



INCLUsive Disaster Education (INCLUDE)

**Output 2: A framework to reimagine online distance learning education that
can support the diverse DRR community**

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Introduction

Shaw et.al (2021, p. 568) define Disaster Risk Reduction (DRR) education as an experiential process whose goal is to “internalize risk perception” and improve disaster preparedness. The emergency switch to an online environment in the aftermath of the COVID-19 pandemic and the experience of this novice reality for educators and students left plenty of room to further develop a renewed approach to online education for Disaster Risk Reduction. The purpose of this report is the development of a co-created and experiential-driven framework for a DRR specific online education taking into consideration the challenges and opportunities identified by educators and students through the interviews and surveys of Output 1, as well as the contextual particularities and educational characteristics attributed to the DRR field as well as the dynamic needs of the DRR industry sector. Such a framework ought to keep at its core the connection between knowledge and skills which is elemental for DRR education and practice. At this point an important clarification needs to be made. When referring to educators and students or learners, the terms are not necessarily used to describe formal roles in higher education, as students/learners can also be professionals who have different experiences with disasters risk reduction, and this highlights the importance of taking into consideration the role of the industry when designing an educational framework.

Learning Theory

An emergent framework for online DRR education has its foundation in one or more learning theories. The present experiential-aimed framework builds both on a cognitivist and a constructivist approach to learning. The constructivist learning theory approaches knowledge as constructed through the learners’ previous experience (Koohang et.al, 2009). Online education increases the opportunities for enhanced collaborative learning between students and educators (Reid-Martinez & Grooms, 2018) thus pointing towards a constructivist approach as a foundation for the co-creation and development of online means for education much beyond a traditional view of learners as passive recipients of knowledge, as highlighted in the interview findings from Output 1 of the project. The constructivist paradigm rejects knowledge as passively received but suggests that it is created through the process of individuals trying to make sense of their experiences (Maclellan, 2004).

Cognitive theories on learning emphasize the degree of interaction between the learner and the content (Moore, 1989). Under this framing, learning becomes an interaction between the environment and the individual behaviors of students that in turn generate representations that shape learning (Malik, 2021) in an experiential manner, going back to the definition by Shaw et.al (2021). This function of learning as a connector between the environment and the individuals' behavior is key to reimagining a framework that emphasizes the importance of experiential-driven learning.

The experience from the emergency online shift due to the implications of the COVID-19 pandemic as captured through the interviews with educators and the surveys with learners in Output 1 provide with a variety of individual responses to challenges faced and several patterns arise that assist in crystallizing the main aspects of online education that a renewed framework ought to pay attention to in relation to the reality of the DRR field and its needs, as a constant interaction between theory and practice, today and in the future.

The Purpose of the framework

The proposed framework for online DRR education is an outcome of the challenges identified both for educators and students in Output 1, as well as the DRR context specific particularities. It is a student-centered and experience-based framework that responds to the challenges identified in Output 1 for students and educators and to the contextual aspects of the field of DRR in education and practice.

As demonstrated in Figure 1, the framework consists of three main layers in constant interconnection and interaction with each other:

- 1) Outer layers: the theoretical considerations that underpin it
- 2) Layer of core outer-principles
- 3) Layer of core-inner principles

The two inner layers are informed by the contextual DRR realities of the field and the needs of the industry while the outer layers in the visual becomes the theoretical backbone of the proposed framework adhering to the learning theories described in the previous section, the social constructivist, and the cognitive learning paradigms. The first inner layer presents an

overarching set of principles that respond to the main challenges of online education for DRR identified in Output 01. The second-inner layer of principles relates to the overarching ones but is an outcome of their interaction among each other but also with the nature and specificities of the DRR field in education and practice, highlighting the need for the framework to be a product of its environment in line with recent scientific developments and the needs of the DRR industry.

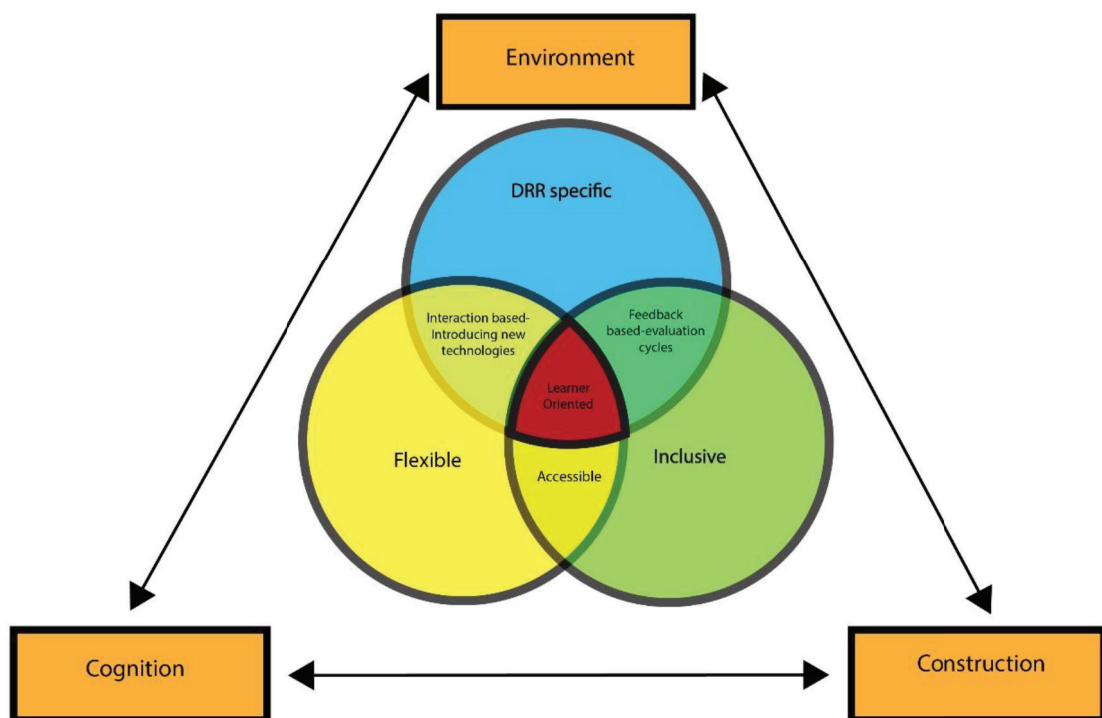


Figure 1: The framework visualized

Assumptions

This approach to the development of the above proposed framework for online DRR education builds upon several fundamental assumptions regarding online education and the specifics of the nature of the field of DRR:

1. **DRR is a highly multi- and inter-disciplinary field:** Thus, it cannot be confined to a neat single discipline, and it draws students from an extremely wide array of educational and professional backgrounds. This means that students bring with them also a wide

spectrum of skills and knowledge that they can integrate in DRR education through an experiential way of designing modules as proposed in the present framework.

2. ***Programs are highly practical:*** Modules related to Capacity Development, Preparedness as well as Response Management and Risk Assessment highlight the need for a practice-based approach to designing educational curricula for DRR. An online educational framework needs to acknowledge the need to adapt to this practice-based environment through a series of principles that assist in retaining the highly practical nature of the DRR field in an online setting.
3. ***There is an equal focus on skills and knowledge in programs:*** Knowledge and skills as well as their connection is an inherent characteristic of DRR education. Knowledge becomes the foundation for developing and enhancing skills in different aspects of DRR. Most courses in relevant programs demonstrate the need for equally developing knowledge and skills as well as their interconnection.
4. ***The interaction between students is critical to the overall learning experience:*** Interaction is vital in a learner's experience centered educational framework. The lack of interaction both in a one-way communication classroom setting but also in an online synchronous and asynchronous setting has been described as contrasting to learning being an inherently social activity (Hurst et.al, 2013). To achieve an environment of co-generative learning, it is important to focus on means to enhance interaction between students, making them central actors of the learning process.
5. ***Students learn from each other as much as, if not more than, knowledge imparted by tutors:*** A peer-teaching oriented model is based on the assumption that students learn and perform better in highly interactive learning environments where they are able to depart from their single-role as students and become teachers for each other (Gal & Fallik, 2022). Collaborative learning among students with diverse educational and professional experiences but also between students and educators becomes a precondition for developing one's own cognition (Liu, 2008), which is a main cornerstone of and for the proposed framework.

6. ***Tacit knowledge is critical for DRR education and needs to be factored into any learning platform design and functionality:*** The integration and sharing of implicit knowledge in the form of experiences and skills, intuition and values should be encouraged through the features of online platforms for learning in the context of DRR. As Weichselgartner and Pigeon (2015) argue, the production of knowledge is taking place through social interactions that involve both explicit and tacit knowledge which is crucial but also significantly underrepresented in DRR education, policy, and research. Students constantly exchange knowledge within a classroom setting but also outside of it through informal conversations on various topics or peer reviews of assignments. Students develop their own means of knowledge sharing but this implies that they have the ability to form interpersonal relations as a precondition for feeling comfortable enough to share their thoughts and work with those of others. It is important that an online environment provides the possibilities and fosters a safe space for students to feel comfortable and facilitate knowledge exchange.
7. ***Students tailor their learning experience and activities in an individual and unique way informed by their background and future career plans:*** DRR is an interdisciplinary field and a reason for that is also that professionals come from very different backgrounds and disciplines. This means that learners carry with them knowledge as well as skills acquired from different fields. This informs their learning experience as well as the learning experience of other learners in an interactive and experience-informed environment. In this way the learning experience is co-created through the different experiences of students who as mentioned in assumption (5) above learn from each other in a collaborative learning setting.
8. ***In DRR education students can't be funneled through a narrow mold and come out identical replicas of each other:*** As highlighted in the previous assumption, the diverse background of DRR students comes to play a critical role in the way knowledge and skills are acquired in any relevant educational curricula. Learner's shape and are shaped through the learning process by carrying with them their past learning experience which is not identical to others. This means that as they exit their education, they are not replicas of each other, rather very distinct professionals whose experience is

shaped both by their old and new learning experience, skills, and knowledge, in a constant interaction with each other.

9. ***Learning platforms need to allow for flexibility and an individualized approach to learning:*** As Learning Management Systems involved a lot of emphasis is placed on the generation of personalized courses (Essalmi et.al, 2015). There are several parameters on how this can succeed. An example of which is personalization through the level of knowledge of the learner for instance if they are beginners, on an intermediate level or more advanced (ibid, 2015, p. 310). One way to achieve this personalization is through game-based learning for modeling individuals' personalities (Denden et.al, 2018). At the same time, personalization allows for accommodating visible and non-visible learning (dis)abilities and learning difficulties, considering that students who come from vulnerable and developing contexts as well as students with competing priorities represent a significant number in DRR student cohorts.

10. ***In certain cases, online learning and its functions cannot replace the benefits of classroom based learning or field training:*** The highly practical and interaction-based nature of various modules in DRR imply the need for a mixed method approach to learning rather than a complete shift to an online environment, while not exacerbating existing educational and social inequalities.

Main principles

The main principles that encompass a renewed framework for online DRR education are a product and an outcome of the main challenges identified in Output 1 in relation to the contextual particularities and uniqueness of the DRR and related fields. Two are of broader nature, outer-core, interconnected framing principles, necessary for any kind of educational framework are Inclusivity (P1) and Flexibility (P2), in constant interaction with the reality of the field, being DRR specific.

P1. Inclusivity

The issue of inclusivity came up rather frequently during the surveys with students and interviews with educators in Output 01 in the aftermath of the emergency online shift during

Covid. It is seen as a major determinant of the effectiveness of online education for DRR, which can be understood by defining the barriers in online education. Inclusivity in online education arose as a prominent issue to deal with as in numerous cases students (and educators) came across numerous barriers to being part of an online curricula due to issues like inadequate ICT infrastructure, lack of adequate internet connection, digital illiteracy, financial reasons, and psychological factors. Inclusive education aims to embrace the high diversity of learners and overcome bias welcoming students regardless of age, disabilities, background (financial, ethnic, or religious), becoming less a privilege and more of an inherent trait or property of a system beyond a specific target group (Weber et.al, 2022). This can be realized by a mixed-method approach for teaching modes in online DRR education (e.g. Onsite and online) but also through more emphasis towards self-directed learning. Inclusivity can be the outcome of the language used in online education, the technologies utilized as well as the frequent trainings both for students and educators in using these new technologies as well as platforms like Learning Management Systems and their variety of tools in the most efficient way but also a product of adequate ICT infrastructural arrangements. All in all, inclusivity is a principle that any educational framework ought to embrace so as to realize a shift towards a more equitable learning

P2. Flexibility

In the same way as inclusivity, flexibility must evolve to something more than just a buzzword to a core principle in developing a novel approach to online DRR education. Flexibility, besides ensuring the continuation of a diversity of users (Carmichael & Moore, 2020), is necessary to keep an online framework up to pace and date with the multidisciplinary and multi-faceted nature of the DRR field. In other words, flexibility ought to become an inherent characteristic of DRR education in general. However, when it comes to the flexibility of teaching modes, a lot of barriers are generated from within, i.e. from the educational institutions that host programs and trainings on DRR and related fields (Aghaei et.al, 2018). Institutions such as universities need to make more room for flexible changes in program curricula that will allow for the integration of a variety of modes of teaching as well as a combination of locations of teaching and learning.

A combination of synchronous and asynchronous online learning comes with multiple benefits as discussed in Output 01. Synchronous online learning enhances the element of interaction (this will be analyzed further in Principle 4) while asynchronous can become not only complementary but an important aspect of the framework adding not only to flexibility but inclusivity. An example is the case Sri Lanka mentions in the challenges listed in Output 01 and the difficulties faced there due to power cuts in a precarious learning environment. Asynchronous learning can also be utilized for different paces of learning as well as for revisiting material by learners and educators when necessary. Another challenge pointed out in the interviews of Output 1 that can be addressed through a combination of synchronous and asynchronous learning is the struggle of educators and students to adjust their personal and professional commitments to their educational commitments.

The location of teaching can also become a challenge, adhering to certain particularities encountered within fields and courses of DRR and related subjects. Certain university courses and training courses in DRR such as those related to Disaster Response Management or Preparedness and Planning come with certain practical difficulties in fully developing them in an online setting. The reason for this is they are highly related to what occurs out there in the field. For instance, skills and abilities related to disaster preparedness may derive from organizing, taking part, and evaluating simulation exercises, which can be difficult to fully develop in an online environment. What could be done in this case is develop such exercises in person (or in-classroom) setting, preceded by an asynchronous package of information and preparation and followed by a synchronous setting of discussing and evaluating the outcomes of the exercise. This combination of teaching location has the potential to enrich the learning experience in certain aspects of DRR such as preparedness.

P3. Accessibility as the link between inclusivity and flexibility

Online education needs to be accessible to adhere to the very first principle of inclusivity in the first place and at the same time to ensure that a flexible approach to learning is realistic. Accessibility to the learning content has been identified as a major challenge for learners in Output 01. An accessible online environment can be first and foremost ensured by an accessible Learning Management System to support it. An accessible LMS implies a simple interface and format that does not demand more than an average internet connection

requirement, thus limiting the access to students with a reliable and stable internet connection. Preferably an LMS that could also have an offline version for storing assignments and viewing the learning content or having the ability to download lectures in an asynchronous setting would benefit numerous students around the globe with limited connection access.

At the same time, a flexible learning environment that combines online lectures (either synchronous or asynchronous) with an in classroom setting such as the example mentioned earlier in P 2, needs to ensure that this is accessible by learners in order to avoid a hybrid learning model of some learners being able to attend in person and at the same time some attending an online synchronous setting, such as the one that several educators referred to as problematic and inequitable (Output 1). Flexible alternatives to a strictly online setting need to be accessible by everyone but also more specifically the different student cohort categories as pointed out in Output 1. Motivated students, experienced students, undergraduates, graduates, and students facing difficulties should equally be able to access an online classroom setting. Students facing difficulties can be those who come from developing contexts with no adequate internet connection or digital literacy, students who struggle with competing priorities and students who come from impoverished and disadvantaged communities.

P4. Interaction based

The lack of interaction in an online environment was raised as a major concern in Output 01. Interaction is a prerequisite to building meaningful connections between educators and learners which allows for adapting teaching based on the learners' behavior. Techniques for generating an interactive environment are necessary to adhere to the interactive and collaborative nature of the DRR field but also to ensure the creation of a more effective learning environment based on a higher degree of personalization and interaction, a major deficiency that was highlighted by both learners and educators during the COVID period and the unplanned emergency shift to an online environment.

P5. Introducing new technologies for enhancing the learning experience

As highlighted by Minges (2019, p. 3), the "rapid spread" of digital infrastructure holds vast potential for the further integration of disruptive technologies in disaster risk management. Besides that, disruptive technologies can also be utilized to assist in disaster risk

reduction education, especially online education through various modes. Disruptive technologies can be integrated in education curricula through modules that teach about them but also as assistive means for making disaster risk reduction education more effective. However as pointed out by de Meira and Bello (2020), what is important to begin with is access to these new technologies by institutions, educators, and learners. One example of how disruptive technologies can assist online education is regarding courses related to preparedness and simulation exercises. Kuglitsch et al. (2022), highlight the potential that artificial intelligence holds for DRR in the form of new applications for observations and data-processing thus becoming necessary tools for preparedness. Reddin et al., (2021) suggest that AI can also assist in the creation of new environments for developing computer-based simulation exercises. Similarly, other forms of disruptive technologies such as the wider application of drones could be integrated as educational tools for improving the learning experience in relation to several aspects and modules in DRR. The section regarding the use of disruptive technologies for online DRR education will further be developed through case studies in Output 04. The employment of disruptive technologies is also a means to respond to, integrate, and connect to the needs of the DRR industry.

P6. Co-created/Feedback based

The findings from Output 01 point towards feedback as being a key factor for enhancing interactive learning which becomes a major component for an online educational framework for DRR. Hattie and Timperley (2007) highlight the importance of feedback and its effectiveness for learning when it leads to an outcome that is co-constructed by students and teachers. The need for feedback becomes vital for effective learning beyond just synchronous learning in the form of live online lectures or a hybrid mode of teaching as described earlier. Feedback is then key for constantly improving education through the re-evaluation of any educational framework and it needs to derive both from educators and learners through their experiences. As Gottipati et.al (2017) point out, students provide feedback to improve instructions, the curriculum, and the overall learning experience. Similarly, educators provide feedback on their teaching experience by evaluating tools for online learning, learning platforms and their functions as well as ways to integrate more recent developments in DRR into the curricula.

Providing regular feedback is a way to keep the educational framework up to date with all the new developments in the field of DRR, integrating them into the educational curricula through modules and novel DRR industry developments that might assist the teaching process. Educators also evaluate the students' learning experience and take into consideration their feedback for making changes in modules and programs. In this way, learning becomes a co-created process by all those involved. Any educational framework needs to involve both educators and learners in the making of it. Moreover, any educational framework ought to be regularly evaluated and updated in accordance with the feedback provided. This can occur through establishing regular evaluation cycles through which the proposed educational framework is reconsidered and updated according to feedback and other developments in DRR.

P7. Privacy considerate

Any educational framework for online learning ought to be built upon considerations for the protection of users' data, complying with privacy provisions of an organization or institution base but at the same time taking into account the students' base and what laws and regulations for the management and use of personal data apply there. One example of such a regulatory framework is Europe's General Data Protection Regulation (GDPR) which was adopted by the EU in 2018 with the purpose of setting guidelines for the collection and processing of information from individuals living in the EU (Sadler, 2020). Such frameworks ought to be taken into consideration especially when utilizing external tools to generate a more interactive environment in order to enhance the effectiveness of online learning experience.

P8. Learner centered

Learner Centered Teaching (LCT) is a concept developed in juxtaposition to traditional or conventional modes of teaching where the teacher is at the center of the educational process, responsible for designing the courses, the tasks and assessment criteria (Kumar Shah, 2020; Attard et.al, 2010). As Attard et al. (2010) point out, LCT's foundations lie in the learning theories of cognitivism and constructivism. The learner's experience significantly shapes the learning process and becomes a central focus in the creation and evaluation of an educational framework. A LCT approach also places students' interaction in the forefront of education in

an online environment. This has not been given a lot of attention however, in the past years and during the emergency shift to an online environment significant attempts have been made by educators to personalize courses. Thus, student interaction becomes a vital component for the social dimension of learning and one of the most important factors for humanizing the digital space of learning (Knowlton, 2000), promoting a more equitable and accessible learning environment. The present framework for online DRR education places learners at the core of its foundations not only as recipients of knowledge but also as co-constructors, of both knowledge and skills which are fundamental components of DRR education and practice.

P9. Principle of Research availability and Preparedness

The COVID-19 pandemic hit suddenly, and as mentioned, the shift towards an online environment was rapid and was largely based on improvisation on behalf of the institutions and teachers but also the students. The courses material was not fully and adequately adapted to online learning. A lesson learned from this experience was that the educational community needs to be prepared for any kind of disruption in the future. This principle of the educational material being ready to be adapted to an online classroom setting is fundamental for a framework that is created to be relevant to the needs of an uncertain future. This can be materialized through a guideline that dictates what needs to be in place in terms of hardware and software in case of a new disruption that might occur anytime in the future, placing emphasis on the availability of resources.

Conclusion

The emergency online shift during the COVID-19 pandemic generated a new learning landscape for DRR and related fields, one that came with plenty of shortcomings. This was an outcome of both the rapid unplanned switch to an online mode, as well as the nature of the modules that could not be easily adapted to this new reality. The present suggestion for an online educational framework for DRR takes into consideration all these challenges identified and brings forth a set of principles that address them while highlighting the importance of connecting such an educational framework with the dynamic characteristics of the field with a high emphasis on the connection between knowledge and skills in relation to the DRR

industry's needs and developments. An educational framework itself cannot be a static structured approach but a dynamic product of its environment that is adaptable to internal and external changes through constant processes of feedback and evaluation. At the same time, it ought to be a product of co-creation by learners and educators, emphasizing the need for interaction among them and between them for achieving a more effective learning outcome. Finally, importance is placed on the learner remaining at the epicenter of education.

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