INCLUsive Disaster Education (INCLUDE)

Digital Platform for University-Industry Collaborated Learning for Inclusive Disaster Education

University of Central Lancashire (UCLan)

10th May 2023

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Co-funded by the Erasmus+ Programme of the European Union

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Introduction

Communities around the world are facing disaster, resulting in loss of life and habitats on a large scale, with the constant threat of disaster hindering sustainable development in many countries. The term disaster risk reduction (DRR) emerged as a topic of interest in the worldwide education systems to develop awareness and state-of-the-art mitigation techniques with regards to global disasters. Twigg (2015) states that the scale of losses caused by disasters between 2003 and 2012 and the data are overwhelming. His data suggests that, on average, 106,654 people have died, and 216 million have been affected with average losses of $157 billion during this period, globally. In relation to the 2004 tsunami disaster in south and south-east Asia, Shaw et al. (2012) highlighted lack of awareness on DRR among the public as a major restriction for mitigating disaster impacts. Shaw identified that organizations closest to the affected public (i.e., non-government organizations (NGO), community-based organizations (CBO) and local community groups) lack access to up-to-date knowledge resources coming through universities to address local disaster risks. It has, thus, become essential to reinvent methods for effective knowledge transfer from universities to relevant community organizations and industries, which aids in reducing disaster impact. In theory, the scale of catastrophic losses can largely be reduced by early safety actions, which are unseen among communities in developing countries.

Over the years, several DRR education-related studies have been published on cause-related marketing for DRR in the tourism industry (Aliperti, 2018) and conceptual frameworks (Faulkner, 2001; Ritchie, 2004; Mistilis & Sheldon, 2005; Agustan 2019). Research has implanted the idea that DRR-related education is well spread within worldwide education systems and well absorbed by the higher education institutions (HEI). Particularly, Shaw's (2012) report highlighted that HEIs must play a major role in distributing DRR education than school or family/community education, which are the most conventional mediums. He discusses the importance of forming collaborative alliances between academic institutions, governments, and NGOs for the success of DRR. Although DRR is well researched, Shaw highlights a barrier to sharing this knowledge with the industrial and/or corporate bodies. In fact, technological and infrastructure developments have been delayed in contrast to other DRR-related studies due to a stagnation of knowledge transfer from HEIs to the industry.

So far, the most conventional and effective methods for DRR education have been through first-cycle (i.e., bachelor's level) and second-cycle (i.e., postgraduate or research level) education. They usually rely on in-person and teacher-centric forms, thus limiting the education from reaching far beyond the student cohorts. Moreover, traditional educational patterns are restricted to tacit knowledge transfer, apart from second-cycle research outputs, which are rarely reached to local communities. With the ever-changing nature of natural disasters and the traditional disaster prevention knowledge coming from local communities, the need for an open, highly available and easily accessible knowledge sharing mechanism is identified. One such form is open education provided via online learning platforms, which are accessible as both paid and free online courses. The term "open education" conceptualizes "a way of carrying out education, often using digital technologies. Its aim is to widen access and participation to everyone by removing barriers and making learning accessible, abundant, and customisable for all." (European Union Science Hub, 2022) The authors have identified that such a platform will be usable for the purpose described above, with relevant modifications. Aligning with the discussions above, Output 3 (O3, hereafter) of the project INCLUDE (INCLUsive Disaster Education) is formulated to develop an open online learning platform to facilitate an enhanced form of DRR-related knowledge transfer between universities, industry, NGOs and other community organizations.

With regards to the platform of choice, we have further identified a key set of high-level criteria that must be satisfied from it. Firstly, it should provide an open, free and safe space for collaboration between the

participants. In this context, collaboration refers to contribution to the shared knowledge pool and absorption from it. The safe space is essential because of the involvement of various sensitivity levels of shared knowledge, intellectual-property (IP) rights and so forth. Secondly, it is essential to remove teaching boundaries by introducing learner-centric education. Conventional teacher-centric education lacks knowledge generation and restricts learners within a frame by means of curriculums. On the other hand, learner-centric courses freely evolve and culminate on the participants knowledge, which is beneficial in open access environments. Thirdly, there should be a learning content management system through which tacit knowledge transfer happens. This system helps evolve the learning techniques within the community at the initial stages where participants lack common knowledge on the subjects, which is essential for active collaboration at later stages. For that, DRR researchers, industry partners and university lecturers are provided a tool for content sharing, and the open community procures its benefits. Finally, the platform is expected to reach a wider audience via the use of social media, blogging sites and other open communication mediums. This would facilitate implementing the learner-centric concept, increase the platform's popularity, widen the knowledge reaching boundaries, and consequently, protect the platform's sustainability.

Output 3 has defined a five-layer architecture that describes the features of the learning platform in a modular manner, and they are listed in table 1.

Industries play a role at a pivotal point in the DRR lifecycle, and we highlight two such hypothetical situations for illustration purposes. A natural disaster such as flooding or earthquakes in a tourist destination may cause damage to the tourism industry in addition to loss of life, livelihoods, and infrastructure. Alternatively, a chemical disaster releasing harmful, toxic substances to the environment may sometimes cause minimal impact on the chemical industry, but massive effects on the surrounding communities and livelihoods. In both cases, the risk reduction measures that should have been taken by the industry would have had a large effect on the extent of the resultant losses. These measures help either mitigating losses or avoiding disasters from happening at all. Therefore, the collaborative learning environment for DRR education should formulate a good relationship between industries and other institutions.

University-industry collaboration (UIC) has been a widely researched and practiced area in numerous domains. In 2020, the UK instated its Institute of Coding (Devenport, 2020) as an initiative between universities and industry to help mitigate the UK's digital skills crisis. Another more generalized framework by Awasthy et al. (2020) highlights the general importance of collaboration between institutions with fast-paced digital economy, encouraging parties to increase engagement- particularly engineering and computer science practitioners. This study demonstrates that (i) academics having background in industry are a useful resource, (ii) overcoming intellectual-property (IP) barriers is a challenge and (iii) online platforms are the way forward for enhanced and effective collaboration. Lockett et al. (2008) have also emphasized the difficulty of overcoming IP barriers, highlighting universities' concern with IP rights over industry. This forms the belief that UIC systems must have trustworthy mediators to allow for better involvement from academia. Mediators in the form of digital online platforms are highly capable of fulfilling these requirements. Lee (1995) discussed the existence of a cultural difference between universities and industry as an early barrier for materializing the UIC concept; however, modern situation, with the aid of digital mediators, appears to be rather neutralized on the cultural difference.

The "open innovation" conceptual paradigm has similar characteristics to the ideology of INCLUDE O3 (Becker and Eube, 2018). Its purpose has been to integrate universities and businesses in the digital age. They have accentuated the importance of government involvement in projects collaborating universities and industry, bringing out insights from the triple-helix approach by Etzkowitz et al. (1995). According to their definition, open innovation is a national system and the authors of this paper believe such systems are

beneficial for addressing community-based problems. With that, the authors feel that open innovation is suitable for addressing DRR problems because of its community-based nature. Becker et al. mention that, in addition to trust barriers, differences in overall objectives between universities and industry hinder such collaborative systems from achieving success.

Given the above, modern collaborative learning platforms, such as cMOOCs (connectivist massive open online courses), are suitable candidates to play the mediator role in open innovation, providing "corporate learning 2.0" for German language, as an example. cMOOCs have therefore become an interesting model for the proposed learning platform. See pages 5-10 for a detailed review on cMOOCs.

Methodology

The process of the development of the proposed cMOOCs platform consists of several steps:

1. An internet search for existing online learning platforms with a screening process (a reduction method) based on the project's definitions.
2. A review of academic literature on cMOOC platforms.
3. Feature extraction and matching framework between existing and proposed solutions.
4. Designing the system.
5. Developing the prototype software application.
6. Collecting feedback from a pilot workshop revealing the platform and improving the prototype for a finalized system.
7. Launching the platform in main stakeholder workshop and collecting feedback

Step 1

The purpose of step 1 was to identify suitable online education platform/s that can be adapted to our research project and to extract features of the selected platforms to develop INCLUDE O3 platform. As online learning platforms are somewhat common on the internet, it is arduous to select those with features meeting INCLUDE project's O3 criteria. Several websites provide aggregated lists of online learning platforms, which present an effective route for meeting the O3 criterion. However, many of these platforms are built for either corporate training environments or as conventional online course providers. Moreover, a considerable portion of platforms target high-school education levels, which are not relevant for this project. However, using a carefully constructed reduction method, the research team generated a list of important features to include in the platform system design. Figure 1 depicts a flow chart of the reduction method used for platform filtering operation.

In the first phase, a basic internet search was carried out to identify the current available platforms. Three of the selected websites list online learning providers related to universities or industry. Class Central and MOOCLab generally contain higher education course providers that are of Massive Open Online Courses (MOOCs) type. With MOOCs, there are two parallel ideologies: cMOOCs and xMOOCs. cMOOCs (as defined previously) resemble many of the collaborative learning features that are expected to be present in the currently proposed system. In contrast, xMOOCs are mostly of traditional curriculum-based, teacher-centric learning type, that describes many popular platforms, including Coursera or EdX. Class Central and MOOCLab contained a large number of xMOOCs, while E-Learning Industry contained various types of industrial learning and training platforms, in addition to several higher-education-related course providers. Many features available in platforms from E-Learning Industry can be categorized within the connectivist pedagogy; therefore, 225 platforms were identified that containing basic features of Learning Management Systems (LMS) and MOOCs.

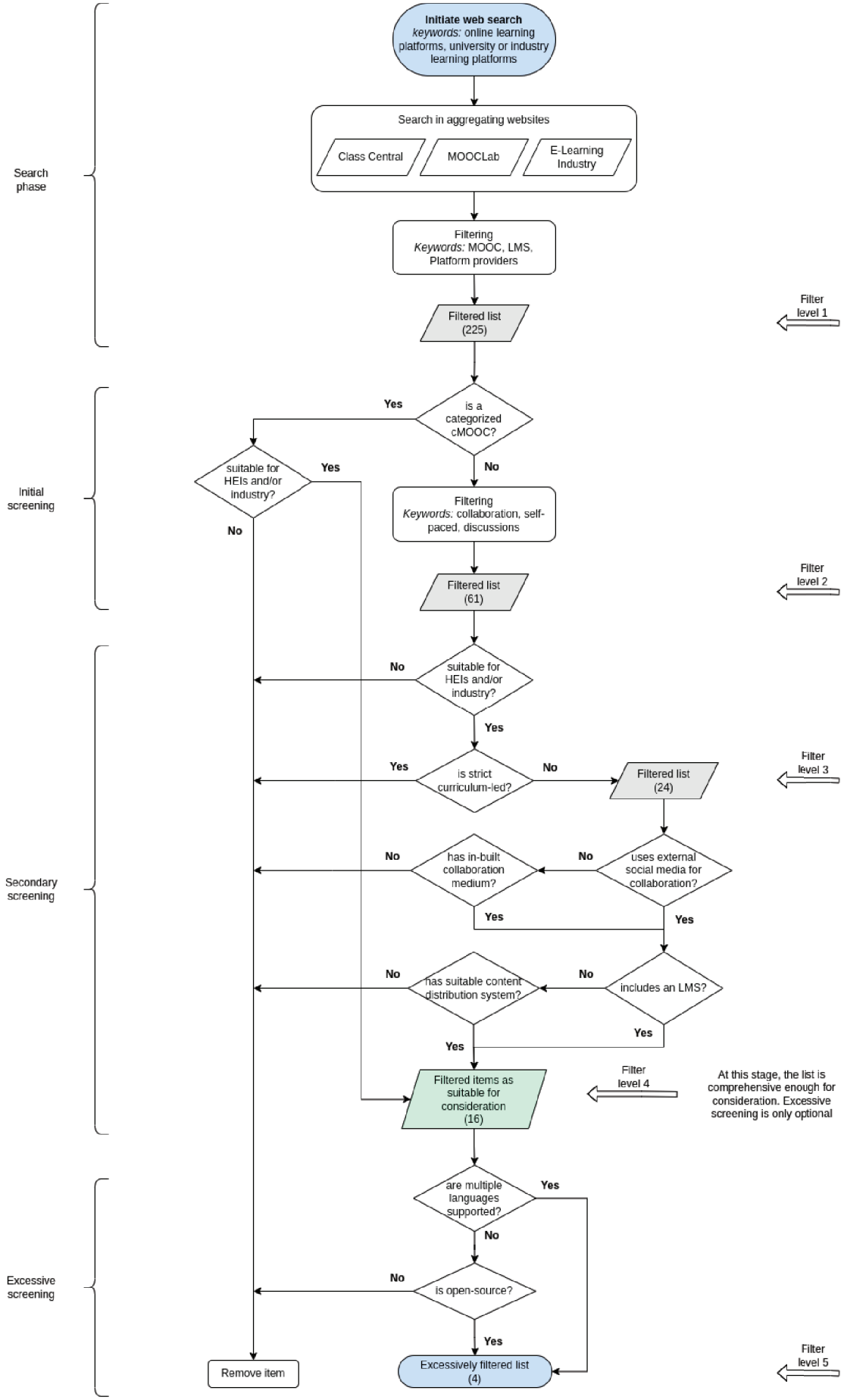

Figure 1: Reduction method to filter existing online learning platforms

Initial screening was applied on the selected list to identify platforms that are categorized directly as cMOOCs or have keywords related to connectivist pedagogy. The keywords included collaboration, self-paced, and discussions to identify cMOOCS that are not strictly certification-oriented, curriculum-based, or teacher-centric. 61 platforms were selected from the initial screening, mostly consisting of those from E-Learning Industry. Specifically, only 13 were from Class Central or MOOCLab; but many of the 61 platforms are homogeneous in nature, and it is therefore rare for platforms to have distinguishable features from the majority.

Secondary screening was more comprehensive and detailed, within which the authors have been able to determine a final list of collaborative online platforms suitable for INCLUDE O3 purposes and to extract features for the development of the INCLUDE platform. The first filtering criterion was the relevance to HEI/industry, thus systems built for first-cycle education (or lower-level education) were eliminated. This criterion is important because the proposed open education solution is expected to reach communities with more experience in higher education and disaster awareness. Secondly, the pedagogical aspects of the platforms are considered to establish if they are strictly based on a fixed curriculum. Therefore, the education providers that offer certification or degree-oriented courses are eliminated as they are in direct conflict with the connectivist pedagogy. The INCLUDE platform aims to attract as many participants as possible while providing a free space for knowledge dispersion and generation. Further to the connectivist features, the authors have evaluated the presence of socialisation mechanisms. Socialization has been an important element for open education to allow increased knowledge dispersion and generation. Many of the industrial training/learning platforms included a socializing mechanism integrated to the platforms themselves. Most common were discussion forums or chat rooms, while some provide capabilities to create groups of participants within learning content specific channels. While these are not strictly "open" (because they are integrated within the web sites and limited to intranet), their relevance to proposed solution are assessed. Finally, those with a suitable learning content management and distribution mechanism (like an LMS) were selected. Although the social learning mechanisms are involved, in such industrial learning platforms, participants who do not possess essential preliminary knowledge on the concepts of discussion tend to struggle with collaboration. Therefore, it is a necessary requirement to have a mechanism where educators can share knowledge by posting essential learning materials in the form of videos, images, or texts in the early stages of the course. In addition, an unconventional LMS can be beneficial for universities to share research data and publications. As a requirement of the INCLUDE project, the proposed platform is expected to provide multilingual proficiency to reach local and underrepresented populations. In addition, the authors expected to gain advantage from open-source software projects to aid development of the platform. With the inclusion of two final elements (i.e. two filtering elements in the excessive screening stage), the reduction method has been extended with an optional excessive screening stage, in which it evaluates whether the filtered platforms contain multilingual capabilities and/or are open source. However, out of 16 platforms suitable for feature extraction, only 4 were able to get through the excessive screening.

Step 2

The purpose of Step 2 was to carry out a literature review on online education platforms and their relevant features. Searching through the academic literature for findings associated with open online education tends to return a set of heterogeneous results. The authors were cautious to pick a set of keywords that accurately represent requirements of the connectivist paradigm defined within INCLUDE O3. The literature search was carried out entirely on Google Scholar (to search for peer-reviewed articles) and the keywords used were: "cMOOC", "collaborative learning platforms" and "university-industry learning platforms". The authors have not specifically considered DRR aspects for this search as learning platforms in general can be used for learning any subject. Furthermore, resources are extremely scarce relating to DRR and open

learning. Thus, developing a platform including connectivist features and doing DRR-specific customizations accordingly has been recognized as the most feasible approach. The features identified were broken down into the 5-layer architecture as shown in Table 1.

Table 1: The 5-layer architecture

Layer	Features
Layer 1 – Underpinning Principles	They are Improving Access & Connectivity, Sustainability, and Emerging Technologies (ISE). Improving access and connectivity highlights the need for providing learning material free and in local languages to underrepresented communities. Improved connectivity promotes university-industry alliance and collective innovation. *Sustainability* is achieved through changing perspective towards digital learning and participatory engagement. *Emerging Technologies* such as Drone Technology, Virtual Reality etc., and their application in DRR to improve disaster resilience is promoted.
Layer 2 – Computing & Middleware	Defines system requirements for the platform. System scalability (ability to add computing resources), *c*oncurrency (ability to run multiple web applications), and accessibility from around the globe are required for the proposed platform. Therefore, cloud computing and storage technology is envisaged. Server technologies required to implement cMOOCs such as Nginx or AMP (Apache, MySQL, PHP) would also be defined in this layer.
Layer 3 – Resource Management	Data used in cMOOCs such as instructional videos, course material, user data, and corpus services for multilingual support will be implemented in Layer 3. It will also be possible to access teaching resources stored in this layer by the research repository implemented in O5.
Layer 4 – Functional Services	Functions required for delivering effective learning are implemented in this layer. These may include site management, user management, course management, groups/forums, chat rooms, assessment, feedback, questionnaires etc.
Layer 5 – User Interface	Portability (ability to use with multiple operating systems) is an important requirement in improving accessibility. Thus, the platform is designed to support multiple user devices (PCs, Smart Phones and Tabs.) and operating systems (Linux, iOS, Android, Windows).

Online education is not a novel medium for today's learners. The most successful form of mass online education format has been MOOCs (e.g., Coursera, EdX, Udemy), which have been there for over two decades to date. However, the main ideology behind MOOCs is conventional instructivism, *aka* teacher-centric education (MOOCTalk by Keith Delvin, 2020). In contrast, connectivism is the latest educational paradigm introduced into MOOC systems by Siemens and Downes (2008) in their online course "Connectivism and Connective Knowledge" (CCK08). The primary concepts behind the CCK08 (and similar courses) are: (i) learner-centric education, (ii) collaborative learning and (iii) new knowledge generation instead of tacit knowledge absorption. To facilitate their concept, they have integrated a social learning form into the platform in which users collaborate and communicate with each other to share knowledge and generate new knowledge. According to Fini (2009), CCK08 mainly consisted of blog posts,

as participants used to blog about the new knowledge they learned. CCourses is another collaborative learning platform majorly based on blogs, with some integration of other social media, such as Twitter or Facebook. As commonly identified with the prefix "collaborative", these (c)MOOCs have evolved over the past decade to become an established learning methodology within HEIs and corporate environments.

An alternative open learning platform is DS106, initiated by the University of Mary Washington, USA and accessible from the web, the platform was tested within 3M, a US multinational corporation. The purpose of the course was to build community and collaboration through effective communication skills (Lockridge et al., 2014). However, Lockridge et al. have not identified DS106 as a MOOC due to its smaller participant community, but as an open online course (OOC) for distributed learning. DS106 was hosted by a public university while being centred within the 3M corporate intranet, hence suited for our first criteria, that is, HEI/industry friendly. However, DS106 had in-person weekly meetings to distribute weekly tasks, which were frequently carried out collaboratively via blog posts. To increase engagements with external participants, they have also utilized remote forms for conferences. Several limitations have been identified with the DS106 model, reducing its alignment with INCLUDE's O3 criteria such as: (i) lack of exposure to public audiences, (ii) use of physical meetings, (iii) no evidence for collaboration between university and industry, and (iv) limited use of active social media.

Yeager et al. (2013) implemented a purer cMOOC for learning "Creativity and Multicultural Communication" (CMC11). The cMOOC was a purely social media-based open online course, which recorded 515 registrants. Despite the somewhat small number of registrants, 362 of the participants were still engaged in the course 17 months after its commencement. Such data highlights important aspects of connectivist learning courses, demonstrating that they should not contain formal learning boundaries or time frames, but rather freely evolving learner communities. This platform was built around a central data aggregator mechanism, which collects shared knowledge data from the previous day from all forms of social media (often shared using the hashtag #cmc11 on Twitter) and blogs to summarize into an item called 'newposts'. The 'newposts' were distributed among all participants, sharing insights on important discussions, and encouraging active engagement. The authors believe such mechanisms to increase active learners are beneficial for the sustainability of the platform. Yeager et al. also demonstrates an impressive number of 67 blog posts published during the course, which should act as a key element in new knowledge generation.

Another form of cMOOCs with a slightly different architecture, MobiMOOC, was presented by Rodriguez (2014). According to Rodriguez, MobiMOOC only used a centralized web page and mailing lists as the connectivist feature. They utilized google groups to maintain mailing lists and the web page was used to structure the course by providing a curriculum in the form of a 'tree'. The 'tree' was used to distribute learning load through the duration by scheduling more topics towards the later part of the course and fewer at the beginning. Rodriguez states that it is essential for all participants to reach the same understanding of the topics before more complex learning takes place. Their numbers show initial registrations of 490 and 648 in the central wiki page and the mailing list, respectively. The critical aspect Rodriguez has focused on their paper is the contribution of lurkers (slient parcipants who only consume knowledge), mentioning the importance of active participants in connectivist courses. In fact, only 5-6% of participants were actively involved in the course during the second and third weeks of MobiMOOC and they mention the 'tree' structure had been the main reason for the diminished activity due to dispersion of the community along the tree's branches.

A more sophisticated cMOOC with increased participation was launched in 2013, 2014 and 2015 under the name CLMOOC – a name derived from its topic "Connected Learning MOOC". CLMOOC occupied a concept called Make Cycles, which is different from traditional modular and non-modular curriculums.

CLMOOC was presented in the paper by Smith et al. (2016), and the paper states Make Cycles as "open-ended invitations to make, compose, play, learn and connect". Sharing the content that was made and how they were made during the cycles were central to the ideology of CLMOOC. CLMOOC followed the first format defined by Rodriguez in MobiMOOC and contained weekly newsletters that posted invitations to make and reflections on what were made. CLMOOC has utilised many social media in both real- and non-real-time forms of collaboration with Twitter, Facebook, and Google Hangouts (for real-time video chats). They have recorded 2950 participants, 27743 tweets, 2521 and 239 members in Google+ and Facebook groups respectively. CLMOOC's numbers demonstrate that, with better structure, organization, and openness, cMOOCs can attract wider audiences and longevity, which are two main objectives of the INCLUDE project's O3.

Unlike the cMOOC platforms reviewed above, INCLUDE O3's proposed learning platform will be beneficial for local communities and organizations, as effective DRR is only possible through awareness among the public. Non-governmental organizations (NGO) and local communities can spread awareness effectively, typically more effectively than universities or corporate organizations. On the other hand, tacit DRR knowledge transfer must be made through HEIs via conventional LMSs or traditional MOOCs. Tacit knowledge transfer is critical to form the foundational knowledge before collaboration is initiated. However, generating new knowledge is equally or more important than tacit knowledge in DRR education due to the fast-changing nature of the globe and its disasters, hence the requirement for collaboration. We expect that once the platform is implemented, clusters of communities will be formed when collaborating, due to the varied nature of disasters in different parts of the world. We identify popular social media including Twitter, Facebook and YouTube will be important for new knowledge generation and sharing within the connectivist paradigm, as they are easily accessible from anywhere. However, we have identified the need to consider other types of collaboration mediums during the system design process.

Step 3

The next step, following the platform filter and academic literature review, is to develop a mechanism to effectively align features of existing platforms against the proposed INCLUDE O3 requirements. For this, a matching framework has been developed, as depicted in Table 3. The authors have accumulated features from Steps 1 and 2 to develop the matching framework. The features listed are compared against the 5-layer architecture presented by INCLUDE O3 for matching. The expected outcome from this framework is to derive the list of features that should be compatible under each layer within the 5-layer architecture, which are later used in the system design stage. In the below table, the first column explains the features of the existing platforms (extracted from Steps 1 and 2), the next 5 columns of Table 3 are the 5 layers as defined previously. Next, the "relevant" column identifies newly identified features that are relevant for the proposed O3, but undefined in the existing project description. The last column lists features that are identified in existing platforms but are irrelevant for O3, given the platform requirements/descriptions.

Table 2: Matching framework – Features of existing platforms vs. O3 requirements

Features	Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Relevant	Irrelevant
Open with massive crowds or organization-based with limited audience	✓						
Suitable for higher education and beyond	✓						
With or without predefined curriculums	✓						
Learning materials management system - video lectures, readings			✓				

Task-based learning - these tasks help learners create new knowledge contents in the form of blog posts, videos etc.						✓	
Administrators, facilitators and learners				✓			
Weekly meetings (by in-person or video conferencing)						✓	
Cycles of learning - a single course runs a multiple cycle							✓
Blogging (using external blogging sites) to share in-depth knowledge				✓			
Tweets for knowledge dispersion on larger audience				✓			
Facebook & Google+ groups to discuss topics of common interests				✓			
YouTube/Tumblr to share multimedia				✓			
Weekly newsletters distributed to keep everyone updated						✓	
Course facilitators initiate discussions within social media						✓	
Course facilitators are more involved for tacit knowledge distribution in the beginning				✓			
Learners invloved in discussion forming and other teaching-related functions later in the course	✓						
Courses tend to continue in social media further beyond the official end dates						✓	
Formation of several learning networks/communities within the same course network	✓						
Content aggregation and distribution mechanism - e.g., gRRShopper from #change11				✓			
Feedback collection mechanisms for the improvement of the system				✓			
Multilingual	✓						
Built for use within corporate employee training/learning environments							✓
In-built & course-specific discussion forums				✓			
Internal chat/direct-messaging services				✓			
In-built, custom socializing platforms where users can create and maintain their own social profiles							✓
Gamification features to enhance user activity and retention							✓
Capability of creating groups of users within the platform						✓	
Micro learning/curriculum nature with flexibility for users to create their own learning path and schedule							✓
Blended learning							✓
Capability to share content on external social media			✓				
Internal space for blogging							✓

Create learning channels/spaces where users can collaborate and communicate about specific topics				✓			
Mobile learning					✓		
Collaboratively edit content posted on internal sharing platforms						✓	
Sophisticated tools to build learning content (authoring tools)						✓	
Peer reviews	✓						
Analytics capabilities						✓	
Integrated/external social media	✓			✓			

In addition to the above, the authors have derived another list of standalone features from the Output 3's definition under 5-layer Architecture (see Table 4). These features are derived by using the description of output 3 and excluded features that coincide with the ones in table 3.

Table 3: Derived additional features under 5-layer Architecture

Layer 1	**Layer 2**	**Layer 3**	**Layer 4**	**Layer 5**
Formation of clusters of users	Scalability	Sensitive Content securing mechanisms	Administration roles and a portal for central management of website	Cross-platform accessibility
Manage multiple institutional access through an admin portal	Concurrent and fast access	On-site multilingual translation services	Users and roles management capabilities	Easy to use and attractive user interfaces
Different roles assignable to users		Integration with external data repositories	User permission assignments	
Ability to retain more active collaborators			Course management capabilities for facilitators	
Becoming popular on the global stage				
High presence within social media				
Real-time video streaming capabilities within the platform (emerging tech.)				

Step 4

The features identified and derived in Tables 3 and 4 have been considered for the next step of the methodology- designing the system. To outline the system design, all features are categorized according to their behavioral and functional characteristics. From here, all 30 functional features are selected for inclusion in the final system design excluding the behavioral features because only functions are needed at the designing stage of the system and behavioral features are achieved when using the system. In addition, there are 17 other behavioral features making the total list of features 47. Table 5 displays the final list of

functional features and their functionality category. The 6 functionality categories were aligned with the INCLUDE Output 3 baseline description and based on the nature of features.

Table 4: Final functional features

Feature	**Category**
Multilingual	Accessibility
Scalability	Accessibility
Concurrent & fast access	Accessibility
Cross-platform	Accessibility
Good user experience and interface	Accessibility
Manage multiple institutional access	Administration
Content securing mechanism	Administration
Central admin and management portal	Administration
Course management facility	Administration
Feedback collection mechanism	Analytics
In-built user activity analytics capabilities	Analytics
Blogging capability	Connectivist Concepts
Tweets, Facebook groups, google+ groups, YouTube, Tumblr	Connectivist Concepts
Newsletters	Connectivist Concepts
Content aggregation and distribution mechanism	Connectivist Concepts
Integrated & course-specific discussion forums	Connectivist Concepts
Internal chat services	Connectivist Concepts
Capability of creating groups of users within the platform	Connectivist Concepts
Sharing capability with external social media	Connectivist Concepts
Create learning channels where users can collaborate and communicate about specific learning content	Connectivist Concepts
Collaboratively edit content posted on internal sharing platforms	Connectivist Concepts
Peer reviews	Connectivist Concepts
Ability to form clusters of user networks	Connectivist Concepts
With/without predefined curriculums	Learning Management
Integrated LMS	Learning Management
Sophisticated tools to build course content	Learning Management
Emerging technologies	Learning Management
External data repository integration	Learning Management
Different user roles (admin, facilitator, learners)	User Management
User management portal	User Management

The hub-spoke diagram (see Figure 2) is a graphical representation of the final features list, where each feature extended from its respective category.

Figure 2: Hub-spoke model of the final features overview

Technological considerations for system design

Out of the six functional categories mentioned above, *accessibility* and *security* have the largest impact on infrastructural aspects of the design because system scalability and availability (technical terms describing how large an audience can access the system without issues in any given point in time) are largely affected by the type of infrastructure used while the same is critical for providing security for underlying data and resources. User interface/experience (UI/UX), cross-platform and multilingual elements demand quality in the outermost layer of the system design, while scalability and concurrent/fast-access elements speak for the inner-most layer. In contrast, good coding techniques and frameworks are effective in delivering a robust outermost layer while physical infrastructure resources for hosting the platform must be held responsible for the system backbone. However, for best practices in security, both outer layer and innermost backbone are equally decisive. Listed below are the **technological choices** made during the system design phase after careful consideration of aforementioned details.

- Website user interface
    - JavaScript – undeniably critical for web applications.
    - HTML and CSS – undeniably critical for web applications.
    - Laravel Blade – a framework compatible with the backend code.
- System backend
    - PHP Laravel – highly popular, secure web framework suitable for our use case.
    - MySQL – highly popular database engine, seamlessly compatible with Laravel.
- Infrastructure
    - Azure VM – widely used, highly available and highly scalable cloud server infrastructure from Microsoft Cloud Services. This is a GDPR compliant service that is secure and trustworthy to be used in research.

Importantly, during the design phase, we have evaluated the findings from INCLUDE Output 2 (O2) team from the Lund University of Sweden. We have made sure to incorporate the 8 core principles defined within the O2 report as below.

1) Inclusivity: Our proposed model has inherent characteristics to provide unrestricted education for every learner across the world through openness of the model. In contrast, any participant joining a learning course are not necessitated to fulfil any pre-defined demographic or geographic criteria. It is completely open and free of charge for everyone, and we have made sure the inclusivity is well retained within this model
2) Flexibility: Even though our system is centralised within this platform, it provides fully asynchronous learning. The fact that no course forces learners to obtain certificates or complete a course within a timeline ensures the asynchronous nature. Also, integration of external social media allows more flexible means of engaging in the conversations. Moreover, the newsletters feature allows participants with limited internet access to receive knowledge via less sophisticated mediums like emails or postal services. It is up to the course facilitators to handle these arbitrary mediums of knowledge dispersion and the required facilities are made available within the platform.
3) Accessibility: This is also a major design aspect we have considered within our hub-spoke model ensuring better accessibility for course learners across the globe
4) Interaction based: Core principle of our model is based on connectivist learning paradigm, which inherently allows high levels of user interaction in learning and knowledge generation
5) New technologies: We have not put extra effort into integrating new technologies but via the video posting mechanisms, we believe novel drone technologies (specifically live video streams) can be attached to the courses. We expect future studies in this learning model to better integrate AI and other latest technologies to improve learning experience.
6) Co-created/Feedback based: We believe this criterion is also fulfilled by the connectivist nature of the model. In addition, our system allows courses to be co-hosted by multiple facilitators and new knowledge is also considered to be co-created by all participants and we introduce that as knowledge generation. Also, the ability to comment and reply comment on each new *post* by learners is a way of receiving feedback on their content. However, proper feedback mechanisms in relation to courses, would-be important additions.
7) Privacy considerations: Our platform has ensured full privacy of its users through adherence to GDPR guidelines and the IT infrastructure we have utilised are fully conformant with user privacy considerations. Further, access restrictions and permissions mechanisms integrated within this platform allow better security against any sensitive resources hosted within the platform.
8) Learner centred: The utmost important and the core concept of our model is learner-centric education, and we ensure this criterion to be utterly fulfilled.

Step 5

We have developed the platform according to the design and technological considerations, and it is hosted on Azure cloud platform under the public IP (internet protocol identifier) http://108.143.135.119. Under this section, principal elements of the platform are described, with snapshots included for visual aid.

Learner's landing page

This is the web page (see Figure 3) where anyone who joins the platform will arrive after registration. From here, the learner has facilities to browse or navigate to a desired course, just like in conventional MOOC platforms (e.g., Coursera). In addition, learners can apply to become a course facilitator by submitting a registration form, enabling them to host new courses.

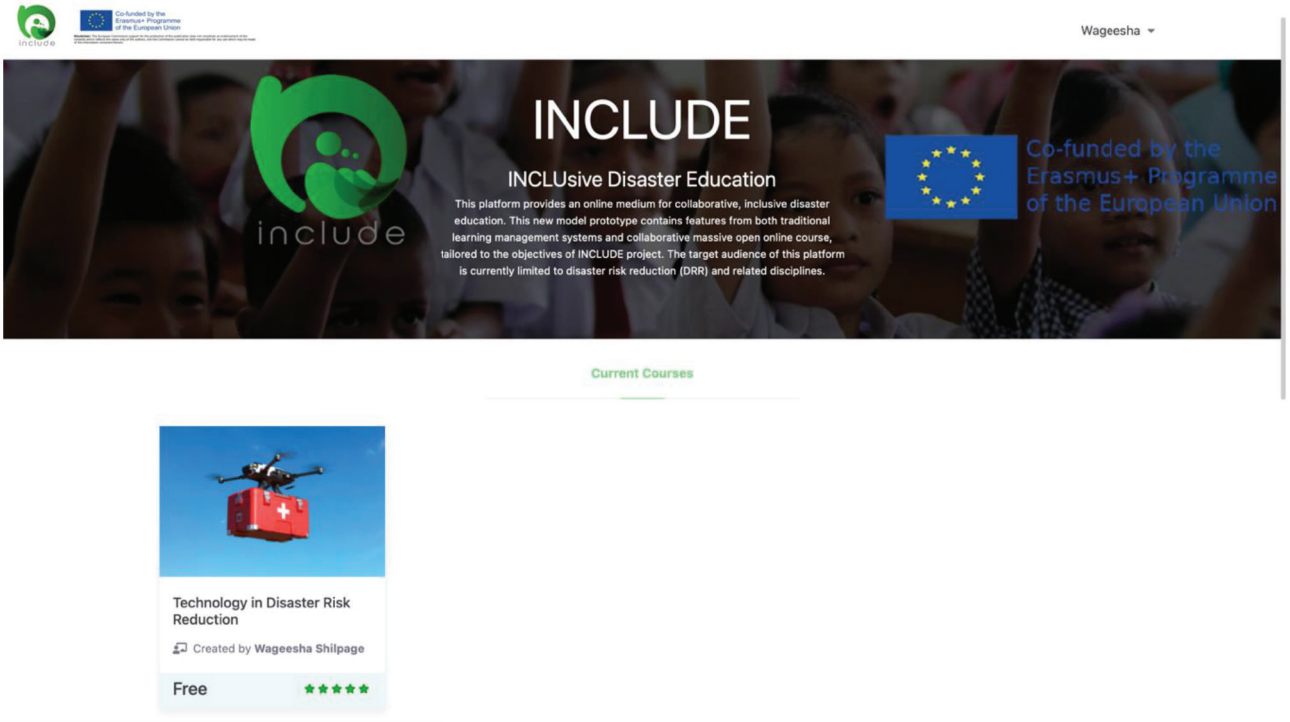

Figure 3: Learner's landing page

Facilitator's portal

Every course facilitator is given access to a personal course management page (Figure 4), where they have control over every course they facilitate and several other functional features.

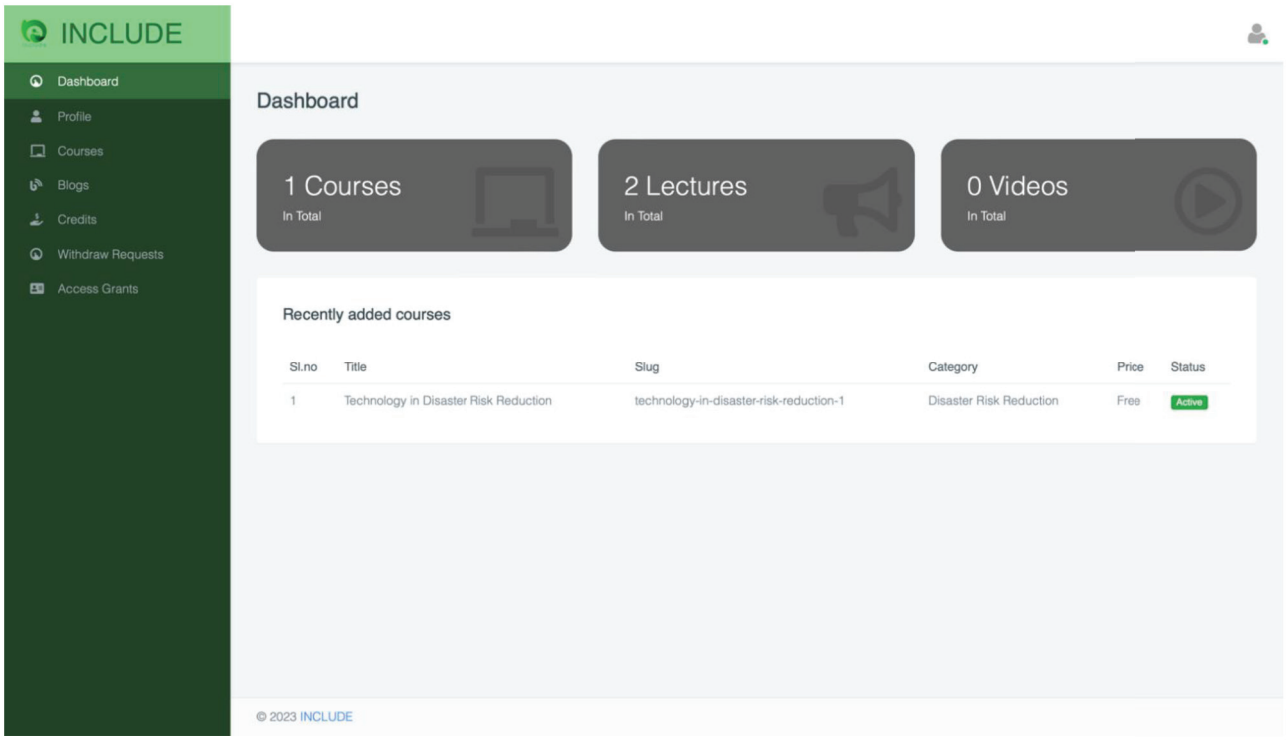

Figure 4: Facilitator's landing page

Course content edit pages

Within a facilitator's portal, they can add or edit content belonging to a given course. Just as in a conventional MOOC platform, they can create course structure by adding/editing course content. They can add textual or media content to the course under any number of sub-topics. However, currently, we do not display all the content facilitator can add to a course, except for the primary description. This is because the novel connectivist paradigm we have adopted in this model does not require detailed course structures and learners only see the course titles and sub-topic descriptions before engaging in social discussion within the course. Student-centric content generation is highly encouraged from this model; thus, facilitator's activities are limited. However, two new features introduced in this hybrid model of connectivist learning are *course resources portal* (Figure 5) and *social media content portal* (Figure 6) which are used to add/edit classified or unclassified resources and content related to external social media. Course resources portal help integrate academic/research study support to the portal by allowing researchers/academics add important resources into courses under restricted access privileges and social media content portal adds support for integrating external social media content within the platform. This content will be displayed within the main course discussion pages for learners to access.

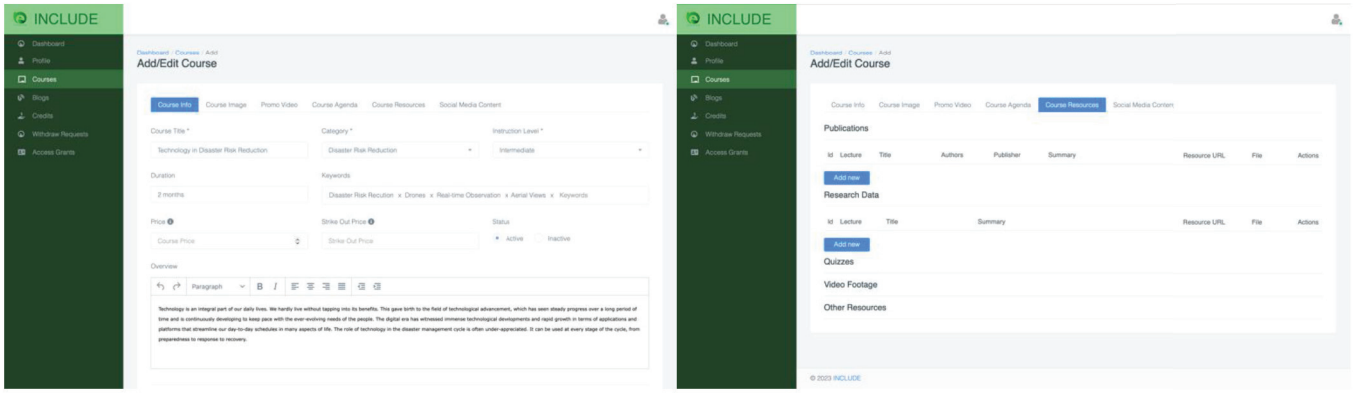

Figure 5: Course content and resources editing pages

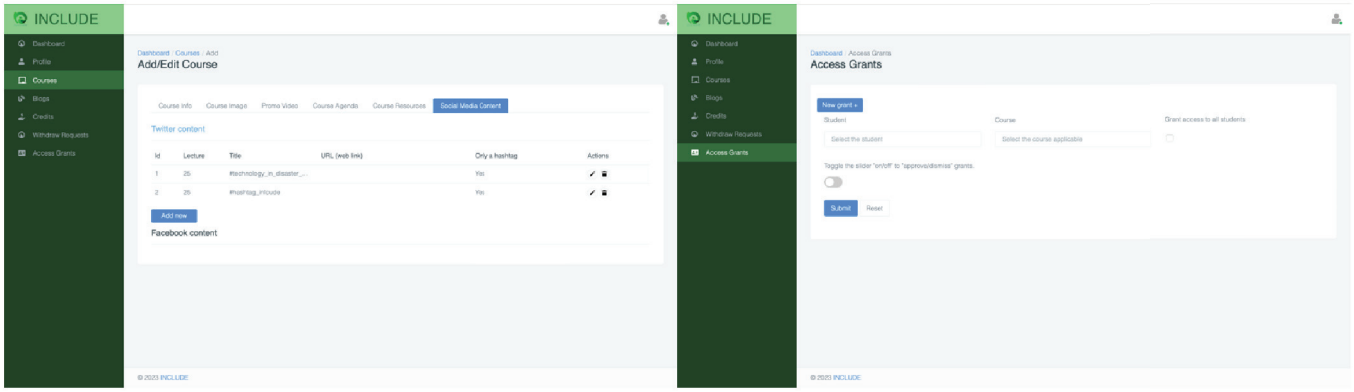

Figure 6: Social media content editing and special access granting pages

On an additional note, facilitators can grant special access to students who request to view classified course resources (e.g., special publications or research data). Once access is granted, those students have the privilege to view special course resources in addition to engaging in social discussions.

Course learning

Once a learner navigates through a course, a high-level course structure (Figure 7) is displayed with the sub-topic descriptions added by the course facilitator. These descriptions help learners to grasp the idea of the discussion involved. Under the course structure, they have the facilities to read/add topic-related blogs (published by both students and facilitators) or directly join the course discussion within the integrated discussion portal.

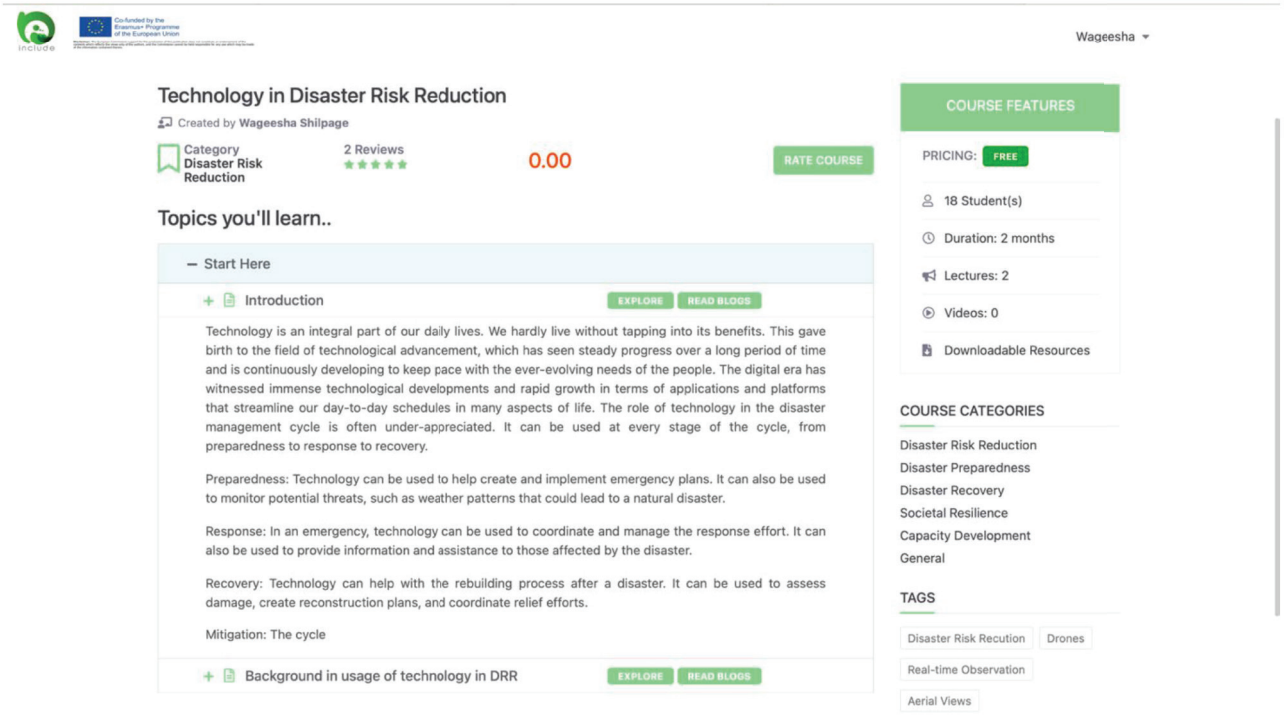

Figure 7: Course structure view page

Course discussion page, referred to as the ‘course feed’ is a newsfeed-like learning feature where learners can socialize with other learners to generate new knowledge and share among themselves. Within the course feed page, learners have the facilities to publish new posts of various formats. These formats include: (i) textual content, (ii) video/live-stream content form YouTube, (iii) images with texts or (iv) Tweets.

Depending on the evolving pattern of this model, there can be other types of content included in the feed. Similar to other social media, these posts can host individual discussions of their own about the content in the given post and learners can comment or reply-comment their ideas, questions, etc.

As shown in Figure 8, the right panel of the course feed page hosts a section for popular social media, for example, Twitter (Figure 9) and Facebook. The content displayed here are updated by the course facilitator within the facilitator portal. A striking feature in this social panel is the inclusion of Twitter hashtags, which allow participants to engage in a global discussion via twitter by using the same hashtag for a given course. This enables the course to grow beyond the platform itself and reach a global community. The same hashtags can be used to invite communities to join the platform.

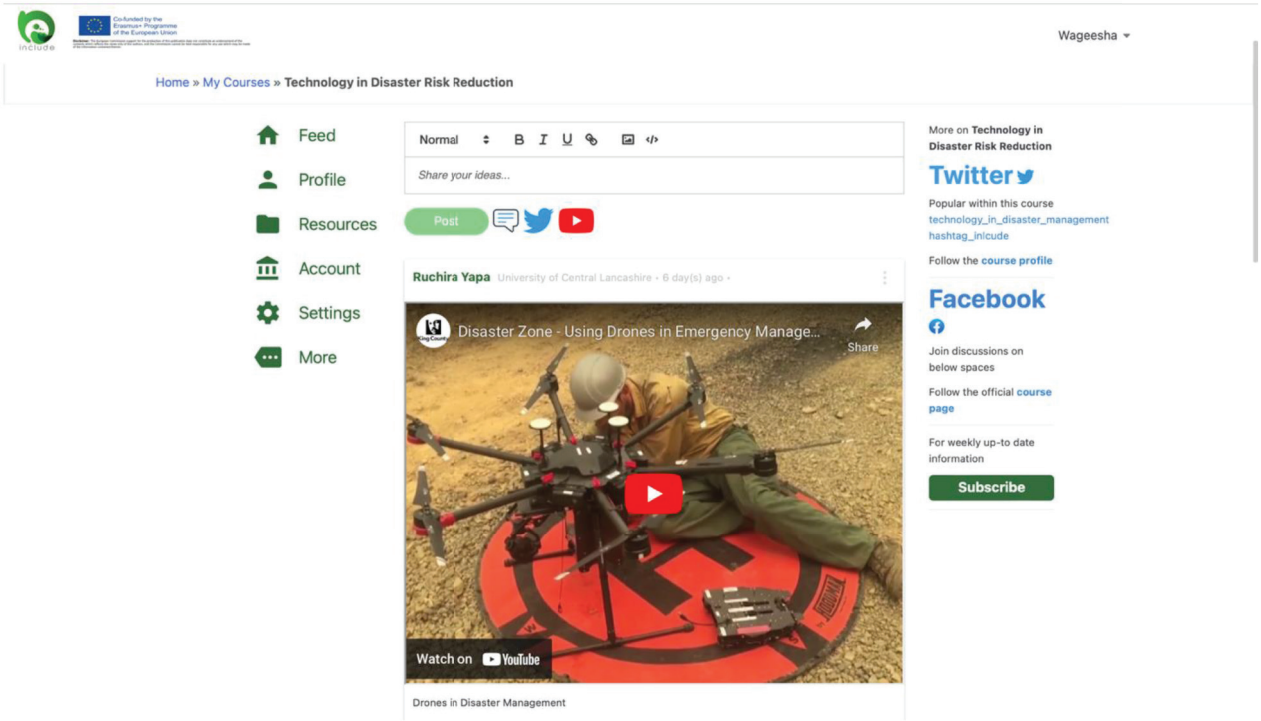

Figure 8: Course feed page with a YouTube video shared

An additional novel feature introduced in the platform is the course resources section (Figure 10), in which learners have access to classified material under special access privileges granted by the course facilitator. Students who need access can contact the course facilitator by an email requesting permission to access. The facilitator can in turn grant them access to resources by using the facilitator portal. Resources in this section include publications, research data, video footage, quizzes, etc. Due to sensitivity involved in these data, access to this portal is inherently blocked. Facilitators can upload content for the resources using the course edit feature explained previously.

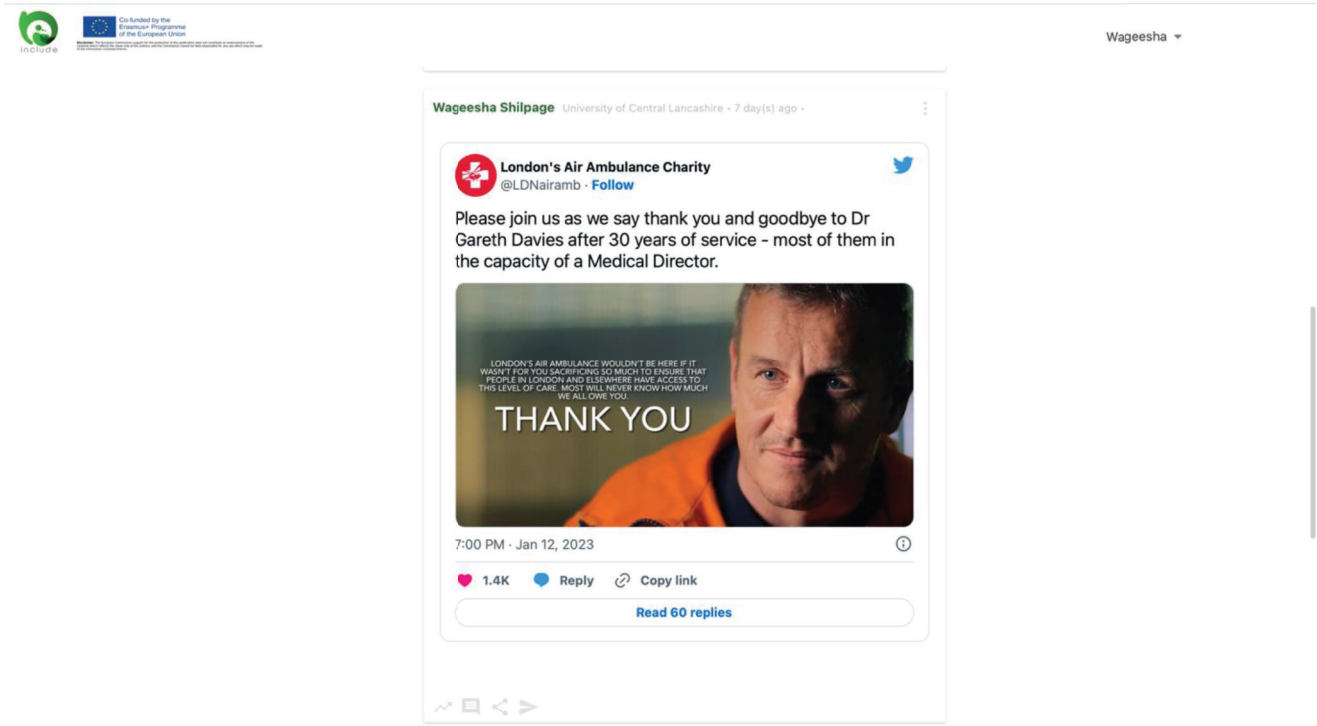

Figure 9: Course feed with a tweet shared

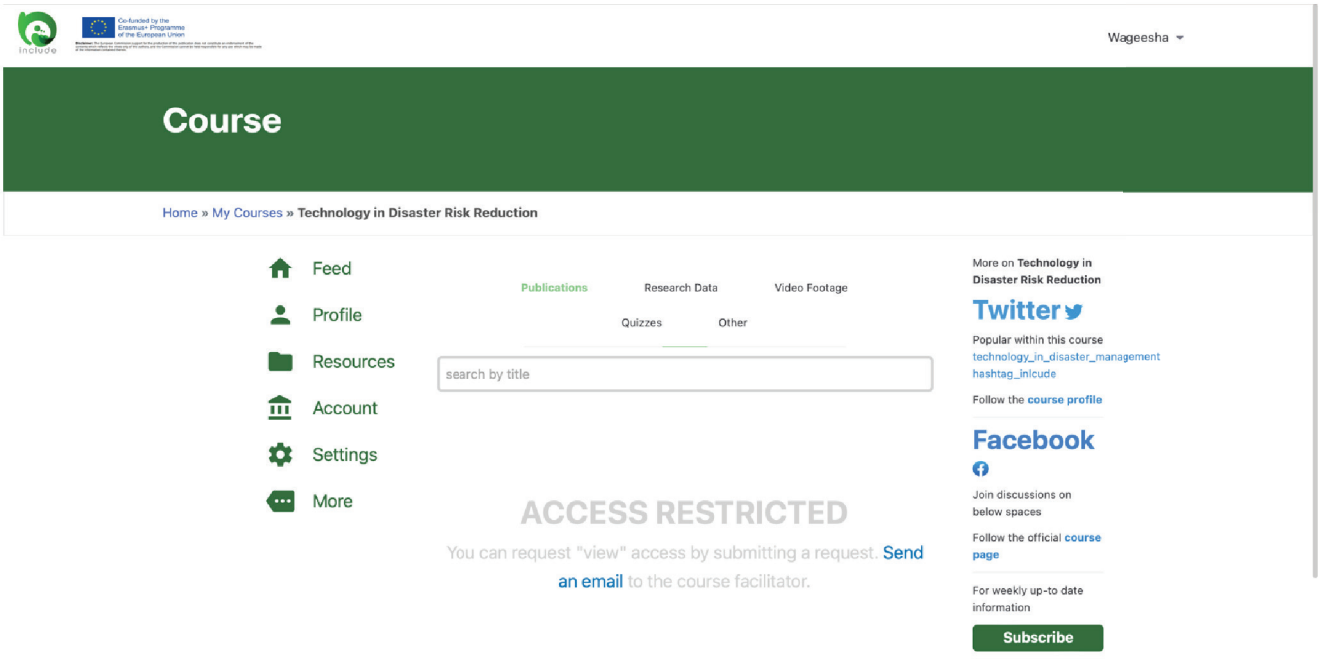

Figure 10: Course feed resources section

In addition to leaner and facilitator roles, there is the administrator role, which has all the permissions and privileges to manage platform-wide features. The administrator (Figure 11) can manage institutions (universities, industrial organizations, local community organizations etc.), users, user roles and permissions, and other miscellaneous elements.

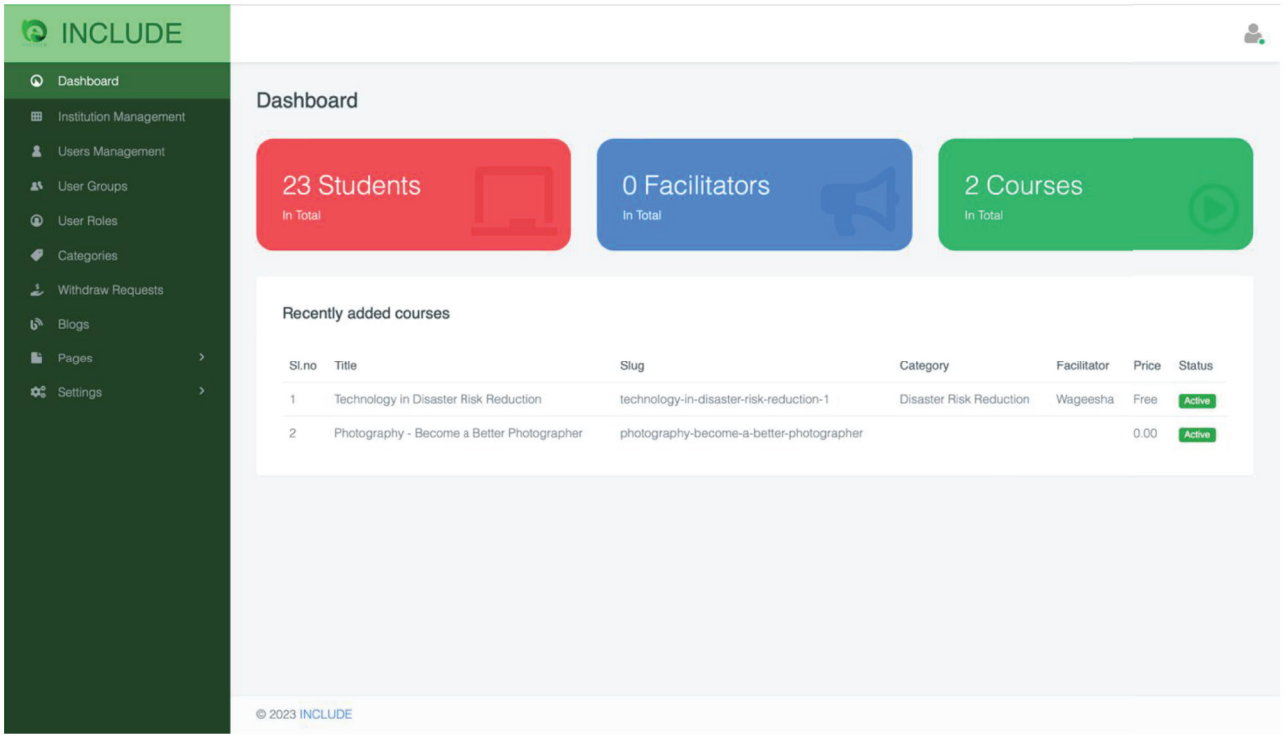

Figure 11: Admin portal and features

Step 6

As the final two steps of Output 3 process, improving the system with user feedback has been considered. We have hosted the Pilot Workshop for introducing the developed prototype and collected participants feedback on aspects to be improved in the platform, which are attached in the Annex a. The Pilot workshop was held on 19th of April 2023 with a participation base of mainly PhD students and a few academics. Further to that, we will be making some of the improvements suggested with consideration of the available time and expect to finalize an improved version of the platform before the platform launch workshop to be held on the 11th of May. Listed below are three of the important points gathered from the discussions of pilot workshop. We have been able to refine the model only using points 1 and 3 below given the tight timeline available and further refinements are possible to be done, including point 2 below, in the future.

1. An automatic or manual content moderation/filtering mechanism to avoid potentially irrelevant or harmful content being posted within the course feeds. The intervention to moderate content will be handled by the course facilitator and by the system administrator in more severe cases.
2. A mechanism to interconnect courses and sub-topics such that learners can easily navigate between similar conversations.
3. An anonymous content posting mechanism to allow introverted users to engage in discussions or ask questions from course facilitators

Step 7

As the final step of our methodology, we have conducted a stakeholder workshop, in the form of launching event of the prototype hybrid-cMOOC platform, on 11th May 2023. The feedback received during the workshop are attached to the report as the annex B. Since this was the final event of Output 3 work, we do not expect to further revise the platform by using the new feedback collected, but we want to highlight that this feedback will be immensely helpful for potential future work based on our model.

Summary and Conclusions

A majority of existing online learning platforms are essentially MOOCs, thus demanding teacher centric education and a single point of access. Popular MOOCs such as Coursera or Udemy provide the course structure, materials, and completion certificates to force the teacher centric learning and allow students to only *gather* the knowledge and not new knowledge generation. Furthermore, such platforms are restricted to a single domain or a website for accessing all the learning resources and provide a single point of access. Improving from this model, the novel cMOOC provides a learner centric education by eliminating the role of the teacher to grant power to the learner. Such models, as detailed earlier in this report, do not provide a single point of access. Although several models contain a domain of access (e.g., a website), they are distributed across popular social media platforms to upscale the learning and learner-network formation.

From the authors' understanding, the cMOOCs model alone does not provide a controlled nature and is extremely reluctant to stabilisation. Thus, we have designed the INLCUDE O3 platform to be a hybrid model of both MOOC and cMOOC models. This platform grants a limited power to course facilitators while allowing unlimited knowledge generation from learner centric education. By inclusion of access links to external social media, steps have been taken to ensure the formation of a large learner network outside of the platform, similar to conventional cMOOCs. However, as a special feature, this model contains in-model socializing facilities to provide single-point access to a wider extent. In contrast, learner centric model and network generation can happen within the platform itself, removing the necessity of external social media. In this model, the course facilitator has control over modulating a course structure without specifying the learning materials. This allows learners to follow a structured path to learning while having control over the knowledge being shared and generated. In addition to these primary differences, this model contains a few more attractive features suitable for multiple institutions and academia in general. The *course resources portal* provides an access-restricted means of distributing important research materials- DRR related data and multimedia as well as quiz facilities. Also, the platform administrators can regulate the institutions who have access to the platform, which is an important feature for multi-partner research and collaboration projects. These features are combined to provide a feasible, scalable, free, and open platform for communities across the world to develop inclusive education. This model/platform has the potential to enhance DRR related education and interest every other community-based education paradigm.

Participant feedback was collected through a pilot workshop after introducing this platform. The positive comments included the platform's ability to level-up the research partner collaboration due to their inherent basic knowledge about subjects making them easily navigate and generate new knowledge, as well as the involvement of the facilitator for regulating course structures. In addition, some feedback for improvements were also received, including a consistent content filtering/moderation mechanism preventing malicious users posting unrelated content within the social feeds and an anonymous posting mechanism for allowing introverted users to clarify and raise their ideas without being exposed to the public. Future comments will be expected to further improve this model by integrating newly suggested improvements and other important ideas that may come up in the future.

References

1 Agustan, A. and Kausar, D.R.K., 2019. Towards a framework for disaster risk reduction in Indonesia's urban tourism industry based on spatial information. *Geographia Technica*, *14*.

2 Aliperti, G., Rizzi, F. and Frey, M., 2018. Cause-related marketing for disaster risk reduction in the tourism industry: A comparative analysis of prevention-and recovery-related campaigns. *Journal of Hospitality and Tourism Management*, *37*, pp.1-10.

3 Awasthy, R., Flint, S., Sankarnarayana, R. and Jones, R.L., 2020. A framework to improve university–industry collaboration. *Journal of Industry-University Collaboration*.

4 Becker, B.A. and Eube, C., 2018. Open innovation concept: Integrating universities and business in digital age. *Journal of Open Innovation: Technology, Market, and Complexity*, *4*(1), pp.1-16.

5 Davenport, J.H., Crick, T. and Hourizi, R., 2020, April. The institute of coding: a university-industry collaboration to address the UK's digital skills crisis. In *2020 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1400-1408). IEEE.

6 Etzkowitz, H. and Leydesdorff, L., 1995. The Triple Helix--University-industry-government relations: A laboratory for knowledge based economic development. *EASST review*, *14*(1), pp.14-19.

7 Faulkner, B., 2001. Towards a framework for tourism disaster management. *Tourism management*, *22*(2), pp.135-147.

8 Fini, A., 2009. The technological dimension of a massive open online course: The case of the CCK08 course tools. *The International Review of Research in Open and Distributed Learning*, *10*(5).

9 Delvin, K. (2021) *Online education during a global pandemic*, *MOOCtalk*. Available at: https://mooctalk.org/2020/03/29/online-education-during-a-global-pandemic/ (Accessed: January 6, 2023).

10 Lee, Y.S., 2000. The sustainability of university-industry research collaboration: An empirical assessment. *The journal of Technology transfer*, *25*(2), pp.111-133.

11 Lockett, N., Kerr, R. and Robinson, S., 2008. Multiple perspectives on the challenges for knowledge transfer between higher education institutions and industry. *International Small Business Journal*, *26*(6), pp.661-681.

12 Lockridge, R., Levine, A. and Funes, M., 2014. A DS106 Thing Happened on the Way to the 3M Tech Forum. *Journal of Interactive Media in Education*, *2014*(2).

13 Mistilis, N. and Sheldon, P., 2006. Knowledge management for tourism crises and disasters. *Tourism Review International*, *10*(1-2), pp.39-46.

14 Ritchie, B.W., 2004. Chaos, crises, and disasters: A strategic approach to crisis management in the tourism industry. *Tourism management*, *25*(6), pp.669-683.

15 Rodriguez, C.O., 2014. MobiMOOC 2012: a new tree structure for the delivery of connectivist MOOCs. *Turkish Online Journal of Distance Education*, *15*(1), pp.41-49.

16 Shaw, R., Takeuchi, Y., Krishnamurthy, R., Pereira, J.J. and Mallick, F., 2012. Universities and community-based disaster risk reduction. In *Community-based disaster risk reduction*. Emerald Group Publishing Limited.

17 Smith, A., West-Puckett, S., Cantrill, C. and Zamora, M., 2016. Remix as professional learning: Educators' iterative literacy practice in CLMOOC. *Education Sciences*, *6*(1), p.12.

18 Twigg, J. (2015). *Disaster risk reduction* (New Edition). Overseas Development Institute.

19 Yeager, C., Hurley-Dasgupta, B. and Bliss, C.A., 2013. CMOOCs and global learning: An authentic alternative. *Journal of Asynchronous Learning Networks*, *17*(2), pp.133-147.

Annex A (participants feedback from pilot workshop on 19th April 2023)

Feed display

Is the feed shown chronologically, or by most likes? (How is it sorted?) **It is chronological, if an algorithm was used, the experience may be impacted, and the facilitator may lose control.** Should the feed be shown in a different way? Is there a control for this? - for example, a lecturer may pin the comment. If it does go off interaction, there could be a ranking system, so the lecturer would have a higher ranking, so their interaction has a bigger impact, and they have more control.

It would be nice make a flow chart/diagram to map out the literature- it is important to show specific posts fits in the literature- this would allow us to build a map of the literature. For example, like a mind map. As the system is set out in a linear way- would it be possible to set it up as a mind-map to see how all of the information is linked. **We could use tags to do this, so if somebody clicked on a tag, it would show all of the other posts (a word pool, or a network graph to show which words are often used together to see where the links are between the information).**

Content Moderation

How do you filter posts to make sure everything is related to the course. **This is the course facilitators responsibility and there is currently no filtering. The instructor has the power to delete a post.**

It would be great to have an autonomous course moderator. For example, can we implement a bot to filter the information on the page. **We can get access to existing platforms (API) which might be helpful.**

Are we going to include something to screen the information to make sure that all of the information is moderated before being posted? **Currently there is no moderation for the information, however, this is something that should be added. Therefore, the standard/quality of the content would be validated.**

Is it possible to kick somebody off the course? **It would be useful for the course leader to be able to remove people from the course if they are causing problems.**

We need a system to make sure that people are not abusive or sharing inappropriate content. **We need to think about what information students are allowed to share and what they cannot.**

Course Content

Because you are relying on learners to add the content- do you need to start the 'fire'? Should this be in the form of a lecture or a set of guidelines? All courses will start with information shared by lecturers, and a guideline about the information that is relevant to the course. The guidelines for the course will be different for each course. Perhaps there could be a module on how to use the platform. **Yes, this information would be included in the guidelines.**

Is there any way to anonymize comments? Some students may be uncomfortable asking questions if their name is attached. Could you have an area specifically for autonomous questions (questions could lead to threads) so that all of the most relevant questions are in one area. **We can introduce anonymised posting so that students feel comfortable posting or asking questions.**

Should there be a specific section for questions- so people can discuss the answers. **We could have a section with a Q&A section so that all of the questions are in the same place and people can see the answers.**

“Two potential strategies for the course design could be: 1. Mandatory tests could be an effective way to ensure that participants have a thorough understanding of each module's content before moving on to the next. By requiring a 100% score on the test, the course can ensure that participants are adequately prepared to handle the subsequent modules. Allowing unlimited attempts at the test is also a good way to ensure that participants have multiple opportunities to grasp the material before moving on.” - Do we need exams so that people can move through the course? **Maybe not, because the course is not rigid. However, we could have a hybrid approach so that some modules have examinations and some that do not.**

“2. Mandatory participation in forums in each module can help facilitate interaction and collaboration among participants, enabling them to share their insights and help deepen participants' understanding of the course material.” **Although it is great for students to participate in the course, passive learners will also be important in the courses.**

Should there be a way to ensure that students interact- maybe a badge system. **This could be useful to encourage student interaction without punishing students who are passive learners. The literature highlights that passive learners are important for this type of learning.**

General queries/feedback

Will the platform be used to broadening the knowledge of the students? **Yes. this is an important part of the connectivism paradigm as students are sharing information.**

Do we have feedback so that learners can contact the facilitators/other students about the information. **The quiz feature can be used for this (we can use this to obtain student feedback).**

Are the courses going to be free? **Yes, they are.** So, will the instructors be paid, or is this voluntary. **Currently, they are voluntary.**

It would be good if we incorporated findings from other projects, to add to the reflective practises. It would also be good if we can incorporate a quality benchmark to recognise students who have completed the course- a certificate for example. **(Malith has worked on other projects and may be helpful to direct us to this information)**

The system would be specifically good for postgraduates to find gaps in the research.

Would we be able to expand the system outside of DRR? **Yes, that would be possible**

One feature that could be added is a contributor score, maybe with a list to show the most frequent contributors (this can increase engagement)

It would be good to have a ‘hot list’ of topics to get an idea of the areas that people are discussing/interested in.

“This is just a suggestion, how about linking these courses to the professional institutes. DRR is currently a part of everyone's agenda and if these could be linked as a part of the CPD programs of the Professional Institutes all the relevant professionals can have the basic knowledge on DRR. Thank you and congratulations to the project team for this development.” **– the professional bodies have specific information to include, it would not be possible for undergraduates, for example, but it may be possible to adapt it for CPD.**

“The platform is really good and interesting. From the practice we are aware that students who enrolled are not always willing to give their 100% to the course. Therefore, depending on the content provided by the students may not be best way forward. There should be a moderating point where moderator need to involve more in reviewing the content. If no one doesn't want to provide any content the topics will be inactive or blank. as Daniel mentioned it is better to provide initial guidance. Moreover, there should be a mechanism of evaluation and monitoring as well. It is better to have a hybrid approach instead of totally depending on the content of student. Also, the platform should have more interactive approach for students and the facilitator to interact on the content for productive outcomes.”

Annex B (participants feedback from main stakeholder workshop on 11th May 2023)

General comments

"Great platform, Better than blackboard. Very friendly way to deliver courses and interactive. I like it."

"It is an excellent platform…it is novel, it is a good idea… and I congratulate all the people that have worked on it."

Main Themes

- Inclusivity
- Target Audience
- User Experience
- Evaluation
- Moving Forward

Inclusivity

In terms of inclusivity, it appears that you must be a member of an institution to enrol. Is that going to be changed?

Members must be part of an institution to protect the academic aspect of the platform, rather than it being another social media platform. We have inclusivity within the institutions, and anybody in any institution in the world can join.

Once somebody stops being a students, would they no longer be able to be part of the platform?

That is a good point.

Currently, there is no check for whether somebody is a member of an institution. Therefore, people may be able to login using their institution email, as long as the email still works. However, it is also important to consider that university email accounts expire after a length of time, so students may be allowed on the platform until their email account has expired. One development idea is to have a separate 'status' on the platform for students which can change once they are no longer students, so they are retained in the system. However, these individuals may need to change their email address to avoid the account expiring. Alternatively, students may join the module under a personal email, and verify their institutional membership using an alternative method, for example, their student card. On the other hand, it may be beneficial for students to leave the system once their student email account expired, as it ensures that all members of the cMOOC are part of a university or industry. It is important to note that, although this problem is relevant to university students, the platform is aimed towards both universities and industry.

Will you lose the learner-centric aspect of the platform by removing students once they are no longer part of an institution.

The platform does not automatically exclude students. If students have joined a module, it may be useful to allow students to stay in the module but under a separate 'status', as discussed above. Alternatively, it may be beneficial for students who are graduating to make themselves known to the administrator, so they are allowed to remain on the module. It may also be important for students to provide a valid reason as to why they should stay on, for example, if they are planning to continue their learning in the module or hoping to work in the industry. However, this process may be cumbersome.

How would people that require special adaptations (if you were blind, for example) engage with this platform? Does it have that facility?

Modern technologies can be implemented within the platform. For example, there are technologies that allow information to be read out for blind members. It would be important to include icons for users to click, so that information would be read aloud. There could also be an icon for people who need information translated into a different language.

Target Audience

Who is the target audience? Is it people who live in disaster zones?

The initial idea was for online education for the DRR community. It is great to be as open as possible, although there will be some restrictions in information that can be posted, for security reasons.

If people who live in disaster zones are part of the target audience, how would they join the cMOOC if they are not part of a university or industry?

There may need to be a separate global institution (or something similar) that people could join to ensure that they can join the cMOOC if they are in a disaster zone. Alternatively, people in disaster zones could sign up to the cMOOC using their personal email account, and then be provided with a student or industry account to continue using the platform.

Has anyone thought about running these workshops for communities affected by disasters?

We have not done this yet. It makes me feel uncomfortable that we are offering a solution to the communities affected by disasters but are also seeing the communities as a problem as well. It would be beneficial to look at the work done in the US by Femur, where emergency planning includes the communities.

If the target group is community, we may need a better idea about what the community needs. It would be best to trail the system with students or researchers, and then open up the platform to the target group to ensure that the system is working effectively before opening it up to the community.

There seem to be mixed perceptions about what the purpose of the platform is. Depending on the purpose of the platform, you would need different types of moderation- is it moderation by a person or is there AI involved?

There would be AI involved in the platform to moderate information shared.

User Experience

The platform appears to have a linear, chronological format, similar to that of a Teams discussion. So, how is that accessible/searchable/how do we maintain some order so that there is not just an overload of information that we have no control over?

This is a point that came up in the first workshop and we discussed it being similar to a social media feed. The information is structured using an algorithm to sort information, but it could be more sophisticated by implementing AI. The information can be sorted in a variety of ways, for example, by trending topics or those with the most views appearing at the top of the page. Important posts can also be pinned at the top of the page, such as those which provide a general overview of the topic.

Can we implement a search function? If so, will this be via keywords or a more sophisticated search?

We can implement a 'search' function by keywords or tags. The problem is that keywords or tags are user-generated and there is no way to know that users will use the same tags for the same information. It may be beneficial to utilise Archives to contain all the information that has been discussed previously.

As a more sophisticated method, would we be utilising an API and, if so, how would the API ensure that information shared is GDPR compliant?

If we can manage to implement the AI, it would be beneficial. However, it is difficult to know how well this would work and it is something that could be looked at in the future.

What would happen if somebody posted information that was incorrect, or started to go down the conspiracy theory route? How does moderation deal with this?

This is something to be aware of. The facilitator will identify the course or the topic and provides structure. They may also be able to keep the information in the cMOOC relevant to the topic, reducing the likelihood of conspiracy theories to steer the information away from the topic.

Evaluation

Are we doing any evaluation?

If the platform is an open learning platform, we do not need a certificate. However, if it is a course, we may then need to provide a certificate, or other evidence of completion. There needs to be a decision on whether the platform holds a course or is a repository for learning materials. It will be a lot simpler if we go the repository route because it is very difficult to get agreement, assessment and award or certificate, particularly when this is done across institutions.

If the platform is a repository of shared learning materials, which different courses can make use of, a lot of the difficulties with the institutional arrangements are removed. This means that the focus is then on the quality of the repository itself, and maintaining the standard of the materials shared, which must conform to certain criterium. People uploading the materials must comply with the standards set out.

Moving Forward

Who keeps the copyright when information is shared?

People using the platforms will have signed an agreement to upload materials on 'a share and share alike' basis to enable them to use the platform. This procedure has been used on previous platforms and has been successful.

How can the partner universities contribute to the CMOOC after the INCLUDE project is finished?

A multi-institution platform is very attractive but poses huge problems in terms of governance and management, who is resourcing it etc. as there are legal implications and so forth. The project needs to develop a clear sustainability plan, how it will be managed, who the representatives will be to form a board etc. It is also about having a clear decision-making process. If institutions are going to have their named linked to the platform, everybody will want to have some decision-making influence and will want to have some representation. These are some of the governing questions we are going to have to pose in the next phase of the project.

Are you moving away from the original aims?

The project is not moving away from the original aims because, even though the moderator has a lot of control over the course, learners are sharing information to the course, which is the aim.

To LIS (Library and IT Support) representative: Is this cMOOC something that LIS UCLan would be willing to support?

In terms of integrating the platform into UCLan learning management systems, students, particularly research students could use it to communicate and interact regarding the learning materials.

Is this a live website at the moment?

It is a live website on Microsoft Azure hosted by UCLan as a demonstration.

To LIS representative: If we wanted to implement the platform at UCLan, would there be any restriction?

I am not sure, if you go and speak the chairman of the Horrack's Institute, they consider things like this. However, LIS is not involved in those networks, meaning that you could go outside of LIS. If you wanted support from LIS, this would be something that we could consider.

Who hosts/funds the platform currently?

At the moment, the platform is funded by the INCLUDE Project, but it is currently hosted by Microsoft, which we have access to at UCLan and is GDPR compliant. It is still important to go through the university's legal team to ensure that any information shared on the platform is also GDPR compliant, as this becomes the University's responsibilities once the platform is included in LIS.