

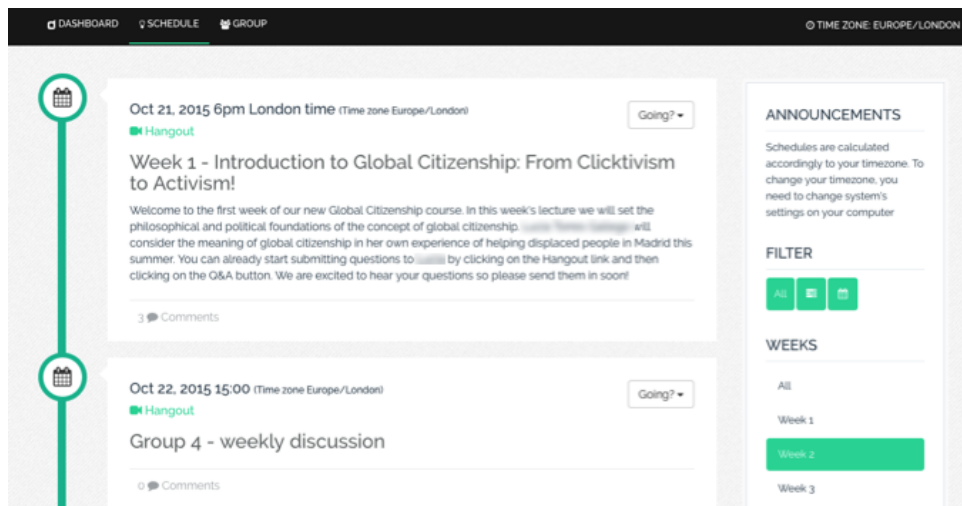
As per *DR1: Organise the Resources* and *DR3: Automate Mundane Tasks*, several learning support and automation features were implemented in order to simplify course logistics and experience sharing by learners and in turn facilitate focus on civic-minded initiative planning.

#### *Activity Dashboard*

Both projects and blogs were aggregated in a timeline (see Figure 5.3), which was the central part of the courseware for both learners and facilitators. The entry point for approved Learning-Circle.io learners into a simple timeline makes it easy for students to find information about the course to focus their discussion less on logistics and more on course content. On the website, students could find all the information about the courses (such as schedules, assignments). This was also the space where they could both easily create projects and gather feedback from the community. Finally, it was a space to consume reflective posts created by fellow learners. All information was structured on a timeline, ordered by most recent action on an item, updates and comments (but not likes). This feature was implemented as content aggregators were found to help learners navigate the resources (Kop, 2011; Mackness et al., 2010; Siemens, 2004).

#### *Blogging*

Blogging feature was implemented as connectivist courses relied on learner co-creation of materials through their preferred blogging or microblogging infrastructures (Ho et al., 2014; Kotturi et al., 2015); blogging and discussion forums have also been shown as important tools for distributed mentoring in affinity groups Campbell et al. (2016); Evans et al. (2017); Gee (2003, 2005a). Learners could easily create blog posts on the website, or embed links to external sources. Integration with Embedly allowed for external content to be presented on the timeline as attractively as native content. This was done to ensure learners could be creative with their submissions by completing their projects on other platforms as per *DR2: Enable Creative*



**Figure 5.4** LearningCircle.io schedule feature helped learners understand the starting point for course interactions

*Expression in Tasks.* Students were encouraged and reminded of the need to provide feedback to others as a core element of their learning (though this was not a condition necessary to graduate from the course). The platform made it easy to type comments on all platform content directly on the timeline and made it easy to see notifications and incoming messages about feedback received next to their profile picture.

### ***Projects***

These were created as separate from blogs to help learners distinguish between course assignments (blogs) and community projects to be launched in their communities. The project feature was inspired by activist community platforms, which enable members to get feedback on their projects (Harness, 2011).

### ***Course Schedule***

On the Schedule part of the website (see Figure 5.4, students could find all the information about the courses (such as activity schedule and assignments). This feature was implemented in line with *DR1: Organise the Resources* to facilitate learning by simplifying course schedule and administration support tools.

### ***Administrative Support***

The platform also included several features which addressed challenges previously reported by courses organisers using loosely-coupled media approach (around administrative tasks and assigning groups by course organisers) as presented in Chapter 4, especially in *DR3: Automate Mundane Tasks*. These tasks included for example application and group assignment processing and email management. Groups were created automatically based on maximum learner difference (the algorithm favoured learners with most different profiles available at the same time), as per *DR4 Supporting Scale and Sustainability*. With this diversification feature I additionally hoped



to avoid echo chambers which are likely to emerge if learners are left to their own devices to self-organise, a challenge observed in many connectivist MOOCs (Mackness et al., 2010). Students are automatically assigned to groups based on their availability and optimising diversity within a group (having participants from maximum number of unique countries). This focus on learner diversity is supported by literature on connectivist MOOCs (Siemens, 2004, 2005, 2006). The platform was integrated with Google Hangouts API for easy automated creation of group Hangouts. Students could ask to reschedule their session through the website and provide times when they were available so that facilitators could complete this change (these requests were manually processed by the course organiser).

The main features which were designed to help learners focus on building their knowledge of civic issues and how to solve them included blogging, learner cooperation tools and efficient administrative tools (to ensure participant focus on learning tasks as opposed to logistics). These features were used in tandem with social features, which helped build a strong sense of community.

### 5.2.3. *Community Building Features*

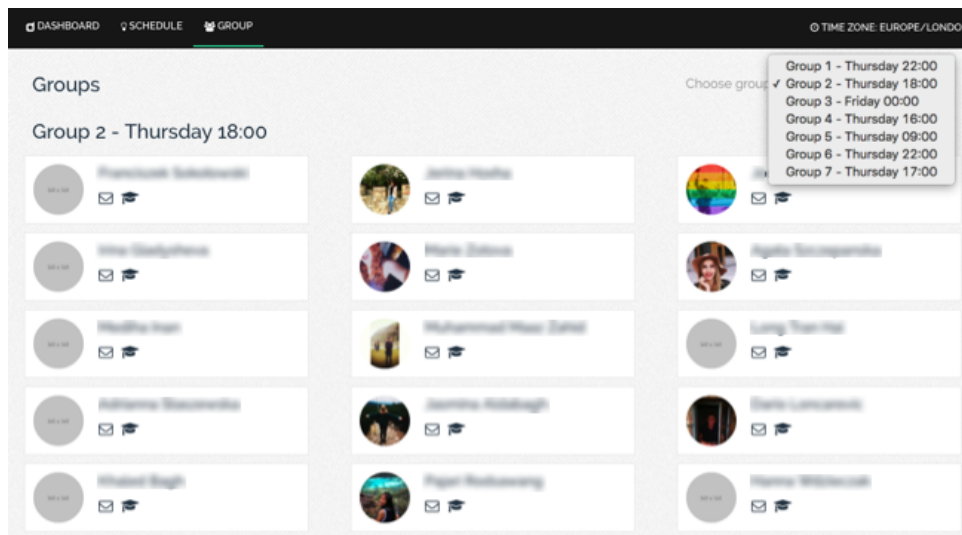
Social interaction features have been shown to be important in creating online communities and were intended to reinforce the sense of community among course participants (Gee, 2003, 2004; Jenkins, 2009; Preece, 2000). Main community building features included personal profiles and layered community design (group views and group content filters) as per *DR6: Layer Community Engagement*. Accepted students were able to see profiles of members of their class and group as per *DR7: Surface Learner Presence*, as well as like and comment on others' contributions. They could also tag other users in their posts, and were also able to send each other private messages.

#### *Learner Profile*

Students created their profiles when they signed up for the course, a feature I implemented as per *DR7: Surface Learner Presence* to support bond-based commitment as well as compliance with community standards (Ren et al., 2012). They could add an avatar picture to their profile to suggest to others they were active in the course.

#### *Work Groups*

To reinforce the interactions that matter most to driving deep discussions, I set up work groups of up to 10 people as per *DR6: Layer Community Engagement*. These groups met once a week via an automatically scheduled Hangout (see Figure 5.5). I designed an algorithm to split learners into randomly generated groups to support the diversity of perspectives, which has been shown to promote learning. This feature is similar to collaboration companion for MOOCs TalkAbout, shown to increase learning in online courses (Kotturi et al., 2015). Learners and facilitators could see other participants by group in the Groups section of the website, message others or view their profiles (including names and published content) as per *DR7: Surface Learner Presence*.



**Figure 5.5** LearningCircle.io group view showing active learners and feature to view other group

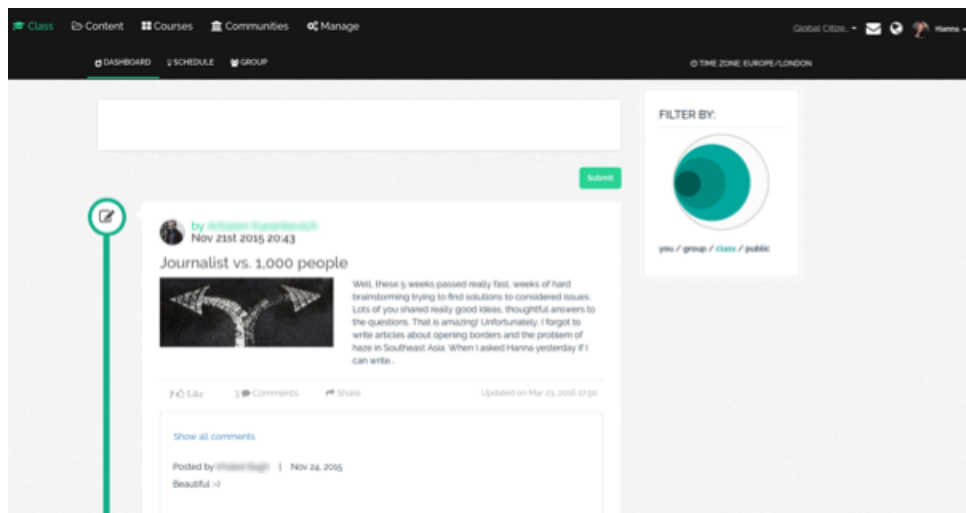
The built of these features was prioritized to enhance community building and make it easy to find and interact with others, which was a challenge for participants in loosely-coupled media courses signalled in previous research (Preece, 2000; Ren et al., 2012).

### *Community Layers*

I recognized the need for enabling social interactions through different community layers (wider community, class and small group) to increase bond-based commitment (Preece, 2000), in line with *DR6: Layer Community Engagement*. The community features of the website were introduced to reinforce interactions in layers that felt comfortable to learners. Learners could both explore the content of their own small group as well as interact directly with the large community by toggling the view filter (see Figure 5.6). Learners could easily switch between different views of the website. They could restrict class content to only the students in their own small group for increased personal relevance (group view, restricted to 10 people); they could also review the content created by everyone in their class (class view, restricted to 200 people in a class cohort). The filter feature was incorporated with scaling in mind and uses two extra levels: course and public. If registrations exceed 200 participants different classes (class cohorts or sections) are created for each course, and the course view would enable learners to see posts for everyone in their class. The public layer allows learners to see content that has been featured across different learning communities. Course organisers and facilitators can feature all content with permission of content owner to enable this view. Thus I sought to address the challenges experienced by learners of connectivist MOOCs (Kop, 2011; Mackness et al., 2010).

### *Social Media Integration*

The first test course was organised using only the social features of the LearningCircle.io platform. However, I found that learners did not spend enough time on the platform (about 3h per week) for the course interaction to feel lively and responses to be provided in the timely way. Therefore,



**Figure 5.6** LearningCircle.io filter feature helped learners navigate between different layers of the community (self, work group, course and public)

for the second edition of the platform course I decided to also create a private Facebook group to which all course participants could add themselves. This group was used for ad-hoc course communications and helped answer urgent questions, such as ones relating to technical problems and logistics as per *DR9: Tackle Technology Problems Upfront*. It also helped learners stay connected after the course as per *DR5: Focus on Learning*. I also used it in the first week for learners to start introducing themselves, as using a familiar technology helps establish interaction (DiVall and Kirwin, 2012) and doing so in a private setting helps build trust between members (Preece, 2000).

#### 5.2.4. *Promotion of Constrained Self-Organization and Peer Feedback*

The course design promoted constrained self-organisation and peer feedback, but was also supported by facilitators. Facilitators were a special user type that had additional privileges (which included moving learners between groups, accepting applications and sending weekly mailings, or making posts public). Their inclusion was guided by the need of connectivist course experience to have more teacher presence in the course (Liaw, 2008; Mackness et al., 2010) and as per *DR8: Reinforce Facilitators*. While course organisers provided a starting point for the discussions each week, students were encouraged to navigate their own way around the topic and explore different technologies to complete their work. Students were encouraged and reminded (by facilitators and in weekly emails) of the need to provide feedback to others to signal this was a core element of their learning (though this was not a condition necessary to graduate from the course) as per *DR10: Make Negotiation of Learning a Habit*. Learners received notifications and incoming messages about feedback received next to their profile picture.

### 5.3. LearningCircle.io Testing Study Design

The initial MVP of the platform build was tried out during a UX testing day. Then, it was implemented during two courses (one where it was used as a sole integrating platform of the

course, the other where it was used in tandem with social media presence). The analysis shown in this chapter will present the initial platform evaluation, which was done in order to refine the features of the MVP into a final learning environment design. This analysis proceeds the detailed study of learning interactions covered in Chapter 6 and the detailed study of teaching contributions of all course participants covered in Chapter 7.

In order to enable us to make comparisons with the second (largest and most active) of the loosely coupled implementations (thereafter referred to as Loosely-Coupled course), similar course set up was employed where possible. The courses used similar weekly course structure. In one of the courses I used an identical configuration of facilitator support model, while in another I amended their role (to compare results). A custom build platform LearningCircle.io was used as the central organising space for all course materials, filling out the gaps highlighted in loosely-coupled implementation to effectively support collaborative learning and effective organisation in the online courses (see Figure 5.2 for details). I will first provide the overall structure of the three platform experiences (testing, platform course and hybrid course), then present the methodology of the study before presenting the evaluation - first by experience, then by design goal. Finally, the discussion of the findings will summarise the key points of analysis.

### 5.4. UX Testing

UX testing day was organised with the help of 14 members of Open Lab at Newcastle University. Participants were gathered in a room and were given a walk-through of the website. They were asked to complete several tasks, including registration, creating a profile and creating a blog post on several devices. They were asked to both provide general feedback about the look and feel of the platform, as well as report any difficulties in written documents. Participants were also asked to complete a survey at the end of the exercise.

### 5.5. Platform - Social Entrepreneurship

This iteration of the course was delivered to older learners (alumni of United World Colleges as opposed to prospective students) and afforded the opportunity to test several of the hypothesis proposed by experiences running Online UWC courses using loosely-coupled media. The experience focused on testing design solutions which showed promise of significantly helping the scaling potential of the platform. Previous studies have suggested that strong community leads (mentors or facilitators) are necessary to provide ad hoc structure and support for learners (Mackness and Bell, 2015). I defined the role of facilitators differently in the two iterations of the course. In Platform course, the facilitator's role was to provide ad hoc commentary for learner projects – they were not required to regularly participate in all class activities (such as weekly Hangouts). Their involvement was far less formal and focused around providing specific project feedback), so I were able to achieve a 1:50 ratio vs. 1:10 used in the first three iterations of the Online UWC course. While 5 more facilitators initially signed up for the course they were not clear on their role and did not actively contribute to the discussions online. It was hoped that

the pre-existing sense of community among UWC alumni (who feel a bond of belonging to the same school organisation and adhering to the same principles) would help provide the necessary support for the learners. Members of the Online UWC organising team who were also United World Colleges alumni and Facebook was not used organised the course and students were not actively encouraged to interact outside the course platform.

Learners registered on the Learning Circle platform and upon acceptance of the course would receive push notifications via email from an organising team. The focus in this edition was to focus entirely on scaffolding real life complex projects from start to finish throughout the five-week course. Consequently, the course required a significant workload from the students. Instead of needing to meet participation requirements (group participation and assignment completion) in order to “complete” the course learners had to focus on output of the work, which was community projects which learners created throughout the 5 weeks of the course (by creating descriptions, websites, social media presence, etc.). Unlike other Online UWC courses, I decided to not charge an entrance fee to see the impact on learning engagement (as reflected by consumption of course media and contribution to course discussions).

### **5.6. Hybrid - Global Citizenship**

While the Platform course experimented with a slightly different learning structure, the Hybrid course was designed to make it directly comparable to the largest implementation of the loosely-coupled media Online UWC course. Therefore, the same course structure was used: the course followed a topic-based instruction (as opposed to full focus on final project). Facilitators were assigned to each group (with a ratio of 1:10). Facilitators were recruited and trained prior to the course. The facilitators were responsible for tracking attendance, assignment completion and contributing to both live discussion and online discussions on the LearningCircle.io platform and in the Facebook group) and provided facilitators with training ahead of the course. This course was coordinated by a third party (to the research teams) who worked with some new and some experienced facilitators from previous Online UWC courses; training was offered for all volunteer organisers before the start of the course.

A Facebook group was integrated as an additional means of communication (though participation in the Facebook group was not obligatory). Additionally, based on partial feedback from students and course organisers I also made small changes to website design, the most important of which was to simplify the process of rescheduling a session and clearly displaying the time for all events in the timezone of the learner with clear timezone label.

Finally, particular emphasis was placed on promoting self-organisation among students. The role of feedback was emphasized in the training to facilitators and explained to students with email communications that feedback on other students’ work was an important component of their learning (though not a formal requirement to pass the course). More collaboration was embedded into course design, by encouraging students to self-organise to do assignments together (but without assigning groups that they would have to work with). Finally, the final assignment was redesigned as a “social media takeover” of all official Online UWC accounts by

self-organising students to promote awareness about the issue of haze in Indonesia (which was one of the topics of the class).

### 5.7. Methodology

Similar methodology to the one used to evaluate the three initial Online UWC courses was used. Data reviewed included course applications, engagement with course content and activities as well as qualitative review of participation surveys.

#### 5.7.1. Participants

<i>Participation metric</i>	<i>UX Testing</i>	<i>Platform</i>	<i>Hybrid</i>
Registered Participants	14	178	104
Active Participants (week 1-5)	14	33	40
Participants who Submitted Survey	14	6	16
% Female Approved Participants	64%	48%	63%
# Countries Represented	NA	20	25

**Table 5.1** Participants in UX testing, platform and hybrid courses

Table 5.1 shows summary participation statistics for each of the three experiences. Participants in the UX testing course were HCI researchers and advanced degree candidates working with the Open lab at Newcastle University. Participants in the Platform (Social Entrepreneurship) course were alumni of United World Colleges (including alumni of previous Online UWC short courses) and were aged 14+ (most participants were 18-30 years old, and several were more than 30 years old). Participation by more advanced learners was encouraged given the fact that the learning platform was still in experimental stage. Participants in the Hybrid (Global Citizenship) course were youth aged 14-18 who were interested in learning more about civic-impact related topics and who were interested in United World Colleges. The gender balance across user testing and both courses was leaning towards female participants. Learners for the two courses represented a variety of different countries.

#### 5.7.2. Methods

Methods used were the same as used in for the loosely-coupled courses described in Chapter 4. The mixed methods analysis was conducted after each experience and included summarising and comparing the quantitative engagement indicators gathered through the course.

Quantitative analysis related to aggregating data generated by course participants throughout the course platform and social media (esp. Facebook group page and YouTube channel).

Qualitative data was reviewed using inductive thematic analysis, to identify relevant themes from learners and facilitator survey results. Learner posts were classified into categories deductively, based on post categories identified in the analysis discussed in Chapter 4. As is

recommended by action research, the categorisation of posts was reviewed in order to better reflect the context of the new courses - subsequently, several small post categories were rolled up into one to simplify the discussion of data.

Additionally, both the UX testing session and the two courses using the platform asked participants to answer several survey questions about their course experience using a Likert scale.

Each cycle of design and analysis resulted in immediate adjustments to next iteration of live implementation of the platform. For example, after the UX testing, several bugs were fixed. Also, after the experience of running the Online UWC course once solely with the learning platform, a decision was made to continue actively adding social media to the mix.

### 5.7.3. *Measures*

Measures of analysis were in line with the measures used in the analysis conducted in Chapter 4. Key measures of engagement included registration, week 1 course engagement and week 1-5 course engagement as well as course completion. Conversational learning measures such as counts of post, comments and likes were used. Conversational activity was also split by platform (either Facebook or LearningCircle.io). Qualitative data was summarised using themes counts and share of total were discussed for both surveys and posts.

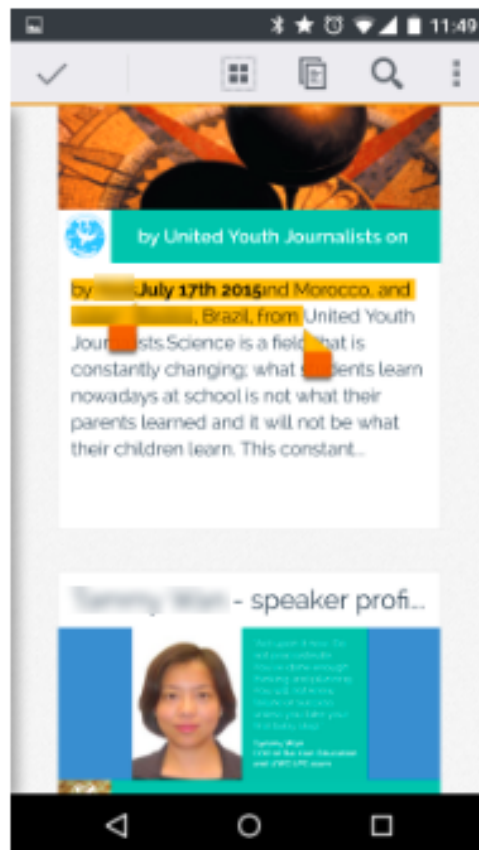
## 5.8. Evaluation

In order to understand the sequential nature of the learning environment design and improvement process, the first section of evaluation will explore the high level findings from each of these iterations, and how these impacted selection choices for the following live implementations. To begin with, findings from the UX testing day and decisions made following it will be reviewed. Then, high level engagement and usability comments will be shared about both the Platform and Hybrid course. Finally, both the Platform and Hybrid course will be compared against their success in meeting the three design goals.

### 5.8.1. *UX testing recommendations*

User testing involved 14 testers. While all 14 participants attended the testing sessions, 13 filled out the detailed platform survey and 8 submitted detailed qualitative descriptions of suggestions and problems.

User testing picked up several problems with the LearningCircle.io website, the most important of which were regarding problems with the application form (18 bug reports), content and formatting of public pages such as Homepage and FAQs (8 bug reports), problems with user profile creation (7 bug reports). Other important issues flagged included incorrect formatting on mobile devices (page elements were not aligned) and difficulties with website flow (for example illogical steps in the user sign up flow), as well as general website malfunctions (for example inability to select a time to sign up for group sessions). Figure 5.7 shows an example of very detailed display bug in the blogging feature of the LearningCircle.io platform.



**Figure 5.7** Screenshot provided by one of the users showing a bug in formatting of blog posts title and date

Based on this feedback, several important changes were implemented on the platform in order to fix the formatting, flow and malfunctioning features. Given the high number of bugs reported (60) and the detailed nature of the feedback (including screenshots) the changes to the platform took several weeks to implement and the timeline started pushing close to the planned start date of the Platform course. With benefit of hindsight, it would have been more prudent to delay the launch of the Platform course until after another round of UX testing. However, given the constraints of the real life application of this platform, it was decided that the Platform course starts as per the planned schedule.

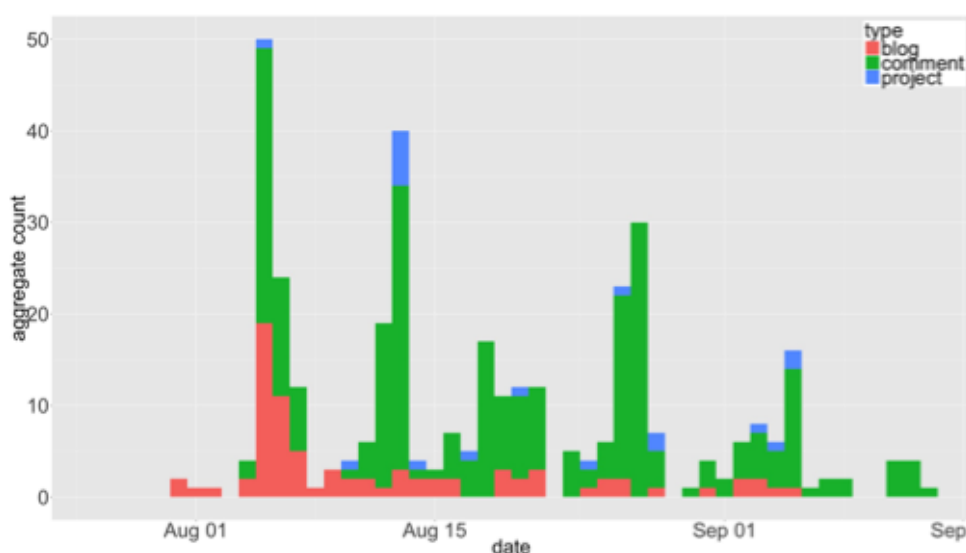
### **5.8.2. Platform course engagement and learning environment usability review**

In the Platform course, out of 33 active learners 48% met the criteria to complete the course (Figure 5.2). While only 16 completed the course (by submitting the final project on the website), several other users, who did not submit a final project, engaged at different levels throughout the course: at least 33 participated in the course (33 anonymous unique users simultaneously viewed the first lecture live), while 26 registered learners completed at least one action on the website. Additionally, 25 learners took at least one action on the website. The low completion rates of approved registrants is comparable to the average rate of free MOOCs which is below 13% (Onah et al., 2014) vs. 10% observed in the Platform course. Additionally, website bugs



<i>Metric</i>	<i>Platform</i>	<i>Hybrid</i>
# Active Learners (Week 1-5)	33	40
% Actives who graduated	48%	63%
Active Learners / Facilitators	11	3.3
WatchTime minutes / Learner	171	134
Facebook posts / Learner	n/a	5.8
Facebook and LearningCircle.io Posts / Learner	3.4	6.2
Projects Set Up	7	3
Social Impact Evidenced	3	14

**Table 5.2** Summary statistics for Platform and Hybrid editions of the course. Number of active students measured as students who completed at least one action during the course. Watch Time (WT) denoted in minutes. Impact evidenced calculated as projects in which an individual took part (can be more than one per individual). Individual projects were not a requirement for graduation in LC



**Figure 5.8** Participant Contributions in the Platform Course

observed in the first two weeks of the course (affecting communication capabilities of the website and causing high latency) most likely contributed to the high drop off of learners in week 1.

Figure 5.8 shows a summary of contributions by participants in the Platform course, showing a drop in participation level from weeks 1 to 5.

The Platform course was the first time the new platform was used after testing, which meant that in the first two weeks several glitches were observed and had a negative impact on user experience. One bug included inability to join a Hangout if not logged in to admin account which blocked users from participating in the first weekly Hangout. Another made the website load very slowly.

The platform did not fully meet its role as an effective way to organise resources in the eyes of participants in Platform course. Three respondents mentioned platform functioning as a source of disappointment and confusion related to the course. P1R8 says “*The LC platform felt kind of confusing, I just always felt I was missing some things*” and P-R7 adds “*I signed*

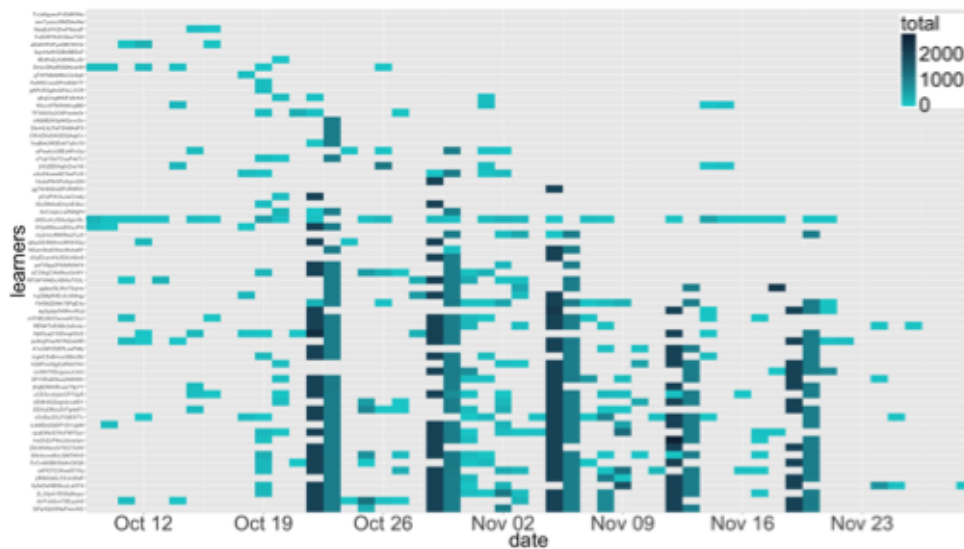
*up, but was not able to understand how to access to the content and find out which group I was in, and I was never able to participate.”* P-R8 also mentions the shortcomings of the platform as a main reason why the initial excitement about the course decreased: *“Things were often (even on good browsers and Wifi) slow to load, so it wasn’t fun to use and felt cumbersome and disorganized. It felt overall like such exciting course design, such great organizers and participants, but the potential felt quite lost....partially (mainly?) due to the platform issues.”* Also course organiser of the Platform course shared this view: *“I think website teething issues such as when the notifications function stopped working or messenger glitches partly contributed to this not being as good as it could have been.”*

For the Platform course, in feedback forms (see Appendices G and I for details) 5 out of 8 respondents mentioned issues using Hangouts, for instance P-R8 says: *“The course page with who was in which group has helpful, but it still felt a bit unclear how to communicate with them as a whole, hangouts seemed to rarely work, it would have been nice to have a centralized group location to communicate.”* Given during the Platform course learners were not invited to join the Online UWC Facebook group, they could not use it to get real-life help from their fellow course participants; however, they used the group view on Learning Circle to contact other members of their groups.

However, despite the high attrition rate I saw that several learners chose to engage passively in the course and some saw a lot of value in such participation. This passive participation is evidenced by quantitative indicators such as watch-time of videos that were sent out on average (30% higher per active participant than in the Hybrid course which given similar length of expert lectures per course suggests more participants were viewing the lectures than were actively engaging in the course) and 70-100 unique users recorded by Google Analytics who visited the website on the day weekly emails were sent (while there may be some cross device overlap, this suggests that more learners engaged with the push email notifications sent than were actively participating in the course). While I did not actively seek feedback from passive learners, one passive learner spontaneously reached out to the organising team to explain reasons for their participation mode: *“In August I signed up with full passion for the online course. However, to my regret, due to certain circumstances my free time was affected and I wasn’t able to participate in the online sessions and discussions. Nevertheless, at the moment I am able to go over the course resources, video’s, and doing the exercises, and I am enjoying it incredibly much and learning so many new things!”*. Another learner (who did not graduate or actively participate in course activities but submitted feedback) also provided a valuable perspective: *“I was not planning to be an active participant due to time constraints, so when I could not figure it out the first day, I put the course on the side and only read the emails to follow.”* (P-R7).

### **5.8.3. Hybrid course engagement and learning environment usability review**

Before the Hybrid course I fixed these bugs and added small tweaks which made the website easier to use on mobile devices and which made the time zone of events clearer to learners. However, functionality wise, the website remained largely unchanged in its design. However,



**Figure 5.9** Summary attendance, social activity and assignment completion statistics for Hybrid course

given that the course was planned to include younger learners than the Platform course, and given the positive learner experiences with the loosely-coupled courses, in order to limit the risk of bad experiences social media was used as a key communication part of the course. This was to make sure that even in case of LearningCircle.io tech challenges learners would have the opportunity to easily reach out to course organisers and to each other. Instead of keeping the focus on questions of scaling, the research honed in on the question of providing a good learning experience and providing facilitators with guidance how to best support learners in this learner-led, open-ended curriculum model. This research direction choice is in line with the action research methodology, which prioritises the needs of the partner community in the research project Hayes (2011).

In the Hybrid course, out of 40 active learners 63% met the criteria to complete the course (Figure 5.2). Of these at least 40 students were active at least once throughout the course and 25 students completed the course, which was a return to the engagement level, which are comparable to completion rate seen in previous Online UWC courses done outside of the platform (63% vs. 70-77% in loosely-coupled courses described in Chapter 4 and 48% in the Platform course, see Figure 5.8 for details).

For the Hybrid course I saw 60-100 unique users visits the Learning Circle website after weekly mailings (with some cross device overlap possible), but I did not otherwise observe evidence of passive participation in the Hybrid course. However, there was a big difference between the number of active participants who completed at least one assignment or participated at least once in a Hangout (40, most of them completing just the initial “Introduce yourself” task in week 1) and the average number of participants in a Hangout throughout 5 weeks (22) or average number of assignments completed throughout the course (29). These drop out rates in week 1 were similar to those observed in the Loosely-Coupled course and much lower than the ones observed in the Platform course, which shows that proposing a payment for the course allows recruitment of candidates that are more likely to want to complete the course. Figure 5.9 shows detailed pattern of participation in the Hybrid course, showing a cluster of participants

who dropped out after week 1 and strong participation from remaining learners throughout the course as well as after the course.

In feedback surveys in the Hybrid course respondents did not voice dissatisfaction with the platform (see Appendices G, H and I for details on questions asked). In fact, of 7 responses to the question “*Do you have any other comments / suggestions to improve the course*” 5 were primarily to say “*it was awesome*” [H-R8], “*the course was amazing*” [H-R12] or “*I really loved everything*” [H-R9] etc. This high level of satisfaction suggests that learners did not have the same difficulties using the platform as participants of the first course.

Table 5.2 summarises participation in both courses. By comparing the two courses it is clear that the course organised including components of social media interaction and lower facilitator to learner ratio resulted in higher learner engagement. With this high level engagement summary of the two courses in mind, I will now be able to consider the three design objectives of the platform through a more detailed evaluation of the two courses conducted on the Learning Circle platform: (1) empowering students to launch their own activist initiatives; (2) enabling students to become a resilient community; and (3) facilitating self-organisation of students. I also addressed the potential of the platform to scale and be guided by learner centric pedagogy.

### 5.8.4. Design Goal 1: Enabling Activism

In the evaluation of the goal to enable activism I considered both primary impact (evidenced through projects created, evidenced or inspired) and secondary impact of building awareness and sharing relevant course topics with the wider community and the world.

Both the Platform course and the Hybrid course resulted in creation of community projects. Several projects which emerged through the Platform course were complete with a website and a social media presence. The overall community level impact was high – for example, the Irembo Foundation project resulted in building an actual social enterprise that helps artisanal creators in Rwanda sell their goods abroad <sup>2</sup>. However, projects conducted were mostly individual and some pre-dated the course in different stages of completion as evidenced by the applications (the Irembo Foundation project is one such example). The learning community provided feedback in the different iterations of the project, which participants really valued, for example P-R1 says “*I liked them a lot, we had inspiring talks and gave one another a very helpful feedback.*” Participants also saw course materials as useful in advancing their thinking about the project; P-R6 explains how the course helped her with her project: “*I found the reading references and the video lectures very useful in helping me think through the little details of my project that I hadn’t quite considered.*” For the Platform course learners who were engaged in the course by week 3, there was 100% completion rate of projects. In the Hybrid course only 5 projects were set up on the website and only 1 of these related to an actual community initiative (others are assignments which are normally submitted as blog posts). However, based on evidence in the Facebook group I saw 3 community initiatives emerge – for example Exchange the World is a

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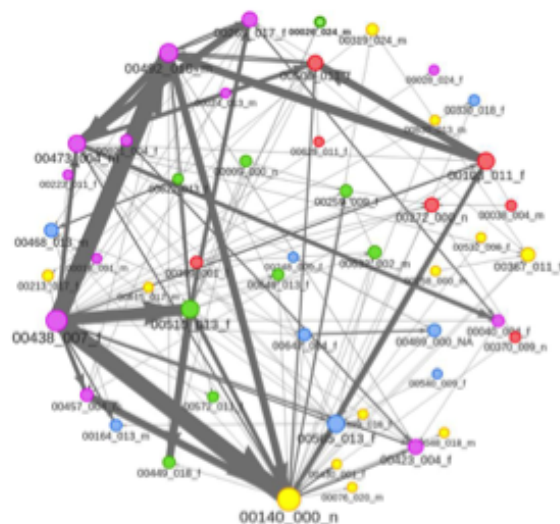
<sup>2</sup><https://www.irembofoundation.org/>

platform that the students set up on Facebook to exchange postcard and physical objects between each other across country borders and involved several of course participants. Another example of project is The One World, created by one of the learners who also actively participated in United Youth Journalists (a project created in the Loosely-Coupled course) to share video journalism with youth. A third example involved a learner presenting awareness materials about the environmental issues in Southeast Asia in her school. I saw evidence of several course alumni participating in these initiatives (there is evidence of at least 14 examples of participation).

I also observed some indirect social impact of both the Platform and Hybrid course. In the Platform course learners shared their projects with their communities and via social media (through the pages they created throughout the course) and invited their friends to vote on projects in the course. In the Hybrid course, in addition to this direct evidence of community involvement, 8 out of 12 respondents to question about planning to use skills acquired in the course mentioned their willingness to get involved in their communities in different ways (6 through increasing awareness in school and local communities and 2 through participation in local NGOs). H-R8 has already shared the knowledge with their classmates: *“Yes, I already had a presentation about the haze at my school. I told my classmates what products have palm oil in it and how they can change the situation in Indonesia by buying things with sustainable palm oil.”* In the Hybrid course learners also participated in a final project where they created an awareness campaign about the issue of the Haze in Asia. 24 students participated in the campaign, which reached more than 2,000 people through Facebook and Twitter (posting 26 articles, 6 of them students’ original works (including video montage and short story), on Facebook and 27 tweets on Twitter).

Given that creating a social enterprise project was a requirement for participation in the Platform course, people interested in the topic but not ready to complete the project would have found it discouraging to participate fully in the course as they would have fallen behind on assignments quickly. In this way the course could have felt exclusive to some learners, as of the 9 respondents to the Platform course survey (not all of them completed the course) only 2 listed starting a community project as their main motivation to take the course. P-R1 provided useful feedback regarding high expectations set out by the course structure: *“I for example and others in my group did not feel as if your project idea was developed enough to make a website (...) The course was nearly expecting you to have a very well developed idea already.”* In the end P-R1 did not set up a project as a social enterprise, as she: *“finally came to the result that an enterprise might be the wrong way to organize the project, but an organization might be better.”*

It is additionally interesting to note that the platform kept the focus on task of learning about activism and made it easier to provide feedback on projects and this was reflected in the output. In the Platform course I see that posts in category projects received an average of 4.3 comments each – both from other students and from members of outside community who were invited to contribute at the end of class. The added focus on activist learning is especially visible when I compare results from the Loosely-Coupled and Hybrid course. Overall, the number of comments per participant in the Hybrid course was the same as during the Loosely-Coupled course (14.2).



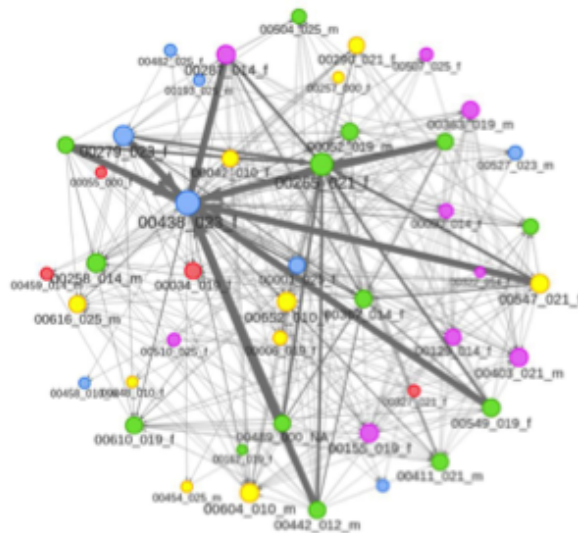
**Figure 5.10** Social network created through interactions in Platform course

However, content sharing and assignment related posts constituted 46% of all Hybrid course posts on the Learning Circle website and Facebook page while only 35% of all posts during the Loosely-Coupled course, showing how the platform allowed for the learners to focus more on class related tasks. Finally, the length of comments during the Hybrid course was 36% more than in OU2. What is especially interesting, within the Hybrid course the comments made by participants on the Learning Circle platform were 2.4x longer than the Facebook comments made during the same course. This can be an indicator that a dedicated space for assignment discussion allowed the participants (facilitators and learners) to be more reflective when providing feedback on a dedicated platform.

High level of project feedback in the Platform course and discussion in the Hybrid course between students shows the potential for this reflective pedagogy in a self-organised context. Honing in these design elements can help design a platform that is capable of scaling to a larger audience, where most of the feedback and commentary is provided by peers instead of facilitators.

### 5.8.5. Design Goal 2: Promoting Community

In both the Platform and Hybrid course learners were satisfied with the opportunities to meet others in the course. To question, “*Did you have enough opportunities to get to know each other*” most respondents responded “*Yes*” and “*Yes but*” (78% in the Platform course and 87% in the Hybrid course). Of the respondents who did not feel this was the case several provided qualitative details that “*I did not put in any time to doing so either*” (P-R7) or “*I think the reason is that I don’t use Facebook. It would be nice if there’s a group chat*” (H-R14). Figure 5.10 shows patterns of network created in the Platform course, heavily skewed towards a few of the facilitators and loose infrequent or non-existing contacts between other learners on the platform.



**Figure 5.11** Social network created through interactions in the Hybrid course (both Facebook and LC website).

Figure 5.11 shows a network created in the Hybrid course, with more frequent exchanges between learners, less skewed towards facilitators, but showing the importance they play in providing repeated feedback.

The main difference from a community building perspective was that in the Platform course Facebook was not used and in the Hybrid course it constituted a key part of pre-course, course and post-course communications. I observed that distinctive use cases emerged for Facebook vs. Learning Circle platform uses, with Learning Circle being used to share assignments and continue the discussion on their content via comments, while Facebook was used for relationship building before the course, logistics during the course as well as content sharing during and after the course. Figure 5.12 summarises share of different post types on the two platforms.

Course organiser of the Hybrid course (who was also a learner in the Platform course) commented on how the Learning Circle platform fit within the wider course infrastructure: *“I thought that the information was distributed in a logical way across the channels I used in the course: emails contained instructions and longer overviews, while the course platform provided reinforcements and grouped all the learning materials together under each module. Then, Facebook allowed for “last minute” information transmission, for instance a change in the Hangout schedule.”*

The Facebook class group used in the Hybrid course helped learners easily find each other’s names and add each other on social media (when it was not used students did not connect via external means until late weeks of the course). One learner mentions that they used external means of communications to catch up on weekly group hangouts they missed: *“I used whatsapp for exchanging information, preparing tasks etc.”* (H-R14). H-R10 also mentions these external communication tools as a way to support one another throughout the course: *“Yes, I talked a lot in facebook chats and hangouts chats to help each other about questions I had about the course*

Type	LC1	LC2		
	Total	Total	LC	FB
Assignments	40%	28%	70%	1%
Relationships	24%	33%	17%	44%
Logistics	6%	8%	4%	10%
Content sharing	7%	18%	2%	29%
Technical issues	6%	3%	1%	4%
Self organisation	16%	6%	5%	6%
Other projects	0%	4%	0%	7%
<b>Share of total</b>	-	-	<b>60%</b>	<b>40%</b>

Figure 5.12 Percentage of topics of threads and comments per course edition (by platform and total for Hybrid course)

or the assignments and maybe if someone had trouble I could help in some way to help for the assignments.”

The fact that external tools were used for the purpose of helping each other could be seen as a shortcoming of the platform. However, as evidenced by the number of posts and comments, especially relating to the core topics of the class, these external interactions did not impede interactions through official channels and directly supporting community building and acquisition of activism related knowledge and skills. Course organiser of the Hybrid noted in her feedback: “they did not seem distracted by, but rather used for different purposes.” These external connections helped reinforce lasting connections between participants even long after the course was over. In the Hybrid course, several students continued using the Facebook class page long after the course has ended to share articles of interest (for LC2, 22% of posts and 21% of comments on Facebook were posted after the end date of the course vs. 5% of posts and 6% of comments posted after the end of OU2 course). This could also be an indicator that the discussion habits acquired during the class continued after the course and across a different platform.

However, even in the Platform course, where no external social networking platform was proposed to learners, one of students groups from the Platform course showed incredible longevity and still met regularly several weeks after the course; P-R9 accounts in the feedback survey: “I formed connections with other students, which are continuing in a form of Google hangout every Thursday afternoon. I just had the first one today and it is great to have this set of peer facilitators and hear how everyone’s projects are progressing. I also networked with other course participants and I hope to join their projects, which I found to be really exciting.” Not using Facebook resulted in fewer opportunities for learners to interact – with the course noting 81% fewer posts per participant than the Platform course and 79% fewer comments.

I also asked the Hybrid course learners if they used any “unofficial” channels of communications and 13 of 14 respondents who answered this question did. Most frequently mentioned means are: connecting directly on Facebook and using Messenger or small private groups (9),



videoconferencing via Skype or Hangout (6) and email (2). H-R6 provided a valuable commentary: *“When someone really love to collaborate , he/she will find an easy way.”* Learners said they got together to continue discussions on class related projects, for instance H-R6 says *“I got in touch through facebook to discuss on other topics related to being a Global Citizen”* and H-R3 mentions *“I discussed some global issues with a couple of fellow students.”* There is also evidence of learners interacting with each other on social media via community created projects such as United Youth Journalists (created by students in the prior Online UWC editions of the course organised using loosely-coupled media) and Exchange the World (created during the Hybrid course).

Students in the Hybrid course saw facilitators as extremely important to their learning. 10 of 11 respondents agreed it was useful to have a facilitator, giving the following reasons: they helped start the conversation (3 mentions), they are always there to help (3), they help deeper thinking about class topics (2) and they help with organisation (2). H-R8 mentions their role was especially important in the first part of the course: *“Yes, really useful, mostly at the first sessions when I didnt know each other so much it was for each of us to talk because I were just shy.”* H-R9 agrees with this tenet: *“Yes, because in the first weeks I had some tension in starting to talk to each other, but the facilitators helped us a lot.”* H-R12 and H-R6 mention facilitators availability as a reason, which made them very important, they say respectively *“It was really easy to interact with them, because they were always there”* and *“I could always rely on them”*. H-R4 even describes the as an element of course structure: *“Yes, because it was a great structure to the course”*. H-R8 points the importance of facilitators’ unique perspectives: *“they made us think deeper than I thought about the topics.”*

However, the ratio of learner to facilitator is one of the factors limiting growth of the platform (in the implementations I used 1:50 ratio in the Platform course and 1:10 ratio in the Hybrid course) so thinking through ways to divide the complex role of the facilitator into different platform and community members should be considered in greater detail. As the Platform course showed, without appropriate number of accountable facilitators who are able to staff the Hangouts learners can experience confusion. Course organiser for the Hybrid course offers an interesting perspective: *“The facilitators are necessary at the start of the course (...) but already in Week 2 the students should have chosen a peer-leader and this repeats for the remaining weeks. This method of gradual easing students into taking charge of their own learning means that the facilitator’s active role diminishes as time goes on.”* One of the challenges of scaling is high facilitator to student ratio in order to animate all groups when learners are still getting to know one another and answer ad hoc questions; however a model where the number of facilitators decreases throughout the course as learners become more independent and accustomed to each other could partially help address this concern.

#### **5.8.6. Design Goal 3: Self-Organisation**

One of the best instances of self-organisation could be observed in week 1, when students were asked to create a blog post collaboratively (but groups to do so or format of submission were

not defined). The students found each other and completed the assignment in smaller groups, frequently working across time zones. This is evidenced in the reflections from feedback of the Hybrid course organiser: *“It resulted in problem-solving on many levels; the most basic one: how to coordinate collaboration across time zones was their starting point. Most of the students did not know each other well yet and they were tasked with producing a high-quality reflection collaboratively, which led to strategies like a jointly authored Google document and setting their own deadlines for submission of individual pieces.”*

Also the final social media campaign in which learners took editorial control over official Online UWC channels on Facebook, Twitter and YouTube showed high involvement from all the students (24 learners participated in this project, posting articles and tweets across all platforms). While the original plan was for students to fully self-organise (by just proposing an assignment to be completed by all students together), the organiser made a choice of proposing roles for students to sign up for roles after low engagement in the first few days of the takeover, as per guidelines from Catalyst (Cheng and Bernstein, 2014) and Wikipedia (Ung and Dalle, 2010) showing that signing up for specific roles helps organise volunteer efforts. Once students saw the sign up sheet to select roles in groups responsible for Facebook, Twitter and YouTube accounts engagement and self-organisation took place. In the smaller groups students completed technologically complex tasks (as in merging a videos together and joining content to produce a promotional video for the cause).

Without facilitator intervention, the Platform course was meant to be a great example of a self-organising initiative. One example of self-organisation was how learners created their own social connections. Course organiser of the Hybrid course, who was also a participant in the Platform course, comments on how course organising process can, however, accelerate this organic process: *“It seems to me that it took a bit more time in course 4 before we all added each other on Facebook. It happened after many Hangouts and after working together on various tasks, while the students in course 5 did the Facebook connections, friending, etc. much earlier. In part because they were instructed to do so.”* In the context of scaling, the role of external platforms and suggestions of precise interventions from course organising team to catalyse these behaviours and provide initial scaffolding will need to be considered and reviewed in detail.

An additional connection is learner behaviours, which emerged organically, for instance learners started compiling and sharing notes as blog posts after every discussion on the Learning Circle platform. Posts classified as examples of self-organisation constituted 16% of all Learning Circle posts during the Platform course (vs. 7% in the Hybrid one).

Learners in the Platform course recognised participation and presence as key challenges, which especially impacted course participants in the first few weeks, before the number of attendees stabilised. Several learners in the Platform course expressed their concern about the lack of participation from their fellow classmates, for example: *“Group turnout wasn’t ideal but I REALLY enjoyed meeting the two people that I met.”* (P-R6). However, throughout the course students self-organised and created back-up Hangouts and invited others by sending them a direct link to the Hangout through the Learning Circle platform, for example one learner responds

to another who posted about missing a weekly Hangout: *“I have sent you an invitation to my hangout contacts. [another learner] and I will be meeting again on Sunday at 9am London time if you want to join us”*.

### 5.9. Discussion

During the two editions of the online learning activity which I implemented in different configurations on the Learning Circle platform I demonstrated that using a dedicated platform has unique advantages to supporting collaboration, activism and self-organisation between young would-be activists. However, some of the challenges encountered show that additional research into the role of facilitatorship and technology enabled pedagogy specifically designed for self-organising learning environments is necessary ahead of scaling this learning approach to more than 100-200 learners per course.

#### 5.9.1. *Organising Logistics*

Among the most important factors contributing to the success of a course is to ensure that the schedule of all events is clear to learners (especially when it comes to displaying the time zone) and that any technical malfunctions can be resolved quickly. Learners have also found reminders ahead of the events helpful. The timeline view helped organise not just the events but also key assignments, resources and their deadlines. Email provided an additional way to share the plan with learners. This is why also other education platforms such as edX and Coursera put a lot of emphasis on this feature.

However, no matter what infrastructure is designed, ad hoc questions will always arise, which is why it is important to empower learners to be able to connect easily with members of organizing team, facilitators or each other. While directly embedding student discussions in this central space catalysed creation of social connections between learners and helped orient learners who required immediate help, I think that without integration of a tool where learners are always active (such as social media, email or messaging service) learners will not receive questions to their logistical issues quickly enough to help address them. Without this element of “social logistics” learners find themselves confused and give up in the early stages of the course. One idea would be to include links to preferred social media means of communication for all learners who wish to be contacted via external tools in addition to using the Learning Circle website.

#### 5.9.2. *Activist Reinforcement*

During the Platform course I saw that focusing a whole course on scaffolding a community project leads to creation of advanced level community projects (with website, social media presence, etc.). However, focusing the course solely on the activist endeavors discourages learners who are looking for different ways to become involved and as such only helps activists and not would-be activists. In order to empower would-be activists emphasis on collaboration,

community creation and interacting with community related content can inspire future change makers by showing them concrete ways in which they can make an impact. One solution could be to provide different progression paths throughout the course to not alienate the learners who do not have clear ideas for civic engagement opportunities in their communities.

The platform should also make it easy to encourage sharing all featured content (with the permission of the author) to external communities via social media. Learners should be encouraged to set up their projects also outside of the platform but to keep a record of where they can be found as a place of reference for all future community members. As content becomes broadcasted to a wider audience, questions of ownership will become more important. It would be ideal to expose viewers to the names of the different authors of a project or a blog posts, as in current design collaborative projects are only shown with name of one author (and others are difficult to find).

One challenge for scaling impact will be to enable continuous growth of the learning community. One way would be through proposing a process of commissioning to assure that other members of the community, not just the original course organisers, can create courses. As another strategy for scaling it would be great to break down courses into components (units), which can then be easily re-assembled and appropriated into alternative editions.

### **5.9.3. Community Reinforcement**

Design decisions regarding openness of access to the course (e.g. using the application process to screen candidates and using a token entrance fee as a barrier to entry) will impact learner dropout in the beginning, which can lead to some confusion. Better mechanisms to address this need to be implement into a truly open self-organising platform. One solution could be to define their preferred terms of engagement during registration (e.g. signing up as explorers or auditors if they are not sure they will be able to fully commit to participate in the course activities). Alternatively, the set up used in the Hybrid course or in loosely-coupled media courses provides sufficient barriers to entry to gather together a sufficient number of learners for an engaged learning experience.

The ability for learners to change their group (due to schedule conflicts) as well as working with a diverse groups of people is crucial to learning process. Giving learners the ability to meet others from different continents and countries through joint assignments has proved very successful and should be reinforced by an easier technology set up (for example by the ability of learners who already have their group to be shown separately). Also, additional design choices can help learners visualise not only other active members of the community but also recommend connecting to learners with whom they have the least in common and with whom they have not yet connected to fully expand the social network within a cohort.

Facilitators, in addition to orienting learners who require immediate help, play an important role to enable connections between learners and contribute their expertise to the learning process. However, several students show qualities that are facilitator-like (some are as connected or as willing to offer help and advice as many facilitators and student-facilitators). Their role to the

community should be explored in greater details and specific recommendations about how to re-create these behaviours among students should be provided. Potential pathways could include identifying such learners early in the course through analysis of interaction or allowing them to self-identify and sign up for different community roles.

### **5.9.4. *Self-Organisation Reinforcement***

Student interaction in a self-organising context relies on learners providing feedback to one another. Feedback and teaching how to give it well will become the key feature of the platform and the learning methods as it puts focus on community and iteration of projects. Focusing learning around feedback can also have a beneficial effect of removing the stigma of failure by encouraging continuous iteration of projects.

The implementations showed that students do well to organise each other into smaller groups (for example to complete weekly assignments together) when they are shown other learners who are on the platform. In current implementation, being reliably present is an important and unique quality of facilitators, which made them helpful and easy to interact with. This concept of surfacing presence is a key enabler for students to fulfil the role as facilitators to help each other out in case of issues. In this way learners know who to contact when they are looking for urgent information or are looking for people to work with on assignments. This feature, in addition to enabling easier connection through social media which are most frequently used by learners, would strengthen visibility of learner presence and ensure that all active learners are easily seen (even if they are shy to take a first step and start interaction).

The group project organised in the Hybrid course showed that defining potential roles for users to sign up for can catalyse the process of self-organisation among smaller groups. This concept should be explored within a broader context of the learning environment. Learners would be able to self-organise easier through the website if they are also able them to set up and sign up for their own Hangouts.

## **5.10. Conclusions**

This LearningCircle.io platform evaluation found that a custom built platform can help enable the learning process of would be activists while opening up the potential for scaling through automation of administrative tasks for facilitators and course organisers. The limitations of the recommendations are that the sample sizes used in this research are relatively small. Additionally, several variables explored in the deployments simultaneously (such as use of facilitators and social networking in Hybrid course and lack of payment fee and lack of facilitators in Platform course) could each have separate impacts that are currently difficult to evaluate. However, this is one of the limitations of the action research methodology, which has been mitigated to the extent possible in this in-the-wild study.

As I considered the implications of this work, I became increasingly aware that the methodology that I was using made the reliability of results is difficult to establish, as there was no clear

test for pre and post gains in knowledge. Additionally, I was relying on self-reported metrics of participant satisfaction and qualitative responses to course survey which can be unreliable without a more structured qualitative analysis of the learning data. The next step in adjusting the approach of this action research project was to propose a way to formally evaluate participant contributions to group discussions which would show how learners engage in learning in the course. Several methods were considered, but given the volume of the data, the ideal method would use a theory based deductive thematic analysis. Such a method, relying heavily on peer reviewed body of existing theoretical work, would help increase the trustworthiness of the evaluation and therefore produce design recommendations that would be more transparent and therefore applicable beyond the context of the original research project.

This change in focus also resulted in a change of approach to evaluating learning outcomes. In analysis done so far it was useful to reflect on the courses through the three design goals which were set forth for the course learning environment (supporting social impact, community building and self-organisation). However, in order to reflect on the learning process in more detail it was necessary to focus the analysis around the learning outcomes. The learning outcomes for these learner-led open-ended curriculum courses are centered around two domains, cognitive and social. The cognitive domain includes promoting critical and higher-level thinking skills, creativity and self-driven learning to enable learners to understand and explain complex problems. The social domain includes supporting community building and self-organisation to encourage and help learners build a global community. As these detailed descriptions of social and cognitive elements of learning suggest, there is quite a lot of similarity with the learning environment design goals. The main difference is in highlighting the cognitive elements of learning about social impact through both course discussion and course co-creation, and re-orienting elements of self-organisation and community building as broader social area of learning. This change in language make the analysis more relevant from a point of view of an individual learner, who engaged in social and cognitive learning, as opposed to from point of view of efficiency of the course learning environment in meeting the needs of the class as a whole. Nonetheless, the social and cognitive aspects of learning can still be applied to discuss the group achievement of the course as a whole.

The consequence of the change of approach was to move away from further improvement of the platform to help scale the approach until two questions were answered: (1) how does learning happen differently depending on technological configuration used (are there any trade-offs or is choosing a learning platform always the preferred choice from learning outcomes point of view?) and (2) what pedagogy can be used to support learning in student-led online environments, where curriculum is highly flexible. From the point of view of the first question, without additional analysis, my view was that the hybrid course worked best. However, knowing my bias as a course and platform designer I wanted to make sure that this was not a finding based on convenience: as course co-organiser the hybrid course was the easiest to run and from design point of view it told a clear story of progressive improvement through design iterations. While the original plan was

to consider how to scale, in order to design features that enable scale it was needed to gain more understanding about the role of facilitators.

In Chapter 3 I highlighted that action research is messy and time-intensive, and by the time I finished the 5 course iterations I saw that I was able to do either more courses or detailed qualitative analysis. Of course as an action researcher my commitment was also to provide a sustainable solution to my research partner, United World Colleges. However, around the same time personnel changes in the central office meant that I no longer had knowledgeable collaborators within the organisation and would have to, to some extent, start the project from scratch.

Given all of these factors combined, I made the decision to not repeat the experience of platform or hybrid course and instead focus on the analysis of data that has already been gathered.





## Chapter 6. Learning Trade-Offs

### 6.1. Introduction

Chapter 4 explored the challenges encountered by learners identified in cMOOC literature through the first deployment using a mixed media approach on the topic of Sustainable Development (loosely-coupled condition). As with cMOOCs, the course was ran without a platform and relied solely on pre-existing media available (YouTube, Google Hangouts, email, Facebook). I also tested two conditions of using the custom built LearningCircle.io website: first with alumni on the topic of Social Entrepreneurship, using only the platform (platform condition), then with similar participants as the loosely-coupled social media Online UWC courses (youth 14-18), on the topic of Global Citizenship, where the platform was complemented with a closed participant Facebook group (hybrid condition). In this chapter I will compare the learning experiences using a loosely-coupled approach and using the hybrid of the two approaches. The platform only condition, using only social features of the Learning Circle platform with no external social media led to high drop-off rates of learners so it will be excluded in this deep-dive. This analysis was published as "*LearningCircle. io: Lessons Learned from Organising Courses with and without a Dedicated Platform*", co-authored by Dr. Ahmed Kharrufa, Prof. Patrick Olivier and Dr. Clement Lee (Celina et al., 2018).

### 6.2. Designing for Civic Engagement

Designing for civic engagement learning requires meeting a unique set of needs: honing a deep cognitive understanding of complex social or environmental challenges and building the social skills and social capital while minimising operational hurdles for learners and course organisers. Organisers have to decide between using specialized (online) learning courseware, social media and communication tools, or some combination of both.

The literature recognised several trade-offs between learning with and without a platform. One of the most prominent fears of connectivist MOOCs (cMOOCs) scholars (where loosely-coupled media is preferred by participants) is that using a central structure would pre-define learning pathways (Cormier, 2008b; Rhoads et al., 2013) and lead to lower innovation or un-democratic learning design (Rhoads et al., 2013). Using a loosely-coupled media approach enables participants to select their preferred communication channels (Cormier, 2008b; Siemens, 2004) to help support learner autonomy. Platform-based courses focus on pre-produced content and do not sufficiently leverage the diversity and skill base of their participants (Kotturi et al., 2015). On the flipside, connectivist courses, while leveraging learner diversity, create

chaotic learning experience (Kop, 2011; Mackness and Bell, 2015), and are thus inappropriate especially for less experienced learners (Kop, 2011). There is a trade-off in designing for the environment between creating a safe and controlled communication environment and a lasting network between learners. However, connectivist learning embodies a paradox: the more the learning environment conforms to the connectivists' ideals of autonomy, diversity, openness and interactivity, the more likely it is that the learning is limited by the lack of structure and support and the more participants lean towards working in smaller groups (Mackness et al., 2010). It is surprising that no comparison of connectivist courses run with and without a central platform exist, as this would allow us to consider the trade-offs of both approaches.

This research aims to contribute to addressing this gap. The approach is to compare two iterations of a connectivist inspired online course focused on topics of civic engagement: a loosely-coupled approach without a learning platform, and one that uses a learning platform which was designed with this connectivist course in mind. I contribute design considerations of trade-offs to organise connectivist inspired courses between using a mixed media approach and a custom platform.

### **6.3. Methodology**

The analysis presented in this chapter focused on understanding learners contributions to class discussions (both posts and comments). Thematic classifications was conducted of the core of course content – the posts and the comments produced across all learning platforms and summarized by course (for the platform course this includes both Facebook and platform content). These insights were complemented with participant course surveys (from learners, facilitators and course organisers).

#### **6.3.1. Participants**

The analysis relies on a sample of 86 learners and 20 facilitators in the loosely-coupled course and 40 active learners and 12 facilitators in the platform course. I classified a total of 782 posts and 2,176 comments across Facebook and Learning Circle (details in Figure 2). I considered 59 participant survey responses and 2 course organisers' written interviews. The course size corresponds to the size of smaller connectivist MOOCs and with its diversity of participants (across geographies, genders, financial circumstances) enabling us to gather a depth of representative data that allowed for detailed review of the nature of interactions in the course. I carried out qualitative analysis of course content contributed by learners (assignments, resources shared and comments) and feedback surveys submitted by learners, facilitators and course organisers. Study participation metrics are shown in Table 6.1.

#### **6.3.2. Methods**

Thematic analysis is rarely either purely inductive or purely deductive (Braun and Clarke, 2006). Posts were inductively classified into six categories based on the earlier work classifying posts

<i>Metric</i>	<i>Loosely-Coupled</i>	<i>Hybrid</i>
Registrations	169	104
Active Learners (week 1-5)	86	40
Countries represented	24	25
% Female Learners	64%	60%
Facilitators (inc. Organisers)	20	12
Learner / Facilitators	4.3	3.3
Learner surveys completed	11	12
Facilitator surveys completed	9	6

**Table 6.1** Participation in Loosely-Coupled and Hybrid Courses.

done in Chapter 4. Comment categories were deductively defined by using a combination of Bloom's Digital Taxonomy (Anderson et al., 2001a; Churches, 2010) and collaborative activity classifications from (Soller, 2001) and fit within two broad categories: cognitive and social (Table 6.2). This theory based approach was used in order to increase the trustworthiness of the analysis and help keep my own biases as researcher and course organiser in check, by allowing me to compare my own initial reflections to a more theory based and educationally relevant analytical framework.

Some methods were changed from prior analysis to best meet the objectives of this study, in line with action research approach. Given that discussion in the course was a key means of learning, the metric of words in comments was selected as a proxy of time and effort spent by learners on course activities (as opposed to using the comment count metric). This is different from using a simpler measure of comments counts used in analysis presented in Chapter 4 and in Chapter 5. I also previously included data from all course participants (including facilitators and course organiser), while in this paper I have limited the analysis of comments to those of learners, in order to better account for their learning and community building interactions (and not skew the data with facilitator contributions).

To gain insights into participants' reflections of the two courses I conducted learner and facilitator survey analysis, using the same approach as in previous analysis of the courses. Surveys asked for quantitative and qualitative feedback about the course, its structure and effectiveness of communication channels used. The results were analysed using inductive thematic analysis of learner, facilitator and course organiser surveys (Braun and Clarke, 2006) to account for learning experience also from course organizer perspective. For surveys, Likert scale responses and Yes/No responses complete the qualitative responses.

Discussion materials were separated into posts (the first post of a thread) and comments (the following comments in the discussion). These original posts were not included in the comments counts or word count in the analysis conducted in this chapter. Initial posts were classified using the same thematic categories as have been identified through analysis of the data in Chapter 4.

This was done to enable creation of a matrix of posts by comment categories to show what kind of learning discussions resulted from original posts.

### 6.3.3. *Measures*

The focus of analysis was qualitative analysis of learner contributions through posts and comments. However, the data was summarised based on measures of frequency such as count of posts, count of comments and count of sum of words in comments. These measures were used as a proxy for learner time invested in different topics in class discussions.

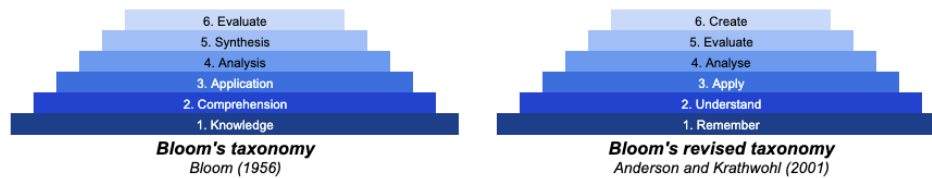
In terms of counting conversational learning, several changes were made to the approach used in the analysis shown in Chapter 4. In terms of nomenclature, it became clearer to refer to posts as threads, given they summarise the whole threaded discussion, not just the initial post of a thread. Comment counts were done excluding these initial posts which were done separately.

## 6.4. Evaluation Framework

As suggested in Chapter 2, evaluating learning has typically been a very technological and pedagogical context dependent activity. There is no agreed universal framework to evaluate collaborative learning. What was needed to provide the reliable evaluation of learning in Online UWC courses was a framework which could describe learning in student-led, open-curriculum online activity in several different technological configuration.

Evaluating interaction in student-led environments is difficult in part because of broader challenges of understanding the dynamics of collaboration: (1) it is hard to assess individuals who contribute to group work (Van Aalst, 2013) (2) it is not clear if individual achievement is a good measure in the first place as learning is achieved through the group (Stahl, 2006; Van Aalst, 2013) (3) assessing collaboration as a means to an end ignores it as a useful skill in its own right (Van Aalst, 2013) and (4) it is difficult to assess collaboration objectively in novel contexts (e.g. exploring new knowledge as opposed to solving a fixed problem) (Van Aalst, 2013; Zhao and Sullivan, 2017) Additionally the development of a broader array of social skills, such as persistence and curiosity, has been presented in research as difficult to explore as these are subjective, hard to measure, and evidence of their development may not show within the duration of short studies (Birbeck and Andre, 2009; Pierre and Oughton, 2007). Research more frequently focuses on understanding dynamics of collaboration and on cognitive contributions of participants (Gunawardena et al., 1997; Hmelo-Silver and Barrows, 2006; Hmelo-Silver et al., 2007; Soller, 2001; Stahl, 2006).

Several different existing evaluation frameworks prevalent in both HCI and learning were considered when selecting ones that would be combined to provide basis for the theory-based thematic analysis of learner contributions. SOLO and Community of Inquiry frameworks were considered, but ultimately not used for this analysis. SOLO (Structure of Observed Learning Outcomes) taxonomy (Biggs and Collis, 2014) is normally used to evaluate learning based on its outcomes. It is applied as an analytical method to evaluate the quality and complexity of learner



**Figure 6.1** Bloom's cognitive taxonomy and Bloom's revised cognitive taxonomy

assignments, which can be classified as prestructural, unistructural, multistructural, relational, or extended abstract (Biggs and Collis, 2014). However, given its focus on evaluating learning outcomes and given that it was difficult to measure the impact of the 5 week learning experience (reasonably short), SOLO did not seem to be the best choice.

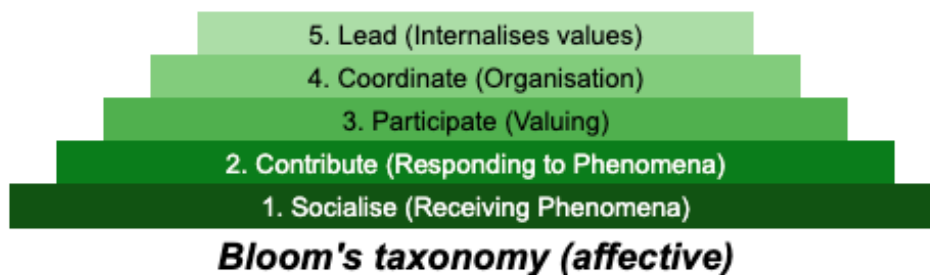
Community of Inquiry framework has been described in detail in Chapter 2 and its main limitation has been identified as the fact that teaching presence is separate from cognitive and social presence. Additionally, social presence is seen in terms of the atmosphere and conditions required for cognitive learning, not a skill set of collaboration in its own right. Finally, it is a framework that was born from analysis of threaded discussions within courses (Anderson et al., 2001b; Garrison et al., 1999), but ones where the discussion was not the key learning space (given the courses were typically much more instructor led) (Lister et al., 2006). Instead, two existing frameworks, Bloom's cognitive taxonomy and Soller's collaborative learning framework were retained as grounds for the thematic analysis.

#### 6.4.1. Bloom's Cognitive Framework

The most widely applied and reviewed evaluation framework for learning, including online learning, has been Bloom's taxonomy (Anderson et al., 2001a). Originally designed by a conference of leading American college examiners it includes three domains: cognitive (thinking), affective (feeling) and psychomotor (doing) (Bloom et al., 1956). The cognitive taxonomy has evolved from its original version after being refreshed in 2001 as shown in Figure 6.1 and currently proposes six hierarchical levels of learning (from lowest: remember, understand, apply, analyse, evaluate, create) has been widely applied over the last 70 years, its affective counterpart has received little attention and has not been refreshed to relate to affordances of digital and social media technologies (Churches, 2010; DiVall and Kirwin, 2012; Greenhow and Lewin, 2016).

The affective domain, defined as individual dispositions, willingness, preferences, and enjoyment as shown in Figure 6.2. Researchers have suggested it must be re-integrated into curricula as it has the potential to promote softer 21st century skills, such as self-awareness, analytical thinking, leadership skills, team-building skills, flexibility, acceptance of diversity, the ability to communicate effectively, creativity, problem-solving skills, listening skills, diplomacy and change-readiness (Birbeck and Andre, 2009; Pierre and Oughton, 2007).

However, assessment of the affective domain comes with its own challenges given that achievements relate to value development and are thus subjective, complex and varied (Birbeck and Andre, 2009). Birbeck and Andre (Birbeck and Andre, 2009) suggests that affective domain



**Figure 6.2** Krathwohl's revision of Bloom's Affective taxonomy Krathwohl et al. (1964)

can be evaluated objectively through the means of analysing group participation: “When you work through the layers of what team / group work really is you find that it may be framed as an exercise in ethics and trust. How one behaves within a group is about ethics and one's sense of responsibility to self and group.”

### **6.4.2. Soller's Collaborative Learning Framework**

Furthermore, evaluating collaboration in larger settings, such as popular online discussion forums, is especially difficult and usually relies on summary statistics such as participation rates, server-log data or number of entries created by learners (Lee et al., 2006; Van Aalst, 2013; Zhao and Sullivan, 2017). Soller (Soller, 2001) proposes a framework for evaluating collaborative learning skills in class discussions, with three main skills categories, as shown in Figure 6.3: conversation (subskills: task coordination, maintenance, acknowledgement), active learning (subskills: requesting, informing, motivating) and creative conflict (subskills: argumentation, mitigation). The model proposed goes down to the granular level of interactions (28 attributes), but it does not order skills, subskills and attributes from least to most complex, which make it difficult to use for discussion of results and high level comparisons (eg. between different courses or between different course participants).

The main limitation to Soller's taxonomy, as identified in Chapter 2 is that it is not hierarchical. Therefore, it is not possible to summarise the level of complexity in the interaction among course participants.

### **6.4.3. Combining Approach**

The thematic analysis conducted in this study is deductive and based on a combination of Bloom's taxonomy (for cognitive components) and Soller's collaborative learning skills taxonomy (for social components). Bloom's taxonomy's (of learning objectives) popularity is due in fact to the fact of its hierarchical nature - it makes it easy to differentiate between simple and complex learning goals. It is useful because it can be applied to both set the learning goals (pedagogy design) and evaluate learner progress against these goals (evaluation). I have therefore used Bloom's taxonomy as a guide for categorising learner contributions by complexity. However, affective taxonomy by Krathwohl and Bloom Krathwohl et al. (1964) only has 5 levels (while cognitive taxonomy has 5). In general, it seemed that using more than 10 categories to discuss

Skills	Subskills	Attribute	Sentence opener
<b>Creative Conflict</b>	<i>Mediate</i>	Mediate	"Let's ask the teacher"
	<i>Argue</i>	Conciliate	"Both are right in that"
		Agree	"I agree because"
		Disagree	"I disagree because"
		Offer alternative	"Alternatively"
		Infer	"Therefore", "So"
		Suppose	"If ... then"
		Propose exception	"But"
		Doubt	"I'm not so sure"
<b>Active learning</b>	<i>Motivate</i>	Encourage	"Very Good", "Good Point"
		Reinforce	"That's right"
	<i>Inform</i>	Rephrase	"In other words"
		Lead	"I think we should"
		Suggest	"I think"
		Elaborate	"To elaborate", "Also"
		Explain / Clarify	"Let me explain it this way"
		Justify	"To justify"
		Assert	"I'm reasonably sure"
	<i>Request</i>	Information	"Do you know"
		Elaboration	"Can you tell me more"
		Classification	"Can you explain why/how"
		Justification	"Why do you think that"
		Opinion	"Do you think"
		Illustration	"Please show me"
<b>Conversation</b>	<i>Acknowledge</i>	Appreciation	"Thank You"
		Accept/Confirm	"OK", "Yes"
		Reject	"No"
	<i>Maintenance</i>	Request Attention	"Excuse me"
		Suggest Action	"Would you please"
		Request Confirmation	"Right?", "Is this ok?"
		Listening	"I see what you're saying"
		Apologize	"Sorry"
	<i>Task</i>	Coordinate Group Process	"OK. Let's move on", "Are you ready?"
		Request Focus Change	"Let me show you"
		Summarize Information	"To summarize"
		End Participation	"Goodbye"

Figure 6.3 Soller's collaborative learning skills taxonomy

learner performance will be complex, so instead I rolled up indicators into broader categories of low, medium and high level of interaction. Soller's taxonomy inspired the approach to creating the initial code book (Appendix A), with clear and detailed attributes and example sentence openers. Also, the collaborative learning skills seemed to be more useful language in terms of identifying learner contributions that the language used to describe the affective categories of Bloom's. The resulting high level framework used in this analysis is shown in Table 6.2.

<i>Level</i>	<i>Cognitive Domain</i>	<i>Social Domain</i>
High	Create and evaluate	Lead and coordinate
Medium	Analyse and apply	Collaborate and share
Low	Understand and remember	Bond and socialise

**Table 6.2** Summary of high-level social and cognitive comments categories assigned

### 6.5. Results

I consider the findings as an analysis of the trade-offs that I found in the two study scenarios at the cognitive and social domains. In Table 6.1 I observe that overall the loosely-coupled media course was larger and had a higher share of actives who graduated. While the number of learner posts was similar in both courses, the loosely-coupled course had more comments per learner and more words in comments per learner. On the other hand, the platform condition resulted in a higher number of evidenced community impacts per active learner.

Overall, in Table 6.1<sup>1</sup> I observe that the loosely-coupled media course was larger and had a higher share of actives who graduated. While the number of learner posts was similar in both courses, loosely-coupled course had more comments per learner and more words in comments per learner. Platform condition resulted in higher number of evidenced community impact per active learner than the loosely-coupled condition.

As summaries in Figure 6.4, in the loosely coupled condition participants put a lot of effort in the top three categories of assignments, content sharing and relationships. In the platform course, learners spent much more of their energies in the core areas of discussing assignments and projects. However, the share of attention devoted to content sharing was much lower than in the loosely-coupled condition. The logistics category represented a much smaller share of participant efforts in the platform condition compared to loosely coupled.

#### 6.5.1. *Cognitive domain: spontaneity vs. structure*

I found that the platform did lead to lower level of learner course co-creation: the platform course focused more on task-oriented posts and had a much lower share of content sharing activity. Learners were far more focused on completing the assignments proposed by course organisers in the platform condition and used the Learning Circle as a repository for those, keeping the

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<sup>1</sup>Active Participants are those who completed at least one action. Evidenced community impact is projects in which an individual took part (can be more than one)



<i>Metric</i>	<i>Loosely-Coupled</i>	<i>Hybrid</i>
# Active Learners	86	40
% Graduated	77%	63%
Threads / Active Learner	4.5	4.4
Comments (ex. original posts) / Active Learner	14.2	8.3
Words in Comments (ex. original posts) / Learner	332	212
Total Threads	446	258
Threads with >10 turns	15%	11%
Total Comments (ex. original posts)	1,512	655
Share of Facilitator Comments (ex. original posts)	20%	50%
Evidenced Community Impact	18	14

**Table 6.3** Engagement Measures for Loosely-Coupled and Hybrid Courses.

Learner Only Focus	Loosely-coupled						Total	Platform						Total
	cognitive			social				cognitive			social			
	Low: Understand and remember	Med: Analyse and apply	High: Create and evaluate	Low: Bond and socialise	Med: Collaborate and share	High: Lead and coordinate		Low: Understand and remember	Med: Analyse and apply	High: Create and evaluate	Low: Bond and socialise	Med: Collaborate and share	High: Lead and coordinate	
Assignments and projects	3%	7%	11%	4%	1%	0%	26%	13%	34%	10%	6%	5%	1%	69%
Content sharing	4%	11%	14%	1%	2%	0%	30%	1%	4%	2%	2%	1%	0%	9%
Relationships	6%	3%	1%	18%	2%	1%	31%	1%	1%	0%	12%	1%	0%	16%
Self Organisation	0%	0%	0%	1%	1%	1%	3%	0%	0%	0%	0%	3%	0%	3%
Technical Issues	0%	0%	0%	0%	1%	0%	2%	0%	0%	0%	0%	1%	0%	1%
Logistics	0%	1%	2%	1%	3%	0%	7%	0%	0%	0%	1%	0%	0%	2%
Category total	64%			36%			100%	67%			33%			100%
Total	14%	22%	27%	26%	9%	2%	100%	16%	40%	12%	21%	10%	1%	100%

**Figure 6.4** Summary of learner effort (learner words in comments used as proxy metric)

Facebook group as a place for building relationships and sharing additional resources, which is shown by the fact that all learner-generated posts on Learning Circle were classified as assignments and projects, and the majority of all other learner-generated posts fell within other categories (content sharing, relationships, logistics, etc.). At the same time, students' in the platform course were more satisfied with course structure and learning infrastructure used (87% "liked it" or "liked it very much" vs. 74% learners in the loosely-coupled media class).

The share of comments evidencing higher order thinking among learners was lower in the platform condition (Figure 6.4) than the loosely couple condition. The largest post category driving these high order-thinking exchanges were content sharing posts. For instance, the below comment followed several others after one learner shared a personal story about a young immigrant in her country – as the discussion moved from the concrete to the abstract: "(...) world countries don't have friends they have interest and if it is in the best interest of the United States to cause wars then they would cause wars. This is what people call realpolitik. And even if you educate them and their economy becomes independent, if they keep segregating minorities like it has happen in the past that would cause wars by itself." Efforts in the cognitively high "create and evaluate" category in content shared posts accounted for 13% in the loosely-coupled media condition and only 2% in the platform condition.

The assignments submitted by learners in both courses showed strive for originality, expressed especially though wide use of media and formats. Interesting examples from the mixed-media

approach included a poem, video and photos. However, using platform did not mean that assignments were less varied when it comes to the format of submission – all blogs were richly illustrated (some with three or more images), learners also embedded assignments hosted elsewhere, for example on YouTube, using the blog functionality as an aggregator for assignments produced on a platform of their choice. Within the platform course itself, there was a clear difference in the usage pattern of, and engagement with, the platform vs Facebook. The comments made on Learning Circle were more than twice as long as comments on Facebook in the same course. Moreover, Learning Circle was used to share assignments and continue the discussion on content via comments, while Facebook was used for relationship building before the course, ad hoc logistics during the course as well as content sharing during and after the course. A course organizer commented on how the Learning Circle platform fit within the wider course infrastructure: *“I thought that the information was distributed in a logical way across the channels I used in the course (...) Facebook allowed for “last minute” information transmission, for instance a change in the Hangout schedule.”*

Share of time spent discussing logistics was higher in the loosely-coupled course. This meant that in the platform course facilitators had the capacity to engage in core support-providing activities. In the platform condition, there were fewer posts in the tech and logistics category (Figure 6.4). Technical difficulties took less attention away from learners, who were well informed about the schedule (Figure 6.4). In the platform I saw as high a share of logistics posts as in the loosely-coupled course (14% vs. 15%) but they were of a different kind: in the platform condition most were pro-active notifications from organisers sharing links to events about to start on social media. In the loosely-coupled condition, learners frequently enquired about the timing of group sessions, which they could not find in their email. Learners also set up smaller Facebook groups for each section to interact with the groups from their weekly video call. These threads took more attention away from learners, as the share of words in comments was 3% vs. 13% in platform course. In the platform condition the share of course organisers’ posts was much higher in the learning category than in the logistics category showing that time was freed up from administrative tasks (Figure 3). The interesting trade-off of additional facilitator time was that, despite their small number, they dominated discussions, contributing 50% of comments during the platform course (vs. 20% in the loosely-coupled course, as per Table 6.3).

### **6.5.2. Social domain: learner collaboration on and off platforms**

The lack of platform was one of the factors that made it difficult to collaborate across geographies: 36% of learners in loosely-coupled media mentioned that while they enjoyed group projects, it was difficult to find partners. One learner complained: “I don’t understand how you expected us to work with students from other regions through the web. I did, but it was complicated to get together, there was a platform missing.” Learners in the platform course self-organised when they were asked to create a blog post collaboratively. Participants found partners easily as active learners were marked by an updated profile photo and all group participants were shown on the

platform. Learners found each other and completed the assignment in smaller groups, frequently working across time zones.

In the loosely-coupled media course, learners spent more effort discussing relationships (31% vs. 16% in platform course). While the platform course had a slightly lower share of social capital building comments (33% vs. 36%) in answer to the question in final survey “Did you have enough opportunities to get to know each other” it scored higher with 87% of respondents responding “Yes” and “Yes but” (vs. 74% in loosely-coupled media course). Of the respondents who did not feel this was the case several provided qualitative details such as *“I think the reason is that I don’t use Facebook. It would be nice if there’s a group chat”*.

I saw evidence of external connections (outside of administrated course platforms) in both courses, but the mechanism of how learners established these connections differed. In loosely-coupled media learners created long, 50+ comments threads where they shared their Instagram, WhatsApp, Skype etc. user names. While Learning Circle platform enabled private messaging, learners also took to other methods of communication. Based on post-course survey 13 of 14 respondents used “unofficial” (external) channels of communications. Learners said they got together to continue discussions on class related project. In the platform course learners were able to connect without sharing their details with everyone in threads that distracted from knowledge building. In loosely-coupled media, course evidence emerged of 18 learners (of 86 actives) participating in civic focused projects as compared to 14 (of 40 actives) in the platform condition, with projects similar across both courses.

In loosely-coupled media course evidence emerged of 18 learners participating in civic focused projects as compared to 14 (for a much smaller class) in the platform condition, with projects similar across both courses and including presentations of civic centric content in school presentations, raising awareness online about topics related to course content or organising protests. In platform course, in addition to this direct evidence of community involvement, 8 out of 12 respondents to question about planning to use skills acquired in the course mentioned their willingness to get involved in their communities in different ways (6 through increasing awareness in school and local communities and 2 through participation in local NGOs). Learner in the Hybrid course has already shared the knowledge with their classmates: *“Yes, i laredy had a presentaion about the haze at my school. I told my classmated what products have palm oil in it and how they can change the situation in Indonesia by buying things with sustaiable palm oil.”*

In the Hybrid course learners were invited to create an awareness campaign about the issue of the Haze in Asia. 24 students participated in the campaign, which reached more than 2,000 people through Facebook and Twitter (posting 26 articles, 6 of them students’ original works (including video montage and short story), on Facebook and 27 tweets on Twitter). Students were meant to self-organise to take editorial control over the course organisers’ channels on Facebook, Twitter and YouTube. However, they requested more support from course organiser, who scaffolded the process by proposing roles for learners for which they could sign up shown to help collaboration. This was inspired by literature on problem-based learning (Hmelo-Silver et al., 2007) and Wikipedia (Ren et al., 2012), showing that signing up for specific roles helps

organise volunteer efforts. Once the scaffold was in place 24 learners who participated organised their work in smaller groups, in which they completed technologically complex tasks (as in merging a videos together and joining content to produce a promotional video for the cause). In the loosely-coupled media learners self-organised to launch a young journalist network using Facebook group as a means of communication without any input from course organiser. This resulted in the creation of United Youth Journalists, recently winners of European Best Media Initiative award, an online magazine that has since published more than 110 articles.

### 6.6. Discussion

Using a central management system for a connectivist inspired course is sure to have trade-offs as has been theorised by both the supporters and critics of this approach within connectivism research (Cormier, 2008b; Kop et al., 2011; Mackness et al., 2010; Siemens, 2004). Through the study I have shown two kinds of trade-offs that designers have to consider when thinking about structuring a learning environment for a community of inquiry. These trade-offs only crystallised after careful side-by-side comparison of two courses: conducted with and without a platform. Design choices on whether to use a platform depend on course context: what is the learners' level of experience (both in terms of age and familiarity with learner-centered methods), what is the number and experience of support staff (facilitators, organisers), what is the primary objective of the course (in depth analysis of cognitively difficult challenges or ability to effectively collaborate across a complex global network). The findings are of course limited by the size of the sample and the application of the analysis in the specific domain of activist education.

#### 6.6.1. *Contributions to course co-creation vs. higher learner satisfaction with course structure*

While research has indicated that learners' chaotic experiences in loosely-coupled media environments are a source of frustration, I found that some level thereof can be a source of positive spontaneous interaction and help build resilience to deal with a complex world (Kop et al., 2011) as evidenced through content-sharing in the loosely-coupled media course. Learners contribute more external sources during the course than in the hybrid course, where they fall into habits of pre-defined content, consistent with hypothesis of (Cormier, 2008b) and (Siemens, 2004). Loosely-coupled approach can thus work better when learner co-creation of the course is of large importance.

I found that using a platform creates a more structured environment where learners are oriented towards class assignments and express higher satisfaction with the course, which is consistent with (Kop et al., 2011). In contrast to (Cormier, 2008b) and (Siemens, 2004) the results show that using a platform does not stifle creativity of learner contributions and does not limit the preferences of other media used. Both the hybrid and loosely-coupled approach led to assignments of different types and formats. Using the platform allowed learners to receive

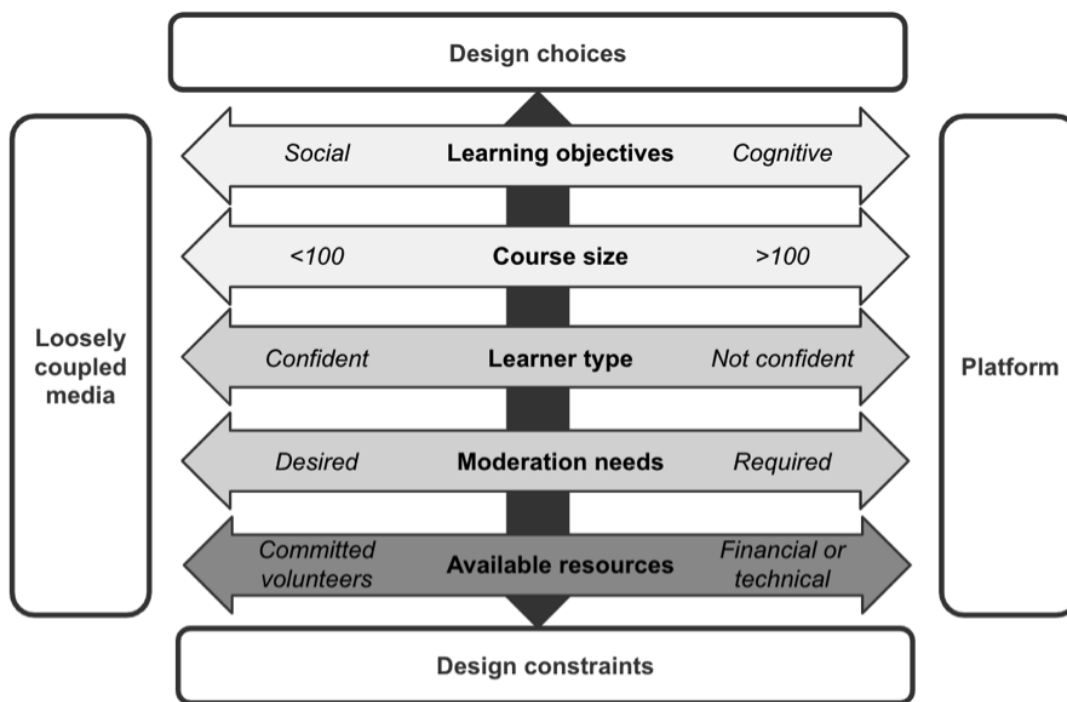
more feedback on their assignments from both learners and facilitators than loosely coupled condition with most discussions being focused on course content such as assignments. Thus, using a platform can be beneficial when working with less experienced learners, to help orient them in new materials and ways of working together, and encourage their future participation. There are, however, clear advantages of at least complementing any platform with “native” social media channels, as such forums can long outlive a course, and help course participants continue their learning by both sharing course related content (knowledge building impact) and keeping in touch (social capital impact).

Logistical support for a course, which enables delivery of learning, can be provided in two ways: through a network of central community figures or through organisational features of a platform. However, finding an existing platform or building one suitable for the specific needs of a learning community requires significant effort, time and resources. The implementation of schedules and group views in the platform made it simple for learners to see what activities they could engage in and who were the course participants - as evidenced by lower share of words in logistics comments (Figure 3). Given the time saved on admin tasks, facilitators were more involved in providing feedback to learners but, excessive facilitator time can discourage learners from occasionally stepping in to fill the role of experts leading to lower share of critical posts by learners. Therefore, it is important to consider early on whether capable staff or volunteers are readily available to help coordinate the complex activities of running a course, or whether to allocate resources for selecting or building and maintaining a platform to facilitate the course.

### **6.6.2. Risk of low interaction vs. ease of layering and scaffolding interaction**

With respect to social domain, the main trade-off facing course designers is between the risk of low interaction when relying solely on a custom learning platform and the ability to layer and scaffold interaction between large learner groups. When the platform of the course is relatively small, organisers face the challenge of low learner interaction (Deng and Tavares, 2013) as I found in the test iteration which ultimately led to the decision to include social media presence as a key component of the learning infrastructure. In the platform course most of the social domain discussions took place on the class Facebook group and the communication networks set up by learners (WhatsApp, Skype). The implementation of layered community views (group views and filters) helped learners navigate the learning space and establish connections. In loosely-coupled conditions, learners self-organised to create private Facebook groups to interact in smaller forums. In the platform course learners identified the members of their community using the groups feature, which enabled them to organise into smaller groups. However, the group features in the platform condition did not replace the support needed to coordinate large projects. Such scaffolding, however, does not need to be implemented through the platform and can be delivered ad hoc through facilitator communication (organisers and facilitators defined roles and organised the sign up process).

Paradoxically, for some learning contexts there are advantages of making logistical challenges visible to learners by managing them through a support network. Breakdowns in operations



**Figure 6.5** Example criteria which can help course designers decide on learning environment configuration (while frustrating) may also result in learning opportunities (Kop et al., 2011). Learners in loosely-coupled media course were given valuable problem-solving practice of solving logistical and technical challenges without clear instructions, gaining skills that can be applied to similar contexts (e.g. setting up the United Youth Journalist project without any support from instructors). Choosing a less structured and comfortable learning environment may be beneficial if it can help learners build strong collaboration skills – as is the case for example for training learners interested in making civic impact.

One additional advantage of a platform is that codes and norms of interactions can be clearly defined and negotiated for and by learners, which helps build an environment of trust. Lack of clear norms can lead to negative learner experiences in loosely-coupled courses (Kop et al., 2011; Mackness et al., 2010). The use of a controlled communication platform may be preferred when working with vulnerable audiences (for example school-age youth).

### 6.6.3. Navigating Learning Trade-Offs

It is important from the learning environment and course designers’ point of view how to navigate these trade-offs, especially as a function of organizational constraints (eg. availability of resources, type of learners, moderation requirements) and pedagogical choices (course size and learning outcomes desired).

**Course size:** Courses of 100 or fewer participants can effectively utilize existing social media and in case of confusion, course participants and/or organizers can step in to solve problems. For organising learning interactions of courses with more than 100 participants, some level of organising infrastructure is important, to ensure that logistical challenges do not become a roadblock to learning for the community. Based on prior experiences running connectivist

courses, including (Mackness et al., 2010) and the work presented in Chapter 4, communication starts feeling chaotic for learners as the number of participants approaches or exceeds 100.

**Learning objectives:** In courses that have a strong focus on cognitive learning, a specialised platform can have positive impact on ensuring learners stay focused on learning activity, collaboration can still be supported on such a specialised platform, but social interaction is less likely to be a big part of the course. For activities where development of social skills is important, loosely-coupled media can present interesting opportunities to foster interaction between course participants.

**Learner type:** Loosely-coupled media has the potential to work reasonably well for learners with high level of self-efficacy. With learners who are less comfortable connecting via digital technologies, a more structured learning platform is a better option.

**Course organizer resources:** It is possible to provide a reasonably comfortable course experience with loosely-coupled media if course organizer has access to a group of motivated facilitators who can provide the social structure that can step in and support learners who have questions or have problems orienting themselves in the course. Developing a platform can be an expensive process and using an existing platform can have some limitations in terms of features or administrative access, or can constrain the format of educational experiences. However, for organisations that dispose of technical resources, building a custom learning platform or content to use on an existing platform can be an attractive choice.

**Moderation requirement:** One of the main limitations of using loosely-coupled resources for online learning is the difficulty in moderating content, as standards of communication are instead set by organisations owning the mainstream social media used. If a course organizer is working with vulnerable populations, using a platform for core course interactions may be preferable.

The list shown in Figure 6.5 above is likely non-exhaustive, as these criteria have been identified through the review of this particular project. It should, however, serve as an example for the kind of factors which should be considered. With this view of the nature of learning objectives and organizational constraints, course and learning environment designers can consider the design implications.

### 6.7. Conclusion

This analysis presented the trade-offs between using loosely-coupled media and a central learning platform to help build learners' cognitive and social skills, and discussed design implications for various course types. The platform may be a good choice to help learners focus on core learning tasks, integrating course resources, while allowing learners to choose their preferred communication tools. Working with loosely-coupled media natively used by learners can more prominently and naturally lead to the creation of lasting social bonds that survive the course, as was shown in post-course resource-sharing on Facebook in both platform-led and loosely-coupled media course. A "platform" for a connectivist inspired course should integrate and organise media, not aim to displace it.

This analysis shows that different approaches to configuring learning environments lead to different types of learning. There is no learning environment which works better - each configuration achieves different objectives and helps support organisations working with different set of resources. When I built a connectivist platform to support student-led learning I was expecting to find a more clearly defined outcome and expecting for the platform to not only help organise and automate the course, but also to lead to more complex behaviours in both cognitive and social areas of learning.

In student-led online learning environments, at least theoretically, learning and teaching are two sides of the same coin. Prior research has pointed out the importance of reflection on strategies for pedagogy in student-led environments (Garrison, 2015; Hmelo-Silver, 2004; Hmelo-Silver et al., 2007; Mackness and Bell, 2015). The analysis in Chapter 7 will consider the contributions to class discussions from all course participants and investigate how contributions of learners and facilitators are different. Based on that analysis, as well as the findings of prior empirical chapters, will lay grounds for building learning-environment agnostic design recommendations for course designers.

The method of analysis presented in this chapter has incorporated an additional lens of theory based deductive methods to the inductive analysis of learner contributions presented in Chapter 4 and initial analysis of learner surveys conducted in Chapter 5. I have made this decision in order to increase the trustworthiness of the results. However, given that I have coded all of the participant comments myself, and that I was hoping to produce design and recommendations and code books relevant beyond this project, I had started considering other strategies to help further increase the transparency and reliability of methods used (such as for example involving other coders in the project so that inter-rater agreement could be reported).



## Chapter 7. Student-Led Teaching

### 7.1. Introduction

The experiences organizing courses across three different technological configurations (loosely-coupled discussed in Chapter 4, platform and hybrid described in Chapter 5) identified the need to both explore how learning happens (both in terms of its cognitive and social aspect, as described in Chapter 6) and how to provide facilitating support (strategies for student-led teaching, which this chapter will consider).

The analysis in this chapter will be distinct from the analysis of prior chapters as the data will both consider the most granular detail of interaction (individual comments) and include all participants (learners, facilitators and course organisers). First, the broader motivation for exploring approaches to pedagogy in student-led courses will be reviewed. Then, further improvement to initial socio-cognitive framework presented in Chapter 6 will be proposed. After sharing a detailed methodology of the analysis, cognitive and social aspects of teaching behaviours will be explored. A summary of findings will lead into Chapter 8 where it will then be possible to provide evidence based learning environment and pedagogy design recommendations, as well as discussion and conclusions. The findings of this chapter are awaiting publication (expected October 2020) in a peer reviewed paper “*Supporting Pedagogy Through Automation and Social Structures in Student-Led Online Learning Environments*”, co-authored with Dr. Daniel Lambton-Howard, Dr. Clement Lee and Dr. Ahmed Kharrufa (Celina et al., 2020).

### 7.2. Exploring the Dynamics of Interaction in Student-led Environments

Student-led online courses present exciting learning and engagement opportunities compared to traditional teacher-led online courses. Student-led courses require distinct pedagogical and technological considerations, with teaching behaviours that emerge from learners being a major contributor to their success. As such, our goal is to explore the teaching behaviours manifested by the learners and facilitators of such courses and how these are affected by, and can consequently be supported through, different online infrastructures. We examined data from three student-led courses supported by different online infrastructures (a) mainstream loosely-coupled social media, (b) a custom-built learning platform and (c) a combination of both. To fully explore the emergent teaching behaviours in these courses, we adapt existing cognitive and social taxonomies introducing a unified lens through which teaching behaviours can be identified and explored. We conclude with design recommendations for course designers to best utilise the affordances of selected infrastructures in supporting teaching behaviours.

The 2015 World Economic report on the future of education opens by stating that “To thrive in a rapidly evolving, technology-mediated world, students must not only possess strong skills in areas such as language arts, mathematics and science, but they must also be adept at skills such as critical thinking, problem-solving, persistence, collaboration and curiosity” (World Economic Forum, 2015). While the need for the development of these skills in a knowledge based economy is clear and has been strongly advocated for through the 21st Century Skills movement since the 1980’s, there is a debate as how to best achieve these objectives, especially in a world where learning and technology increasingly go hand in hand.

Student-led approach to education, especially in online contexts, has high potential to help developing 21st century skills at scale and in a variety of contexts (Garrison, 2015; Rhoads et al., 2013; Siemens, 2004; World Economic Forum, 2015). Online student-led course pedagogy research explores the role of facilitators and facilitation best practice (Anderson et al., 2001a; Ferguson and Sharples, 2014; Haavind and Sistek-Chandler, 2015; Salmon, 2012; Scardamalia and Bereiter, 2006), as well as showcasing design features that can help learners meaningfully contribute as co-creators of courses (Celina et al., 2016, 2018; Cormier, 2008b; Kotturi et al., 2015; Kulkarni et al., 2015a,b). Different design features are proposed to help support teaching presence by all course participants in a variety of settings (Akyol and Garrison, 2008; Garrison, 2015; Garrison et al., 1999).

Whilst massive open online courses (MOOCs) are usually teacher and content focused (Baggaley, 2013; Ferguson et al., 2016), some have started to include learner led approach, for example to fill in some teaching roles, such as providing feedback or grading assignments (Baggaley, 2013; Ferguson et al., 2016). Connectivist inspired MOOCs and online Communities of Inquiry (CoI) show how it is possible to leverage diversity of experiences and expertise in learners, but some have been criticised for providing poor learner experiences (Mackness and Bell, 2015; Mackness et al., 2010).

In student-led environments, learning and teaching are intertwined: learners engage in activities on the verge of their zone of proximal development (the difference between what they can do on their own and with some help) and gradually, through peer to peer interaction and sense making become capable of solving problems of their own (Anderson et al., 2001a; Garrison, 2015; Garrison et al., 1999; Vygotsky, 1997). In such environments a teacher is closer to a peer and acts as a facilitator, which enhances learning (Anderson et al., 2001b; Bielaczyc et al., 2013; Vygotsky, 1997). These student-led learner approaches propose a new paradigm for both learners and teachers to operate, where learners develop agency and social skills to create new knowledge and teachers learn to show vulnerability as constantly evolving learners. Some claim such change in paradigm is a “more radical cultural change than becoming ‘digital’” (Scardamalia and Bereiter, 2006).

Several types of teaching behaviours, distributed among all participants in learning communities, have been identified in previous work, such as: providing design and organisation, facilitating discourse and direct instruction (Anderson et al., 2001a). Whilst changing the overall learning environment has been identified as crucial to foster collaboration and problem-solving skills,

teachers can also strengthen their learning by targeted pedagogical moves (servicing students needs (Baran et al., 2011), scaffolding student participation (Baran et al., 2011; Hmelo-Silver et al., 2007), fostering shared understanding (Baran et al., 2011)).

Given the reciprocal nature of learning in student-led environments, and the variety of actions that participants can take to impact learning, it is important to simultaneously consider a range of cognitive and social behaviors. Most work within CSCL has focused on understanding and supporting collaboration among learners (Hmelo-Silver, 2004; Soller, 2001; Stahl, 2006), as opposed to describing this broad range of social actions. Much more work is required to understand student-led interaction in online settings, with more focus on understanding teaching presence (Garrison, 2015) and on applications that go beyond specific problem solving assignments (Bielaczyc et al., 2013; Stahl, 2006). Finally, most research focusses on understanding learning, with less attention devoted to understanding teaching best practice (Soller, 2001; Stahl, 2006). Existing evaluations of learning in social contexts rely on reductive participation statistics, which are sometimes extended with social network statistical reviews (Celina et al., 2016; Van Aalst, 2013). Several researchers have identified the gap to effective evaluation as a challenge to the popularisation of collaborative learning in formal education (Birbeck and Andre, 2009; Lee et al., 2006; Van Aalst, 2013).

The topic of interest is in how all course participants can contribute to, amplify and negotiate the initial curriculum provided. This work is based on a dataset from three online courses organised in three different learning environment configurations (loosely-coupled, platform and hybrid). Recommendations are provided to help course designers maintain teaching in different online learning settings (loosely coupled media such as Facebook, YouTube and email; learning platform only; and platform supported by social media). The contribution of this analysis is twofold: 1) to propose a framework that can be used as a lens to identify and describe pedagogical and social contributions of all course participants in student-led learning communities and 2) to provide guidelines to support sustaining online courses yet maintaining teacher presence through a) supporting learners' self-organization, and b) supporting facilitators.

### **7.2.1. Preliminary Social-Cognitive Framework**

Based on analysis in Chapter 6, a first attempt at creating a socio-cognitive framework in student-led environments has been presented. This initial framework is used to describe learner contributions to online forums, accounting for both cognitive and social participation mechanics. The framework was established based on evaluation of text contributions to discussions in learning environments in two student-led courses and summarised how learners spent their efforts during the course (both in terms of post themes as well as levels of cognitive / social learning noted). In the first course learners were using solely loosely-coupled social media (loosely-coupled) and in the second one a learning platform LearningCircle.io, together with a mix of social media (hybrid). A third learning environment configuration, using only the LearningCircle.io platform (platform) was excluded from analysis presented in Chapter 6 given the course faced technical challenges that made its data unsuitable for inclusion based on the

objective of understanding how learning is happening in different technological set ups, and compare and contrast the success factors of each learning environment to contribute to knowledge creation across social and cognitive domains. That work was focused on the differences between technology settings, and not the framework itself.

The study has shown how combining the cognitive and social domains can contribute to understanding the impact of technology choices on learner contributions. The thematic analysis of comments in learning discussion threads divided learner contributions by social and cognitive categories and low, medium and high levels for each category. These subcategories were loosely based on Bloom's taxonomy (hierarchical structure) (Bloom et al., 1956) and Soller's collaborative learning framework (non-hierarchical) (Soller, 2001). The learning evaluation framework proposed in Chapter 6 is a useful starting point for exploring the contributions of both learners and facilitators to teaching, using the same scale. However, while working with the framework I have identified several gaps and wanted to further explore and improve the initial framework. First of all, the presented framework only provided high-level categorization, which may lead to a loss of important fine-grained detail about the quality of interactions. Second, I found that the most granular indicators, which were used to assign comments into high level categories, were not all mutually exclusive. Especially when classifying long messages it was very hard to focus on what the intent of the interaction was - therefore the framework was both too granular at the lowest level and not granular enough at the level at which data was discussed to be useful.

### 7.3. Teaching Behaviours in Learner-Led Courses

This study explores how key platform design components impacts contributions of learners and facilitators to teaching behaviours. The analysis will focus on asynchronous discussions between learners and facilitators in the course-based discussion spaces (such as Facebook groups or the course platform), as these were the most important spaces where all participants had a chance to interact.

As a reminder, it is useful to remember the high level features of the three learning environments in more detail. The first course used loosely-coupled media (with Facebook as the central component of the learning environment, and other tools such as Hangouts, email and YouTube live stream used throughout the course). The second platform course used a custom-built learning management software, LearningCircle.io. The third hybrid course, complemented the use of the LearningCircle.io platform with social media (primarily Facebook). The course management system built to support course participants on the platform courses included (1) an administrative space (used instead of managing the course through a combination of email, spreadsheets and documents in loosely coupled media), (2) group and user spaces (where community members could create their own profiles and see other members of their assigned discussion groups; users were automatically assigned to these with an algorithm optimising for intragroup diversity) and (3) a course discussion space (a designated timeline where users created blog posts and shared links to external work as well as commented on others' entries and easily filtered entries).

	Learners			Facilitators		
	LC	P	H	LC	P	H
Create curriculum	N	N	N	Y	Y	Y
Add resources	Y	Y	Y	Y	Y	Y
Create assignments	B	B	B	Y	Y	Y
Invite guest lecturers	B	B	B	B	B	B
Create group video hangouts	B	B	B	B	Y	Y
Evaluate assignments	Y	Y	Y	Y	Y	Y
Evaluate resources	Y	Y	Y	Y	Y	Y
Provide feedback on projects	B	Y	Y	B	Y	Y
Trouble shoot technical issues	B	N	B	Y	Y	Y
Coordinate course communications	B	B	Y	B	Y	Y
Structure groups	B	B	B	B	Y	Y
Contribute resources	Y	Y	Y	Y	Y	Y
Build sense of community	Y	Y	Y	Y	Y	Y
Contact others in the course	B	B	Y	Y	Y	Y
See list of all participants	N	B	Y	Y	Y	Y
Define code of conduct	B	B	B	B	Y	Y

**Figure 7.1** Learning Environment Affordances by Learner Type

After running the courses, I have reflected on different course tasks to identify the differences in terms of technological affordances for learners and facilitators (Figure 7.1). Despite the intention to create a fully learner-led course experienced, there were several course features which were reserved for facilitators, which is consistent with the risk of subconsciously reverting to the design and set up to which I was most familiar, as highlighted in prior research (Bielaczyc et al., 2013). Other affordances, to which theoretically learners had access, faced barrier to entry (indicated with "B" in 7.1 for example learners could evaluate other learners' assignments across all three learning environment configurations, but in loosely-coupled course, due to the volume of assignments and inability to filter by post type, they were not able to easily complete that task).

### 7.3.1. Study Overview

I conducted a qualitative review of the dataset of comments from the three different learning environment configurations. Given the different focus of this work, it was beneficial to also include the platform course to enable comparison between three different technological settings. This allows to further test the validity of the framework in all three configurations. The dataset contains both comments (including word count, number of likes, time, links included, the posts that started each comment thread) and anonymized data about participants' names and roles. This analysis builds on the work conducted in previous chapters and adds new perspectives including (1) a revised socio-cognitive framework, (2) a summary of contributions of all course participants to teaching and social behaviours. This then makes it possible to propose design

recommendations to help leverage different technological configurations in learner-led online courses in Chapter 8.

### *Participants*

The participants in the three courses are 159 learners and 35 facilitators in three editions of the online courses (Table 7.1). Participants came from 40 countries, including Syria, Venezuela and Australia to name a few, and were recruited from an United World Colleges (UWC) alumni community (an organisation of international high schools).

<i>Metric</i>	<i>LC2-2</i>	<i>P</i>	<i>H</i>
Active learners (week 1-5)	86	33	40
Countries represented	24	20	25
% Female Learners	64%	58%	60%
Facilitators (inc. Organisers)	20	3	12
Learner / Facilitator	4.3	11.0	3.3

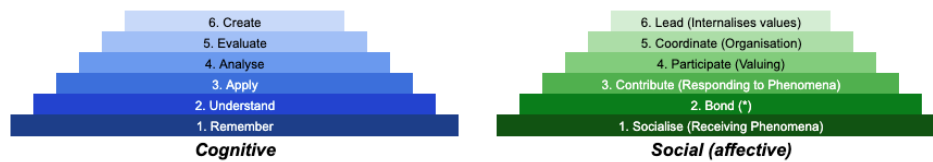
**Table 7.1** Summary Participation Statistics

In the LC2 and H courses, facilitators were assigned to each group (with a ratio of approximately one facilitators to 10 registrants). In P course only course organisers were involved and there were no facilitators. Facilitators were volunteers from the pre-existing UWC alumni community.

### *Methods*

A deductive thematic analysis of comments made by all course participants across all learning platforms was conducted. The starting point was the structure proposed in Chapter 6 with social and cognitive areas and three sub-areas for each in Table 6.2 in Chapter 6. This is different from analysis conducted in Chapter 6 as all participants are included. Additionally, instead of classifying first posts in a thread into separate categories, I have classified them in line with the categories used for other comments. This led to comments which were the first in the sequence to be excluded from the initial counts of comments. After reflection, I decided that to clarify it will be more meaningful to classify first posts as both comments as proxy for topics of threaded discussions. This is in line with action research methodology, which recommends that methods are adjusted in line with dynamically evolving project (Hayes, 2011; Rogers, 2012).

In this analysis, comments have likewise been classified as either cognitive or social (affective). However, several modifications to the framework proposed in Chapter 6 were made. Instead of low, medium and high, I built a more detailed classification with 6 levels for each cognitive and social areas (Figure 7.2), to provide more fine-grained detail to our understanding of participants' interactions. Such detailed view also ties more closely to Bloom's cognitive and Krathwohl and Bloom's affective taxonomy, which is well respected as an evaluation method across a variety of applications within education research (Schneider, 2014). The cognitive



**Figure 7.2** Taxonomy of social and cognitive learning areas; original names of categories from Krathwohl and Bloom’s affective taxonomy shown in parenthesis

category is used as presented by Anderson in 2001 iteration (Anderson et al., 2001a), refreshed for digitally relevant activities (Churches, 2010).

The social category aligns to Krathwohl and Bloom’s affective category Krathwohl et al. (1964), with the exception of the addition of a *bonding* level. This added level helps differentiate between simply socialising (receiving phenomena, including initial low-risk interactions with peers), which was at the bottom of the original model, and bonding by sharing (a very common online activity where learners are making higher risk commitments such as sharing private contact details or actively contributing resources to the group). Previous research indicated the difficulty of working with Krathwohl and Bloom’s affective taxonomy (given it is very difficult to gauge whether values have been genuinely internalised) (Birbeck and Andre, 2009). However, it also highlighted its importance in developing learners’ core values, which in turn make it possible for them to work with others (Birbeck and Andre, 2009; Pierre and Oughton, 2007). The realignment of Krathwohl and Bloom’s affective taxonomy with the cognitive taxonomy focuses more on the observable outputs relating to working with others, as laid out in Soller’s classification (Soller, 2001) for describing group work and applied in the analysis shown in Chapter 6. Soller’s work focused on collaboration, while this study is interested in more generic social behaviours as well, a generalization necessary to be able to surface teaching relevant behaviours. Additionally, this revision is necessary in light of new technological developments (e.g. social media) and associated usage patterns, since these taxonomies were created. Using the updated framework, each comment was assigned one of these twelve categories, as I wanted to provide an exhaustive list of all interactions.

The resulting detailed and hierarchical classification for cognitive and social areas make it possible to separate the simple behaviours from the complex, and evaluate affective attributes of learners through the lens of group collaboration.

I have opted to engage two collaborators within the Open Lab to help discuss and align on meanings to the categories used. This discussion based methodology is both aligned with the overall philosophical grounding of constructivist view of learning (Lave et al., 1991; Piaget, 1937; Vygotski, 2012). To begin, I selected a representative sample from the data set (Boyatzis, 1998). As shown in Table 7.2, the sample covered 10% of posts, ensuring correct representation of (1) posts from the three courses (weighted by words in comments), (2) thread length (long if >5 comments, and short if <5 comments) and (3) including posts from different parts of the course (beginning, middle and end). The resulting data set covers 20% of words in comments in all three courses. The unit of analysis in the study was an individual message (comment), which

is the most fitting given “it’s the unit on which the interpretation of study will focus” (Boyatzis, 1998).

<i>Metric</i>	<i>LC2-</i>	<i>P</i>	<i>H</i>
Threads	446	93	258
Sample tested	49	10	29
% Sample	11%	11%	11%
Words in Comments	41,471	21,109	24,862
Sample tested	10,620	4093	6,091
% Sample	26%	19%	24%

**Table 7.2** Summary of Course Data and Sample Selected

The data sample was then analysed by me and two researchers from the Open Lab (we did not further split the sample among researchers). Given the methodology intended to combine quantitative and qualitative analysis of the data, it was necessary to ensure data validity through inter rater agreement (Boyatzis, 1998). First, I carried out a qualitative analysis of a representative sample of course content. Then, to establish code validity, codes were discussed in a meeting and a full guide to code grading was produced as recommended by research best practice (Boyatzis, 1998). For each level, the Codebook provides description, examples, key words, technologies and sentence opener examples. For instance the post: “*After watching numerous architecture and design talks on youtube, I fell on this one.*” would be classified as Social – Contribute as it relates to technology sharing links and is in line with the beginning of this category description “*Is active participating in the course by contributing content (...)*” The full codebook can be found in Appendix A.

After initial review, interrater agreement Fleiss’ kappa (Fleiss and Cohen, 1973) was 67%. In line with qualitative research best practice (Boyatzis, 1998), researchers conducted a discussion to align and review categories, and reflected relevant changes in the coding book. Interrater kappa improved by 21ppts to 86%, which is high agreement and thus allows to make more assertive inferences about data analysed. There was a disagreement by at least one researcher on 69 of the 327 comments reviewed, of which 28% was driven by differences in social v. cognitive areas assignments, 41% by assigning a different cognitive level, and 32% by assigning a different social level. For comments with disagreement, we agreed to use the level assigned by lead researcher.

***Measures***

Based on previous studies (Akyol and Garrison, 2008; Cormier, 2008b; Kotturi et al., 2015; Siemens, 2004; Stahl, 2006), learners can contribute to providing learning support in a course in a variety of ways. However, no study that I have identified has explored differences in contributions between learners and facilitators in student-led learning environments.



I would like to clarify that I did not use null hypothesis significant testing in this analysis for a few reasons: First, none of the three courses can be considered as the benchmark in the null hypothesis. Second, the data is ordinal and discrete, rendering it inappropriate to test the difference between the courses using, for example, 2-sample t test, which is designed for continuous data. Third, this approach seemed quite limiting in the wider context of action research - a detailed qualitative review of the underlying data seemed more relevant to the aims of this analysis.

Two main measures to discuss the results. First, share of words in comments, rather than share of number of comments, was used as a measure of the time and effort participants spent in the main discussion spaces. It did not seem helpful to interpret the results (Boyatzis, 1998) based on count of comments while working with data, which showed a wide distribution of comment lengths (from 1 word to 2,193 words). The disadvantage of this method is that longer comments have stronger impact on average score, but this risk can be mediated by careful discussion of results.

The second measure was a summary score, calculated separately for each of the two areas: cognitive and social. A score per post is derived by assigning a numerical score (1-6) to each of the ordinal subcategories in social and cognitive areas. This then makes it possible to calculate summary social and cognitive scores. The summary score is as weighted average of comments by level of social or cognitive participation and it is calculated using the following formula; it is calculated separately for social and cognitive areas.

$$\frac{\sum_{i=1}^{N_c} w_i S_i}{\sum_{i=1}^{N_c} w_i} \quad (7.1)$$

In the above equation  $i$  is an index that labels individual comments, running from 1 to  $N_c$  (total number of comments),  $w_i$  is the word count for comment  $i$  and  $S_i$  is the score for comment  $i$ . This measure was also calculated at individual participant level. We used these summary scores to add another analytical lens to our analysis of the data, in order to better surface other types of patterns, which may not be as apparent in purely qualitative reporting.

### 7.3.2. Study results

First, general course interaction results will be presented, followed by detailed qualitative review of contributions across cognitive and social domains. In general, all courses had a higher share of words in comments classified as cognitive (>70%), with the loosely-coupled course showing the largest skew (79%). As shown in Figure 7.3, in the cognitive classification, apart from the platform course, facilitators scored lower than learners. The hybrid course saw the highest learner cognitive score of 5.1, closely followed by the loosely-coupled course at 4.7. Facilitator cognitive scores were highest in the platform course. In the social category, facilitators scored higher than learners, with facilitator social score higher in loosely-coupled course than in hybrid course. Learner social scores were comparable for both loosely-coupled and hybrid course, and lower in the platform course.

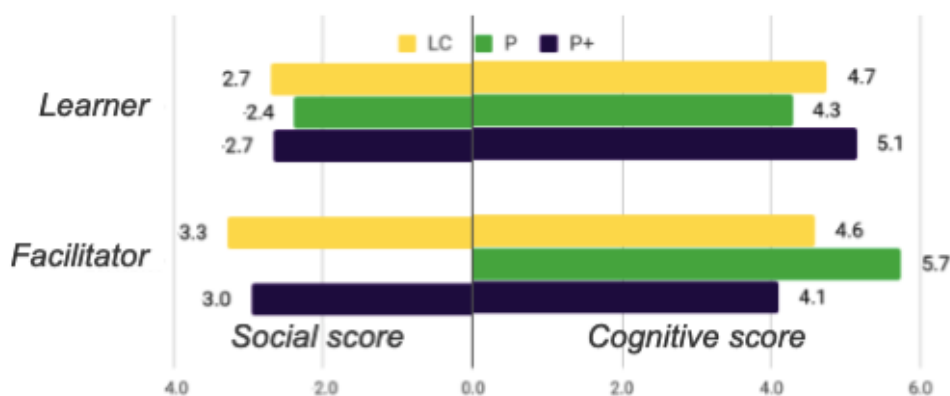


Figure 7.3 Social and cognitive scores by participant type

	LC		P		P+	
	L	F	L	F	L	F
Social score >3	7%	17%	0%	0%	6%	0%
Cognitive score >3	38%	17%	38%	50%	26%	33%
Number of participants	60	12	8	4	31	6

Figure 7.4 Share of participants with scores >3

In the evaluation framework proposed, the top three levels of cognitive and social scales are the most relevant in indicating teaching behaviours; it follows that an average score >3 would indicate some level of teaching behaviour. In Figure 7.4 we show share of learners and facilitators whose contributions achieved an average score >3. In cognitive area, 38% of learners in both loosely-coupled and platform courses achieved this score, in comparison to only 26% in the hybrid course. This was lower than facilitators in all but the loosely-coupled course. Similar achievement in social category was much less frequent: only 6% in hybrid and loosely-coupled course among learners, and 17% among loosely-coupled course facilitators (and none in the other two courses).

The analysis of initial comments (ones that initiated conversations threads) showed that 86% of the 88 comments threads started in either the Create (cognitive, 32/88) or Contribute (social, 44/88) categories. Most Create initial posts were learners sharing their assignments (submitted as blog posts, videos, poems, etc.). The discussions started by comments in Create category had the highest cognitive score. The comments that followed were predominantly relating to cognitive categories (96% for learners and 97% for facilitators). Most initial posts classified as Contribute had to do with learners sharing resources or projects they cared about with their community. The discussions that started with a contribution of an external resource had a larger mix of social and cognitive comments (38% cognitive for learners and 30% cognitive for facilitators).

The analysis will now turn to detailed analysis of comments in the two areas: first cognitive, then social. All names in comments database have been anonymized. Codes indicate course name LC2-, P or H, followed by participant type L or F and number; for example H-F4 would indicate facilitator 4 in the hybrid condition). The discussion will focus on the top 3 levels of

	LC		P		P+	
	L	F	L	F	L	F
Create	25%	2%	14%	52%	54%	11%
Evaluate	29%	6%	0%	0%	5%	3%
Analyse	31%	1%	22%	2%	5%	3%
Apply	1%	0%	0%	0%	2%	0%
Understand	4%	0%	8%	0%	4%	1%
Remember	1%	1%	0%	2%	6%	7%
<b>Total</b>	<b>91%</b>	<b>9%</b>	<b>44%</b>	<b>56%</b>	<b>76%</b>	<b>24%</b>

**Figure 7.5** Share of words in cognitive comments by category

both areas: they respectively relate to complex and elaborate cognitive contributions (Create, Evaluate, Analyse) and social behaviours indicating leadership and advanced teamwork (Lead, Cooperate, Participate). In addition, the analysis will also discuss Contribute for the social area, given its high share of participant effort (grouping messages where learners contributed resources to the course). As explained above, these categories are the most relevant for surfacing teaching behaviours.

### 7.3.3. Cognitive Teaching Behaviours

Overall, cognitive comments accounted for about three quarters of words across the three courses. First, contributions from learners and facilitators at each of the cognitive levels will be discussed – the percentages shown reflect share of learners and facilitator contributions towards total of cognitive words in comments. We then review qualitative detail in categories most relevant to teaching behaviours – Create, Evaluate and Analyse.

As summarized in Figure 7.5, learners in the hybrid course spent the highest share of their time in the Create category. Learners in the loosely-coupled course spent much more effort in Evaluating and Analysing than their peers in the platform or hybrid courses. Facilitators were the most active in the platform course, contributing high cognitive value comments, but this coincided with learners not contributing a lot in these categories. In comparison to the loosely-coupled course, facilitators were more active (24% share of voice v. 9% in loosely-coupled).

Learners in the loosely-coupled course were far more active in discussions than facilitators, accounting for 91% of all content, and also had a high share of content in the hybrid condition. In the platform course facilitators contributed more comment content than learners.

**Create:** Learners were given freedom in all courses to specify the format in which they could submit their assignments and the submission format variety was not affected by course technology (all courses saw submissions in rich media formats, Prezis, videos and even poems and artworks). For example in the loosely-coupled course LC2-L12 says: “*Here is my project :) if you have any questions feel free to ask!*” and attaches a link to a Prezi. In hybrid course learners created blog posts directly on the platform, for instance H-L8 posts a group project:

*“Week 1 Question : Should We open Borders ? We are going To answer this Question By asking another question to make things clear ; which it is " If borders were opened How it would be ? (. . .)”* Whilst a variety of assignment types were not affected by used learning platform, learners in the Platform and hybrid course had the additional option of writing rich blog posts directly on the platform, which several of them did. This is the main factor for why learners spent much more effort in the create category than in the loosely-coupled course. We found this by separately looking at the 5 longest posts in all courses (to review the impact of weighting by word count on results); our analysis showed that in the hybrid course top 5 comments accounted for 45% of all words in the sample (v. 26% in the loosely-coupled course), and were all classified in the Create category.

**Evaluate:** Participant evaluation of both the content of shared articles and of other learners’ assignments, frequently brought in diversity of perspectives and new information, as well as evaluating the validity of previous contributions. For instance in loosely-coupled course LC2-L25 says: *“There’s something behind all this that we don’t consider. (. . . ) To produce computers and smartphones there’s a necessary material: the coltan. This material is present in east Africa and there are wars everyday to take it. (. . .).”* Similar examples were also noted as contributions by facilitators across all three types of courses; here facilitator LC2-F1 comments on an assignment: *“Great idea! (. . . ) Perhaps you should think how to convince your school to do something about it and work with them and a team of other students to implement it?”* As seen in example above, facilitator felt comfortable directly commenting on the quality of learner contribution.

**Analyse:** Learner posts in the Analyse category contributed interesting perspectives, but unlike the Evaluate category, they did not evidence to the same extent a strong underlying sense of values. For example LC2-L26 in loosely-coupled course says: *“I agree with what you said about diminishing poverty, LC2-L13, but I’m not sure how what I said about educating people to think critically and for themselves tied into what you were saying about Muslims not feeling like they belong (. . . )”* Another example is learner H-L6 reflecting on the political situation in Poland *“Why is it so easy to win the elections? You just tell people that you’ll give them around 120 Euro and they elect you... And majority of community doesn’t know anything about economy and don’t know that they’ll just print that money which will increase the inflation level.”*

Learners and facilitators across all courses spent relatively little effort in **Remembering, Understanding and Applying** their knowledge. This is due to the fact that average length of posts was lower in these categories. Apply posts evidenced learners bringing their local context to the discussion, for instance learner LC2-L3 replied to a peer’s comment: *“LC2-L5 Yes, I agree. At least Vzla is good in renewable energy thanks to all the electricity we produce with our hydroelectric plants on rivers and dam.”* In understanding comments learners contributed small pieces of new knowledge to the conversation, for example LC2-L17 says: *“Yeah I know what you mean. Sometimes they sell flowers or newspaper too”* or facilitator H-F3 from hybrid course says: *“I will take some time this weekend to read what exactly have they agreed and try to pin point the weak points of the agreement. In any case this is without precedent and exciting, if even for symbolic value.”* Typical posts in the Understand category acknowledged that a participant

	LC		P		P+	
	L	F	L	F	L	F
Lead	1%	0%	0%	0%	1%	0%
Coordinate	3%	7%	0%	0%	3%	1%
Participate	2%	0%	0%	0%	1%	0%
Contribute	40%	13%	59%	0%	43%	25%
Bond	21%	2%	20%	0%	12%	2%
Socialise	7%	3%	21%	0%	11%	1%
<b>Total</b>	<b>75%</b>	<b>25%</b>	<b>100%</b>	<b>0%</b>	<b>71%</b>	<b>29%</b>

**Figure 7.6** Share of words in social comments by category

has reviewed others' work, eg. LC2-L14 in loosely coupled course confirms she saw the video: "Nice video", H-L15 responds to a post created by a peer "Exaaactly !!", or P-F1, a facilitator in platform course, shows she has read the contents of a learner's introduction: "We need to talk about your cooking stoves idea! Sounds very interesting. You seem to have 4 jobs minimum - how do you do it? ;-)". While posts in the lower categories of cognitive area did not directly relate to teaching behaviours, they were an important part of interaction in the course – participants acknowledged having reviewed each other's work and added valuable perspectives, even if in shorter and less complex format.

#### 7.3.4. Social Teaching Behaviours

Comments classified in the social area accounted for about a third of all interactions across all three courses. We will first consider structural differences between the three courses and contributions of learners and facilitators before reviewing the details of interaction in Lead, Coordinate, Participate and Contribute categories.

Figure 7.6 shows the % share of social comment words per course (with facilitator and facilitator contributors adding to 100% per course). Learners accounted for about  $\frac{3}{4}$  of all social comments (in platform course facilitators did not make any social comments). Contribute had the highest share of effort by all participants. Bonding and Socialising were also important contribution areas. Share of words in the top three social levels was low across all courses and participant types – except Coordinate for facilitators in loosely-coupled course.

**Lead:** Leading category was the lowest in terms of share of word count across all courses (1% or less). Interestingly, learners accounted for a higher share of words in comments in this category than facilitators. The two posts that were classified as leadership included learner LC2-L2 proposing to the loosely-coupled course using additional communication methods (her initial post attracted 33 follow up comments): "If any of you are on instagram, twitter and/or snapchat, I'd love to connect with you there as well so comment your username! Instagram and snapchat: mysnap Twitter: mytwit." In another leadership instance in hybrid course learner H-L20 offered to help solve a logistical issue another learner was facing: "add me as a friend so I'll be able to add you to our conversation."

**Coordinate:** In some instances, learners were on the verge of taking a lead, but instead passed the issue on to another participant instead of stepping out of their comfort zone and solving issues independently. In the loosely-coupled course several of the coordination posts by both learners and facilitators related to technical and logistical challenges faced, while posts in this category in hybrid course had less of a sense of urgency and related to learners finding partners for class assignments. For instance in loosely-coupled course learner LC2-L26 responds where another learner asks if a private Facebook community has been set up for their group: *“Go ahead and create one! I tried but I couldn’t! See if you can”*. Facilitator LC2-F4 later clarifies: *“LC2-L26 you are in the EMEA class, not the AP class!”* In platform course learner P-L5 coordinates interaction with peer: *“Hello P-L6, we could work together I couldn’t attend the session because of some communication issues (...).”*

**Participate:** In some instances where a technical difficulty was highlighted, learners signal the issue and flag that while their wish to participate, they are unable to do so without help. For instance learner LC2-L17 seeks help to her logistical challenge in loosely-coupled course: *“hi, I also wasn’t able to participate in the hangout. May I join your conversation when it’ll be set up?”* Another example of participation shows a learner responding, late, to an assignment, and not in a way which shows particularly high level of effort, but in a way that the learner recognizes they are members of the community and therefore have the responsibility to participate; LC2-L13 says: *“Hi, I think it’s never too late to introduce myself, my name is LC2-L13, I am from Venezuela, I like going out with friends, inquire about anything and read books, (my favorite book is The ALC2-hemist by Paulo Coelho) I am very happy to be here and I hope to meet soon.”*

**Contribute:** This was one of the most frequently assigned categories for both facilitators and learners, who frequently contributed content. Half of all conversation threads started by a comment in the Contribute category and resulted in discussions with a mix of social and cognitive comments – where learners both evaluated and analysed the content and built inter-personal relationships and coordination skills. Content contributed included sharing links through course platforms (eg. *“He saw a problem in his community and did something about it [link to TED talk]”* posted by facilitator LC2-F9) or sharing social media contact details (eg. *“Oh and mine @mytwit on twitter!”* by facilitator LC2-F10). In the hybrid course these contributions also included links to external communities hosted on social media platforms, for instance learner P6-L says *“Hi! I would like to invite you all to discover a new initiative created by students from different nations - Young Diplomacy. It’s an online academic journal about foreign affairs. (...).”* In hybrid course contribute comments also related to learners flagging technical difficulties with the learning platform through the Facebook group which was also used in the course, learner H22-L says: *“Is it just my problem or are some other people not able to use learningcircke.io?”* and several learners and facilitators respond confirming seeing similar issues.

**Bonding and Socialising** were two categories dominated by learners across the three courses, and where learners spent approximately a third of their efforts in social comments. This is where learners got to know one another: bonding grouped comments with high level of emotional charge (eg. learner LC2-L22 in loosely-coupled course exclaims: *“LC2-L11 yeah! Now there’s*

*4 of us who'll study at the USB!! (...)*” or learner LC2-L1 commented *“God, you all have so many amazing projects...I mostly commented on those who grabbed my attention. (...)*”). Bonding comments aimed to finding similarities in an effort to build relationships. Comments grouped in socialise category were shorter and less charged comments, such as (*“Thank you for sharing (...)!”* or *“:))))”*). Facilitators rarely posted comments in these categories (5% share of effort in social area in loosely-coupled, 0% in platform and 3% in hybrid).

### 7.3.5. Discussion

The review of the data showed that all course participants had an important teaching role to play in the three student-led courses. Some of the mechanics of these interactions were influenced by the technology used. The main way in which learners contributed to co-creating the course was by sharing their assignments and resources, and building a sense of community by bonding and socializing, which helped them get to know others. The courses with a higher share of social comments also had higher cognitive scores, and that using loosely-coupled courses had higher levels of cooperation and coordination behaviours among learners as they solved each others technical and logistical challenges. Facilitators were crucial in solving more complex technical and logistical challenges and they delivered more helpful feedback in courses where technology freed up their time from administrative tasks.

### *Learners Add Original and Secondary Content*

Learners had two main ways in which they co-created the course – by sharing their own assignments as class material, and by sharing sources from external platforms. Interestingly, it was these original assignments that resulted in more thoughtful discussions, with a higher cognitive score than threads starting with external links. We saw learner involvement in contributing resources to be stronger in a loosely-coupled course than in a platform course which can be explained by learners falling into a habit of going with pre-defined learning paths and convenience in the presence of a dedicated learning platform. This is consistent with (Ferguson and Sharples, 2014; Siemens, 2005). Facilitators, like learners, also engaged in sharing external resources, but they only contributed external links in the loosely-coupled and hybrid environments. Involving learners in co-creation of the course helps them build collaboration skills and makes them more invested in contributing learning content. Therefore, it is important to ensure that they can be leveraged for this role using optimal technology setup.

### *Social Sharing Can Kick Off Cognitive Activity*

The analysis observed that the loosely-coupled course with the highest shares of social comments also had the highest cognitive score among learners, which is consistent with previous research pointing to need to work within environments which are both familiar and preferred by learners (Cormier, 2008b; Siemens, 2005; Wenger, 1999). One explanation for this is that learners who have higher level of trust, interacting in a more close-knit community, are more

likely to share their reflections, as suggested in prior literature (Wenger, 1999). In the platform course facilitators had a higher share of voice in cognitive comments than learners (56% in the platform v. 9% in loosely-coupled and 24% in the hybrid course). However, with a lower share of time devoted to promoting sense of community by course participants, learners in that course had a lower cognitive score than in the other two (as shown in Figure 7.3, learners actually had a higher cognitive score than facilitators in the two courses, which to some extent used social media and promoted a sense of community). Facilitator comments at high cognitive levels have displaced learner ones in the platform course.

### ***Learners Excel at Bonding, Less so at Coordination***

Learners accounted for the highest share of Bonding and Socialising comments, which contributed towards a sense of community among learners in the online forum. Facilitators spent notably less effort in these two interaction categories. This may be because traditionally these type of comments are seen as distraction from learning, not contributions to learning (Greenhow and Lewin, 2016). Additionally, in a student-led environment facilitators may feel the need to only get involved when learners are seen as needing help, and given the volume of these comments this would have likely looked like an area of mastery for learners.

However, it was far more rare for any type of participant to achieve higher order social categories (such as Lead or Coordinate). Additionally, it was rare for posts by participants to start in ways other than sharing an assignment or contributing sources (less than 14% did not start in one of these two ways). This shows that learners may require an extra nudge to think of other ways in which they could affect course structure. The existing posts that relate to coordinating, for instance, were mostly relating to instances where learners faced technical or communication challenges and were most prevalent in the loosely-coupled course (for example not knowing course schedule or link to lecture). As explained in prior research (Celina et al., 2016; Kop and Carroll, 2011; Mackness and Bell, 2015), in loosely-coupled courses, learners, especially less experienced ones, tend to feel information overload, which can explain why learners in loosely-coupled courses suggested alternative, more private ways to communicate with others (such as for instance using personal WhatsApp and Instagram accounts).

### ***Not All Participants Contribute Evenly***

While facilitators in general showed behaviour that was in some areas different from learners, not all facilitators acted in the same way. Several facilitators, for example, were less engaged than learners and even if they contributed, it was at a lower cognitive level than learners, which is consistent with previous findings that in student-led courses facilitators were often not clear on how to provide meaningful contributions (Garrison, 2015). Less than half of the facilitators have been evidenced to achieve a score of more than 3 on social and cognitive scores for any of the courses. No facilitators achieved a score higher than 3 in social areas during the platform and hybrid course, and only 17% of facilitators in loosely-coupled course achieved a cognitive score of >3. This shows that even within a group expected to have more experience managing a



course, not all participants were effectively contributing to teaching behaviours. Consequently, it becomes equally useful for learners and facilitators to see their summary contributions, as highlighted by prior research (Soller, 2001; Stahl, 2006; Zhao and Sullivan, 2017). Supporting facilitators in creating a community among them also has potential to improve their contributions ((Celina et al., 2016; Salmon, 2012; Zhao and Sullivan, 2017).

### ***Time Freed For Facilitators Results in Better Feedback***

Facilitators should be freed from organisation mechanics to the extent possible so that they engage in core activities of deepening learners' knowledge and building community as discussed in Chapter 4. In the loosely-coupled course several types of administrative activities took course organisers' and facilitators' time without adding clear benefit to learners as described in Chapter 4 (these included administrative tasks and managing users). Their automation in the platform courses freed facilitator time to provide more in-depth feedback to learners. Both learners and facilitators brought insightful comments of high cognitive complexity. Additionally, in the loosely-coupled course it was mostly facilitators who stepped in to solve complex logistical and technical challenges, devoting the largest share of their social comments on such tasks – this meant they could spend less time to engage at cognitive levels with learner assignments and resources shared.

### ***7.3.6. Conclusions***

The analysis of dynamics of teaching in student-led courses helped identify contributions to teaching by both learners and facilitators. It has also helped highlight how learners and facilitators contribute to course co-creation in different ways - both because of the affordances of technological environment and because of their focus. Learners are able and willing to contribute content to the course, among others by contributing creative assignments presenting their unique points of view. They readily engage in social activities, and these informal social interactions can draw learners out into discussions at high levels of cognitive activity. However, contributing at complex levels of collaboration (such as leading or coordinating group activities) is less frequent and requires support from additional scaffolds, which can be provided by facilitators or course organisers. When facilitators are spending less time tackling logistical challenges, they provide more meaningful feedback to learners. There are big differences between learners in terms of their contributions, showing opportunity for both learners and facilitators to highlight meta-cognitive trends at class level and help individual learners improve the quality of their contributions to the course.

The hierarchical socio-cognitive framework is an interesting measure of individual, user group and course level activity. It enables to capture insights at both high level (quantitative weighted average of word count score) and in detail (by deep diving into individual types of comments). It should be highlighted that despite its hierarchical structure, a higher *is* not necessarily desired - all interactions at simple, intermediate and complex level are needed in course communications. If the framework is explained and shared with course participants in the

course it can also serve as an educational tool which helps define expectations for participation in learner-led courses.

The reflective review of learning environment affordances has highlighted that it is possible to omit some key functionalities from learner access, even when specifically designing for learner course co-creation. This has also helped me reflect on the survey instrument used to request qualitative participant feedback - in a learner-led course it should be possible to design an instrument which would equitably treat learners and facilitators when asking for feedback (learner, facilitator and organiser feedback forms used in the study are shown in Appendices G-I).

Chapter 8 will reflect on findings from the four empirical chapter (Chapters 4, 5, 6 and 7 and propose learning-environment agnostic design recommendations.

## Chapter 8. Discussion and Conclusions

### 8.1. Introduction

The Online UWC project has brought online activist education to nearly 200 learners. It has led to the creation of 63 social impact projects, 41 of which have documented evidence of completion. The project's social media channels have over 3,800 subscribers and its video content has generated more than 11,000 views since the project has started. Online UWC has also had social impact beyond the courses themselves. For instance, it inspired its participants to pursue their work on personal projects. Online UWC alumni learners set up an online media called United Youth Journalism, which has since produced 308 articles<sup>1</sup>. Online UWC alumni facilitators are bringing transformational learning to refugees and disadvantaged youth through the Amala Education<sup>2</sup> program. Since the findings of this research have been handed over to the United World Colleges International Office, I have trained a new generation of online short courses leaders and, in the midst of the coronavirus pandemic, they have helped 5 short courses to be re-designed to take place online<sup>3</sup> (see Figure 8.1).

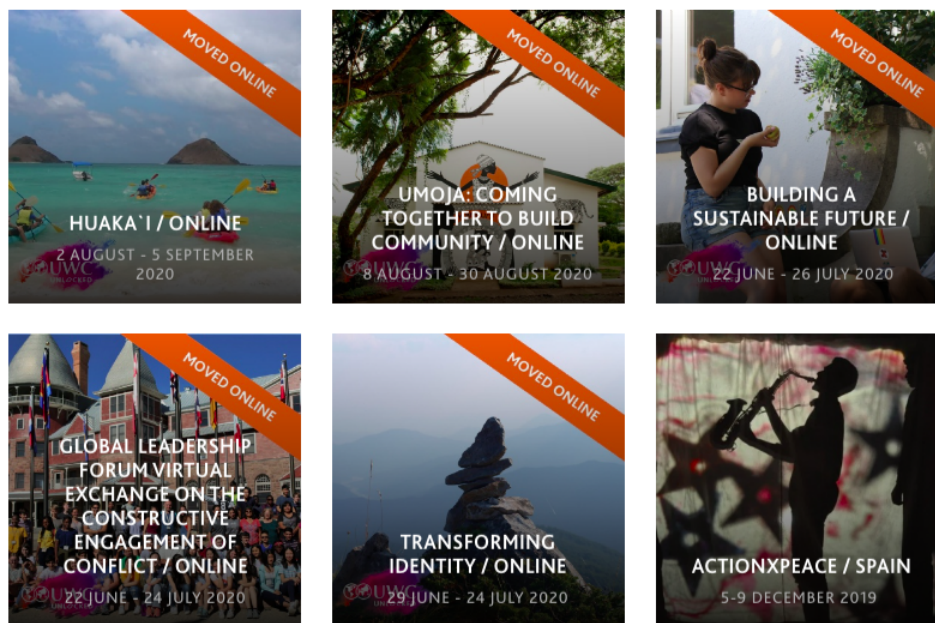
Most participants of Online UWC both enjoyed the experience and provided helpful recommendations towards the design of future courses. While the project harnessed the energy of about 30 passionate and hard-working contributors throughout its lifetime, its social impact more than justifies these efforts. This opportunity for social impact makes me even more excited about the potential of collaborative online learning today than I was when I started my PhD project. Online learning presents exciting opportunities not only to connect people to learning materials and each other but also create social bonds with others which long outlive the courses and contribute to mutual inspiration. This creates a virtuous cycle of continued social impact - which has been the strength of United World Colleges, and which, as has been demonstrated in this study, can also be generated by reaching out to a broader audience online. The configuration of learning activities and technological support present a unique set of challenges to course instructors and facilitators, when it comes to supporting both cognitive and social elements of learning. This research set out to answer three primary research questions: (1) how do different learning environments (loosely-coupled social media, platform, hybrid) affect the social and cognitive elements of learning in a student-led context, (2) What design trade-offs exist when supporting social and cognitive aspects of student-led learning, and (3) how to design learning environment and pedagogy in a way that promotes social and cognitive learning.

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<sup>1</sup>[https://unitedyouthjournalists.wordpress.com/page/42/?page\\_id=46](https://unitedyouthjournalists.wordpress.com/page/42/?page_id=46)

<sup>2</sup><https://amalaeducation.org/ourstory>

<sup>3</sup><https://www.uwc.org/news/?pid=6069&nid=65>



**Figure 8.1** Five short courses have taken place online since project was handed over

This research project has reviewed learner and facilitator interaction over courses organised in three different technology configurations (using loosely-coupled media, a custom-built learning platform and a combination of the two approaches). Through reflecting on the results of this analysis it has been possible to produce a theory-based analytical framework which helps understand social and cognitive learning happening in these courses. This framework was applied to conversational learning data in an open curriculum and learner-led nature course - a course in which it would have been difficult to apply pre and post testing. This framework helped classify interactions on the courses' key learning platforms to give insights into their dynamics and then to identify the trade-offs of the different technology approaches. The ordinal socio-cognitive framework provided a lens to discuss teaching presence contributions by learners and facilitators. It helped both compare their relative inputs, and combine high level quantitative and detailed qualitative review of the data. The data analysis revealed that supporting both the learners and facilitators in such courses requires distinct pedagogical and technological considerations. Both learners and facilitators make important contributions to teaching in student-led courses: for learners it most frequently takes the form of sharing their assignments or external resources, and for facilitators to contribute to organisation and logistics. Loosely-coupled media promotes sharing, but creates more organisational constraints on facilitators. In any technological setup it is rare for learners to step up to leadership and coordination roles, which calls for additional research on what are the best ways to do so through course environment and content design.

I will now consolidate the design recommendations partially discussed in Chapter 4 and present new recommendations resulting from the additional analysis conducted in Chapters 5, 6 and 7. These recommendations resulted from the analysis of qualitative quantitative analysis of course participants surveys and interactions, as well as analysis of prior literature presented in Chapter 2. The aim of the guidelines was to provide recommendations to both learning environment and platform designers who are hoping to achieve a similar set of learning

outcomes: promote learner-led learning, support learners to become comfortable with loosely structured collaborative challenges, gain life-long learning skills and create community. The findings are most relevant within the context of online courses that seek better understanding of the cognitive and social teaching behaviours of all course participants. This conclusion chapter begins by summarising the findings of the research presented in Chapters 4, 5, 6 and 7, and revisits the initial research questions presented in Chapter 1, to show how this research has addressed the response to these questions, as well as evaluate the future direction of research in HCI and future direction of design in related application field (education).

## 8.2. Overview

As highlighted in Chapter 1, the contribution of this thesis is to explore interactions in student-led learning environments and provide an analytical framework to help compare social and cognitive learning in courses with an open curriculum. This is done in order to present design guidelines for learning environment and pedagogy designers for courses with similar objectives as Online UWC, which was the scope of this research.

In Chapter 2, I discussed how researchers to date have explored computer supported collaborative learning (in classrooms, online, and through community approaches) and digital activism. The grounding of the method in constructivist and socio-constructivist theoretical literature helped identify the importance of social and collaborative aspects of learning, and the importance of learner-led approach. Practical questions of pedagogy and evaluation were considered based on a priori research on communities of practice and inquiry, problem-based learning and knowledge building approaches. MOOC literature was presented to showcase the latest trends in online learning and consider the current approaches to supporting these activities with technology. Aspects of supporting activism online helped explore further different approaches for supporting young people for social impact.

Chapter 3 then elaborated on the methodology of this action research project. The method was justified as a good fit for the project from ontological, epistemological and methodological perspective. Research design, including environment design, data to be gathered and analysis to be conducted, was summarised. The iterative nature of the project (including research design, learning environment design, methods and measures) was highlighted, foreseeing likely changes to approach during the course of the work, and considering ethical implications thereof.

Chapter 4 explored interaction of different sized learner groups in loosely-coupled media environments, with the design objectives of (1) helping learners get involved in mission-driven initiatives, (2) enable learners to get to know each other, and (3) empower learners as co-creators of the course. These experiments with differently sized courses in loosely-coupled environments found that while it is possible to build a sufficiently structured, impact-focused student-led course using such approach, learner experience becomes increasingly chaotic as the number of participants exceeds 100. Social media channels, while helpful to drive engagement, lack important features for community building and project development. Design features for a connectivist inspired learning platform were derived from these experiments.

Chapter 5 presented the design of a connectivism inspired LearningCircle.io platform, and evaluation of experiments with it. On this learning platform, course participants could be subdivided into smaller groups, as well as had a setting favourable to project discussions and feedback. In early experiments in courses using only the LearningCircle.io, learners faced challenges relating to communication. This in turn led to design of a hybrid environment (using a mix of the LearningCircle.io platform and social media). During experiments with the platform questions arose about the best way to evaluate learning interactions in learner-led, impact focused open curriculum environment to identify advantages and disadvantages of using both set ups in terms of cognitive and social learning.

In Chapter 6, I analysed course discussion materials to identify trade-offs of different learning environment configurations on social and cognitive aspects of learning. Theory-based approach was applied to build an analytical framework to discuss learning in student-led learning environments. The framework had to meet several design objectives: (1) be grounded in previous learning and collaboration literature, (2) provide a view about level of challenge of actions reflected in each utterance, (3) describe both cognitive and social aspects of learning, and (4) be applicable to all course participants (both learners and facilitators). Comparing interaction in loosely-coupled and hybrid courses this research found that there are two kinds of trade-offs that designers have to consider when thinking about structuring a learning environment. The first trade-off is between contribution to course co-creation (favouring loosely-coupled media), and higher learner satisfaction with course structure (favouring more structured, platform based approaches). The second trade-off is between risk of low interaction (high in platform-only environment) and ease of layering and scaffolding interaction (difficult in social media only environments).

Chapter 7 presented a refined view of the analytical framework, supported with interrater agreement scores. A new iteration of the framework was required to both simplify presentation of conversational data from the course (by merging the post and comment dimensions of the data into one) and enable more meaningful categorisation of underlying data (moving from total of 3 categories to 6 in each social and cognitive area). However, original inter-rater scores were found to be low at 67%. An iterative process of collaboration and review followed to help define a refined framework. The two co-graders were asked to review 10% of data ahead of discussion session. During the session with co-researchers it became apparent that this classification was both too detailed (in how comments were classified) and too reductive (in how the results were presented) to discuss interactions in learner-led courses. An alternative was proposed, much more closely aligned with initial Krathwohl and Bloom's affective taxonomy, and with a much more detailed grading codebook. The inter-rater agreement scores consequently improved to 86%. This improved framework was then used to consider pedagogy in student-led learning environments. This framework was then used for analysis of pedagogical approaches to student-led learning. This research found that all course participants have an important teaching role to play in student-led courses, but learners and facilitators engage differently with the course depending on technological platform used to support the course. Learners were

found to most readily contribute learning content and facilitators most uniquely positioned to solve the most complex technical and interaction challenges. The courses with higher share of discussions classified in social categories also showed higher share of complex cognitive behaviours, suggesting that social behaviours are not simply a distraction to cognitive learning, but a factor which can promote cognitive learning among course participants.

#### 8.3. Impact of Technological Environment on Student-Led Learning

*Q1: How do different learning environments (loosely-coupled social media, platform, hybrid) affect the social and cognitive elements of learning in a student-led context?*

Traditionally, connectivist courses have relied on loosely-coupled media to conduct courses in order to build learner-led experiences, where participants contribute content to courses and use their preferred means of communication. These courses shied away from using platforms, described as too limiting and constraining to course participants (Cormier, 2008b; Siemens, 2004). However, research into connectivist courses found that chaotic learner experience and sense of being overwhelmed also limited full participation (Kop, 2011; Mackness et al., 2010). The first research objective of this thesis has been to leverage experiences from a student-led, connectivist inspired course to provide design recommendations for a connectivist inspired learning platform – which would both support learners and enhance their contribution to creation of the course v. loosely-coupled scenario.

In Chapter 4 this research discussed learner and facilitator interactions in loosely-coupled learning environments, as they relate to empowering learners to start their own impact initiatives, enabling formation of social connections among learners and facilitating learner contribution to course co-creation.

This research, informed by existing literature, was also able to explore the advantages and disadvantages of using a loosely-coupled social media approach. The main advantages had already been highlighted in previous research and included the fact that all participants could select media that they were the most familiar and comfortable with and the ease of system set up by course organisers. The main disadvantage identified (and also highlighted in previous studies) was the challenge of providing a positive learner experience. As guided by previous literature, this research leveraged the support of facilitators to help provide structure of the course in absence of an organising platform. However, full commitment of facilitators to ensure no learners were feeling lost or overwhelmed with the course in loosely-coupled setting meant that time spent per facilitator in the course doubled between when the course was organised for a smaller group, as class logistics became more complex with a larger group.

Drawing on these experiences, the analysis helped identify functionalities that were required for a centralising platform which helps support connectivism inspired courses. The three types of design implications were identified through this research were: logistical, community-supporting and self-organisation supporting. Experience with a course of more than 100 signups highlighted the importance of logistical support for organisers and facilitators, to help with such tasks as application processing, group division and resource organisation. From a community point of

view, the experiences in loosely-coupled courses indicated the need for layering interaction: in larger groups to ensure learners had the potential to interact with a diverse group of peers, and smaller groups to ensure they had a chance to participate in in-depth discussions and experience the safety and comfort of interaction in a smaller group. Additionally, the need to identify active members of the community (as opposed to learners who registered but were inactive) was identified as an important feature to support. Finally, self-organisation was found to happen in two different situations: when technical or logistical issues happened and learners supported one another to resolve the situation and give guidance and when learners contributed resources to learning.

Experiences with the loosely coupled learning environments, and design recommendations drawn from these experiences, have helped design and build a connectivism inspired learning platform, described in detail in Chapter 5. The main features were driven in part by experiences with loosely-coupled courses, and in part by literature relevant to creating online courses and online communities. The features served two main design objectives of student-led online courses: knowledge building (cognitive domain) and community building (social domain). Cognitive features were focused around supporting ease of contributing to course tasks – organisational features which organised course content (to ensure learners and facilitators could devote more time on course content) and blogging interface, which allowed creation of multimedia content (in form of short posts, more complex blogs or projects) directly on the platform. A searchable and chronological course timeline was a key feature that aggregated course content. Social interaction features sought to respond to the most urgent needs identified: layering community interaction through large and small groups and ease of identification of active v. inactive learners. Combination of public (commenting) and private (messaging) tools establish a variety of ways in which diverse learners could interact.

In Chapter 4, the second and largest iteration of the loosely-coupled course was compared to the two courses that were organised later using the platform (one using only the platform, and one using the hybrid of both approaches). The impact of technology on interaction and social and cognitive learning was thus explored in Chapter 7. Two main tradeoffs to using a platformed v. unplatformed approach were identified. The first tradeoff is that learners seem more satisfied with more structured platformed courses, but at that same time that very structure seems to be inhibiting or constraining their own contribution to these courses. Even though the LearningCircle.io platform and the Online UWC courses had been designed specifically with course co-creation in mind, it has not been able to demonstrate as high a level of course co-creation as in loosely-coupled courses. This finding is consistent with a hypothesis put forth by the originators of connectivist massive online courses (Cormier, 2008b) and (Siemens, 2004). As such, this finding contributes to knowledge by demonstrating empirically (while using both platform and course design built for course co-creation by learners), that using loosely-coupled social media, though resulting in less pleasurable learning experiences, actually has positive impact on learner contribution.



Additional research is needed to explore the reasons for that. Several hypotheses can help explain this phenomenon. One has to do with the fact that learning often is a challenging and transformational experience and as such, it is not always described as positive. Another hypothesis would be from a community point of view; seeing how unstable and stretched the community is (with technical and logistical errors surfaced by all course participants), learners feel the need to positively contribute to their peers. The final hypothesis is that social bonds formed are stronger when learners interact in close proximity to their real (non course) social networks, and feel closer association to learners in the course than learners in a quieter curated social network.

### 8.4. Evaluating learning in student-led learning environments

*Q2: What design trade-offs exist when supporting social and cognitive aspects of student-led learning?*

Literature review in Chapter 2 has helped identify the different technological affordances of different approaches to supporting collaborative learning within online course context, which flagged that there could also be trade-offs in term of interaction and learning outcomes. Loosely-coupled media learning environments used in connectivist MOOCs are seen as a powerful way to cater for individual preferences and encourage learners to co-create the course (Mackness et al., 2010) but can lead to negative learner experiences, especially if they are not confident users of digital technologies (Kop et al., 2011; Mackness and Bell, 2015). Behaviourist MOOCs enable a great way to present content but despite some recent progress on that front they do not enable learners to interact and get to know each other (Kulkarni et al., 2015a,b). Some early feature designs needed to support learner-led and social impact focused online learning have been identified, including the need to help learners gain confidence during the course by community building and providing of initial structure, features enabling learners to easily navigate content created by other learners, and ensure randomness in group creation (to fight the effect of echo chamber). The review of different theoretical approaches to evaluation has helped demonstrate the complexity of accounting for cognitive and social components of learning interactions in learner-led environments, measured at both individual and group level, which can be applied agnostically of platform type. Chapter 6 went into detail reviewing existing frameworks and their relative use cases. Both the framework which originated from the analysis of the data in Chapter 6, and the detailed review of the trade-offs identified by applying the framework to collected data are contributions of this thesis.

The three frameworks considered were Bloom's taxonomy, Soller's collaborative learning framework and Communities of Inquiry. While Bloom's taxonomy consists of three categories of educational objectives: cognitive (related to development of knowledge), affective (related to development of learner values and preferences) and psychomotor (most relevant for physical tasks), only the first one has been widely adopted since and refreshed to best reflect technological developments. At the same time, with the advent of the internet and the increasing focus on collaboration in a knowledge based fast moving economy, affective components, relating

to how one is part of the society and interacts with others, became increasingly important. Simultaneously, researchers of collaboration have also been able to propose a framework to explore behaviours in online collaborative systems – one of the most prominent examples is Soller’s taxonomy. Additionally, Communities of Inquiry framework, showcasing the importance of learning, social and teaching presence, has been widely applied in the field on learning in online communities. These three frameworks were deemed the most relevant to the analysis required. However, each one was incomplete to understand interaction in student-led learning environments. Bloom’s cognitive taxonomy responded to the cognitive aspects of learning, but its affective counterpart was very individual focused and difficult to measure. Soller’s framework considered individuals social interactions with others, but it was not easy to separate the simple interactions from complex, additionally, in addition to social aspects of collaboration, also cognitive components of collaboration were included. Communities of inquiry framework faced similar challenge as Soller – it was not easy to separate the simple from complex interactions, and it separated teaching as a separate presence. While acknowledging that learners could also fill teaching roles, it implicitly separated teaching from highest levels of social and cognitive achievement. In a fully student-led environment, where learners are empowered to fully take charge of their learning, such a split is not necessary.

In Chapter 6 I have constructed a distinct framework based on these foundational theoretical approaches and applied it to identify learning trade-offs. This was achieved by combining the contributions of Soller’s and Community of Inquiry frameworks and adapting them as part of the refreshed Krathwohl and Bloom’s affective framework language and definitions. This research developed an analytical framework for investigating learning in online connectivists settings. The framework proposes two categories of learning behaviours: cognitive and social. The cognitive framework is consistent with the digital Bloom’s taxonomy proposed by Churches (Churches, 2010). This classification was proposed by Bloom’s student Anderson, including six hierarchical categories, from most simple to most complex: remember, understand, apply, analyse, evaluate and create. Churches contributed to the framework by adding examples of how this framework applies to tasks common in the digital age (which fed into the codebook in Appendix A). The affective taxonomy introduces an extra layer of bonding, to distinguish between simple and complex means of contributing to the community. It also refreshes the original affective taxonomy to describe affective qualities of individuals as they can be approximated when they interact with others. They also are refreshed for the aspects of collaboration that have been created since the original Krathwohl and Bloom’s taxonomy was produced.

As presented in Chapter 6, two primary trade-offs have to be navigated. One is in the cognitive area, between ensuring high level of contributions to course co-creation by all course participants vs. higher learner satisfaction with course structure. The second trade-off is in the social learning area, between managing the risk of low interaction vs. facilitating the benefit of layering and scaffolding interaction. While the answer will depend on the specific context of each learning activity, there are some criteria which can help navigate the design choices. The design choices are summarized in Figure 6.5 in Chapter 6. It should be noted that the

choices are never binary – a platform can be used as a complement to social media presence, or some degree of automation (eg. content aggregators) can be used in order to better leverage social media tools. Five primary criteria were proposed for course and learning environment designers to consider when evaluating learning trade-offs: learning objectives (leaning towards either social or cognitive), course size (smaller or larger than 100), learner type (confident or not), moderation needs (desired or required) and available resources (committed volunteers or financial and technical). The more the answers lean towards the first answer shown above in parenthesis, the more the loosely-coupled learning environment is recommended (as shown in Figure 6.5 in Chapter 6).

### 8.5. Pedagogy in Student-Led Learning Environments

*Q3: How to design learning environment and pedagogy in a way that promotes social and cognitive learning?*

The refined version of the evaluation framework presented in Chapter 7 was used to discuss teaching contributions of all participants in student-led courses, and impact that technology has on means of supporting them. This research helped provide course design recommendations that can help build teaching behaviours among all course behaviours (both facilitators and learners). The area of interest was to investigate which behaviours are likely to happen when online learning is supported using different technological setups and therefore which desired cognitive and social behaviours require additional facilitation. The objective was not to identify which of the three setups works better, but which different learning objectives can benefit from each technological configuration. Understanding the impact of design decisions on learning can then help identify what kind of pedagogical support should be provided to reach a community's learning objectives. The similarities and differences between learner and facilitator contributions in learner-led learning environments were also investigated.

A learner's most important contribution to creating the course was by adding original and secondary content to course instruction. The original contributions to the course were assignments submitted. Given these were extensively discussed by peers, they contributed a crucial component of course stimuli. Secondary content contributed consisted of media articles and social media links to other impact driven organisations and initiatives. The learning platform impacted how learners co-created the course, in particular they did so more frequently on average in the loosely-coupled learning environment. In a platformed course, despite the platform being specifically designed with student-led courses in mind, learners nonetheless faced limitations to the extent of their contributions – for example they had limited ability to create group Hangouts. In a loosely-coupled environment both learners and facilitators faced similar barriers to task creation, so were at a more equal footing and learners did not rely on facilitators to provide solutions to their challenges.

Previous research has identified social media as a potentially useful medium for promoting learning and collaboration among learners (DiVall and Kirwin, 2012; Greenhow and Lewin, 2016), even if conversations do not always stay on topic and lead to clear cognitive gains

(Greenhow and Lewin, 2016). I have found social media usage to be related with higher level of cognitive activity than when using a learning platform. The course with the highest share of social discussion also noted the highest share of cognitively complex discussions, indicating the social community building can kick off cognitive activity. However, in addition to promoting community through social features such as user profiles, likes and commenting features, which in turn helps promote cognitive sharing, it is likewise important to encourage cognitively complex contributions explicitly through elements of pedagogy.

This research found that while learners in general do not find it difficult to socialise and bond (simple levels of social learning), they find it much harder to coordinate and lead than they do to provide cognitively complex contributions. Therefore, more support is required to show learners how to contribute as coordinators and leaders – this can mean both in terms of learning design, but also in terms of technological scaffolding.

This research has also found that not all course participants contribute evenly to the course, which is true both among learners and among facilitators. In fact, many facilitators achieved participation scores below those of the learners they supported. This shows the need to provide summary statistics to all user groups, and inform learners about what simple and complex behaviours look like. Specifically for facilitators, it is recommended to help them share best practice among each other. However, while time freed for facilitators through automation of manual tasks helps them devote more time to providing complex feedback, their responses can crowd out contributions that learners would otherwise make. Nonetheless, automating scheduling or other routine organisational tasks gives them more time to devote to supporting learners.

The socio-cognitive framework provided a lens to understand teaching contributions of learners and facilitators and help provide high-level comparisons between different technology set ups, course iterations, but also individuals. While the framework is the most relevant within the context of online courses where learning objectives are both cognitive and social, it could be applied in a wide range of learning activities, where discussions between participants are core for building knowledge. It can be adapted to a variety of learning tasks, as opposed to only being applicable within a specific technological or methodological context.

Of course questions arise about the transferability of the findings to larger scale courses. All courses discussed within this research had no more than 200 participants. It is not clear if the findings would reflect the reality of truly massive open online courses (with participation greater than 500).

### **8.6. Design Recommendations**

Based on the experiences in the loosely-coupled, platform only and hybrid learning environments this research contributes design recommendations to both learning environment and pedagogy designers for online courses. These design recommendations have evolved during the course of this action research project. Several of these design recommendations (eg. “Organise resources”) have been already been presented in Chapter 4 to help drive design of the learning platform described in Chapter 5. However, the analysis of learning trade-offs conducted in Chapter 6

has helped explore these design recommendation in the context of organizational constraints and learning objectives pursued. Therefore, after a further analysis of nature of contribution to learners and facilitators to learner-led course pedagogy (discussed in detail in Chapters 6 and 7), the initial design recommendations have been modified to reflect the findings of the entire project. The most important change is that the recommendations will be presented as platform-agnostic view of these recommendations, instead of focusing on proposing platform features. Instead, I will focus them around the type of functionalities that will require additional support, either through strong social structures to be provided by facilitators, or embedded as technological features of the learning environment. Where relevant, I will provide examples of previous successful implementations as reviewed in Chapter 2.

### **8.6.1. DR1: Organise Resources**

Learners in connectivist courses have faced chaotic experience as loosely-coupled social media environments were difficult to navigate, especially for less digitally confident learners (Kop, 2011; Mackness et al., 2010). Without a place where all existing resources can be navigated, learners may find it difficult to fully participate in the course, as I have found through the analysis of the loosely-coupled courses in Chapter 4. When using loosely-coupled media, organising resources may mean having an aggregator of tags used across several social media channels, or a working document or aggregation tool where course participants or course organisers can add platforms on which course activity is taking place. Implementation examples:

- Platform showing a chronological starting point for curriculum (Ho et al., 2015)
- Content aggregator used to group course conversations or newsletter (Mackness et al., 2010)

### **8.6.2. DR2: Ensure Technology is Set Up for Course Co-Creation**

Without careful learning environment setup, facilitators and learners are at risk to regressing to the roles they play in non-learner oriented environments (Bielaczyc et al., 2013). In learning platforms, many functions are designed with the implication that the organiser or facilitator will be the originator of events, groups, and lectures, as even the best meaning designers subconsciously lean towards using a structure with which they are the most familiar (Bielaczyc et al., 2013) and which I also observed while interpreting the set up for co-creation in the platform and hybrid courses, as highlighted in Chapter 7. Tools that enable learners to also be co-creators of the course should be available – learners should be able to create their own events and groups, and to propose assignments, discussion topics, and items on the agenda. They should ideally have a way to share resources and exchange with others through social media, as this helps contextualise their learning (Lave et al., 1991; Wenger, 1999). It could also mean providing technologies that help aggregate and review all externally brought materials (Cormier, 2008b; Mackness and Bell, 2015; Siemens, 2004, 2005). While many students and facilitators may still

choose the default, the platform should readily surface and reward innovation and customisation with a view of inspiring others to experiment. Implementation examples:

- Functionality to aggregate resources (DiVall and Kirwin, 2012; Mackness and Bell, 2015)
- Allowing learners to use their preferred social media communication channels for the course (Cormier, 2008b; Siemens, 2004)
- Allowing learners to schedule additional events with others on learning platform (Kulkarni et al., 2015a)
- Make negotiation of learning a habit early on to ensure participants do not get stuck in the roles that they are the most comfortable in (Bielaczyc et al., 2013)

### **8.6.3. DR3: Promote Helpful Learner Cognitive Inputs**

Promoting learner cognitive inputs is important to ensure that the limited number of facilitators can focus on providing most complex contributions (for example – meta commentary about what is and what is not good student feedback, or engaging less-active learners) (Garrison, 2015). There are several ways in which learners can be additionally prompted to deliver strong contributions (either as their original assignments or cognitive feedback on materials shared by others). Implementation examples:

- Structured feedback (Kulkarni et al., 2015a)
- Including coaching to give feedback as part of learning task design

### **8.6.4. DR4: Automate Organisational Tasks**

Custom platforms help meet learning community (learners, facilitators and organisers) needs. Automation can bring more clarity around scheduling and help run the course with less noise about logistics in learner discussions, as the analysis of learning trade-offs shown in Chapter 6. In loosely-coupled media this will be more difficult. Implementation examples:

- Automated scheduling (Kotturi et al., 2015)
- Automated organisational tasks (eg. groups set up, videoconferences set up etc.) (Kotturi et al., 2015)

### **8.6.5. DR5: Layer Community Interactions**

Connectivist courses suffered from two main challenges: one was learners were feeling overwhelmed with the chaotic interaction (Mackness and Bell, 2015; Mackness et al., 2010) and the other was that learners were grouping themselves into echo chambers (Kop, 2011). A solution is layering community interactions by dividing up larger courses into smaller size sub divisions helped the learners retain positive experience (as shown by survey results for all courses in

Chapter 6). Interaction in larger groups (up to about 100) allows learners to participate in a diverse and vibrant community where they can benefit from spontaneous interactions and learning from others experiences in online discussions. Once the number exceeds 100, the interaction becomes increasingly chaotic, as was observed in prior connectivist courses (Mackness et al., 2010). Interacting in smaller groups helps build a sense of responsibility and allows participants to give personal feedback to one another (Kulkarni et al., 2015a,b). An important feature is for learners to be easily able to navigate between different layers of the community and dive in and out of the overall class discussion. Implementation examples:

- Break down larger courses into human sizes groups (about 100 for written asynchronous discussions, about 10 for video synchronous discussion)
- Focus in pedagogy on findings others who have the most different view from their own
- Assigned study partners based on diversity maximising algorithm eg. TalkAbout as a companion to Coursera MOOCs (Kulkarni et al., 2015a)

### **8.6.6. DR6: Show Learners How to Contribute to Social Area**

It is important to embed some ideas about a variety of types of contributions to course co-creation outside of submitting assignments or sharing useful resources, such as leading a group to complete a task or proposing a new technology solution for the class, as I the analysis of data for the three courses in different technological configurations has shown in Chapter 7. Some examples of such social behaviours include leading a project, setting up a discussion group or solving a technical issue. These first signs of leadership should be recognised as valuable contributions as much as completion of assignments as they will both promote collaboration and help create a self-sustaining and self-organising learning environment. Implementation examples:

- Activity scaffolds enabling learners to sign up for roles for group assignments and projects (Hmelo-Silver et al., 2007; Stahl, 2006)
- Platform prompts to set up a group, add communication channel, etc.

### **8.6.7. DR7: Surface Participant Activity**

Online courses suffer from large attrition, especially in the first weeks of activity (Ho et al., 2014). In order to build community learners need to be able to know which learners are still active in the course (as I found based on response survey results following the loosely-coupled course). Therefore, students need to be able to identify who is in their group, and who has already been active in the course. When students know who else has been active in the course, they are able to reach out to others and find others with whom they can complete assignments. Additionally, throughout the course, showing summary statistics such as number of posts and comments per user, length of posts per person is helpful in recognising learners or facilitators that require support. Implementation examples:

- Clearly flag which course participants have been active in the course since registration
- Summary of connections between learners (Gunawardena et al., 1997; Lee et al., 2006; Soller, 2001)
- Include number of posts and comments in user profiles (Soller, 2001)

### **8.6.8. DR8: Focus on Facilitator Community Building**

Facilitators are important, as they are the more experienced members of the learning community (Salmon, 2012), even in learning environments where learning is supported through technology and a self-organising learning community. In student-led learning, effort is normally put into building the community for the learners overlooking the facilitators. However, their empowerment and professional training should be a priority (Baran et al., 2011; Garrison, 2015). Their training can help them best support learners towards self-sufficiency by moderating discussions in a way so as to not displace learner contributions (Salmon, 2012; Zhao and Sullivan, 2017). Bringing all facilitators together as a community of practice to exchange best practice can help them learn from one another, as has been observed to be beneficial for teacher community using problem-based learning (Hmelo-Silver et al., 2007). Implementation examples:

- Create a community for facilitators to exchange ideas (eg. through weekly video conference discussion)
- Activity toolkits for facilitators (eg. sample assignments for promoting skills in social areas) uploaded on learning platform

### **8.6.9. Applying the Design Guidelines: Online UWC in Retrospect**

Have these design recommendations existed before the start of this research, I would have probably decided to design both the course and its learning environment differently. I would like to demonstrate how I would use the course type criteria for navigating learning trade-offs proposed in Chapter 6 and apply the above design recommendations to build an improved version of Online UWC learning environment.

In Chapter 6, I proposed five primary criteria to consider when evaluating learning trade-offs: learning objectives, course size, learner type, moderation needs and available resources. Learning *objectives*, as defined by the needs of future digitally enabled change makers would have to be leaning toward social: facilitating both learning of collaborative practices in unstructured problem-solving environments, and creation of a community of learners that can outlive the course. The course *size* of Online UWC was expected to be between 100 and 200 participants. *Learner type* would be digitally confident and intrinsically motivated, but like with limited experience in individually navigating unstructured learning challenges. Given the nature of UWC as an organisation and the fact that the course would be working with vulnerable learners, the *moderation* need would be required. The organisation has a strong group of motivated alumni



but frequently appeals for financial funding, so in terms of *available resources* likely the effort would have to lean towards relying on volunteers to run the course.

Based on the *learning objectives* of the course and the volunteer *resources* available due to the kind of organisation such as UWC, loosely-coupled media would be the best suited technological support for running Online UWC courses. However, given the expected *size* of the course and the fact that the *type* of learners are not experienced working in unstructured learning environments (both from technology and pedagogy point of view), the loosely-coupled media approach would face some organisational challenges. *Moderation* would be difficult as using some social media tools that allow anyone to post in a thread with a hashtag without the ability to easily control content or remove it (eg. Twitter will only remove posts that do not meet its own, not the courses, community guidelines). Some platforms that could be considered as the main spaces for the course would include Facebook or Slack – both of which focus on community creation and allow for some level of discussion control. Discourse, which specifically focuses on promoting constructive discussions, would have also been an attractive choice.

However, given group video hangouts would be desirable to strengthen creation of bonds between learners, some additional tools should also be included: either Google Hangouts or WhatsApp could be added to the mix of media, to ensure that learners also have meaningful interaction in smaller groups (DR5). Given the focus on project work, some project management software (such as Trello or Monday.com) could be used to help plan the work. Work of volunteers would have to provide the structure needed to orient the learner – there should be a high number of facilitators in comparison to learners to make sure that the organisation of the course goes smoothly and that learners are adequately informed about the course structure, given there would not be a platform to organise all of the resources (DR1). Tasks that are likely to take the most time from logistical point of view should be identified and costs of building specialised solutions could be estimated (or specific tools could be looked for to close these gaps), and would include dividing learners into groups and tracking attendance and participation across the mediums (DR4). If that is not possible, workarounds and strategies to address these should be identified ahead of time. In a course relying on a mix of loosely-coupled social media surfacing learner presence throughout the weeks could be achieved by creating a simple tool for weekly check ins, which would both help automate course participation tracking for facilitators and surface this participation to learners (DR7).

From course design point of view, I would add a module on meta-cognition to the first part of the course, to help learners identify what meaningful feedback looks like (DR3). I would also think about designing assignments or course norms in a way that learners recognise the ways in which they can advance their social skills (DR6). One way to do this would be to make this a part of the initial lecture on how learning in student-led environments look like. I would also make sure that both the topic of meta-cognition and the topic of supporting social learning is discussed with facilitators, many of whom do not have a teaching background. In addition to organising a weekly hangout with facilitators, I would also prepare documentation / helpful

resources to help facilitators draw out such behaviours from learners (DR8), which I would of course also share with learners to make sure that everyone has access to these resources (DR2).

To further ensure that the course is set up for course co-creation, I would also experiment with orchestration of learner involvements in course preparation (DR2): for example by using sign up forms as scaffolds for curriculum or sourcing mechanism for lecturers. I would change the design of participant surveys, to both make sure that they are standardised across all participant types (learners, facilitators and organisers) to fully reflect the learner-led aspect of the course, and to make sure that their recommendations can easily be applied as lessons for a new edition of the course.

This technological set up is not very different from the set of tools used in the final implementation of the course. However, if this was the design approach from the onset, a much shorter list of design features for the learning platform would be defined (eg. splitting learners into diverse groups, processing applications) and perhaps tools would have been identified to close these specific gaps. Pedagogy in this reflective view is also quite similar to the one used during the actual Online UWC courses - the notable differences being the focus on supporting meta-cognition and giving inspiration to learners on how to build their social and collaboration skills.

### 8.7. Limitations of the Thesis

There are several important limitations for the findings of this thesis and they have to do with the scale of experiments, learner type, media used and the ethical approach of this research. The findings have only been tested at what is consider a medium (about 100 learners per course) scale of online learning, and not at the massive (about 1000+ learners per course) scale that is possible with internet and existing online learning approaches. The type of learners in these courses were talented, ambitious, English speaking young adults who had the intrinsic motivation to seek out extracurricular learning opportunities, which may lead to questions about the potential of this method to be used with a wider range of learners. The social media used to study loosely-coupled approaches had been selected at the beginning of this research and a lot of technological development has happened in that space since then. Finally, to some extent, the research project may be seen as falling somewhat short of action research's ethical mission to prioritise stakeholder outcomes.

First of all, this thesis started off with the primary design goal of building a learning environment which would give learners a learning experience of the best of brick and mortar schools, with the scale and extra capabilities of digital connectivity. An important aim to do that was to consider scalability of such courses through process of orchestration and automation. Unfortunately, given the researcher of this action research project was at the same time the organiser, designer and analyst of the courses, the workload required to organise such a large scale deployment was not practical, especially in light of high risks of the community in case of failure (given relatively young age of learners in the course). The reshaping of the original research agenda has led to a significantly different analysis: one which is focused on the impact of

technological set up on social and cognitive learning. While the contributions remain important and distinct, the impact would have been even larger if the findings had also been tested at a larger scale. Given current experiences, it is not possible to know if the learning approaches proposed would scale beyond 200+ learner groups.

Second, Online UWC programme, due to its nature as an extracurricular activity run in English and association with UWC, recruited and attracted a reasonably gifted population: they spoke English proficiently, were sufficiently intrinsically motivated to be involved in an extracurricular activity and sufficiently digitally savvy to find out about these opportunities, advertised primarily on social media. Therefore, one has to be careful in applying the findings of this work to a more typical high school group of learners, with a mix of high and low achievers. As has been highlighted in Chapter 2, problem-based learning research has also been mostly utilised with talented learners, which makes findings difficult to transfer. However, the difficulty here is that the less motivated or confident learners would be less likely to apply without external support. One way to recruit a more diverse group of learners would be to reach out to teachers directly and propose that they encourage a more representative group of learners to apply. Another would be to run a similar program as a collaboration effort between several full classrooms from different public schools in different countries (not affiliated with UWC movement), arranged by interacting directly with school principals.

Third, the loosely-coupled media learning environment discussed in Chapter 4 has been selected in the beginning of this thesis almost 5 years ago. Since then, trends have used in social media and new social media and collaboration tools have since been created and gained popularity. One example of such tools is Slack – which through its collaboration focused design, ease of integration with other tools and the potential to run video and phone conferences, could have been an interesting option. Instagram, Snapchat, Twitch, TikTok or Discourse have since become social media popular with high school populations. WhatsApp and mobile communications became even more important and have been identified during the duration of the course and in recent research as powerful tools to orchestrate learning experiences (Lambton-Howard et al., 2019). With the benefit of hindsight the technology set up could have been done differently, which would have impacted the research methodology (for example by proposing a comparative study of different loosely-coupled media combinations, as opposed to study similar loosely-coupled environments with different course sizes). It is possible that such a different research design would have brought additional benefits to the analysis.

Fourth, given the project was inspired by mission driven international high school, the learning environment also aimed to drive social impact of initiatives and enable learners to interact with a diverse group of others. However, during the iterative research process, parts of this thesis have undergone an extensive process of peer review and the impact of these reviews helped extend research objectives to also consider other means of evaluating learning outcomes than evidenced impact of community projects, driving additional reflection about evidencing complexity of social and cognitive interactions of all course participants. Given action research is especially concerned with the interest of stakeholder group, this focus on publication by

researcher was potentially detrimental to the contributions to the community. For example, after the final iteration of the project, the researcher has not extensively sought feedback from the stakeholder group on drafts of the work and only contributed to the stakeholder group by sharing open source finished evaluations on social media. From an ethical point of view, this could be seen as falling short of the responsibility for a researcher participating in an action research project. However, this is in part explained by the fact that the organisation has had significant personnel changes during the life of the project (main collaborators within the organisation have moved on to other projects before the write ups were in advanced format).

### 8.8. Future Research

Research on learner-led learning environments and how to use web connected systems to drive creation of social bonds and support collaborative learning are rich design spaces, where the research has only just begun. Instead of trying to identify all future research opportunities in this exciting space I would like to highlight the three that are the most natural next steps for work similar in the approach to this one. One has to do with research into loosely-coupled media design space, the second with applying machine learning methods to attempt to build live feedback to facilitators and learners into their contributions to collaborative learning and the third with continuing community learning approaches for international organisations.

#### 8.8.1. *Unplatformed design*

One interesting direction of future research is into the theoretical design implication of using social media as a material for design. Some work has already been done trying to understand the conceptual grounding of secondary order designing – designing with materials by appropriation and remixing (Lambton-Howard et al., 2020). This would also be core to the ideals of connectivist learning, for which such methods are crucial for the learning process. Some other examples presented by (Lambton-Howard et al., 2019) for using social media technologies as material for design in order to coordinate participation included participatory future forecasting (Lambton-Howard et al., 2019) and participatory health research. The work proposes four material qualities that should be considered with configuring and augmenting social media technologies: morphology, role, representation of activity and permeability (Lambton-Howard et al., 2020). Such a theoretical approach for using existing software as material for design (described as “unplatformed design” by Lambton-Howard et al. (2020)) would have both descriptive and pragmatic utility. Descriptively, it would help “*understand why design decisions have been made, but also to potentially identify why some decisions may have been more or less successful than others in coordinating participation*”. Programmatically, it would help conceptualise the design process in this context and make designers and researchers more sensitive to the opportunities and constraints of such a design approach.

### 8.8.2. *Data mining for rich social learning analytics*

Additionally, with the framework discussed and labelled data available, the natural next direction of research would be to move from qualitative theory-based research into data mining, to see whether there are verbal patterns and trends which would enable automatic labelling of data in the course. If this indeed would prove to be possible, live feedback about contribution could be provided to both learners and facilitators. This would in turn enable providing exciting opportunity to give live feedback to learners and facilitators. This would help learners understand how they are contributing to the community and what more they can do to engage in community creation. It would also support facilitators in orchestration of learning activities and providing meta commentary about course dynamics to the class. In this way, it would be possible to train and evaluate learners on life-long skills needed for 21st century, and experience of how to work with others. It would really control for some of the shortcomings of connectivist learning (such as lack of orientation for learners) and potentially enable these technologies to explore their full potential. The theoretical framework would provide an answer to the question that has always been difficult to answer about collaborative learning: is learning happening and how is it happening? Of course this framework is a starting point and requires both further refinement and automation, but it is a useful starting point to separate the simple interactions from the complex.

Much work has already been done in the learning analytics space (especially via LAK and Learning @ Scale research communities). Analysis of online learning threaded discussions using machine learning methods has also been completed using the Community of Inquiry framework, including categorising different learner styles Kovanović et al. (2015) and accounting for relationship between social presence and learning outcomes Joksimović et al. (2015).

### 8.8.3. *Other approaches to organising courses with volunteers*

Finally, the work done as part of this research project has shown the possibility to organise some approaches to setting up courses using the coordinating power of volunteers and new technologies. While this action research project has partnered with United World Colleges, it faced a unique set of opportunities and constraints. Exploring other approaches to run online courses would bring new understanding into different technologies or achieving different learning objectives. Of course for UWC it is also a useful starting point for the exploration of approaches for impact-focused online learning proposition.

## 8.9. Conclusions

This thesis brought some light onto the trade-offs between different learning environments (mainstream social media, learning platform only or hybrid) in student-led context. It has also contributed a theoretical framework to help analyse cognitive and social contributions in a student-led course, both at individual and group level. Finally, it had provided context-sensitive and literature supported empirical design guidelines for how learning environment and pedagogy

can be best configured to support social and cognitive elements of learning in student-led learning environments.

The research area of learner-led collaborative environments is broad and this contribution opens up further areas of investigation. This topic is of particular interest to the HCI community because of the scope of opportunity of impact. This thesis has proposed an alternative way to ask some of the design questions by opening up a definition of learning as both a cognitive and social construct and proposing exploring the understanding of the connection and level of achievement in a method that combines the quantitative and the qualitative findings in novel way. While the numerical framework is relatively simple, it enables the researcher to deep dive into the depth of qualitative efforts. While it helps to understand the work of an individual it also shows how individuals interact in a larger community. I also have proposed to think about the broad problem of re-thinking the approach to learning as opposed to optimising a particular specific implementation. As such, the thesis is only a crude map for navigating the broader literature and inspirations in design and pedagogical approaches to collaboration, but an effort to look at online learning in a more holistic, learner driven process.

Collaborative online learning opens up opportunities to connect people across the globe. Self-guided online learning, with focus on creatively addressing challenges and opportunities while forming social bonds is only at its nascence. Several challenges, both from learning environment and pedagogy design are yet to be even scoped and explored. However, what can be achieved by progress in this space with even more research, especially through action research methods, is humbling. World Economic Forum estimates the value of closing the skills gap (including collaboration and technical skills) at 11.5 trillion US dollars in terms of global GDP by 2028<sup>4</sup>. The impact to fully engage human capital and connect people globally at fraction of a price and the impact on empowering people to reach their full potential given access to learning opportunities, arguably more important, cannot reliably be measured.

Also the implications of additional research into unplatformed design are even broader. Modular design is becoming a huge concept within sustainability – and would help save resources. If I could reuse and recycle existing software easily, non-engineers could also find it easier to connect and deploy existing tools, opening new opportunities. The potential for such scaffolded and orchestrated app design by non-engineers has already been outlined by prior research, for example (Garbett et al., 2016). The theoretical framework to understand unplatformed design is but a starting point on that learning journey.

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<sup>4</sup><https://www.weforum.org/projects/closing-the-skills-gap-accelerators>

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## Appendix A. Code book for Social and Cognitive comment categories

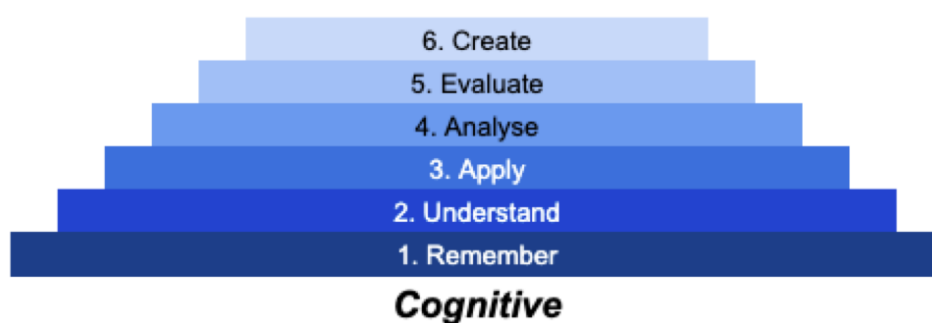
Comments categories have been classified as either cognitive or social (affective). The cognitive category aligns to Bloom's taxonomy, refreshed for digitally relevant activities by Anderson in 2001. The social category aligns to Bloom's affective categories, with the exception of *bonding* level, which was added to differentiate between *socialising* (initial low-risk interactions with peers) and *sharing* (where learners are making high risk commitments such as sharing private contact details or actively contributing resources to the group). This addition was made by the research team primarily in order to build a scale with the same number of units to make it easier to compare cognitive and social level of contributions achieved by the group, and progression of both group characteristics over time.

Previous research indicated the difficulty of working with the affective taxonomy (given it is very difficult to gauge whether values have been genuinely internalised) while also highlighting its importance in developing learners core values, which in turn make it possible for them to work with others. The below realignment of Bloom's focuses more on the observable outputs relating to working with others, as laid out in Soller's taxonomy for describing group work. Additionally, we re-align examples and technologies for both cognitive and social taxonomies with new technological affordances developed since these were created.

Some posts will relate to more than one category. When in doubt, pick the message that's closest to the intent of the post, representing an activity that took more effort for the learner. For instance in "Nice to meet you! Very cool presentation design!" rate as *remembering* to show the learner took the time to review the presentation and not *socialising* (despite part of the message clearly relating to socialising as well). A similar message "Hi, I'm from hong kong and I really like your prezi! I look forward to the online uwc course with you! and also i hope i can see you on food critics shows on TV in the future! ;)" would, however, be classified as *understand* as the learner puts extra effort to paraphrase the content from the presentation shared.

### A.1. Cognitive - knowledge acquisition

Cognitive category captures comments relating directly to course content. Discussions relate to gaining knowledge in the course, through reviewing, analysing and evaluating shared content (including course materials, external stimuli and learner built projects and assignments). The categories are organised hierarchically from lowest of *remembering* (acknowledging receiving information) to highest of *creating* (being able to create new knowledge in the form of assignments, essays and well structured substantial feedback to peers).



### *A.1.1. Remembering*

**Description:** Recalls or retrieves previous learned information. Asks for or provides basic information. Acknowledges reviewing a piece of information.

**Examples:** Recite a policy. Quote prices from memory to a customer. Recite the safety rules. Acknowledge that you have read a piece of content (including work of other students). Agree with previous statement.

**Key Words:** defines, describes, identifies, knows, labels, lists, matches, names, outlines, recalls, recognizes, reproduces, selects, states, reinforce, encourage, compliment, request elaboration, inform

**Technologies:** book marking, flash cards, rote learning based on repetition, reading

**Sentence opener examples:**

- That's right
- Very good, good point
- Your project is great
- Can you tell me more
- Request or provide simple information

### *A.1.2. Understanding*

**Description:** States an issue in his own words. Comprehends the meaning, translation, interpolation, and interpretation of instructions and problems. Builds own understanding by asking for instruction when is unclear about next steps.

**Examples:** Shares notes from lecture. Explains to another student what a lecture or discussion was about. Shows agreement with shared content without questioning values or implications. Rewrite the principles of test writing. Explain in one's own words the steps for performing a complex task. Translate an equation into a computer spreadsheet.

**Key Words:** comprehends, converts, defends, distinguishes, estimates, explains, extends, generalizes, gives an example, infers, interprets, paraphrases, predicts, rewrites, summarizes, translates, agree, rephrase, summarise information

**Technologies:** create an analogy, participating in cooperative learning, taking notes, storytelling, Internet search

**Sentence opener examples:**

- I agree because
- In other words
- To summarize

### A.1.3. *Applying*

**Description:** Uses a concept in a new situation. Applies what was learned in novel situations (also outside of learning space, for example at home).

**Examples:** Shares a simple similar example based on their local context. Use a manual to calculate an employee's vacation time. Apply laws of statistics to evaluate the reliability of a written test.

**Key Words:** applies, changes, computes, constructs, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses, conciliate, assert, suggest, provide example

**Technologies:** collaborative learning, create a process, practice

**Sentence opener examples:**

- Both are right in that
- I am reasonably sure, I believe
- I think, I suppose
- I am familiar with an example of this in my country

### A.1.4. *Analyzing*

**Description:** Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences. Questions others on their assumptions.

**Examples:** Troubleshoot a piece of equipment by using logical deduction. Recognize logical fallacies in reasoning. Gathers information from a department and selects the required tasks for training. Requests others to justify their argumentation or asks for explanations.

**Key words:** analyzes, breaks down, compares, contrasts, diagrams, deconstructs, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, relates, selects, separates, disagree, doubt, elaborate, explain/clarify, justify, request clarification or opinion

**Technologies:** Fishbowls, debating, questioning what happened, run a test

**Sentence opener examples:**

- I disagree because
- I am not so sure
- To elaborate, Also,
- Let me explain it in this way, Let me answer
- To justify
- Can you explain why/how
- Why do you think that
- Do you think

### A.1.5. *Evaluating*

**Description:** Makes judgments about the value of ideas or materials, using robust justification.

**Examples:** Select the most effective solution. Hire the most qualified candidate. Explain and justify a new budget. Provides simple feedback on peer's project. Share an opinion about an article shared by peer, supported with strong rationale.

**Key words:** appraises, compares, concludes, contrasts, criticizes, critiques, defends, describes, discriminates, evaluates, explains, interprets, justifies, relates, summarizes, supports, offer alternative, propose exception, suppose, provide simple feedback

**Technologies:** survey, blogging

**Sentence opener examples:**

- Alternatively, Let me provide a slightly different example
- But
- If... then...
- Your project looks great, maybe you could add X?

### A.1.6. *Creating*

**Description:** Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.

**Examples:** Write a company operations or process manual. Design a machine to perform a specific task. Integrates training from several sources to solve a problem. Submit a multimedia assignment. Revises and process to improve the outcome. Writes a well structured essay. Produces a video. Writes a substantial and well thought out commentary to a peer's work or article shared.

**Key words:** categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes, infer, provide complex feedback

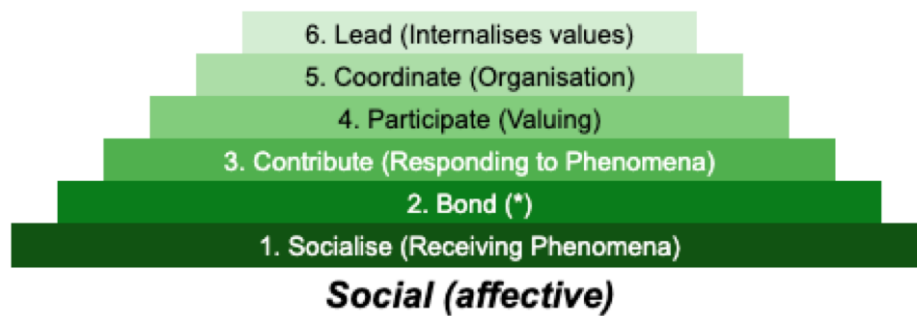
**Technologies:** Create a new model, write an essay, produce a video, write a poem

**Sentence opener examples:**

- Therefore, So
- I had an idea how you could solve X, here is my project
- Linked below is the project that we built as a group

## A.2. **Affective - Collaborating**

This category of comments relate to course interaction and relationship building. These are utterances that relate to how people work together and the process through which they get to know and trust each other. The category is hierarchical - from lowest level of *socialising* (making low risk interventions in the community) to highest level of *leading* (confidently steering the group to work together on complex and ambiguous tasks).



### A.2.1. *Socialising (Receiving Phenomena)*

**Description:** Is attentively taking in her environment - in an offline environment, it is best described as active listening, in an online environment it relates to activities that are fairly simple but acknowledge the presence of others in the course and show openness to working together. Exhibits basic social skills that allow him to meet and interact with others.

**Examples:** Listen to others with respect. Listen for and remember the name of newly introduced people. introduce themselves to the class. Say hello back. Say thank you for help received. Responds yes or no to simple questions. Asks and responds to simple personal questions.

**Technologies:** Liking on social platforms, contributing simple social media messages

**Key words:** acknowledge, asks, attentive, courteous, dutiful, follows, gives, listens, understands, shows appreciation, greets, accepts, confirms, rejects

**Sentence opener examples:**

- Thank you
- Hi, I am ...
- Nice to meet you
- I'm from France, Where are you from?
- Yes, no

### A.2.2. *Bonding (\*added)*

**Description:** Is willing to make relatively low risk emotional connection to others. Is able to start building rapport with others by identifying similarities. Content of her communications are usually not directly related to class content, but the behaviour contributes to creation of learning community. He expresses emotions through exclamations, emoticons, or jokes and laughter.

**Examples:** Tries to find similarities with peers. Responds with language rich in emotional statements and referring to feelings. Says a joke or responds to a joke with laughter. Uses emoticons or combinations of emoticons.

**Key words:** emotion, bonding, similarities, apologise, joke, shares hobby

**Technologies:** Uses emoticons or stickers, writes social media messages that build rapport with others by finding similarities, writes social media messages expressing emotions (eg. I miss you)

**Sentence opener examples:**

- I am also from same country

- Sorry
- I miss you, I will miss you
- ;- ) Haha
- I am also interested in

### A.2.3. *Contributing (Responds to Phenomena)*

**Description:** Is active participating in the course by contributing content and information that is important to creation of a learning community (both in terms of learning - for instance sharing a relevant article, and in terms of community, for instance by sharing direct contact information). Does not yet consistently follow through on commitment, but recognises that it is important to follow through on commitments.

**Examples:** Shares a detailed personal introduction (not just name). Sharing learners' social media accounts, sharing interesting articles relating to the course, seeking help or instructor mediation in relation to respecting class rules, flags lack of clarity about logistics or pointing out technical problems. Helps other learners by providing a link to course or group session. Apologises for submitting assignment late. Apologises for not completing a part of an assignment.

**Key words:** answers, assists, aids, complies, conforms, discusses, greets, helps, labels, performs, presents, tells, shares resources, solves simple logistics problems, shares contact, reports issues, asks for teacher mediation, apologises

**Technologies:** Sharing links, sharing social media accounts

**Sentence opener examples:**

- I wanted to share a resource
- What time is? We are talking about.. x this week
- Here is my WhatsApp, We should speak, You should join this group
- I can't see it, it does not work, what time are we meeting?
- Sorry for not submitting homework yet...

### A.2.4. *Participating (Valuing)*

**Description:** Is comfortable to share his values and opinions with others, and show that he cares about feelings, values and opinions of others, even if they are different from his own. Learners are capable of showing some level of empathy towards others and self-awareness (for instance, because they recognise the impact of their upbringing or cultural heritage). Is comfortable joining group processes set up by others, where light input on their part is required (not the laying out of structure of overall collaboration).

**Examples:** Demonstrates belief in the democratic process. Is sensitive towards individual and cultural differences (values diversity). Shows the ability to solve simple problems. Follows through with commitment. Informs management or teachers on matters that one feels strongly about.



**Key words:** appreciates, cherish, treasure, demonstrates, initiates, invites, joins, justifies, proposes, respect, shares, joins group process, suggests simple actions Technologies:

**Sentence opener examples:**

- I'm in! Count me in!
- I'd like to join your activity and help with...
- I understand your life in Syria may be very different from mine. . .
- I see where you are coming from...

### A.2.5. *Coordinating (Organisation)*

**Description:** Learner is able to coordinate small components of group process. Learner is also self-aware and empathetic in a way that they are able to recognise internal conflicts within values of interests both within themselves, and within their interaction groups and communities. Learner starts being able to compare, set relationships between these interests and values in order to propose actions and next steps. Learner is able to productively and effectively collaborate with others.

**Examples:** Recognizes the need for balance between freedom and responsible behavior. Accepts professional ethical standards. Creates a life plan in harmony with abilities, interests, and beliefs. Prioritizes time effectively to meet the needs of the organization, family, and self. Cooperates and collaborates in group activities (displays teamwork).

**Key words:** compares, relates, synthesizes, collaborates, coordinates group process, reminds norms

**Technologies:** Contributes a small and well defined part of blog or essay write up, brings in images to create a collage when requested by project lead

**Sentence opener examples:**

- It's interesting that what some perceive as cultural norm can be frowned upon in other countries
- We need to focus to finish the work
- OK, let's move on as we need to finish,
- Are you ready to discuss...
- I see you are already doing this, maybe I can help with...

### A.2.6. *Leading (Internalises Values)*

**Description:** Shows high levels of maturity, independence and good judgment. Is self-aware and has a strong set of core values, which regulates her behaviour. Able to emphatically connect to his peers and help guide their progress. Is able to lead a group process, even if presented with vague and ambiguous prompts, providing a helpful starting point to set up collaboration among working group. Shows initiative to guide collaboration of peers.

**Examples:** Shows self-reliance when working independently. Uses an objective approach in problem solving. Displays a professional commitment to ethical practice on a daily basis. Revises judgments and changes behavior in light of new evidence. Values people for what they

are, not how they look. Is comfortable influencing others with no authority and is able to convince others of their views. Happy to coordinate group activities. Proposes novel way for learners to collaborate.

**Key words:** acts, discriminates, displays, influences, modifies, performs, qualifies, questions, revises, serves, solves, verifies, leads

**Technologies:** Sets up a mailing list, sets up a small Facebook groups for others to collaborate, proposes building a website

**Sentence opener examples:**

- I think we could solve this challenge by...
- Did you try doing x? We're meeting at..
- I had an idea which I wanted to share, given everyone's interest in...

## Appendix B. Course Organizer Handbook

### B.1. Introduction

Welcome to Online UWC - we are excited that you would like to organize a course with us! The below should explain to you what are the steps that you will need to complete in order to create and run a successful course on our platform.

The courses are usually 4-5 weeks long. Each week will follow a similar structure centred around three key elements: **lectures** from experts, **group discussion** (video conference) sessions and individual or group **assignments**.

Each Monday your readings and other assignments for the week will be released on the course website. On Wednesdays, experts will give lectures via a Hangout on Air (live-stream video broadcast). Some weeks may have multiple lectures for different time zones. You can either watch these lectures live, and ask questions in real-time, or you can submit questions in advance and watch the lectures later. Following the lecture, on Thursdays, you will take part in a 1-hour group session in which you get to talk to and work with a small group of your new online classmates via Google's Hangout video conference facility. Groups will be facilitated by a mentor, who will help break the ice in the first week, and after this students will take it in turns to chair and write up notes from group sessions.

Each week you will receive a set of assignments, which will allow you to learn through fun and challenging research and project-based learning tasks, often with your peers.

All interaction will take place on the new Learning Circle website, a course management system and social learning platform, where you can interact with your fellow students and mentors in a safe online environment.

The following materials should answer your key questions about what it means to organize an Online UWC course on the Learning Circle platform - from candidate recruitment and curriculum development down to step by step course running best practices. If you have any suggestions about other elements that should be included in this guide, please add your comments - we will do our best to incorporate them!

### B.2. Course organiser checklist

#### *B.2.1. Before the course*

- Set up a course description and set the dates for your course on learningcircle.io and open applications

- If you are not running a course as part of our Online UWC programme you will also need to set up a Google+ page, a YouTube channel (and a Facebook page or group if you would like to send reminders about the lecture through there)
- Devise content and structure of the course for a 4 or 5 week class; this will include defining key topics, finding interesting publically available resources and devising weekly assignments, as well as create weekly email templates to send to students and mentors each week; the weekly assignments should start with low effort fun activities (posting a photo, image, drawing) and build into longer assignments, projects throughout the end of the course
- Recruit speakers for Expert Hour on Hangouts on Air
- Schedule hangouts with confirmed speakers on your Google+ page
- Promote your speakers on social media to drive student sign ups
- Run a community outreach or marketing campaign to drive signups (for a solid course you should try to have 100-200 signups); this will include creating posters and graphics, creating a schedule of social media posts, reaching out to members of your community who can help you spread the word
- Update the learningcircle.io website with your course agenda - including links to hangouts
- Start accepting applications as they come and start emailing future course participants ahead of the course, inviting them to start introducing themselves and interacting on the platform
- If your course will have mentors, you will need to organise at least one hangout to introduce the team to each other and explain some key points about how the course will work; we recommend that you have at least 2 mentors per each group of 10 if possible to make sure that all group discussion sessions are staffed and happen smoothly

### ***B.2.2. During the course***

- Send weekly emails to students and mentors announcing class agenda for the week (usually Sunday night / Monday morning); other emails you will send throughout the week will be reminder to join the video lecture (right before it is scheduled to start) and reminder to join group discussions on Thursday (we are looking to get this automated as well but for now please send an email to all students)
- Send out a separate mentor briefing emails (which will have a little bit more details about the content of weekly discussion sessions)
- Test Hangouts and internet connection with speaker (usually the day before or day of announced lecture)

- Run a Hangout on Air with an expert once a week, where you will moderate the discussion, ask questions from the live viewers or any of your own that you will have prepared ahead of time; you can also edit the theme image and description of the video before you make it public on your YouTube channel
- Stay on call on Thursday, monitoring activity on the Learning Circle course page to assure that all participants know how and when to connect to a Google Hangouts. You should also urge mentors to get to the Hangouts early and monitor activity on the website in case anybody runs into connectivity issues
- Help animate discussions on the website - you will need to like, comment and post as much as possible, especially in the first few days, to help drive student engagement - invite the mentors to help you here

### ***B.2.3. After the course***

- You will need to send a goodbye email - we recommend you create a feedback survey along with this, as it will give you helpful information on how to improve the course over time
- You will need to send certificates to all students who have met the requirements of your course

### **B.3. Who to contact in case of any issues?**

Email [hanna@onlineuwc.org](mailto:hanna@onlineuwc.org) if you run into any issues. If you run into technical issues at any point, it is helpful to include screenshot and a brief description of the issue you are seeing - this will help us file a bug!

### **B.4. Technical guide**

The following guide should help you troubleshoot and resolve any key technical issues you may run into while running a course on the Learning Circle platform.

- The host should have a few pre-prepared questions for the end of the lecture, just in case, however unlikely it is, there are not many questions from students.
- About 10 minutes before the lecture starts, the host should post a link to view the hangout in the Facebook group. To find the link to share, select the link of the specific Google+ event. You can find the relevant event on our Google+ events page, just click on the event you want and share the URL.
- The host and speaker should be in the hangout (note: before you have clicked 'Start broadcast' button. Only do this when you actually want to go live) around 5 mins before

the lecture is due to start. The speaker should already have been briefed on how it will work. If you feel it may be necessary (e.g. if you think you might need to run to find your charger, let someone in the house, etc.), inform the speaker that you might turn your camera off and put it on mute, meaning that all they will see is the UWC logo instead of your face. As long as you do this during the presentation and it is only brief then there should be no problem, especially if they are looking at their powerpoint, but this is just to avoid the situation where the speaker stops their flow as they think you are having connection problems when actually you just muted and turned the camera off to tell your housemate to bugger off!

- When it is time and the host and speaker are in the hangout you can start broadcasting. Make sure not to do this too early as once you start broadcasting you can't stop and restart, meaning you have to create a whole new event. When the lecture goes live (by clicking 'Start Broadcast') the host will briefly introduce themselves and welcome all the viewers (who you must presume are there) to the Xth lecture for Y particular time zone ("Good evening and welcome to the third of five lectures in the Online UWC Fall 2014 class in the Asia-Pacific region. My name's...").
- It is important that you do not 'select' a particular speaker. This is when you click on a particular person's small window, which is in the bottom right of the screen. If a particular person is 'selected' their small box will be highlighted (a white outline around the box), this fixes their screen to the main feed. This can be useful but means that even if you are talking all people will see in the live-stream is the other person's face and this can be slightly unsettling.
- Explain the format of the lecture, that the lecturer will speak/present for 20-30 mins followed by around half an hour of questions.
- The host will remind the viewers that it is best they watch the Hangout through our Google+ page since they can ask questions using the Q&A app, which can be activated by clicking on the 'Q & A' icon on the left hand side of the video window. They are encouraged to upvote questions they agree with. They can ask questions at any time, the host will curate the most popular ones at the end of the lecture. Remind the students that they need a gmail or google account to ask or upvote questions.
- The host will introduce the speaker, saying briefly who they are, and what they are going to talk about.
- The overall broadcast (lecture and questions) should not last more than an hour, since we only schedule an hour and it would be unfair to expect people to stay for longer. At the end, the host will close the lecture, thanking the speaker, the viewers for their participation and questions and will remind students of the group sessions tomorrow (Thursday). Click on the red 'Stop broadcast' button at the bottom of the page to end the live-stream.

- Once you have finished broadcasting, you will remain in the hangout with just you and the speaker. Answer any questions they might have and say thanks.

### **B.5. Ideas for student assignments**

We think that there are several criteria that a good assignment will have: It will help the students develop technical / communication skills It will engage the students creativity It will expose them to a new way to present information

Here are some ways in which students should be able to submit their assignments:

- Powerpoint
- Prezi
- Powtoon
- Google Presentation
- Wordpress/Blogspot/other blog
- Pinterest board
- Tumblr
- Video
- Animation
- Word doc
- Song
- Podcast
- Photopeach
- Dipity - digital timelines
- Make a storyboard
- Spider diagram

### **B.6. Ideas for driving student participation**

1. Have students create a Pinterest board with 10 pins that summarizes them. Ask students to create a 30 second podcast that introduces themselves. Then allow students to present them or play them on separate devices as an audio gallery.
2. Create a classroom blog and ask each student to write a blog post introducing themselves to the rest of the classroom.
3. Have students create a quick comic strip to describe themselves or to recreate a recent funny moment in their lives.
4. Use PollEverywhere to ask students interesting questions and get to know them as a class, like their favorite subjects, bands or TV shows.

5. Use GoogleForms or SurveyMonkey to survey students about their interests, academic inclinations, and background info – a 21st century alternative to the “Getting to Know You” info sheet!
6. Have students create word clouds to describe themselves and share with the rest of the class.
7. Have students go on a QR code scavenger hunt in teams to get to know each other and learn about your classroom rules in a fun, engaging way.
8. Ask students to create their own Voki avatars that introduce themselves to the class. Encourage them to be creative with the backgrounds, characters and details of the avatar to reflect their own personalities and preferences.
9. Have students create graffiti online that speaks to their interests and personalities and share with the class.
10. Have students create mashup videos of themselves with Weavly to introduce their interests to the class.
11. Have students create GeoSettr challenges of 5 places they have visited and share with the class.
12. Have students research their birth date in history and share interesting events with the class.



## **Appendix C. Online UWC Mentor Handbook**

### **C.1. What is the structure of an Online UWC short course?**

On Sundays, students will receive an email with class readings and other assignments. You will also receive a mentor briefing note which will clearly define your role in the discussion session later in the week. You will really only have to fully lead the discussion in Week 1, when at the end you will nominate a student chair for the following meeting. In the following weeks, you will help student chair prepare for leading their session by answering any questions they may have as well as support them throughout the class.

Before Wednesday, we will share with you (and the students) a 15-30 minute introductory lecture prepared especially for you by one of the experts in the given area with whom we are working. As a class, we will come up with a list of follow up questions and we will vote for the most relevant ones. Our expert will then record another lecture in which they will respond directly to your questions.

Finally, on Thursdays, we will have a 1-hour debate or group session over Google Hangouts. In the briefing you will receive each week (which you will then forward to the student chair) there will be precise instructions about how to guide discussion during the class. These are meant to help you, but if you or student chair think it would be better to run the session differently, it's always an option.

### **C.2. What is a role of an Online UWC mentor?**

Online UWC mentors volunteer approximately 4 hours of their time each week of the five-week Online UWC online short course. Mentors work with students between (approx.) the ages of 15 and 18, communicating primarily through a small Facebook group and/or email as well as a weekly one-hour video conference. You will be the first point of contact regarding Online UWC for your 8 students.

Below is an overview of what your role will involve. The Online UWC team will help you to perform your role, by sending out email templates, reminders etc.

- Working with another mentor you will be assigned a group of eight students which you will work with over the five-week period.
- You and your co-mentor will make contact with the groups at least one week before the course starts, so that you can do some pre-course getting to know each other as well as

joining a Facebook group specific for each small class group (as well as the group for the overall cohort).

- You will watch the weekly lecture scheduled for Wednesday evening each week.
- You and/or your co-mentor will lead the first group of five weekly group sessions (held in the form of a Google Hangout video conference) in the first week of the course.
- At the end of the first group session you will find a volunteer to be a student chair who will lead the next week's group session. From this point on your role will change: playing devil's advocate and/or guiding conversation where necessary, particularly since you have experience the students are unlikely to have and as such your viewpoints can be very valuable, however you will be more of a supervisor than a leader, helping the students to guide their own learning.
- At the end of all five group sessions you will present the students with the assignment for the week. You and your co-mentor will be in charge of recording both which students attend each group session and which students complete the assignments. This will help to decide whether students reach the participation threshold (although not set in stone this is approximately 3/5 sessions, approximately 3/5 assignments completed) for students to receive a certificate.
- Sending each student a small amount of feedback for each of the students' assignments would be very useful in terms of helping the students to progress.
- At the end of the course you will help us to decide whether students have reached the minimum participation threshold (see above) to graduate.

This is a fairly comprehensive summary of what your role as a mentor will look like. Including things like answering emails, posts in the Facebook group and looking through the students' assignments we estimate the weekly time commitment to come to four hours a week.

Please don't hesitate to get in touch with any of the people listed above if you'd like clarification on what being an Online UWC mentor involves.

### **C.3. How to do Online Icebreakers**

Frequently you will run into a situation where you are waiting 5-10 minutes for students to arrive. Here is an example of online ice-breakers you can do while you wait: to use the Hangouts draw feature (students can put on funky hats and make their online environment more colorful)

### **C.4. How to Run a Productive Group Discussion**

In week 1, the mentor will play a strong part in driving the discussion. In the following weeks of the course, mentor will try to delegate as much of his responsibilities to a student chair and to

## **C.5 How to Troubleshoot Technical Issues Running Hangouts**

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scribe who will be selected during the week 1 session and onwards. The role of the mentor from week 2 forward will be there to assure that the conversation does not stop or go too much off track. As students are more familiar with each other and the course it will be easier for student chairs to take a stronger lead and the mentors to have more of an 'overseer' role.

You will be there 5 minutes early (if possible!) to welcome everyone and be a familiar face. In normal group sessions, you will take a back seat at the beginning, leaving the student chair to lead, but in week 1' group session, you, as the mentor, should take lead to run the icebreakers. You should welcome the students and thank them for coming. The first task you have is to ask a student to volunteer as scribe. This scribe will create a Google Doc which will be the record for the class in case some students miss it. The scribe will record notes from the class. A new scribe will be selected at the start of each group session.

Since it is the week 1 we will do introductions first, e.g. name, where we come from, why we're doing the course etc. As the mentor you're free to run this however you see fit. Then we can try icebreakers. You can ask us, the 'students' if we have any suggestions, and we can play around with these for a bit, and see what works or what doesn't work. At this point, you will explain the role of the student chair and of the scribe and you will ask both to self nominate for this week's session. After this you can hand over to the student chair.

The student chair will then follow the agenda that you will share with the group as comment in the Hangout (you will copy paste it from the email that was sent to you). Normally, in week 1 the student chair will start by asking if everyone managed to watch the video lecture - does anyone have any immediate reflections they'd like to share? Most lecturers will give a list of specific things for students to discuss in their group sessions so the student chair / you can come back to that list.

As mentor, you should pay close attention to participation dynamics - try to include as many members of the group as possible, as some may be more confident than others.

At the end of week 1 session, the student chair will ask for someone to self-nominate as the student chair and scribe for week 2. The process repeats until week 5, when you will have 5-10 minutes to run a discussion about how the course went and explain the post course process (key points to highlight is that certificates of completion will be emailed to all those who met course requirements, and that student feedback is extremely important for us to create better courses in the future).

### **C.5. How to Troubleshoot Technical Issues Running Hangouts**

Before video hangouts with a guest lecturer we should meet half an hour to an hour early to go over tech.

We must make sure no one clicks 'Only allow users who are over 18' at the start of the hangout. Otherwise any participants with their email registered as under the age of 18 will not be allowed to take part.

Permission to use the webcam: your browser will probably ask if you want to give permission to use the webcam for the Google Hangouts. It will usually give you the option between allowing this once and allowing always (which you can later change in the browser's settings).

Firewalls as part of an antivirus programme may also be an issue as they could stop Google Hangouts accessing your browser. This can be resolved by opening your antivirus programme and adding an exception, or disabling your firewall, which is less recommended.

Slow internet: If you have bandwidth problems, first make sure that you have closed all unnecessary tabs in your browser. Google Hangouts usually automatically adjusts, but you can manually choose, for example, 'Audio only' by clicking on 'Adjust bandwidth usage' at the top.

Notes: it is useful having someone typing real-time notes in the comments box of the google hangout. However, notes already typed in the session are not available for new joiners to see and are also lost forever once the Hangout session ends, meaning that the note-taker must be super-vigilant not to lose them.

To avoid echo: users should wear headphones where possible to avoid the rest of the conversation echoing for the rest of the group.

During lectures: moderator or users themselves should ensure everyone except the lecturer is muted since it is being broadcast on youtube.

You can find even more tips on how to troubleshoot Hangouts on the official help page.

### **C.6. Do mentors have to keep track of student attendance and assignment completion?**

Yes, you will need to fill out student registrar of attendance as well as track if they have completed their weekly assignments. You can do this in the "Manage" part of the learningcircle.io website.

### **C.7. What happens if students want to reschedule their group meeting or cannot attend a group session?**

Students can submit a form asking for group time change directly through the website.

## **Appendix D. Online UWC Sustainable Development - Example curriculum**

### **D.1. Learning objectives**

By the time you finish this course we hope that you learn the following:

Content:

- Issues relating to sustainable development require us to change the underlying system of values and beliefs, as the marginal impact of one's actions as an individual only translates to small improvements at a global scale
- Building a more sustainable world requires creativity to balance the needs of the economic, environmental and social spheres Skills
- You understand that all information comes with a bias
- You appreciate cultural differences while working in teams with peers from all over the world
- You know that true learning happens when you try to implement your ideas in practice
- You are comfortable using different kinds of media and technologies to complete your assignments (presentations, infographics, videos as well as written posts)

### **D.2. Community guidelines**

1. Act towards others as you wish others acted towards you
2. Provide honest and constructive feedback which fuels good discussions
3. Our differences allow us to learn from one another and help us creatively approach issues we face

### **D.3. Week 1: Introduction to Online UWC, key concepts of design thinking and circular economy**

#### ***D.3.1. Introduction***

Welcome to Week 1 of Online UWC Sustainable development class! We are excited to let you know that we have young people from over 30 countries among us. Over the next five weeks we will learn together about issues of sustainable development.

- W1: circular economy
- W2: economic growth and international development
- W3: agriculture
- W4: energy and transportation
- W5: how to kick off a community project

Throughout the programme we will emphasize the importance of systems thinking, exploring creative ideas and teamwork. We hope that by the time the class is over you will understand how to change the world by being an active citizen and that you will have made friends from several different countries.

This is the introductory week of our class, where together with Ken Webster of Ellen MacArthur Foundation we will learn about the concept of circular economy and its connection to resolving the issues of sustainable development. Ken will meet us on Tuesday, March 3 @ 5pm London time (you will be able to watch it later if you cannot make that time). His lecture will be a follow up from his earlier TED talk on circular economy which you absolutely watch ahead of the Tuesday session. Please ask any questions for Ken ahead of time here.

We will learn more about what Online UWC is and how it works. We will walk you through the syllabus as well as answer any questions you may have about the class structure and completion criteria. I will lead this lecture at Tuesday, March 3 @ 5pm New York time (you will be able to watch it later if you cannot make that time). Please ask any questions here.

You will also have the chance to meet your groups for the first time on Thursday. You should have already received an invitation to your group session (check your social / spam folder if you have not seen it yet!). If you did not get an invitation yet, or if the time that we proposed does not work for you, please email us as soon as possible.

It is important that you complete your assignments this week (see below for the list and do not worry, they should not take too much time!) as they will allow you to actively participate in the class discussion on Thursday as well as introduce you to your peers on our Facebook group.

We are really looking forward to meeting you all during our live Hangouts on Thursday!

#### ***D.3.2. Assignments***

#### **Take action**

## D.3 Week 1: Introduction to Online UWC, key concepts of design thinking and circular economy

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- Introduce yourself to your peers on our Facebook group - it can be anything - a video, a picture, a short message, a drawing - just be creative and tell us who you are!
- What is the best way for you individually to contribute to solving sustainable development issue? (assignment to be done in threes, see who is in your group here)
- Come up with a project idea related to sustainable development that you could carry out in your local community, outlining
  - What the idea or project is
  - What skills you currently have that will help make the project a reality
  - What skills you still need to help you make a great project

### Read and watch

#### *Required:*

- TED talk by Ken Webster, Innovation Director at Ellen MacArthur Foundation about circular economy and the need for creativity in education (you can view his slides here)

#### *Highly recommended:*

- Tim Brown, “Designers, think big!” - what it means to solve problems using principles of design
- Prof. Sugata Mitra’s TED talk about the School in the Cloud, which was the inspiration to create this course!
- “Scorched Earth, 2200 AD”, an article about what the Earth will look like in 2200 if global temperatures increase, which also takes a historical view of how climate change has affected civilisations in the past and how humanity always manages to weather the storm.

### D.3.3. *Mentor briefing*

This week the session should be fairly straightforward, as it is an introductory session. Here is the proposed agenda. Please feel free to review the agenda as you see fit - the only important elements are making sure you nominate the notetaker (for this week’s session, then ask them to nominate one for next session) and the chair (for next week) and communicate homework assignments.

The proposed agenda is as follows:

- First 5 minutes (when you are waiting for late arrivals): Say hi and explain you will wait for 5 minutes for everyone to arrive. Ask the people who are joining if they have already watched the lecture and whether they completed the assignments. Designate the notetaker from the first 2-3 people and have them open the Google Document for your group. Do not forget the funky hats feature on Hangouts - have some fun with it!

- Next 10-15 minutes: Give everyone a chance to introduce themselves. You can start using a random order, or start with people born in January then move up the calendar, or people who are furthest away from you geographically then move closer - just be sure you nominate someone to avoid silences
- Next 5-10 minutes: Share the article “Scorched Earth, 2200 AD” with the group and give them a few minutes to read it.
- Next 15-20 minutes: Class discussion about the article. Say that you will be discussing this article, but it’s OK to bring any insights from other reading assignments or personal experience, here are some discussion ideas:
  - What did you think of this article?
  - Who is the author? How does their background influence their writing?
  - What do you think the world will look like in 2200?
  - What can we learn from examples of past civilisations that collapsed due to climate change?
  - How does this article relate to Ken Webster’s presentation? Do you think that circular economy can work to prevent the risks outlined in the article?
  - What is the best way for you to improve on a sustainable development related issue in your community?
- Next 10 minutes: Discuss with the students what ideas they have for their final projects - ask them if they prefer to do this projects individually, or help someone else
- Last 5 minutes: designate the next student chair (enter their email and name in your notes document) and the next notetaker. Explain the student chair will receive a briefing ahead of next week’s class by email so that they can be ready to prepare. Make sure that everyone understands the assignments and make sure that everyone in your group is divided into threes - they can either find each other on FB or see their email addresses in the group calendar invitation) Do not forget to record student attendance and completion of their assignments in the student roster.

### **D.4. Week 2: Is sustainable economic growth possible?**

#### ***D.4.1. Introduction***

Welcome to Week 2 of Online UWC Sustainable development class! We hope that you enjoyed the first week of our classes. In case you had technical issues joining the class discussion on Thursday - get in touch with your mentor - you can find out who your mentor is and what their email is here.



This week, together with Lukas Wallrich, a former coordinator of the UWC Short Course "Together for Development!", we will learn about economic growth and international development. The topic this week has two broad aspects - thinking about what we actually want to achieve when we talk about economic growth, and learning how this can be achieved in a way that does not break people or the environment. It is the week with the broadest topic during the course, so use it to discover, go beyond the assignments, and get answers to the questions that matter to you

Lukas will meet us on Tuesday, March 10 @ 5.30pm London time (you will be able to watch it later if you cannot make that time). Please ask any questions for Lukas ahead of time on our Facebook group, he will also use them to focus his talk to best meet your interests. One aspect he will certainly speak about is the importance of population dynamics - population size, age, migration, death rates and growth - for economic development

We are really looking forward to discussing this interesting topic in our live sessions on Thursday!

### *D.4.2. Assignments*

#### **Take action**

- Discussion: Be a part of the discussion in our live Hangout session. Ask Lukas a question [here](#).
- Charting the world: This week we will spend a lot of time talking about statistics. Explore Rosling's Gapminder tool to check out statistical relationships you find interesting (highly recommended for including in presentations in school as well!). Share the graph that you create on our Facebook group and explain why you find it interesting.

#### **Read and watch**

##### *Required:*

- Watch this 3-Minute video by Swedish celebrity statistician Hans Rosling, which gives a very first introduction to global population dynamics
- Have a look at these maps that show some very different worlds. Can you find your country on each of them? How do they compare? Why do you think they are so different?

##### *Highly recommended:*

- Watch a more extensive video by Hans Rosling about the best stats you've ever seen. When you watch it, do not just focus on the statistics, but also think about what he says about education, and how he presents them
- To get an overview of the global economy - and thereby of the context of economic growth - have a look at these maps

### *Optional:*

- If you want to challenge yourself with a university-level reading, we recommend this lecture that discusses the link between happiness/satisfaction and income, which is quite important when it comes to deciding how much growth we actually want to pursue
- If you want something even more difficult, try to read the introduction of Amartya Sen's book *Development as Freedom* - it's one of the most important books in development studies that shows how we need to look at economic growth

### ***D.4.3. Mentor briefing***

Welcome to week 2! The first week is always the most difficult one from a technology point of view. Hopefully you managed to get all the students on the Hangout last week and solved their technical issues. It would be great if ahead of this week's session you could send a quick email to all the students in your group who did not attend to ask them if they are still interested in the course (please record this in the student roster, where you can also find all students emails). Do not forget to record student attendance and completion of the first assignments in the student roster. The proposed agenda for the group discussion this week is as follows (please also share the below with your student mentors:

- First 5 minutes (when you are waiting for late arrivals): Ask everyone a fun fact about them when you wait for others to join. Introduce any people who are new to the group and have everyone remind their names to others.
- Next 10 minutes: Ask everyone to spend some time looking at the Have a look at these maps that show some very different worlds.
- Next 15 minutes: Class discussion about the maps. Say that you will be discussing this article, but it's OK to bring any insights from other reading assignments or personal experience, here are some discussion ideas:
  - Can you find your country on each of them?
  - How do they compare?
  - Why do you think they are so different?
  - Which map do you find the most surprising?
  - What are some inequalities that are signalled through these maps?
- Next 15 minutes: Ask the students about their assignments this week. If they have done it, ask them to share their map and describe why they chose the statistics they did. If they have not done it, direct them to the tool and have them produce a map. Remind the students to share the assignment on Facebook and in the assignment spreadsheet (we need the links to their assignments to grant them completion certificates), as a reminder, this

week's assignment is: Charting the world: Explore Rosling's Gapminder tool to check out statistical relationships you find interesting (highly recommended for including in presentations in school as well!). Share the graph that you create on our Facebook group and explain why you find it interesting.

- Next 10 minutes: Continue the discussion about student projects, get them to set up their own project in Google Slides (you can find an example template here, students will need to click on File > Make a copy to save their own versions, which they can change in any way they want, just making sure they include all the key elements, they should remember to share it with everyone before posting to Facebook)
- Last 5 minutes: designate the next student chair (enter their email and name in your notes document) and the next notetaker. Explain the student chair will receive a briefing ahead of next week's class by email so that they can be ready to prepare.

### D.5. Week 3: Sustainable agriculture

#### D.5.1. Introduction

Welcome to Week 3 of Online UWC Sustainable development class! This week we will look at the crisis of modern agriculture and new approaches. We will also be investigating alternatives to the current system: government programs, business projects and social movements advocating ways of growing food that are better for people and planet.

Food is one of the most important factors affecting our livelihoods as it impacts our health and wellbeing. However, notwithstanding the importance of food, according to FAO, in the developed world we waste more than 1,300 million tons of food every year (that's enough to feed 925 million people that are starving worldwide). Agriculture (directly and due to deforestation) is responsible for a quarter of global CO<sub>2</sub> emissions (amazing chart here). In addition, agriculture leads to contamination to water resources and degradation of land. Over the last 50 years it has become a more industrial process - allowing us to feed the growing human population. But despite this, a vast portion of the world's population goes hungry, even as we throw almost half of food produced globally away (due to demand for perfect looking products, bad practices in "best by" dates and poor storage facilities). But does it have to be so? The main question is how can we feed everyone on the planet without causing harm to the environment?

We will try to understand different solutions to agriculture and farming. We will speak to Maria from Fruta Feia (EMEA, Wed March 18, 5pm London time) and Mike Johnston from UWC SEA (APAC, Tue March 17, 5pm Hong Kong time) to learn more about reducing waste in agriculture and systems thinking for agricultural solutions. Nadine Souto (Americas, Tue March 17, 5pm New York time) will talk to us about nutrition and its effect on health - discussing specifically the paradox of obesity of the poorest people in some countries like Mexico.

### *D.5.2. Assignments*

#### **Homework due Thursday, March 22:**

- Infographic: How much food does the world produce a year? How much of it is wasted? How much pollution does agriculture produce? Create an infographic that demonstrates these three key components. You can draw on paper and then take a photograph or do a collage in Google Slides (or any other tool that you are comfortable with, like Prezi, etc.). Here is an example of a great infographic on this topic for United States or another example for Singapore.
- Project: Make sure you update and post your community project proposals

#### **Read and watch**

##### *Required*

- Read about Fruta Feia in the New York Times and see this short video about them
- Watch Michael Pollan's TED talk A plant's-eye view to learn more about how to build a permaculture (a farm that does not have a negative impact on the environment)

##### *Highly recommended*

- Huffington Post article You need to know: what colony collapse means for our food supply and trailer for the documentary Vanishing of the Bees
- The Guardian article Amazon clearance for agriculture is "economic own goal" for Brazil
- Al Jazeera article Mexico obesity bulges on diet concerns and FAO press release World hunger falls, but 805 million still undernourished

##### *Other great resources that you can look at if you have time*

- Mercopress article Rural poverty remains strong in Latin America in spite of agriculture boom
- NPR audio story Vermont town's food focus still a growing concept
- Cary Fowler TED talk One seed at a time, protecting the future of food
- GOOD magazine article In Venezuela barrio, recycling a broken McDonald's playground into an urban farm and FAO page on urban community gardens
- IPS News article No Hunger in Brazil by 2015
- Meatless Monday introductory video
- Washington Post article Peru celebrates potato diversity

- FAO video and site on family farming
- Poughkeepsie Farm Project page What is CSA? and Here and Now audio on Community Supported Agriculture
- IPS News article Panama turns to biofortification of crops to build food security
- Colombia Reports article Bancamia brings microfinance to Colombia's farmers
- Slow Food video Good, Clean and Fair Food for Everyone
- Garden in my apartment
- A Guerilla Gardener in South central LA

### *D.5.3. Mentor briefing*

Agriculture is a surprisingly interesting topic. It's also a great opportunity to get down to real examples of systems thinking that the students can really understand.

The proposed agenda is as follows:

- First 5 minutes (when you are waiting for late arrivals): Ask everyone about their experience with agriculture or living in a rural setting.
- Next 15 minutes: First, read the US Union of Concerned Scientists' brief on Industrial Agriculture and watch the trailer for the documentary Food, Inc.
- Next 15 minutes: Class discussion about the article. Say that you will be discussing this article, but it's OK to bring any insights from other reading assignments or personal experience, here are some discussion ideas:
  - What do you consider to be the two most important issues associated with modern agriculture and approaches to food production?
  - Which one of these is most relevant to your life or your local context? Think about a personal anecdote that illustrates this.
- Next 15 minutes: Discuss new ideas (hopefully students will have seen "The Plant's Point of View")
  - What benefits would result from implementing an initiative of this sort in your community?
  - Would it help solve some of the problems identified above? If so, how?
  - What obstacles do you foresee that could hinder its successful implementation?

- Last 5 minutes: designate the next student chair (enter their email and name in your notes document) and the next notetaker. Explain the student chair will receive a briefing ahead of next week's class by email so that they can be ready to prepare. Make sure that everyone understands the assignments and make sure that everyone in your group is divided into threes - they can either find each other on FB or see their email addresses in the group calendar invitation)
- Do not forget to record student attendance and completion of their assignments in the student roster. Also remind the students about the community projects. Make sure they all know where to find the template.

### **D.6. Week 4: Sustainable energy sources**

#### ***D.6.1. Introduction***

Welcome to Week 4 of Online UWC Sustainable development class!

Climate change has become the biggest challenge of our generation affecting all aspects of life. From only a small bit of attention paid to it in the 1990s, it has now become a central to concern to everyone on the planet. From manufacturers, to politicians, to academics, to indigenous tribes, to sailors, to farmers, to business owners, climate change is a very big concern. Despite having signed the UN Framework Convention on Climate Change more than 20 years ago, the world remains dangerously off course in mitigating human-induced climate change. Indeed, the situation is far more perilous today than in 1992. Global emissions continue to rise sharply as the global economy expands, dependence on fossil fuels remains very high, and progress in decarbonizing the world's energy systems remains frustratingly slow. If you are not aware of the terms in bold then it is worth exploring these before we continue. Type them into a search engine and you will find a huge amount of information on what they mean.

It is now clear that climate change is being caused by us humans and our activities on the planet, so how can we stop it? Overall, we are trying - as a world - to keep the rise in global temperatures below 2°C. But attempts so far have fallen far short of this goal. Why? What needs to be done?

In this module we will have a quick look at exactly what climate change is, and then focus on how different people in the world are trying to stop it from happening, or at least slow it down. We will have a look at what attempts have been taken in the past, whether they have worked or not, and then concentrate on what is happening now. As part of this, we will also delve into the world of clean energy as one way of curbing climate change with a massive potential.

#### ***D.6.2. Assignments***

Homework due March 29:

- How do you define climate change? Participate in the discussion on our Facebook page.

- What is your carbon footprint? Every single one of us alive on the planet today has an impact on climate change. Everything we do emits carbon at one stage or another. It may not be directly when we use it, but maybe during it's manufacturing or in transporting it from the factory to the shop. This is called our Carbon Footprint. There are a number of websites where you can work out what your carbon footprint is, and even work on ways to reduce it. Take a look at a few of them and try to enter similar data - what is the range of results that you get? Why do you think each website gives you a slightly different result? Which result is the most convincing to you?

### Read and watch

#### *Required*

- Amy Lovins: A 40 year plan for energy
- Watch our Online UWC lecture with Julia Jaskolska about Sustainable Energy Sources for general introduction to the topic (here are the slides)
- RMI: How the U.S. Transportation System Can Save 1 Trillion, 2 Billion Barrels of Oil, and 1 Gigaton of Carbon Emissions Annually
- Wired: Danielle Fang Wants to Reinvent the Power Grid - Using Air

#### *Highly recommended:*

- The Guardian: Are Solar Panel Road Surfaces the Path the Future?
- The Guardian: UN Backs Fossil Fuel Divestment Campaign

#### *Additional resources (only if you have a lot of time on your hands and find the topic interesting)*

- There is also this great directory of all the information you could possibly want on climate change
- Climate Change 101 from the New England Aquarium:
- This short 15 minute video gives a great overview, from a more academic perspective, on the causes and effects of climate change
- “An Inconvenient Truth”, a feature film which explains things in much more details including the political issues involved in climate change solutions

### ***D.6.3. Mentor briefing***

The proposed agenda is as follows:

- First 5 minutes (when you are waiting for late arrivals): Ask everyone if they have already started on their assignment to share their carbon footprint. If not, have them get started.
- Next 15 minutes: Share the article African Bus Routes Redrawn Using Cell Phone Data.
- Next 30 minutes: Class discussion about the article. Say that you will be discussing this article, but it's OK to bring any insights from other reading assignments or personal experience, here are some discussion ideas:
  - What did you think about the article?
  - What does public transportation system look like in your city?
  - What could be done to improve it?
  - How would you gather the data that would help you improve your city/area transportation system?
  - Do you think there are any ethical issues in using cell phone data to optimise transport?
- Last 5 minutes: designate the next student chair (enter their email and name in your notes document) and the next notetaker. Explain the student chair will receive a briefing ahead of next week's class by email so that they can be ready to prepare. Make sure that everyone understands the assignments and make sure that everyone in your group is divided into threes - they can either find each other on FB or see their email addresses in the group calendar invitation)
- Do not forget to record student attendance and completion of their assignments in the student roster

## **D.7. Week 5: What it takes to kick start a community project**

### ***D.7.1. Introduction***

This is the final week of our class. During this week, we focus on the individual community projects and therefore also on project management. This week we will hear from our two inspirational speakers - Polly Akhurst (EMEA, Tue March 31, 5pm London time) and Victoria Alleyne (Americas, Tue March 31, 5pm New York time).

This week, it is hugely important that you identify inspirational readings and videos about cool projects that relate to what you are working on, and other projects and initiatives that people have completed, such as researching how major NGOs were started (we recommend Plant for the Planet, which we think is hugely inspirational - but feel free to browse).



### D.7.2. *Assignments*

#### **Homework due April 2:**

- Community project: Final submission of community project idea. You will have already updated your proposal, but it would be great to also hear more about the progress you have made.

#### **Read and watch**

##### *Required*

- Read about how Plant for the Planet was founded - yes, it was indeed started by a 13 year old from Germany.

##### *Highly recommended:*

- Take a look at a few inspirational videos about some community oriented projects done by graduates of the Humanity in Action program - these should inspire you to build your own community projects.

### D.7.3. *Mentor briefing*

The proposed agenda is as follows:

- First 5 minutes (when you are waiting for late arrivals): Ask the students about their favorite sustainable development initiatives that they have heard about (can be led both by a for profit company, a government or an NGO)
- Next 15 minutes: Discuss the article about how Plant for the Planet was founded:
- Next 30 minutes: Discussion about the projects - have everyone in your group answer the following questions one after the other
  - Remind us what is your project?
  - What are your next steps for your project?
  - What did you find the most difficult aspect of your project?
  - What do you need help with?
- Last 5 minutes: Say goodbye and mention that we will definitely be doing more courses in the future and that they should check our website [www.onlineuwc.org](http://www.onlineuwc.org) and our facebook page [facebook.com/onlineuwc](https://facebook.com/onlineuwc) in the future (especially since we are launching the new website soon!). If they have completed course requirements (attended 3 out of 5 group sessions and completed 3 out of 5 assignments, including the final project) we will be sending them a certificate of completion and that this will make them UWC alumni.
- Do not forget to record student attendance and completion of the project in the student roster



## **Appendix E. Online UWC Global Citizenship - Example curriculum**

### **E.1. Introduction**

Global Citizenship Online UWC is a short course designed to challenge young people from all over the world to consider what responsibility they have – within their political, social, cultural and professional contexts – to participate as active global citizens.

This is a five-week course where you will learn whilst making friends with other young people from around the world. Part of the course also involves doing action in your own community, either by creating your own project or working with a pre-existing one.

This is a detailed guide for the Online UWC short course on global citizenship. You can see most of the following by looking at your schedule on the Learning Circle platform (under ‘Class’ go to ‘Schedule’), but it is sometimes useful to have it all in one place. The course gives students an introduction to global citizenship. Read on to find out more about how the course will be structured.

### **E.2. Learning objectives**

By the time you finish this course we hope that you begin to explore the following:

*Content:*

- What are some of the components of the identity of a global citizen.
- What changes people around the world are fighting for.
- What are some ways in which you could be an agent of social change.

*Skills:*

- International collaboration
- Identity exploration
- Complexified exploration
- Self location within struggles
- Critical thought and action
- Project management

- Presentation skills
- Collaboration, leadership, and followership skills

### E.3. Programme structure

The course will happen over the course of five weeks:

Week 1 - Challenges to Global Citizenship. Identity, Divisions and Conflict

Week 2 - Challenging Notions of Identity. Reality, Humanity and Oppression

Week 3 - Challenges of Being Informed. Media, Power and Critical Thought

Week 4 - Challenges to the World of Ours. Consumption, Consumerism and the Global Lens

Week 5 - Options for Action. Politics, Participation and Civil Society

Each module (week) contains three elements (4h in total):

A. Monday – students get their readings and assignments (2h)

B. Wednesday – inspiring lecture with the possibility to pose questions (1h)

C. Thursday – group discussion (1h)

Each week will follow a similar structure centred around three key elements: lectures from experts, group discussion (video conference) sessions and individual or group assignments.

Each Monday your readings and other assignments for the week will be released on the course website. On Wednesdays, experts will give lectures via a Hangout on Air (live-stream video broadcast). Some weeks may have multiple lectures for different time zones. You can either watch these lectures live, and ask questions in real-time, or you can submit questions in advance and watch the lectures later. Following the lecture, on Thursdays, you will take part in a 1-hour group session in which you get to talk to and work with a small group of your new online classmates via Google's Hangout video conference facility. Groups will be facilitated by a mentor, who will help break the ice in the first week, and after this students will take it in turns to chair and write up notes from group sessions.

Each week you will receive a set of assignments, which will allow you to learn through fun and challenging research and project-based learning tasks, often with your peers.

All interaction will take place on the new Learning Circle website, a course management system and social learning platform, where you can interact with your fellow students and mentors in a safe online environment.

### E.4. Community guidelines

All students participating in the course will have to obey the following community standards.

- Act towards others as you wish others acted towards you
- Provide honest and constructive feedback which fuels good discussions
- Our differences allow us to learn from one another and help us creatively approach issues we face

### E.5. Who can participate?

Applications are open to any 16-20 year old in all three time zones (EMEA, Americas and APAC).

### E.6. Week 1: Challenges to Global Citizenship. Identity, Divisions and Conflict

#### E.6.1. Introduction

*"Individuals from a wide variety of nations, both in the North and South, move across boundaries for different activities and reasons.[...] We examine global citizens as active political, social, environmental or economic agents in an interdependent world in which new institutional forms beyond nations are beginning to emerge."*

Taso G. Lagos

This module takes an approach to looking at global citizenship from the perspective of individual opposition to the very concept by virtue of definition. By engaging in such manner with the complications of and challenges to the notion of global citizenship, students will get familiar with the concepts while broadening their perspective. What are divisions that prevent a 'global citizenry'? How are humans divided among lines of race, class, sexual orientation, gender, religion, age, ability etc., today? How can we imagine a global community in a growing understanding of our interdependence, overcoming differences in a common humanity?

The module lays particular emphasis on identity politics as both exposing systems of oppression as well as causing conflict to emerge or lighten up. Where do these divisions border intolerance and conflict? How are groups constructed, and why have some attributes evolved as more relevant to constructing groups on their basis? How and why are human societies being divided into 'us' and 'them'? Why do human societies continue to go to war against each other, and continue to deny resources or basic rights to those who are 'other', different from ourselves? What forces allow us to persistently show greater concern for some 'kinds of people' than others?

Students are encouraged to embrace the idea of global citizenship critically upon themselves, reflecting on and exploring aspects of their identity, confronting their privilege. What does it mean to be a global citizen, to you? What challenges exist to the concept of global citizenship within your identity, or the construction of identity in general? Where in your society does stereotyping and group construction happen? When the population of a single state is subdivided by differences in

#### E.6.2. Blog assignment - Introduce yourself to the course

Introduce yourself to the rest of the global citizenship course. Each one of us should try to answer the question: "what are five things that I relate myself to?"

You can do this any way you like - written blog post, video, picture - in the past we have had songs and animations!

We will discuss one feature in which we are different from most powerful people in your country (politicians, lawyers, businessman). It would be great if you could start thinking and writing about that.

Use paint or print and fill out this identity flower. If you are in the powerful group related to the category given, paint the whole category. If you are not, do not paint. The world is complex, and you can half paint, ignore a category or use different colors. You do not have to do this if it makes you feel uncomfortable. In any case, uploading this to the blog is not a requirement.

Don't forget to start every blog or project assignment through the relevant item on your schedule, so that we can keep track of who has done each assignment.

### ***E.6.3. Read, watch & question***

After you have finished the following material, it would be great if you could prepare a question (or two!) for this week's lecturer(s). If you know you won't be able to watch the lecture live, you can pre-submit your question.

*Recommended:*

- The privilege walk - <https://www.youtube.com/watch?v=hD5f8GuNuGQ>
- What does it mean to be a global citizen <https://www.opendemocracy.net/ourkingdom/ron-israel/what-does-it-mean-to-be-global-citizen>
- <http://www.theatlantic.com/business/archive/2015/10/get-rid-borders-completely/409501/>

When you are finished, please select 'Mark as read'.

### ***E.6.4. Lecture***

Our first speaker, UWC Adriatic graduate Lucia Torres Gallego, will set the foundation of the critical questions regarding global citizenship and discuss her involvement during the recent European migration crisis, during which she assisted displaced families in Spain. The lecture will take place on Wednesday 21st of October at 6pm London time on Hangouts on Air. In the first part of the hour Lucia will give a 15-20 minute presentation and answer your questions in the second part of her lecture. Click here to submit your question to Lucia.

### ***E.6.5. Discussion***

The proposed agenda is as follows:

- First 5 minutes (when you are waiting for late arrivals): Say hi and explain you will wait for 5 minutes for everyone to arrive. Ask the people who are joining if they have already watched the lecture and whether they completed the assignments. Designate the notetaker from the first 2-3 people and have them open a new blog post. Do not forget the funky hats feature on Hangouts - have some fun with it!

- Next 15 minutes: Give everyone a chance to introduce themselves. You can start using a random order, or start with people born in January then move up the calendar, or people who are furthest away from you geographically then move closer - just be sure you nominate someone to avoid silences. Explain about the UWC online diploma, and how it works.
- Next 5-10 minutes: How did these videos and talks made you feel? Did you learn anything new? Was there anything surprising?
- Next 10 minutes: Introduce the concept of intersectionalities. How is that manifest in our lives? What does this make you think?
- Next 10 minutes: What is the responsibility that comes with our privileges?
- Next 5 minutes: Go over what we talked about, thank everyone and introduce the next topic. Make sure everybody is on the same page and nobody is left too confused - one sentence feedback.
- Last 5 minutes: designate the next student chair (enter their name in the blog post) and the next notetaker. Explain the student chair will receive a briefing ahead of next week's class by email so that they can be ready to prepare. Make sure that everyone understands the assignments and make sure that everyone in your group is divided into threes - they can either find each other by going to 'Class' and then 'Group' on the Learning Circle platform)

Do not forget to record student attendance and completion of the first assignments in the student roster (Go to 'Manage' and then 'Attendance').

### **E.7. Week 2: Challenging Notions of Identity.**

#### ***E.7.1. Introduction***

*"Race doesn't exist. But it does kill people."* Colette Guillaumin This module emphasizes and complicates the major issue of what relevance to give to identity. Students are invited to explore ways in which identity can help or block the road to liberation towards a common humanity in freedom from oppression, outlining also the conflict between the contextual and the universal. How is the notion of identity being constructed? Where have identities been emphasized by hegemonic groups or minorities, and to what effect? Where could it be more useful to emphasize or ignore divisions of identity for empowerment? When is it necessary to face the reality of communalism and identity based divisions? When can identity and contextuality be ignored for the sake of propagating a common humanity and global community?

Dr. Paul Kershaw, who contributed to the creation of module 2, has noted that visions of (national) citizenship that presume a common culture are "widely out of step with the polyethnic,

multi-faith reality of most contemporary affluent democracies". Many myths of national identity - especially those based on ideas of shared 'race' or 'ethnicity' - are very poor and inaccurate representations of the diverse lived communities of citizens. How are myths of belonging and identity being created? Who benefits from them? What alternatives are there to traditional notions of identity for humanity? How can identity discourse adapt to plural realities? How do collective identities such as nationalism continue to underpin inter-state conflict in the modern world?

Many modern nation states are now grappling with the increasingly multicultural nature of their populace (or are finally acknowledging their multicultural reality). Political pundits laud pluralism as an end-in-itself or highlight the wealth or skills that immigrants bring to their new country of residence. Dissenters claim that immigrants weaken local or national culture and values, or consume resources that belong 'by right' to the 'indigenous' population. In this module, we will ask: What value multiculturalism? What, if anything, can hold a multi-religious, multi-racial, multicultural society together? How do acknowledgement and respect for cultural diversity make the tasks of global citizenship challenging?

### ***E.7.2. Read, watch & question***

After you have finished the following material, it would be great if you could prepare a question (or two!) for this week's lecturer(s). If you know you won't be able to watch the lecture live, you can pre-submit your question.

#### *Recommended:*

- When you are Canada: Nation or notion? Adam Gopnik and Malcolm Gladwell, CBC Radio, Best of Ideas, March 30th 2008.
- Prins, B. & Slijper, B. (2002) Multicultural Society Under Attack. Introduction. Journal of International Migration and Integration 3(3&4): 313-328.
- Inglis, C. (1995). Multiculturalism: New Policy Responses to Diversity. Management of Social Transformations (MOST) - UNESCO. Policy Paper No. 4. Available online at: <http://www.unesco.org/most/pp4.htm>
- Adrienne Clarkson, LaFontaine-Baldwin Symposium Lecture 2007: The Society of Difference ( 45 mins).

#### *Additional:*

- Ethnic Fragmentation in Canada (Cambridge Studios, 2003) (30 mins).

When you are finished, please select 'Mark as read'.



***E.7.3. Lecture***

This week we will be having Vinay Jawahar speaking to us about identity, privilege, intersectionality and how they are affected by globalization. Vinay has his M.A. degree in Comparative Politics from Princeton University. He is a UWC MC (India) alumnus, and teaches Global Politics there.

***E.7.4. Discussion***

The proposed agenda is as follows:

- First 5 minutes: [fill out]
- Next 10-15 minutes: [fill out]
- Next 5-10 minutes: [fill out]
- Next 15-20 minutes: [fill out]
- Next 10 minutes: [fill out]
- Last 5 minutes: designate the next student chair (enter their name in the blog post) and the next notetaker. Explain the student chair will receive a briefing ahead of next week's class by email so that they can be ready to prepare. Make sure that everyone understands the assignments)

Do not forget to record student attendance and completion of the first assignments in the student roster (Go to 'Manage' and then 'Attendance').

***E.7.5. Assignment***

Write/film/draw/create (in any other way that can be uploaded to your blog) about your ideal society and in the context of your local society. Try to answer the following questions:

- How the society organizes itself? (Democracy, anarchism, market run society, etc.)
- Who owns the means of production, and how are resources allocated?
- How are different groups treated? Is there active diversity?

Now compare this to the society in which you live.

- Are they different? How?
- Is it somebody's utopia?
- Is your society more just to some rather than others?
- How/does the state try to improve it?
- What do different peoples try to improve?

### **E.8. Week 3: Challenges of Being Informed. Media, Power and Critical Thought**

#### ***E.8.1. Introduction***

Most discussions about globalization and global citizenship ignore or simply gloss over the central roles played by media (including social media). This week we will focus on how we should critically assess the role of media in the production and reception of today's vastly expanded, global mix of messages.

We will explore questions relating to control of information, the media and mass communications, and will consider topics such as political and economic freedom of the press and critical assessment of media/news, propaganda and persuasion. We will focus on (1) identifying quality sources for information, (2) assessing the biases embedded in different news sources, (3) understand how the use of terminology may affect a debate on a topic.

We will specifically address one case study of global importance, the issue of Haze in Indonesia. Our big question for the week is: "What is the issue with the haze and how can we resolve it?". This week we will research the situation and critically assess the sources that we encounter on our quest to learn more about the topic. This will lead up to the project in the following week, where we will figure out what to do about it. Sanggeet Mithra and Eleana Ennes (both UWC alumni) will join us as project managers and coordinate our efforts.

You will be challenged to ask questions about selective reporting, bias and emphasis, context and vested interest: What information has been selected for representation? What been emphasized as most important? What values or agendas shape the reporting? In what context is the representation being used? Who is communicating to whom, and with what apparent purpose or seeming effect?

We will question vested interests in the spread of information and the language of writing. What is propagated through linguistic choices? Who stands behind this article? Who benefits from it? Who is not mentioned? Who stigmatized? And: Why do people buy this newspaper, hinting at their biases of choice?

#### ***E.8.2. Read, watch & question***

After you have finished the following material, it would be great if you could prepare a question (or two!) for this week's lecturer(s). If you know you won't be able to watch the lecture live, you can pre-submit your question.

#### ***Recommended:***

- Krotoski, A. (2010). Virtual Revolution: The Great Levelling. BBC World Service. (Audio lecture, 20 minutes).
- Hayes, Ben (2015). No, we're not all Charlie Hebdo. <https://www.opendemocracy.net/ben-hayes/no-we-re-not-all-charlie-hebdo-nor-should-we-be>

#### ***Project readings:***

## **E.8 Week 3: Challenges of Being Informed. Media, Power and Critical Thought**

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- Indonesia Fires a Crime Against Humanity - the Guardian, available online at <http://www.theguardian.com/fires-crime-against-humanity-hundreds-of-thousands-suffer>
- 5 Things to know about the haze, the Wall Street Journal Blog, available online at <http://blogs.wsj.com/briefly/2015/09/25/5-things-to-know-about-the-haze-shrouding-southeast-asia/>
- Find xthehaze on Twitter - read a few headlines and stories shared
- Fire Team Stays Alert Over Hot Spots West Kalimantan, The Jakarta Post, <http://www.thejakartapost.com/team-stays-alert-over-hot-spots-west-kalimantan.html>
- 3 Different Levels for Asean Members to Combat Haze, Straits Times, <http://www.straitstimes.com/singapore/different-levels-for-asean-members-to-combat-haze-masagos>

### *Additional:*

- Gardner, S. (2009). The 2009 Dalton Camp Lecture in Journalism. Broadcast by CBC Radio Best of Ideas, Thursday November 26th 2009. Available online at: <http://www.cbc.ca/player/Radio/Best+of+Ideas/2009/11/26/1.1038444>
- Southeast Asia wheezes in pain, Indonesia cracks down on land burning, Reuters, available online at <http://www.reuters.com/article/2015/09/15/us-indonesia-haze-seasia-idUSKCN0RF09P20150915>
- Southeast Asia haze: what is slash and burn? BBC News, available online at <http://www.bbc.com/news/health-23026219>

When you are finished, please select 'Mark as read'.

### ***E.8.3. Lecture***

This week we will have a chance to speak to several journalists - with very different experiences. Nabeelah Shabbir is a journalist for the Guardian, covering Europe, the Balkans and Turkey. She is also involved with several innovative international partnerships projects for the Guardian. Nada Ladraa is the founder of United Youth Journalists. She will talk about her experience as a citizen journalist coordinating the work of more than 40 contributors from around the world.

### ***E.8.4. Discussion***

The proposed agenda is as follows:

- First 5 minutes: How are you from one to awesome? How did you like this week's readings?
- Next 15 minutes: Where do we get our knowledge of the world from? Why does it matter? What are your two favourite sources of information? What are the ones that you do not think are reliable? Why do you think that?

- Next 15 minutes: What are the different perspectives on the issue of the haze? What are Western media focusing on? What are Singapore media focusing on? What is Indonesia media focusing on?
- Next 15 minutes: What is the haze? Who are people writing about the topic? What interest do they represent? Should you trust them if they are not professional journalists?
- Last 5 minutes: designate the next student chair (enter their name in the blog post) and the next notetaker. Explain the student chair will receive a briefing ahead of next week's class by email so that they can be ready to prepare. Make sure that everyone understands the assignments)

Do not forget to record student attendance and completion of the first assignments in the student roster (Go to 'Manage' and then 'Attendance').

### ***E.8.5. Assignment***

For the past two months, people in Malaysia, Indonesia and Singapore have been choked by a thick blanket of haze. Air Pollution Index (API) readings reached hazardous levels, which resulted in schools being closed down and thousands of cases of people with respiratory illnesses reported.

This is not new - the haze has been a yearly occurrence for the past two decades. Every year, forests and peat lands are burnt in Indonesia and Malaysia by palm oil companies for palm oil plantations. Palm oil is one of the biggest ingredients in many household items - cooking oil, soap, even ice-cream. While palm oil is an important material, it is causing catastrophic damage to the environment and communities in Southeast Asia.



This is an urgent and complex issue that calls for immediate action, both at the regional and international level. Although this is a major crisis that affects the global environment, this issue is not as well known outside of Southeast Asia.

In this part of the project, you will conduct research and share your findings with the group and potentially, your home community and peers. Below are the key questions that you will be answering in this part:

*Haze:*

- What is haze? Which countries are affected by the haze?
- What are the causes of haze? How are the different causes linked to each other?
- Who is responsible for causing the haze? (Directly and indirectly)
- What are the effects of haze? What are the short and long-term effects of haze?
- Who is suffering from the haze? (Directly and indirectly)
- What is currently being done to address the haze issue?
- Are these initiatives successful? Why or why not?

*Palm oil:*

- What is palm oil?
- Where is palm oil produced? What is it used for?
- What are the advantages of palm oil?
- What are the disadvantages of palm oil?
- What is certified sustainable palm oil (CSPO)?

## **E.9. Week 4: Consumption and Consumerism in the Global Context.**

### ***E.9.1. Introduction***

*“Each man is locked into a system that compels him to increase his herd without limit – in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.”* Hardin, 1968

What does it mean to be a consumer? What is consumerism? What is a consumer culture? What are the issues relating to consumerism that we need to understand when considering our actions as global citizens? This module examines social, economic, human, and environmental costs of consumerism, as well as various conceptions of consumerism, and encourages students to make connections between those conceptions and an ethic of global citizenship.

Discussion questions and assignments invite students to reflect on personal, familial and cultural meanings of shopping and consumerism. Importantly, this module will consider the impact of consumer choices on world, national and local economies and populations, and challenge students to examine their own consumer choices.

### ***E.9.2. Read, watch & question***

After you have finished the following material, it would be great if you could prepare a question (or two!) for this week's lecturer(s). If you know you won't be able to watch the lecture live, you can pre-submit your question.

#### *Recommended:*

- Shah, A. (2005). Behind Consumption and Consumerism. Available at: <http://www.globalissues.org/TradeRe>
- Hardin, G. (1968). The Tragedy of the Commons. *Science*, 162:1243-1248. Available at: <http://dieoff.org/page95.htm>
- The Story of Stuff (Annie Leonard and Free Range Studios, 2005). Online at: <http://www.storyofstuff.org/>
- Michael Sandel: <http://www.globalissues.org/issue/235/consumption-and-consumerism><http://www.theguardian.com/technology/2013/04/25/michael-sandel-more-things-money-can-buy-harder-to-be-poor-video>
- 

#### *Additional:*

- Global Popular Culture (Oregon Public Broadcasting, 2004)
- Naomi Klein - Capital vs. Climate: <https://vimeo.com/124019047>

When you are finished, please select 'Mark as read'.

### ***E.9.3. Lecture***

[a few words about week 4 lecture and profile of the speaker]

### ***E.9.4. Discussion***

The proposed agenda is as follows:

- First 5 minutes: Check in - how are you and how was last week for you in one sentence.
- Next 10 minutes: Do you know where the things you buy are coming from? Do you know what is the impact of your consumerism?
- Next 10 minutes: This week we heard a lot about the behaviors that we as humans exercise, and how it might relate to consumerism and our environment. Why do you think we behave in this way? How does relate to the last unit?
- Next 10 minutes: Would you consider changing your habits and attempting to change your communal habits in order to positively affect the environment for things you can not see? (We can not see our consumption of electricity, paper, water, etc. visually affecting the world.)

## **E.10 Week 5: Options for Action. Politics, Participation and Civil Society**

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- Next 10 minutes: What culture does consumerism create?
- Next 10 minutes: What are some aspects in which we can start creating a new culture?
- Last 5 minutes: designate the next student chair (enter their name in the blog post) and the next notetaker. Explain the student chair will receive a briefing ahead of next week's class by email so that they can be ready to prepare. Make sure that everyone understands the assignments)

Do not forget to record student attendance and completion of the first assignments in the student roster (Go to 'Manage' and then 'Attendance').

### ***E.9.5. Blog assignment***

- Make a list of ways in which you have already incorporated sustainable living into your everyday life and a list of ways you can realistically improve on your sustainable day-to-day lifestyle.
- Search online for 5 alternative and innovative ways for recycling, and 3 for sustainable replacements of daily products you use.
- List 5 things that are considered commonly used/bought in your household, that your household could attempt to be more sustainable in consuming. Try to see if you could do that.

## **E.10. Week 5: Options for Action. Politics, Participation and Civil Society**

### ***E.10.1. Introduction***

*“Our moral and political interests, too, are interwoven, for the collapse of civil authority in distant parts of the world leads to a flow of refugees who knock on our doors and whom we cannot drive away as we would stray dogs or intruders. Thanks to the global reach of the media, the starvation and suffering in poorer parts of the world impinge on our moral consciousness and address us directly.”* Parekh, 2003 We have spent the past weeks studying some of the underlying

principles of global citizenship and global issues. Where does this leave what Bhikhu Parekh (2003) calls 'globally oriented citizens' – citizens who are rooted in a place, yet see themselves as having rights and responsibilities on a global level?

In this module, we focus on action – what are we to do as global citizens? In many contexts, action can be most effectively taken through collaboration with like-minded others. In this module, we will explore the concept and role of 'civil society' at the local level, and, at the global level, transnational networks, which are one element of what has been termed 'global civil society'. Action is a fundamentally political term, and we will explore the ways that networks and civil society relate to participation in a new global political landscape. Students are therefore encouraged to examine conditions and necessity for action in their local context, reach out to existing movements and initiatives, and connect on a global or regional scale.

### ***E.10.2. Read, watch & question***

After you have finished the following material, it would be great if you could prepare a question (or two!) for this week's lecturer(s). If you know you won't be able to watch the lecture live, you can pre-submit your question.

#### *Recommended:*

- Sachs, J. (2007). Lecture 5: Global Politics in a complex age. BBC Radio, The Reith Lectures 2007: Bursting at the Seams.
- Schutt, R. (1984). Activist Skills and Experience Questionnaire. From <http://www.vernalproject.org>
- Case Studies on Activism

#### *Additional:*

- 198 Methods of Nonviolent Action
- Tools and Tips for Effective E-Activism
- Creative Direct Action Visuals
- Another World is Possible

When you are finished, please select 'Mark as read'.

### ***E.10.3. Lecture***

This week we will have Carrie Shelver speaking about activism and social political change.

Carrie works for People Opposing Women Abuse (Powa), is a feminist and human rights activist who has worked in the violence against women, lesbian and gay sectors for the past decade. Her academic background is in adult education, politics and applied linguistics.

### ***E.10.4. Discussion***

The proposed agenda is as follows:

- First 5 minutes: How are you? How do you feel about the course ending?
- Next 20 minutes: Which types of direct action do you know? Which do you find legitimate (violence/non-violence)? Which have proven to be most effective?
- Next 10 minutes: What is the role of activism in our lives as individuals? What should activism be prioritized towards in our society? What is the place of thinking and reflection in our activism?



## **E.10 Week 5: Options for Action. Politics, Participation and Civil Society**

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- Next 10 minutes: How are you going to move forward with your political awareness? Would you like to attempt to change the society around you? How concretely?
- Next 10: Say goodbye, thank you, ask each to say few sentences about what they are taking away from the course. How relevant has the course been to me, to my context, to my learning?
- Last 5 min: Explain about the Online UWC diploma.

Do not forget to record student attendance and completion of the first assignments in the student roster (Go to 'Manage' and then 'Attendance').

### ***E.10.5. Assignment***

Choose a social goal that is close to your heart, and search in the internet for a movement that was/is struggling for this cause. Create/write/sing/act about the following questions:

- Is this struggle specific, or is it fighting for “general” justice?
- What is it fighting for? Does it allow allies to participate?
- Is this movement viewing the reality in a critical lense?
- What is the ideal reality for this movement?
- Is this movement context specific, or is it struggling on a world bases?

In addition, as this is our last assignment, you might find it useful to write a reflection about this course. Please consider the following questions:

- Did this course make me reconsider my identity and privileges?
- Did this course help me explore my society?
- Did this course help me consider again my habits related to my sustainability habits?
- Did this course advance my critical thinking skills?
- Did this course present me with new tools for social advancement?

In addition, a feedback form will be sent to you in the next couple of days. It would be wonderful if you could answer it, so our team can get better in the future.

**Thank you for participating!**



## **Appendix F. Online UWC Social Entrepreneurship – Example curriculum**

### **F.1. Introduction**

Welcome to the guide for the Online UWC short course on social entrepreneurship, run in collaboration with UWC International. You will receive most of the following information in regular email updates, but it is sometimes useful to have it all in one place. Read on to find out more about how the course will be structured.

### **F.2. Learning objectives**

By the time you finish this course we hope that you learn the following:

*Content:*

- You understand what is a social enterprise
- You understand how to formally set up a social enterprise and what the pros and cons of each option are
- You know how to write a business plan, complete with a robust business model
- You know how to pitch your idea effectively, using powerful slides and promotional materials (videos, flyers)
- You have set up a website for your idea (either set up a simple template one if this is your first go at it, or improved your existing website design to the highest standards of UX design if you're improving an already existing website)
- You understand the dynamics of online marketing, have articulated a clear online marketing and social media strategy and have set up presence and campaigns across different platforms

*Skills*

- Project management
- Business planning
- Web development and UX design

- Presentation skills
- Web marketing
- Social media management
- International collaboration
- Constructive criticism skills

### **F.3. Programme structure**

The course will happen over the course of five weeks.

- Each week will follow a similar structure centred around three key elements: experts from lectures, group discussion (video conference) sessions and individual or group assignments.
- Each Sunday your readings and other assignments for the coming week will be released on the course website. On Tuesdays, experts will give lectures via a Hangout on Air (live-stream video broadcast). Your lectures will be arranged by time-zone, e.g. one lecture will be for the Asia-Pacific and Europe, Middle East and Africa (EMEA) time-zones and a second lecture will be for the EMEA and the Americas time-zones. Participants can either watch these lectures live, and ask questions in real-time, or you can submit questions in advance and watch the lectures later. Following the lecture, on Thursdays, you will take part in a 1-hour group session in which you get to talk to and work with a small group of your new online classmates via Google’s Hangout video conference facility. Groups will be self-led, and participants will take it in turns to chair and write up notes from group sessions.
- Each week students in the Social Entrepreneurship course will receive a set of assignments, which will allow them to fully prepare their pitch in time for the UWC competition.
- All interaction will take place on the new, interactive Online UWC community website, a course management system, which also allows participants to collaborate on community projects and provide feedback to others.
- Throughout the course, there will be a number of expert ‘coaches’ who can take your questions relating to any aspect of your social enterprise. They won’t do the work for you! These coaches are in the fields of:
  - Product/service design
  - Social media
  - Web design/coding
  - Business planning/finance
  - Video editing

### **F.4. Community guidelines**

All students participation in the course will have to obey the following community standards.

- Act towards others as you wish others acted towards you
- Provide honest and constructive feedback which fuels good discussions
- Our differences allow us to learn from one another and help us creatively approach issues we face

### **F.5. Pre-course: What is your social enterprise idea?**

Applications are open to any current UWC students or alumni, of colleges or short courses. Applicants will have to describe a social enterprise idea that they have in less than 100 words. It can be anything from a vague thought to a project you are currently undertaking in the initial stages. If you have come up with an idea with a group of friends or acquaintances who are also UWC students or alumni, please indicate on the application form who your fellow group members are if they are also signing up for this course.

Out of the pool of applicants, we will select the ones who have reasonable ideas for setting up an organisation/initiative with a social objective at its heart, particularly those ideas that align with the UWC mission of creating a more peaceful and sustainable future.

### **F.6. Week 1: What is a social enterprise? What is your social enterprise?**

#### ***F.6.1. Introduction***

In this week we will learn about what the term “social enterprise” means around the world. We will also focus on refining your idea for a social enterprise. You already came up with a social enterprise idea when you applied - but do not worry, you will be able to change it up until the last week of class.

#### ***F.6.2. Task (blog)***

Introduce yourself to the rest of the social entrepreneurship course. You can do this any way you like - written blog post, video, picture - in the past we have had songs and animations! Include also your initial idea for a social enterprise. It's fine if this is not the social enterprise idea you end the course with! You should also go to [www.kickstarter.com](http://www.kickstarter.com) and browse the project ideas there (under the section 'Discover'). Share with us in your introduction one of your favourites and why you liked it.

#### ***F.6.3. Read and watch***

*Recommended:*

- Dan Pelotta: The Way We Think About Charity is Dead Wrong
- Toby Ecclest: Invest in Social Change
- Social enterprise in your country: find resources that help you understand how social enterprises are structured

### *Additional:*

- Watch this video about social enterprises in the UK. Look out for Jamie Oliver and UWC alumna Kresse Wesling talking about their social enterprises!
- Read an article about how Plant for the Planet was founded
- Read an article about Social Enterprise Funding in the US
- David Bornstein on the relationship between social enterprise and democracy, pages 1943-1947 (starts at the bottom of page 1943)
- Richard McEachran: The difficulty of starting up a social enterprise in a warzone
- Aimee Groth: Entrepreneurs don't have a special gene for risk - they come from families with money. This article does not focus specifically on social entrepreneurship, but is thought-provoking nonetheless.

### ***F.6.4. Lecture***

Rob Wilson, social entrepreneurship author, founder of READ International and Director of Ashoka UK, will give an introductory 15-20 minute presentation on Social Entrepreneurship and will spend the rest of the hour answering your questions.

### ***F.6.5. Take action***

- Create an infographic on social enterprise in your country.
- Are social enterprises common in your country? Which legal structure(s) can they take? Investigate the pros and cons of the various models that exist.
- Present this infographic in a blog post.

## **F.7. Week 2: Developing your idea**

### ***F.7.1. Introduction***

You now have an initial idea for a social enterprise. In this week's hangout you will do a short 60-second presentation to the rest of your group where you explain what your idea is and how far you have developed it. The rest of your group then has four minutes to give some initial feedback. At the end of the hangout you will form groups of two or three with other students to work on developing your idea over the weekend.

### ***F.7.2. Read and watch***

*Recommended:*

- Tim Brown: Designers - Think big!
- Market research
- Read an interview with this week's speaker, Kresse Wesling, in the Daily Telegraph.

*Additional:*

- Günter Faltin: Trying new sightlines
- UnLtd: Defining the problem and your solution

### ***F.7.3. Lecture***

Kresse Wesling, UWC Li Po Chun alumna and founder of Elvis & Kresse, a social enterprise selling high-end fashion items from recycled fire hoses, will spend the first 15-20 minutes talking to us about her project and the process of developing an idea. For the rest of the hour Kresse will answer your questions.

### ***F.7.4. Assignments***

- Test your idea, if possible. If it's not possible, come up with a plan for how you will test it. If you have already tested your idea what have you learned from this?
- Do some market research - what is the need for your idea? Is anyone else doing anything similar, in your target geographical area, or elsewhere?
- In Thursday's group session, decide on small groups who you will work with over the weekend. Find a time you can video chat or email to give some positive and negative feedback of each other's idea. Present a summary of the feedback your group members gave you on your blog.

## **F.8. Week 3: How will you explain your idea to others? / How will you promote your idea?**

### ***F.8.1. Introduction***

In this week, we will focus on explaining the social enterprise idea to others. We will also go straight to practice and as we go along defining what the project is, we will start with construction of a basic web page (either by using wix templates, or Wordpress templates). We will also learn about basic HTML and CSS from codecademy.com and learn about getting new code components from Bootstrap.

We will also set up basic presence on Facebook, YouTube and Twitter. We will understand how to get the first fans for our idea and we will see if we can find at least 2 people in our network who would be willing to give us 1 hour a week of their help for a month.

### ***F.8.2. Assignments***

#### ***Take action (start a website)***

If this is a new website you're building:

- Build a page where you say who you are, what you do and how to get in touch with you based on a template
- Add any formatting to the website that is not standard for the template by editing the HTML or CSS.
- Write up the mission and vision for your enterprise: what problem are you trying to solve (mission) and how are you going to solve it (vision)
- Beginners hackathon: one day when all beginners are setting up their websites - we will provide 2-3 volunteer coaches who would be on call to give 15 minute advice sessions

If you are working on an already existing website:

- Ground up peer-to-peer UX review by one of other teams
- Intermediate hackathon: prioritize a set of 3 features you would like to add to your website and make them happen over a day long hackathon, while soliciting help / advice from others who will also be hacking away on their website

#### ***Take action (develop your social media presence)***

- Set up all social media channels
- Build and upload first YouTube video
- Get 100 likes on FB and 100 views on YouTube
- Get your 2 project contributors

#### ***Read and watch***

##### ***Recommended:***

- Explore the Wix website to learn about how to build your first website (newbie starter pack, support resources)
- Read this article about how to write up your vision and mission



- UX principles
- Simplicity sells: TED talk by David Pogue
- How to set up a Facebook page
- How to make a YouTube video
- The role of Twitter

### *Additional:*

- Familiarize yourself with Bootstrap
- Take a tutorial on codecademy
- Stackoverflow forum
- Marketing strategy reading
- UnLtd: Understanding your target audience and defining your value position

### ***F.8.3. Lecture***

We are fortunate this week to have two lectures focusing on the different aspects of building your project's online presence. First, Hanna Celina, alumna of UWC USA, Online UWC organizer and Learning Circle founder, will talk us through the basics of building a website to promote our social enterprise ideas. After a 15-20 minute presentation Hanna will spend the rest of the hour answering your questions.

Then Kanchan Amatya, UWC Red Cross Nordic alumna, Resolution Project Fellow and co-founder of the Sustainable Fish Farming Initiative will talk to us about the importance of social media in spreading awareness about and gaining support for your social enterprise. After a 15-20 minute presentation Kanchan will spend the rest of the hour answering your questions.

## **F.9. Week 4: How are you going to finance your idea?**

### ***F.9.1. Introduction***

In this week we will writing a business plan - see how much money we need to take our social enterprise off the ground. We will build a basic cost and revenue model and prepare basic projections for funding needs for our social enterprise.

### ***F.9.2. Assignments***

#### ***Take action***

- Build a one page flexible model describing how your social enterprise will stay afloat in the first 3 years
- Create a 5-page pitch deck about your social enterprise

### ***Read and watch***

#### *Recommended:*

- Business planning for social ventures
- A video giving some advice for standard businesses (i.e. that are not social enterprises - useful nonetheless)
- An article about the 8 things to avoid when pitching to investors - contains some useful information to think about while doing your business planning.

#### *Additional:*

- A piece in Forbes about not-for-profit charities that emulate startups in their financial models
- Some financial planning advice for non-profits.

### ***F.9.3. Lecture***

Tammy Wan, UWC Atlantic College alumna, finance expert and Chief Operating Officer of Bai Xian Education Foundation will give a 15-20 minute presentation on the different options available for you in funding your social enterprise and will spend the rest of the hour answering any questions you might have.

## **F.10. Week 5: How will you pitch your idea?**

### ***F.10.1. Introduction***

In this week, we will focus on delivery. You should have your project ready for presentation: your website, social media presence, business plan and pitch deck should be ready. This week you will participate in the discussion with your classmates who will give you as much feedback as possible on your project.

### ***F.10.2. Assignments***

#### ***Take action***

- Workshop - pitch the business ideas - record and upload for all to see and criticize, everyone has to upload their pitch and give at least one positive and one negative piece of feedback for their fellow group participants work
- Finalize your 'marketplace' entry - this is where members of the public can view your video pitch as well as give feedback. This is also where other members of the UWC community will vote on their favourite project, something the judges will take into consideration.

### *Read and watch*

#### *Recommended:*

- Crowdcube crowdfunds investment for standard businesses. Check out some of the pitch videos on their site. Crowdcube's guide to creating a good pitch video also has some good tips.
- An article listing some things investors look for in a traditional pitch. You could incorporate some of these into your video.
- Check out some of the videos on other crowdfunding websites such as Kickstarter, Crowdfunder, Go Fund Me and IndieGoGo - what works? What doesn't? If you find a particularly effective video, share it with the course!

#### *Additional:*

- Find videos of people who are reputed for being great presenters.
- An interesting piece on the importance of incorporating a story into your message.
- Watch some of the TED prize winners' videos. These are longer than your pitch videos will be, but they are inspiring and might also help you to think about how to get your story across.

### **F.10.3. Lecture**

Yasmin Belo-Osagie, UWC Atlantic College alumna, management consultant and founder of She Leads Africa will give a 15-20 minute presentation on her entrepreneurship experience and the importance of a good pitch in securing funding and support for your project.

Yasmin's lecture will be held at 8pm Lagos/London time UTC+1 (TBC).

## **F.11. Recommended books about entrepreneurship**

1. The Four Steps to the Epiphany by Steve Blank
2. The Art of the Start: The Time-Tested, Battle-Hardened Guide for Anyone Starting Anything by Guy Kawasaki
3. Founders at Work: Stories of Startups' Early Days by Jessica Livingston
4. The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses by Eric Ries
5. Rework by 37signals
6. The Personal MBA: Master the Art of Business by Josh Kaufman

## **Online UWC Social Entrepreneurship – Example curriculum**

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7. The E-Myth Revisited: Why Most Small Businesses Don't Work and What to Do About It by Michael Gerber
8. The 4-Hour Workweek: Escape 9-5, Live Anywhere, and Join the New Rich by Tim Ferriss
9. The Starfish and the Spider: The Unstoppable Power of Leaderless Organizations by Ori Brafman
10. Anything by, or recommended by Charlie Munger (Warren Buffett's business partner), Jay Abraham (billion dollar consultant), or Seth Godin (marketing guru)

## Appendix G. Course organizer feedback form

How many hours did you spend per week working on the courses during the 3 weeks prior to the course?

*Your answer*

How many hours did you spend per week working on the courses during the 5 weeks of the course?

*Your answer*

Which tasks took most time and effort?

*Your answer*

What did you think about the course structure of the course? How does it compare to the structure of course 4 where you were a learner?

*Your answer*

What did you think about the communication methods used by organising team to connect with learners in each course?

*Your answer*

What did you think about the quality of interaction and collaboration between learners in each course?

*Your answer*

What do you think about the impact on different modes of interactions with mentors in the two courses? What do you think is the ideal way mentors should contribute to future courses?

*Your answer*

Did you observe any instances of students showing evidence of activist involvement or community projects? What did you think about the quality of these contributions?

*Your answer*

Did you observe any instances of students self-organising and/or taking responsibility for their own learning? If yes, please provide examples.

*Your answer*

What did you think about the quality of pedagogy in each course?

*Your answer*

## Course organizer feedback form

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What did you think about the interaction systems used in each course? What role do you think Facebook played in course 5? Was it a good addition?

*Your answer*

## Appendix H. Online UWC - Facilitator feedback form

Feedback form for facilitators to fill in post-group session. Only one form needs to be filled in per group.

Please note that this is not evaluating you as mentors, but is to help us know how to be better at communicating information to you before the group session, and also to help us know we (and therefore the students) are on more or less the same page :)

Feel free to email me (anonymised@gmail.com) at any time for more specific enquiries/issues.

What week is this for?

- Week 1
- Week 2
- Week 3
- Week 4
- Week 5
- Post-course

Which group is this for?

*Your answer*

What is your name?

*Your answer*

Did you or your students have any technical difficulties trying to join the hangout?

**\*\*If you are completing this question post-course, please tell us about how you found the technology, e.g. how easy it was to use, whether we did enough to acclimatise you to it before the course started, etc.\*\***

*Your answer*

How did the discussion go?

Please provide a brief summary. How did the student charring work? If you think it could be improved, please state where and we will try to work out a way to do this :) **\*\*If you are completing this question post-course, please tell us how you found the format for the group sessions, whether you think it worked, what didn't work and how it could be improved.\*\***

*Your answer*

What was the assignment that you agreed with the students?

**\*\*If you are completing this question post-course, how do you think the assignments system worked? Did students seem to enjoy doing them/find them useful?\***

## Online UWC - Facilitator feedback form

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*Your answer*

Did you find a volunteer for a student to chair next Thursday's group session?

It's not a problem if you didn't just so we know whether we communicated this effectively enough to you beforehand :) \*\*If you are completing this question post-course, how did the student chair system work? Did you always have a student chairing the session most weeks or was it usually the mentor? \*\*

*Your answer*

Have you filled in the student attendance register?

- Yes
- No

Is there anything we could have provided you with more information about/clarified better before the group session? Any general suggestions for how we could improve the group session from the point of view of a mentor?

\*\*If you are completing this question post-course, please feel free to give us any feedback about what worked well, what didn't and how you think we could improve the course in the next edition. \*\*



## **Appendix I. Online UWC - Participant feedback form**

### **I.1. Pre-course**

Are you satisfied with the level of information given to you prior to the start of the course?

- Yes
- No
- I don't know

How could we improve pre-course communication to help you enjoy the course more?

*Your answer*

Was the purpose of the course clear before the course?

- Yes
- No
- I don't know

Please describe the purpose of the online short course on sustainability in your own words

*Your answer*

### **I.2. During the course**

How many hours did you spend on the course each week (on average)

- 1 hour
- 2 hours
- 3 hours
- 4 hours
- 5 hours
- More than 5 hours

### **I.3. General questions about the course**

e.g. Monday with pre-class reading and assignments, video lecture on Wednesday and group session on Thursday

What did you think about the course structure?

*I did not like it at all / I did not like it / No opinion / I liked it / I liked it very much*

Did it work well for you to communicate with others using google hangouts?

## Online UWC - Participant feedback form

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*I did not like it at all / I did not like it / No opinion / I liked it / I liked it very much*

What did you think about the introduction of the Facebook group

*I did not like it at all / I did not like it / No opinion / I liked it / I liked it very much*

What do you think about using a student as a chair for the discussions

*I did not like it at all / I did not like it / No opinion / I liked it / I liked it very much*

What did you think about the course structure?

*I did not like it at all / I did not like it / No opinion / I liked it / I liked it very much*

Did it work well for you to communicate with others using google hangouts?

*I did not like it at all / I did not like it / No opinion / I liked it / I liked it very much*

What did you think about the introduction of the Facebook group

*I did not like it at all / I did not like it / No opinion / I liked it / I liked it very much*

What do you think about using a student as a chair for the discussions

*I did not like it at all / I did not like it / No opinion / I liked it / I liked it very much*

How could we improve the course?

*Your answer*

Did you learn new things about sustainability?

*Your answer*

Did we help you to think about creating your own project?

*Your answer*

Did we give you value for your money?

- I paid and I think it was good value for money
- I paid initially, but I would like my money back
- I did not pay yet, but will do as I think this was a good value for money
- I did not pay yet, but will not do as I do not think it was worth the cost
- Other:

What are the best means of communication?

Pick all forms of communication that you thought were useful

- Facebook semi-private class page
- Facebook open Online UWC page
- Email
- Class website
- Other:

Did you get enough chances to get to know each other?

- Yes
- Yes, but...
- Neutral
- No, but...
- No

How did you find the group session where you split into groups?

*Your answer*

Please rate each week based on how much you enjoyed it (topic, methodology, etc.)

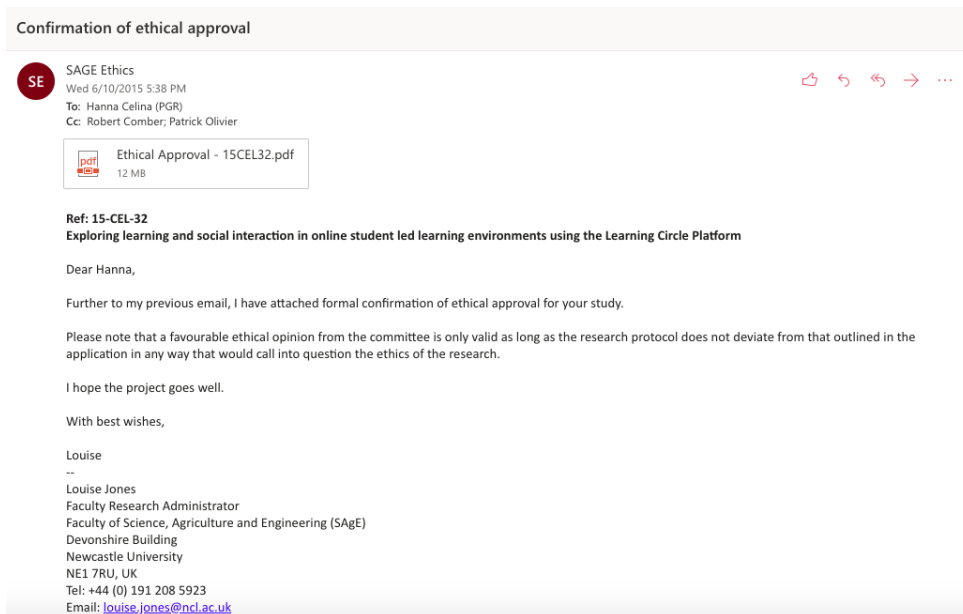
- Week 1: Introduction to Online UWC, Sustainability and Design Thinking
- Week 2: Sustainable cities, presentation by Victoria
- Week 3: Sustainable cities, presentation by Plant for the Planet
- Week 4: Sustainable agriculture: presentation by Fruta Feia
- Week 5: Migration

If you have any other comments/suggestions about the course, please let us know below:

*Your answer*



## **Appendix J. Ethics Approval**



**Figure J.1** Ethics Approval