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Conceptualising 'Disaster Education'

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Abstract: 'Disaster education' has been studied in various disciplines such as disaster risk management and environmental studies. However, disaster education is a relatively 'new enquiry' in the field of education. Particularly, the literature that conceptualises 'disaster education' in education is minimal. This paper aims to fill this gap by synthesising existing disaster education literature linking them with educational concepts. The paper suggests three possible conceptualisations for disaster education. The first is based on a temporal distinction between education undertaken in usual times or unusual times. The second conceptualisation applies modes of learning and teaching: formal, non-formal and informal. Thirdly, establishing disaster education as a sub-discipline in the field of education is proposed: one sub-discipline is lifelong learning and the other is public pedagogy. Critiquing each method of conceptualisation, the paper argues for the suitability and usefulness of locating 'disaster education' within public pedagogy.

Keywords: disaster education; disaster risk reduction; public pedagogy; participation; community-based disaster risk reduction

1. Introduction

'Disaster education (DE)' is becoming increasingly significant given that risks and threats are growing and diversifying worldwide. Historically, DE has been studied in various disciplines including disaster risk management, environmental studies and civil engineering, encompassing a wide range of learning and teaching activities in diverse settings. Despite the term 'education', however, DE is a relatively 'new enquiry' in the field of education [1,2]. Particularly, the literature that conceptualises DE in education is minimal. This paper aims to fill this gap by synthesising existing DE literature across different fields and developing conceptual links to the field of education. The paper refers to a range of DE developed, implemented or evaluated in the existing literature for illustration purposes. The paper will do so by categorising the existing DE literature under educational concepts widely used in the field of education. By 'educational concepts', the paper refers to the notions such as 'the modes of learning' or 'lifelong learning', not 'learning theories', which was explored elsewhere [3].

The driver for DE was the Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action adopted in 1994 as the output of the World Conference on Natural Disaster Reduction held in Yokohama, Japan. 'Education' was identified as one of the key challenges in the Strategy. In 2005, it was revised as the Hyogo Framework of Action 2005–2015: Building the Resilience of Nations and Communities to Disasters. By then, the United Nations Office for Disaster Risk Reduction established in 1999 was playing a leading role in the field of disaster risk reduction (DRR). DRR aims to prevent new and reduce 'existing disaster risk and manage residual risk, all of which contribute to strengthening economic, social, health and environmental resilience, and ultimately to the achievement of sustainable development'. Risks of all types of disasters are covered: small/large-scale, frequent/infrequent, sudden/slow-onset disasters, caused by natural or human-made, environmental, technological and biological hazards. DRR is 'the policy objective of disaster risk management' [4]. The Hyogo Framework

shifted the paradigm of DRR from post-disaster response to pre-disaster prevention and preparedness, 'education' being the central means [5]. In 2015, the Hyogo Framework was revised in the city of Sendai, which was one of the severely affected areas of the Great East Japan Earthquake and Tsunami of 2011. The Sendai Framework for DRR 2015–2030 comprises four priorities for action to prevent new and reduce existing disaster risks: '(1) understanding disaster risk; (2) strengthening disaster risk governance to manage disaster risk; (3) investing in disaster reduction for resilience and; (4) enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction' [5]. As Shiwaku, Sakurai and Shaw put it, 'education' is regarded as 'a crosscutting issue to achieve the four priorities' [5].

This paper broadly follows the definition of 'disaster education' offered by Shaw, Shiwaku and Takeuchi: "'Disaster education", "disaster risk education", and "disaster prevention education" are different expressions that essentially mean disaster risk reduction education' [6]. The paper also encompasses a few more synonyms, such as 'preparedness education', 'civil defence education' and 'emergency education', which are utilised in the disaster research literature. Another aspect in defining DE is what is framed as 'public help [*kojo*]', 'collaborative help [*kyojo*]' and 'self-help [*jijo*]' in Japan [7]. This DRR policy framework is initially to promote 'all of society engagement' in DRR, indicating who owns the DE initiative, planning and implementing it. It could be a national or local government (public help), a community of any kind (collaborative help; e.g. a neighbourhood watch or an interest group) or an individual (self-help). These different ownerships have an implication for the difference between 'education' and 'learning'. The former usually has a provider, whether a state or an institution, who is responsible for the provision of the education; while 'learning' is voluntary putting the responsibility on the learner [8]. The paper returns to this point later.

The paper suggests three major conceptualisations that look at learning and teaching concerning disasters. The first is based on a temporal distinction between education under-taken in usual times or unusual times. Broadly, the common aim of DE is to understand hazards and risks and prepare for disasters to minimise their impacts. Such education *of* and *for* disasters tends to be undertaken in pre-disaster contexts in usual times. On the other hand, education *in* emergencies refers to the education undertaken in unusual times during and/or after disasters. The temporal distinction can be linked to the disaster management cycle. With some variations, the disaster management cycle generally comprises 'mitigation/prevention', 'preparedness', 'response' and 'recovery/reconstruction' [9]. Mitigation and preparedness measures are taken in pre-disaster contexts, and response and recovery measures are undertaken in disaster/post-disaster contexts. Attention should be paid to a rich body of humanitarian and international development literature for education *in* emergencies [10–13]. The paper touches upon some of them to discuss the temporal distinction, even though there may be a question as to whether education *in* emergencies is part of DE.

The second conceptualisation of DE is to deploy the modes of learning and teaching: formal, non-formal and informal. Shaw, Shiwaku and Takeuchi's *Disaster Education* was one of the first comprehensive books that compiled approaches and methods in various learning and teaching settings, with the use of this categorisation [14]. These concepts allow us to discuss education addressing whether it is institutionalised, accredited or prescribed.

This paper further suggests establishing DE as a sub-discipline in the field of education, and this is the third conceptualisation. One sub-discipline is lifelong learning, which has become a discursive norm in the field of education worldwide [8,15]. Generally, 'lifelong learning' means learning over the life course, encompassing formal, non-formal and informal learning. The flexibility of the concept 'lifelong learning' is beneficial as it can encapsulate diverse learning themes including DE.

The other sub-discipline to which DE could be linked is public pedagogy. 'Public pedagogy' is understood as 'various forms, processes, and sites of education and learning beyond or outside formal schooling and is distinct from hidden and explicit curricula

operating within and through school sites' [16]. From this definition, 'public pedagogy' could be seen as part of 'lifelong learning'. What differentiates them is the former underpins political intentions, e.g. 'feminist, critical, cultural, performative, and/or activist dimensions' [16]. Some inquiries challenge and broaden the conventional understanding of curriculum and pedagogy.

The paper offers a critique of each conceptualisation identifying pros and cons to argue for the suitability and usefulness of locating DE within public pedagogy. The paper does so by drawing on Biesta's notion of different 'publics' [17]: *a pedagogy for the public, of the public, in the interest of publicness*. 'Suitable' because these different 'publics' can capture the diversity of DE, and 'useful' because these different 'publics' address the complexity of DE.

2. Conceptualising DE According to Temporal Distinction

2.1. Education of and for Disasters

In disaster-prone countries and regions, education *of* and *for* disasters is promoted as disaster mitigation/prevention/preparedness measures in usual times. Out of the vast amount of literature available, here are a few examples from different parts of the world. Gulay's research looks at an earthquake education programme for pre-school children in Turkey [18]. The province of Denizli which is in the first-degree seismic zone was chosen as the field site. The programme contents included the knowledge of an earthquake, a behavioural instruction if it occurs and awareness-raising of the importance of an earthquake (emergency) bag. The study finds the parent participation in the programme had a positive impact on children's learning [18]. Including this programme, the duration of DE programmes tends to be short-term. Questioning the effectiveness of such short-term DE initiatives, Nakano, Suwa, Gautam and Yamori take a longitudinal approach observing attitudinal changes amongst Nepalese students through their participation in a DRR education exchange programme with Japanese students between 2001 and 2015 [19]. The students' attitudes were expressed as evolving from 'the educational phase' to 'the participation phase' and developing into 'the independent action phase'. The authors argue for the significance of long-term action-oriented approaches in fostering proactive preparedness attitudes in learners [19].

The shared challenges in education *of* and *for* disasters appear to be how to engage communities and individuals in DRR actions and how to sustain them [20]. Not everyone wishes to engage in DE, even though s/he lives in a high-risk area. 'Experience-preparedness relationship' research has evidenced the actual experience of a disaster motivates people to engage in DRR actions. Moreover, there is evidence that people are also driven to get involved in DRR by 'indirect' (someone close having experienced a disaster) and 'vicarious' (via the experience of unknown people or the media) experiences of disasters [21]. This reinforces the current emphasis in DE to invest in preparedness.

2.2. Education in Emergencies

Education *in* emergencies/disasters tends to focus on re-establishing education for children, youths and communities in unusual circumstances of the response/recovery/reconstruction phases of disasters. As Bromley and Andina indicate, the 'world culture' now accepts education as 'a fundamental human right' [22]. Transnational agencies and NGOs have set out 'international standardization'. One example of that is the United Nation's Education for All framework, in which education in unusual circumstances is addressed. Researchers have responded to this end by considering methods and processes to restore and sustain education in disaster-affected areas [10,23,24]. A large volume of literature on education *in* emergencies therefore deals with the impacts of human-led disasters such as conflict situations, mass displacement and refugee camps, as well as large-scale natural hazards.

Pherali proposes three strands of the interactions between 'education' and 'conflict' in the fields of education and conflict. Education can: (1) be both victim and perpetrator; (2)

play a key role in the struggle for revolution and liberation against oppression; (3) become peacebuilder [25]. As an example for (1), Palestinian refugee society can be identified, where education is used for both 'an instrument for oppression and a tool for liberation' [11]. The present-day education is manipulated by 'existing oppressive structures' that reinforce the Palestinian state as 'a problem' and normalise the status quo, despite the previous achievements of building a Palestinian identity and liberation movements [25]. For (3) education as a 'peacebuilder', Pherali, Moghli and Chase draw on teacher professional development in the context of Syrian refugee education in Lebanon [11]. Teachers' readiness to teach refugee students is one of the many challenges in providing education in contexts of mass displacement. Host schools are likely to rely on unqualified teachers. The study explores how those teachers could engage in transformative education practices. Online development initiatives are proposed, given the urgency and volume of the need for professionals in large-scale mass displacements [11].

2.3. Critique of Temporal Distinction

The temporal conceptualisation broadly reflects the timing in which the DE is undertaken. A simplified view might be that education *of* and *for* disasters is offered with or without disaster events, whereas education *in* emergencies only occurs when there is a disaster. Such a view, however, undermines the principle of 'disaster *risk* reduction', which is to prevent new and reduce 'existing disaster risk and manage residual risk' to strengthen 'economic, social, health and environmental resilience' and to achieve sustainable development [4]. It is also important to clarify what 'risk' means: 'The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity' [26]. There is a consensus in the fields of DRR and sustainable development that reducing vulnerabilities in societies enhance resilience to disasters and contributes to sustainable development [27–30]. As 'a product of historical socioeconomic processes characterised by injustice and prejudice' [31], vulnerability is 'the conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards [32].' Hence, disaster is the cost of failures in development because injustice and inequality yield marginalisation, which compels certain groups of people to be vulnerable to hazards [27]. Given these relationships between 'vulnerability', 'risk' and 'disaster', framing education *in* emergencies only in the disaster and post-disaster contexts is no longer feasible. A number of the target locations of education *in* emergencies have had vulnerabilities prior to the disasters.

The temporal conceptualisation has a limitation from the viewpoint of the disaster management cycle as well. A research project from Bangladesh illustrates that DE involves the whole disaster management cycle [33]. Bangladesh experiences cyclones, floods and other natural hazards routinely, and one event can have severe impacts in the densely populated country, including the loss of school sites. The project tackled the challenge of the continuity of schooling that the country had been facing in the response and recovery phases of disasters. School stakeholders worked together creating emergency plans, implementing preparedness activities and designating alternative schooling spaces. These actions are mitigation and preparedness measures. All schools participated in the project were able to open in the following year despite disaster events. The schools continued to revise their measures annually [33]. This case shows the cyclical nature of the DE project, which allowed schools' contingency planning and stakeholders' capacity building. The temporal conceptualisation thus only depicts DE provisionally.

3. Conceptualising DE Applying the Modes of Learning

The updated 2011 version of the International Standard Classification of Education's definitions of the modes of learning is applied in this paper.

3.1. Formal Learning

Formal learning occurs in the education,

that is institutionalised, intentional and planned through public organizations and recognised private bodies and—in their totality—constitute the formal education system of a country. Formal education programmes are thus recognised as such by the relevant national education authorities or equivalent authorities, e.g. any other institution in cooperation with the national or sub-national education authorities. Formal education consists mostly of initial education. Vocational education, special needs education and some parts of adult education are often recognised as being part of the formal education system. [34]

Formal learning mostly occurs in initial education, which refers to the education before individuals enter the labour market [34]. Some countries offer DE as part of their national school curriculum. In New Zealand, the Ministry of Civil Defence and Emergency Management (MCDEM) developed *What's the Plan, Stan?* as a resource for teaching DE for primary school students [35]. DE has been taken seriously in New Zealand, particularly after the 2011 Christchurch earthquake. The teaching and learning strategies for DE are based on 'inquiry learning inquiry learning so that teachers can incorporate activity-based instruction on CDEM topics in any area of . . . Science, English, Social Studies, and Health and Physical Education' [35]. Funded by MCDEM, *What's the Plan, Stan?* is promoted and implemented at the local level across the country.

Another example of formal learning can be found in China. After the 2008 Wenchuan earthquake, the government began the integration of DE in the education system [36]. The General Office of the State Council published the National Comprehensive Disaster Prevention and Reduction Plan 2011–2015, and the Ministry of Science and Technology created the 12th Five-Year Special Plan of Science and Technology Development for National Disaster Prevention and Reduction. The government also designated 12 May, the day of the 2008 earthquake, as the National Disaster Prevention and Reduction Day. Zhu and Zhang's (2017) extensive survey in four regions depicts how students and teachers perceive school-based DE. One of the key findings is the majority of both students and teachers agree school-based DE is an effective way to foster students' awareness of DRR. However, teachers acknowledged the DE taught at school focused on 'knowledge' lacking 'attractiveness and local characteristics' [36]. The paper returns to this point later.

3.2. Non-formal Learning

Non-formal learning takes place in education,

that is institutionalised, intentional and planned by an education provider . . . . it is an addition, alternative and/or complement to formal education . . . . It is often provided to guarantee the right of access to education for all. It caters to people of all ages but does not necessarily apply a continuous pathway-structure; it may be short in duration and/or low-intensity, and it is typically provided in the form of short courses, workshops or seminars. Non-formal education mostly leads to qualifications that are not recognised as formal or equivalent to formal qualifications by the relevant national or sub-national education authorities or to no qualifications at all. Non-formal education can cover programmes contributing to adult and youth literacy and education for out-of-school children, as well as programmes on life skills, work skills, and social or cultural development [34].

One form of non-formal adult learning can be found in Germany. Civil defence and disaster support are mainly provided by highly trained volunteer forces in the German Federal Agency for Technical Relief (THW) and the Volunteer Firebrigade [37]. Both institutions are funded by taxpayers, and the THW is part of the Ministry of the Interior. The THW is also active as a highly trained and efficient search and rescue organisation nationally and internationally. The DE provided to the volunteers of these organisations is 'formal, technical and specialised training', developing the understanding that only trained experts can handle disaster response and support. Joining the THW requires a

significant commitment as well, with extensive training, regular meetings other required activities. Chadderton indicates specialisation is usual internationally, but what is specific in Germany is no alternative for individuals to engage in DE—accessible DE for the public is not available [37].

Japan also has a similar voluntary training system for the Disaster Prevention Officer [*Bousaisi*] administered by the not-for-profit Japan Bousaisi Organization [38]. Bousaisi's role is to promote and implement 'self-help', mutual help' and 'collaborative help' [7] in improving disaster prevention and resilience abilities in society. 'Mutual help [*gojo*]' and 'collaborative help [*kyojo*]' are often discussed separately, although the policy term is the latter meaning both. 'Mutual help' tends to be the help in the neighbourhood, while 'collaborative help' can be offered by strangers [6]. Anyone in Japan can become Bousaisi following these steps: to enrol in the Disaster Prevention Training Course offered by a certified training centre, to pass the Disaster Prevention Officer Qualification Examination and to complete a first aid training course. Currently, there are more than 205,000 Bousaisi in Japan, many of whom proactively engage in the building of community-based DRR [38].

It could be argued the training systems for both the THW members and Bousaisi are formal learning, rather than non-formal learning, given their qualifications are socially recognised. However, for their voluntarism and unpaid participation, it would be more suitable to consider them as non-formal learning.

3.3. Informal Learning

Informal learning, on the other hand, is

intentional or deliberate deliberate but are not institutionalised. It is consequently less organized and structured than either formal or non-formal education. Informal learning may include learning activities that occur in the family, workplace, local community and daily life, on a self-directed, family-directed or socially-directed basis [34].

Informal learning probably accounts for the largest number of examples of DE. In earthquake-prone countries, people must have practised 'drop, cover and hold (on)' at one point in their lives. Many governments and experts agree with the action of 'drop, cover and hold' to be effective in minimising injury and death while experiencing an earthquake [39–41]. 'Drop, cover and hold' takes the form of drilling to establish a stimulus/response relationship so that individuals familiarise themselves with their action in a tremor [3]. Tsunami evacuation drills hold the same principle. The disasters caused by the 2004 Indian Ocean tsunami and the 2011 Tohoku tsunami have demonstrated the significance of immediate evacuation for survival [42–44]. Drilling thus constitutes an important informal form of learning for DE.

Informal learning may occur by visiting memorial sites and museums. Sri Lanka was one of the countries severely damaged by the 2004 tsunami. Disaster relief funds were available, but a sustainable means was required for longer-term DE. The Tsunami Photo Museum was built in Telwatta, which displays the photographs taken during and after the tsunami and children's paintings [45].

Informal learning also occurs in daily life without an intention to engage in DE: e.g., acknowledging flood gauges and warning signs in the neighbourhood, looking at the hazard map distributed in the community.

3.4. Critique of the Modes of Learning

Conceptualising DE using the modes of learning demonstrates the richness and variation of DE. At the same time, the vertical distinction of formal, non-formal and informal criteria does not necessarily capture the horizontal diversity of DE at all. Many existing DE initiatives involve more than one mode of learning. For example, increasingly, collaborative DE between school and community is considered effective. Some authors argue that formal DE at school is becoming more significant because 'children are one of the most vulnerable sections of the society during a disaster' and 'they represent the future'. At the same time, formal DE at school has a potential for a wider impact as

'school serves as a community's central location for meetings and group activities' and 'effects of education can be transferred to parents and community' [46,47]. As Nifa, Abbas, Lin and Othman argue, DE at school plays a critical role in raising awareness amongst parents and the local community, as well as preparing students and teachers for possible disasters [47]. In fact, such collaborative learning and 'cogenerative learning' [48] have been emphasised even more since the launch of the Sendai Framework which promotes 'all of society engagement' [5]. Combining formal, non-formal and informal opportunities appears to be the way forward for effective DRR.

4. Conceptualising DE Situating It within Sub-Disciplines of Education

Limited pieces of literature are available that connect DE with sub-disciplines in education. More work associated with other sub-disciplines may be in the process of development.

4.1. Lifelong Learning

'Lifelong learning' has a long history. Originally referring to as 'lifelong education', Yeaxlee in 1929 introduced the idea of learning as a continuing activity throughout one's life [49]. Particularly since the 1990s, international agencies and national governments published policy documents on lifelong learning and their implications have been discussed in academia. Goal 4 of the Sustainable Development Goals endorsed by the United Nations in 2015 indicates: 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all' [50]. Because of its broad scope, 'lifelong learning' has been used to address various areas of learning from hobbies and leisure to upskilling for employability [8,15], and more recently, DE. It is suggested that DE can be regarded as a type of lifelong learning through which the public prepare for natural and human-made disasters [37].

Preston, Chadderton, Kitagawa and Edmonds (2015) examine DE taken place in the communities affected by disasters in five countries. The authors treat this form of learning 'community learning' as part of lifelong learning [51]. Drawing on international case studies, they develop an ecological learning framework examining community response in disasters. The framework comprises navigation, organisation and reframing, which were identified as broad types of community learning in post-disaster contexts.

Some authors associate the continuing nature of lifelong learning with DE. Dahl and Millora (2016) argue that the learning process of preparing for disasters has to be ongoing and lifelong. They studied how disaster preparedness programmes in Philippine universities had been affected by university leaders' experiences of the super typhoon Haiyan. Employing the theory of transformative learning, the authors demonstrate the university leaders' experiences of the disaster was 'a disorienting dilemma', initiating their critical reflection transforming their social concern towards the increased emphasis on preparing for future disasters [52]. The authors associate the university leaders' reflective and transformative learning as the process of lifelong learning.

4.2. Critique of Lifelong Learning

A number of authors have raised concern against the multi-dimensional nature of 'lifelong learning'. Kitagawa argues that it is the adaptability and legitimacy of the concept 'lifelong learning' that permits various translations at a different time in a different setting [8,15,53]. The concept attracts authorities because 'its rather fuzzy utopian ideals can be converted into both an ideology and a concept' [54]. An ideology because lifelong learning can be a vision of the future; a concept because lifelong learning can be rational for the democratisation of education. DE is no exception. As Chadderton observes, DE as lifelong learning includes

both formal schooling and public information campaigns, preparedness for potential disasters, the training of volunteer forces, disaster mitigation, and learning for future

resilience after the actual experience of a disaster. It can encompass any or all aspects of the disaster management cycle: mitigation, preparedness, response and recovery [37].

Given lifelong learning encompasses almost any learning opportunity 'for and around disasters and emergencies' [37], the conceptual clarity and depth that lifelong learning could provide to the area of DE are limited.

4.3. Public Pedagogy

The emergence of 'public pedagogy' was in the 1960s, and since the 1990s, the concept has widely been utilised in and beyond the field of education. Undertaking an extensive mapping exercise, Sandlin, O'Malley and Burdick suggested in 2011 a typology of public pedagogy literature as follows: (1) citizenship within and beyond schools; (2) popular culture and everyday life; (3) informal institutions and public spaces; (4) dominant cultural discourses; and (5) public intellectualism and social activism [16]. Subsequently, they raised a call for 'problematising public pedagogy' to diminish 'conceptual confusion' and endorse 'distinct theorizations' [55]. Three important questions were posed: (1) how are the terms 'public' and 'pedagogy' conceptualised? (2) what is 'pedagogical' about 'public pedagogy'? and (3) why 'pedagogical', not 'curricular'.

Preston was the first author who linked public pedagogy with DE [1], responding to the above questions (2) and (3), without referring to them. He argues that preparedness operations have tended to be considered as 'information transmission' rather than educational activities. Diverse preparedness methods such as warning signs, leaflets, school curricular, broadcasting and social media involve learning, given they aim to change 'individual conditions concerning emergencies', including behaviours, emotions and perceptions. Moving beyond 'advertising or public relations models', pedagogies of preparedness 'engage individuals in learning about emergency situations whether in preparation, response or recovery from a disaster' [1].

One of his studies examined the 'Preparing for Emergencies' [56] campaign undertaken by the UK government as a response to the 9/11 attacks. The 'multimodal' campaign, which comprised various advertising and a booklet for every household, aimed at a 'multiple hazards' approach to civil protection [57]. Preston et al. (2011) argue that emergency preparedness is 'pedagogical' and hence, 'a public pedagogy' [57]. The notion of 'pedagogical' refers to that the population 'can be taught to mobilize affects, conduct behaviours and operationalize cognitions' [58]. Such a 'pedagogical character of the state' concurs with Bernstein's (2001) conception of 'the total pedagogical society . . . becoming concretized' [58,59]. Preston et al. go on to suggest that emergency preparedness is not only pedagogical, 'but also increasingly politicised' [57]. Pedagogical or 'educative' campaigns are state interventions in '"realizing the political" in terms of not only responsibilisation but also through defining the subject of security as "the other"' [57,60].

Drawing on Preston's works, Kitagawa further conceptualises the notion of 'preparedness pedagogy' [61]. It is a response to Burdick, Sandlin and O'Malley's question '(1) how are the terms 'public' and 'pedagogy' conceptualised?' Biesta's framework of *a pedagogy for the public, a pedagogy of the public* and *a pedagogy in the interest of publicness* is employed, which emphasises the political functions of public pedagogies. The framework allows a depiction of a variety of approaches in DE, addressing the forms of pedagogies and pedagogues, as well as the locations of pedagogies as follows [17].

4.3.1. A Pedagogy for the Public

This form of pedagogy refers to authority-led models of DE, i.e., a pedagogy 'aimed at the public' [17]. The pedagogical form applied is instructive, the pedagogical location being an actual or imagined school. The responsibility of the pedagogue—the state or its agent—is 'to instruct' the citizens 'how to behave'. The contents of the lessons are legal or moral, and there may be national curricula that prescribe what to teach. *A pedagogy for the public* is the most conventional and visible form of public pedagogy in the field of DE. Probably every country has made at least one propaganda film, public campaign

or legislation in preparing the population for a disaster. The aforementioned 'Preparing for Emergencies' campaign certainly is an example of the state acting as the pedagogue instructing the population 'how to behave' in an emergency situation. Many governments have taken a reactionary approach to disaster preparedness and DE [62]—Experiencing a disaster and its damage prompts them to act on preparedness for future disasters.

The 2011 Great Flood in Thailand was 'one in 50–100 year event' [63]. Lasted more than six months, the flooding spread in 64 out of 77 provinces in Northern, North Eastern and Central Thailand along the Mekong and Chao Phraya River basins, as well as the capital Bangkok. The flooding affected 5,247,125 households, resulted in 1026 fatalities [64] and caused the economic damage of US\$46.5 billion [65]. The Thai government's response to the flood disaster was criticised by the public and DRR actors—instead of the existing Disaster Prevention and Mitigation Act, the government employed the Prime Minister's Policy to manage the disaster causing confusions and delays [65]. In response to the public and international criticisms, the Thai government updated the National Disaster Prevention and Mitigation Plan into the National Disaster Risk Management Plan, with the help of international aid agencies [64]. The new plan incorporated what had become the focal point of the global DRR discourse—The emphasis on 'integrated' and 'inclusive' DRR based on joined-up working amongst all stakeholders. These principles were subsequently stipulated in the Sendai Framework for DRR 2015–2030 [5,66].

Biesta, however, poses a concern that *a pedagogy for the public* leads to 'the erasure of plurality' undermining 'the conditions for politics and freedom'. This point could be demonstrated by taking Preston's critical whiteness studies as an example [67,68]. He argues civil defence pedagogies in the US in the 1950s and the UK in the 1980s intended the protection of whiteness, particularly that of the white middle-class family. The states installed 'racialised and eugenic discourse' to emphasise the importance of the continuity of whiteness in the context of an 'emergency'—both real and 'imagined'—for 'symbolic maintenance' [68].

4.3.2. A Pedagogy of the Public

The pedagogical form in this pedagogy focuses on 'learning rather than instruction' [17]. It means that the pedagogical work is determined not externally but 'within democratic processes and practices'. The public nominates the pedagogue, who plays the role of a facilitator in an actual or imagined 'adult education class'. There is no given prescribed curriculum but may be a set of agreements. Compared with the previous pedagogy for the public, this form of public pedagogy relates 'much better to the idea of plurality' valuing the processes of 'collective political learning' [17].

In DE, *a pedagogy of the public* can be identified in participatory and community-based approaches such as stakeholder workshops, which have widely been promoted in the field of DRR. Yonmenkaigi System Method (YSM) is one of the examples of workshop methodologies [69]. Samaddar et al.'s study deployed YSM in a flood-prone slum community in Mumbai in India, one of the most vulnerable coastal megacities [70]. As the 2005 flood showed, victims were from the poorest population demographic, which comprised more than 65 per cent of the total population of the city. Their lack of resources and power makes them vulnerable and not having a 'voice' in development and management processes perpetuates their circumstances [70,71]. Since the enactment of the Disaster Management Act 2005, the government of India has stressed community engagement as part of prevention and preparedness measures. For local communities, however, drawing an effective action plan working with external experts has become a new challenge. YSM is designed to enable the participation of the local community and the collaboration amongst different stakeholders in developing DRR action plans. As a safe platform for face-to-face communication, YSM prompts sharing concerns and wishes and reducing conflicts and disagreements in order to enable the development of a community action plan. A standard YSM workshop has eight to 16 participants from a community, with a facilitator and con-

sists of four main steps: carrying out a SWOT analysis, completing the Yonmenkaigi Chart, debating, presenting the action plan chart [69,70].

Stakeholder participation actualised by tools such as YSM certainly bring various stakeholders together and the unheard voice to be heard. Nevertheless, the initiation and implementation of the participatory activity—the YSM workshop in the above case—is still managed and controlled by external agencies and researchers [72]. An element of 'passive' participation cannot be denied. Moreover, as Biesta warns, *a pedagogy of the public* 'brings democracy under a regime of learning' [17]. 'Learning is not some kind of open and natural process' but 'rather a very particular and specific regime'. Under this regime, citizens are required to learn because the 'politics of learning' is in place. Social and political problems are replaced with learning problems, resulting in learners' individual responsibilities. Applying this scenario in the above Mumbai community's setting, the action plan produced is the community's responsibility, hence, they are also responsible in case failing to implement the plan causing damages in future floods.

4.3.3. A Pedagogy in the Interest of Publicness

Moving beyond the restricted form of public pedagogy, Biesta proposes an alternative form, which works 'at the *intersection* of education and politics', in the pursuance of democracy. *A pedagogy in the interest of publicness* aims at 'an enactment of a concern for "publicness"', that is, 'a concern for the public quality of human togetherness and thus for the possibility of actors and events to *become public*' [17].

Becoming public refers to 'the achievement of forms of human togetherness in which action is possible and freedom can appear'. The pedagogical form is neither instruction nor facilitation but more 'activist', 'experimental' and 'demonstrative'. Activist action is to develop 'alternative ways of being and doing' and 'of acting in concert', which enables 'opportunities for public relationships-in-plurality'. Such alternatives are bound to be experimental. Biesta draws on schooling as an example. As opposed to the focus on 'individual advantage, competition and excellence', 'new ways of doing schooling' require trying out 'public ways of acting in concert' through 'cooperation and the hard work of living together in plurality and difference'. This form of public pedagogy is 'a pedagogy of demonstration' because 'such forms of experimental activism . . . demonstrate . . . that things not only should be done differently but actually can be done differently' [17]. Thus, *a pedagogy in the interest of publicness* is 'entirely public, both in its orientation and in its execution' [17]. It is this form of public pedagogy that restores the public sphere, in which the public logic of democratic decision-making, public duty and collective interest is served.

Linking DE with *a pedagogy in the interest of publicness* also involves participatory and community-based approaches. However, when observed with the lens of 'activist', 'experimental' and 'demonstrative', the number of instances seems to go down. One example could be found in the Sturmer Village Flood Action Group set up by two couples, who were severely affected by the flood in 2014 [73]. Sturmer is in the county of Essex in England having experienced pluvial floods and floods from storm surges historically. Arguing that the major causes of floods were insufficient infrastructure, the action group actively demands the parish council to deepen shallow streams and strengthen overhead bridges. The group engage in risk communication via meetings, flyers and the website aiming to protect village residents. Their experimental demonstrations include flood warning alerts based on checking weather forecasts and flood depth gauges and portable flood gates for the residences prone to flooding. Flood action groups have become one of the major participatory community-based DRR measures, and more 'activist', 'experimental' and 'demonstrative' cases may be found across the UK.

4.3.4. Critique of Public Pedagogy

DE research has largely focused on the 'curricula' of DE. Preston shifted the focus to 'pedagogy', linking DE with public pedagogy but overlooked the 'public' aspect of it. The conceptual connection between DE and public pedagogy can be clarified through the

differentiation between a pedagogy *of the public*, *for the public* and *in the interest of publicness*. Recognising different 'publics' also strengthens the areas of inquiries in the field of DE. The focus of *a pedagogy in the interest of publicness* lies in citizens' proactively initiating the action, which is an experimental pedagogy of demonstration, in which the citizens act in togetherness to develop their own DRR methodologies to fulfil their needs.

Kitagawa further suggests that one particular theory from Japan 'everyday-life preparedness [*seikatsu bosai*]' [74] can be a methodology for *a pedagogy in the interest of publicness* [61]. Yamori defines 'everyday-life preparedness' as follows:

> *Everyday-life preparedness does not consider DRR as an independent activity separated from other aspects of everyday life. Rather, it emphasises integrating DRR activities into every activity in daily life—ranging from work, study, hobby and leisure at the individual level, to elder care, children's safety, festivals and sports events at the societal level. In other words, DRR activities must be 'built in' to these daily activities* [74].

DE instructed by the state or taught by experts is not always appreciated by local communities and individual citizens due to their lack of resources, time and interest, while 'built-in' DE is embedded, not additional. Everyday-life preparedness is a new way of conceptualising DE, which starts with 'what your own circumstances are' [74].

5. Conclusions

This paper has argued for a lack of conceptualisation of DE and discussed three possibilities as summarised in Table 1.

Table 1. Conceptualising 'disaster education'.

Conceptualisation	Options	Pros	Cons
According to temporal distinction	Education in usual/ unusual times	Reflects the timing in which the DE is undertaken. Education *of* and *for* disasters is offered in usual times, while education *in* emergencies occurs in unusual times.	A lack of consideration of the principles of the disaster management cycle. DE involves all phases of the cycle.
By modes of learning	Formal, non-formal, informal learning	Demonstrates the richness and variation of DE.	The vertical distinction of formal, non-formal and informal fails to capture the horizontal diversity of DE. Many DE initiatives involve more than one mode of learning.
As a sub-discipline of education	Lifelong learning	Encompasses every learning opportunity for and around disasters and emergencies, involving all aspects of the disaster management cycle.	A limited conceptual clarity and depth that lifelong learning could provide to the area of DE.
	Public pedagogy	Suitable because the different 'publics' have a capacity to capture the diversity of DE, and 'useful' because the different 'publics' address the complexity of DE.	Still unknown as to how 'degrees of participation'/ 'levels of engagement' could be addressed.

The temporal distinctions between education *of* and *for* disasters and education *in* disasters undermine the principles of 'disaster risk reduction' and the disaster management 'cycle'. DE has to engage with discussions around risks and vulnerabilities in a continuous manner across all phases. Increasingly, DE initiatives involve more than one mode of learning because of the present emphasis on integration and collaboration in DRR. Formal, non-formal and informal learning only capture part of what DE is. An umbrella policy concept 'lifelong learning' is also problematic because of its elusive and adaptable nature. It does not offer more than promoting DE from 'cradle to grave', failing to provide conceptual precision and substance in the discussion of DE.

The paper has exhibited 'public pedagogy' has a capacity for a useful conceptualisation of DE. Shedding light on the significant differences of 'publics', the paper argued the suitability of situating DE within the domain of public pedagogy. Authority- and expert-led DE can be referred to as *a pedagogy for the public*, which is in the forms of public campaigns and national curricula. Designed and implemented by authorities and experts, this type of DE aims to teach and instruct learners so that they could behave appropriately at the time of a disaster. A more democratic version of DE is *a pedagogy of the public*, which takes the forms of participation and engagement organised by a facilitator, who tends to be a community leader or an expert. The DE events are designed to capture the participants' views and requests to bring them on board for DRR planning and implementation. Besides participation and engagement, *a pedagogy in the interest of publicness* involves initiating DE activities and testing various methods and evaluating their outcomes. The public owns the activities, which may influence the decisions of authorities and experts.

It has to be stressed that the paper is not advocating all DE activities should become *a pedagogy in the interest of publicness*. Some research has already demonstrated that stakeholder participation and public engagement approaches may not be suitable for certain communities and activities [75]. For instance, a participatory DRR activity in a society without a culture of participation is unlikely to succeed. Moreover, where democracy is not a norm, being activists experimenting with new DRR ideas and demonstrating their impacts is not a realistic approach to DE. The joint task for the fields of DE and DRR, therefore, is to identify what form of DE—*a pedagogy for the public, of the public* or *in the interest of publicness*—is suitable in a particular setting considering various factors.

This point resonates with an increasing concern raised by Reed against the mainstream policy discourse of 'participatory approaches', 'community-based DRR' and 'all of society engagement' in the field of DRR. He argues that 'degrees of participation' and 'levels of engagement' should differ depending on the context, the objectives of the DE work and the capacity of stakeholders [76]. Similarly, Yamori and Miyamoto indicate the importance of separating 'deep outreach', in which responsibilities are shared between experts and community members, from 'shallow outreach', in which experts instruct community members what to do [77]. What public pedagogical perspectives could offer is a further consolidation of such degrees. 'Shallow outreach' and 'deep outreach', in fact, both come under *a pedagogy of the public*. Some of the latter may only be *a pedagogy in the interest of publicness*, if 'activist', 'experimental' and 'demonstrative' aspects are identified in the activity. The public pedagogical conceptualisation of DE has a potential to further the discussion of participatory and community-based approaches to DRR.

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