TAKE IT SERIOUS

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Methodological Framework for the Teaching of Disaster Management Education

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Introduction

The frequency and complexity of natural and manmade disasters, affecting global communities has risen significantly over the past decade. As such, the need to develop strategies to diminish the negative impacts of such disasters has become ever more important. Countries need to be able to assess their levels of preparedness and consider their capabilities to manage disasters.

Children are one of the most vulnerable groups when faced with natural or man - made disasters. This project, TAKE IT SERIOUS, recognises the importance of imparting necessary knowledge to educationalists and pupils in order to develop disaster management skills, and to increase awareness about disaster-related issues. The project aims to create outputs and activities which are centred on effective, holistic and inclusive approaches and is aimed at pupils between the ages of ten and thirteen years old. Innovative technological methodologies and the use of gamified learning, based on authentic scenarios, is widely recognised as the most effective way to achieve this.

The envisaged long term effect of the project is to strengthen the profiles of teachers, school authorities and school support staff, and to mainstream holistic and effective disaster management in Europe.

Innovative approaches to Disaster Education

Disaster education can support adults and children to learn what to do before, during and after a disaster or emergency. Structures and planning to mitigate such disasters will never protect everyone; emergency services may not be able to help all people. Therefore, disaster education is crucial for preparedness, response and recovery.

There is surprisingly little academic research into understanding the most appropriate content and methods for effective disaster education aimed at educators. Although it is commonly used around the world by emergency organisations to encourage preparedness. Furthermore, there is scarcely any practical and innovative guidance on how to tailor disaster education to local hazard risk scenarios and communities.

The analysis from the questionnaires given to teachers in five European countries, shows major differences in teacher knowledge, preparedness and response to disaster management. From the data captured:

- **More than half of the responses from Bulgaria, Greece, Spain and Turkey indicate that teachers have preferentiality towards innovative teaching strategies.**
- **Overall only 7% of teachers preferred or greatly preferred traditional methods. This would suggest that they are open to more innovative teaching methods**
- **Teachers report that weaknesses in disaster management education include the content being too abstract and resources having a lack of practical application**
- **Teachers suggest that they would like resources that are multimedia, contain practical examples and employ a practical gamified approach**

Taking the analysis of the questionnaires into account, there is a strong desire to veer away from traditional approaches to disaster management education. Instead there is a drive to embrace innovative strategies which contextual disaster management in a relevant way.

Theory and Method

Most disaster management education frameworks designed for schools, are aimed at the students themselves and focus on imparting key knowledge. Our research tells us that there is a need to upskill teachers themselves using effective professional development. The focus should be on how teachers can use innovative approaches effectively when teaching about this subject. As such, teachers themselves need access to continuous professional development that not only increases their knowledge in disaster management, but gives them tech skills as well.

Malcolm Shepherd Knowles has conducted extensive research in the area of andragogical strategies. Knowles (1984), highlighted the differences in adult and child learning. He stipulates that as a person ages, the incentive to take on any new knowledge comes from internal sources. This is in opposition to the incentive provided by teachers (external sources) when teaching children.

Knowles (1984), goes on to suggest four principles that are applied to adult learning (and some may say very relevant to disaster education):

1. **Adults need to be involved in the planning and evaluation of their instruction.**

2. **Experience (including mistakes) provides the basis for the learning activities.**

3. **Adults are most interested in learning subjects that have immediate relevance and impact to their job or personal life.**

4. **Adult learning is problem-centred rather than content-oriented.**

Not only should community education be tailored to the individual learner, it should enable learning from social interactions within communities. Social learning theory promotes the importance of people learning together. It is a theory of learning and social behaviour which proposes that new behaviours can be acquired by observing and imitating others (Bandura, 2007).

In simple terms, social learning is learning with and from others or collaborative learning. This can either happen online (for instance over popular social media) or offline.

Andragogical and social learning theory therefore calls for education that is tailored to the individual's and local community's learning needs.

This idea is supported by evaluations of disaster education programs. For example, in an evaluation of Australian natural hazard education, awareness and engagement programs, Elsworth et al (2009) concluded that programs should be more tailored to local communities, rather than be broad-based information campaigns. Webber et al (2017) in an examination of community participative engagement and learning related to emergency management planning found benefits in understanding communities and involving them in all aspects of local emergency management planning. This research correlates with our own findings across five European countries, (see points 4 and 7).

Results from Take It Serious Questionnaires

1. It is clear and expected that each partner country has a unique experience of disaster management.

2. Responses varied dependent on the type of disaster(s) present in that country.

3. Compared to the other partner countries, responses from UK participants show that teachers from the UK have either no or very low understanding of disasters, disaster management and disaster preparedness.

4. There is a willingness for educationalists to want to learn more about the subject and to integrate it into the curriculum/ syllabus.

5. There is more reticence in the UK to want to integrate disaster management into the curriculum. Assumptions to consider - UK curriculum is already dense, there is a specific focus on core subjects, disaster management for the UK is very different from that in partner countries.

6. Responses from Bulgarian and Turkish teachers tends to reflect that teachers are secure in their knowledge when teaching disaster management, have secure knowledge in this area, use various approaches and have access to resources. This is complemented by Bulgarian and Turkish teachers having access to well embedded disaster management curricula.

7. All partners have expressed similar challenges relating to disaster education curriculum. These include lack of time to teach the subject, lack of resources, lack of thematic approach and lack of motivation.

Framework

Using this theoretical and in practice knowledge and our own findings, the following framework for tailoring disaster education to local communities and countries can be explored, and applied (Dufty, 2014).

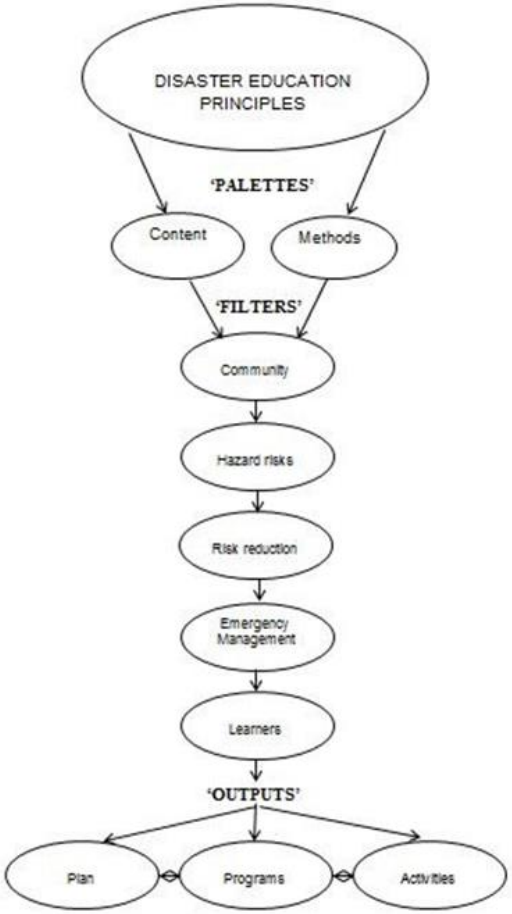

Figure 1: Framework for the design of community disaster education plans and programs

The framework consists of three steps that lead to the 'outputs' - the design of tailored local community disaster education plans, programs and learning activities. The three steps are:

1. **Broad principles of effective disaster education**
2. **'Palettes' of potential content and methods to choose from in the design of the disaster education plan, program or activity**
3. **'Filters' to identify appropriate education content and methods from the palettes guided by the principles of effective disaster education.**

1. Principles of effective disaster education

Many disaster education programs as stated previously rely on 'traditional' approaches which can be lacking in impact e.g. to motivate preparedness behaviours.

Principles based on evidence from disaster psychology, sociology and learning theory have been shown to be preferable. These alternative principles include:

- Strong participation of the learners in the design and implementation of disaster education programs
- Focus on community resilience including learning for preparedness, building capabilities and systems, forming social capital
- Linking education activities with the the Prevention, Preparedness, Response, Recovery (PPRR) model
- Evaluation of disaster education programs
- Using a disaster education plan to ensure longevity of education implementation in communities.

Furthermore, many current disaster education plans tend to use only cognitive learning. However, there are four learning domains available for disaster education according to Dufty (2018):

1. **Cognitive - learning as purely a mental/ neurological process**
2. **Behaviourism - focus on observable behaviour**
3. **Affective - emotions and affect play a role in learning**
4. **Social - humans learn best in group activities.**

An example of teacher training around the scenario of a Pandemic could look like this:

Cognitive	**Activities should provide opportunities to listen, think, understand, justify, explain and recall. For example:** • **Discussion about what a Pandemic is and what might be taught and the important role teachers play in disaster management generally - Nalini R. Chondekar August 2019 The role of teachers in disaster management https://www.ijsr.net/archive/v8i8/18012002.pdf** • **Explore and understand how ideas are connected – use case studies of response in different countries/cultures around the world** • **Justify and explain thinking – consider why responses might be different according to geography** • **Visualisation to improve understanding and recall – Powerpoint, video footage, simulation**
Behaviourism	• **Manipulate the environment to encourage desired behavioural changes – predict/control behaviour** • **Learn through reinforcement – constant feedback, right and wrong, quiz, test, homework** • **Rewards for working well – vocal praise/group praise**
Affective	• **Critical questioning – e.g has social media contributed to the spread of the Coronavirus?** • **Role play - brainstorming possible approaches to use with students** • **Simulations – watch video clips** • **Journaling – keep note of learning points** • **Silence – give time for personal reflection** • **Reading materials – e.g. a paper such as JJ Aguas 'Critical thinking in this time of global pandemic' Philosophia:int J Phil 21, 285-90 2020 https://scholar.google.com/citations?user=dyYkWrAAAAAJ&hl=en#d=gs_md_cita-d&u=%2Fcitations%3Fview_op%3Dview_citation%26hl%3Den%26user%3DdyYkWrAAAAAJ%26citation_for_view%3DdyYkWrAAAAAJ%3AKlAtU1dfN6UC%26tzom%3D-60** • **Reaction paper – immediate reaction to an issue** • **Reflection paper – a paper reflecting a process of change in thinking, valuing and behaving** • **Paired/group work** • **Objectives – emotions, feelings, values** • **Measure what learners will do in the future**
Social	• **Discussion** • **Team based games - taking on different roles – health, police etc** • **Role play & drama activities – act out scenarios**

2. ‘Palettes’ of potential content and methods

As shown in Figure 1, a range of learning content and method options (‘palettes’) should be used to choose from in the tailoring of the disaster education plan or program. The content range is across the disaster management cycle of PPRR.

The range of education methods or processes has been identified by several authors. For example, Molino Stewart (2012) has categorised current disaster learning methods into four main groups:

1. **Public communications, information products and services e.g. publications, internet sites, displays, promotional products, media liaison, advertising/marketing, social media.**
2. **Training, development and industry-specific programs e.g. skills development courses, leadership training, mentoring, emergency drilling and exercising.**
3. **Community engagement programs e.g. public participation programs, forums, discussion groups, events, developing networks, social media.**
4. **Comprehensive personal education programs e.g. school curriculum, university curriculum, personal development courses**

There are many education methods in these four categories from which to choose. Apart from the results of evaluations of disaster education programs and learning activities, exploratory research has shown the potential of some of the disaster education methods related to learning theories as summarised in Table 1.

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Table 1: Summary of potential disaster education methods linked to learning theories and curricula disciplines

Learning	Theory/Pedagogy	Relevance	Examples of Methods	Curricula Discipline
Behavioural	Programmed instruction	Rehearsing behaviours required prior to a disaster	Drilling, exercising, Training, First Aid/resuscitation, Life Saving	Physical Education Physiology Languages Citizenship
Cognitive	Information processing	Disaster information needs to be processed to trigger appropriate behaviours	Warning messages, social media, media releases, signage, crowdsourcing	Media Psychology
	Gestalt	Risk perception, decision-making, attention, memory and problem-solving are all important requirements for appropriate disaster behaviours	Awareness-raising documents and web sites (e.g. risk, preparedness actions), role plays related to disaster scenarios, maps	Mathematics Psychometric testing Geography Economics
	Constructivist	People construct learning from disaster information and experience	Oral histories, social media, diaries, personal research	History (local, national, global) Ancestry
Affective	Experiential	Prior or learned experience is an important factor in people's disaster preparedness and resilience	Gaming, simulations, virtual reality training, exercising	Information Technology Computing Sociology
	Social and emotional	Emotional factors play an important part in people's preparedness and resilience	Workshops, social and emotional learning programs in schools, resilient therapy, social media, counselling	Personal, Social & Health Education Psychology
	Transformational	People may need to change to prepare appropriately for future disasters	Role playing, disaster case studies, mind exploration, critical reflection	Drama Film Languages
Social	Situated learning/communities of practice	Social capital has been shown to be a major factor in community resilience	Social media, post-disaster community meetings, resilience forums, community engagement, team building	Psychology

3. ‘Filters’ to identify appropriate education content and methods

As shown in Figure 1, there are five ‘filters’ that help tailor the disaster education content and methods to local communities. Our Take It Serious research recommended that a review of the current curriculum content take place and that current themes were included e.g. pandemic.

The filters are:

1. Community profile
2. Hazard risks
3. Risk reduction
4. Emergency Management
5. Learners

A study of the community (local and national) should be undertaken as an initial stage of the filtering process. This will help place the disaster education plan or program in the context of this community. It should be noted that the ‘community’ may not be a geographical entity such as a town, suburb or city; it may have a shared sense of belonging (e.g. religious group, school community) or be a social network (e.g. sporting, online).

1. Techniques to better understand communities include:
Community profile using census and other demographic data. Aspects such as gender distribution, age cohorts, ethnicity, education background, transience of the population

2. Social research. For example, some governments and other organisations conduct community surveys and these could provide a useful insight for the design of local disaster education plans and programs. In addition, it may be useful to design and conduct social research to ascertain the disaster education needs of the local community.

2. Social network analysis. It is important to understand the interrelationships of people in the community so that these can be effectively tapped for disaster education.

3 . Vulnerability assessment. Vulnerability is the propensity to suffer some degree of loss from a hazardous event (Etkin et al, 2004). A vulnerability assessment can provide details of specific inherent risks in the community that may trigger specific disaster education for vulnerable groups (e.g. older people, children, poorer people, new migrants, people with disabilities).

As part of the filtering process, it is important to understand the hazard risks facing the community so that these can be addressed through disaster education. This can be done through risk modelling. Both the education content and methods will be different for each institution and country. In schools and colleges in the five countries surveyed there was a preference to embed disaster education content and methods within teaching/learning opportunities in existing curricula. Teachers surveyed overwhelmingly indicated this.

As shown in Figure 1, when the above discussed filters have been applied, appropriate education content and methods for a range of learners in the community can be identified. These then can be moulded into local education plans, programs and learning activities.

In most cases, it would be appropriate to develop a local disaster education plan, consisting of several programs (e.g. for different groups of hazards and different hazards) with each program consisting of several learning activities. These are normally constructed across the 'disaster cycle' of PPRR and should be interdisciplinary using progressive and innovate strategies as previously mentioned.

It is of the upmost importance to include formative and summative evaluation processes in at least the local disaster education plan and programs to assess if the learning outcomes are being met in the short term and also to gauge their longer term impact in public safety in an emergency or disaster.

Conclusion

Many disaster education programs across the world rely solely on the provision of generic information and preparedness plan templates. They tend to use only cognitive learning.

Research has shown the need to localise disaster risk reduction techniques including disaster education. The framework outlined in this paper provides an approach to the tailoring of appropriate disaster education content and methods to local communities and risk scenarios that uses learning theory across all learning domains. It also allows for an interdisciplinary and cross curricula approach not a stand alone subject. This should ease pressure and allow flexibility.

The tailoring filters include an understanding of the risks associated with the particular community (e.g. vulnerabilities, social networks), hazard risks, risk reduction measures, emergency management arrangements and local disaster knowledge.

The output of the framework is a local disaster education plan, and supporting programs and learning activities involving appropriate content and methods for a range of local learners and hazard settings. Instead of relying solely on traditional approaches, the framework enables choice from a range of cognitive, behavioural, affective and social learning methods.

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