






A Cascade Teacher Training Model in Disaster Education: A Case of Turkey

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Abstract

Individuals' reluctance to take precautions before disasters happen is one of the most critical concerns of the disaster management area. The disaster education given through schools is a critical process in addressing this problem. This paper aims to introduce the teacher training program model and the implementation practices of Turkey's School-Based Disaster Education Project. In Turkey, there are few studies regarding the planning, development, implementation, and evaluation stages of Disaster Risk Reduction education for teachers. The project has been carried out within the framework of the Ministry of National Education and Japan International Cooperation Agency. An at-scale cascade teacher professional development model was implemented. The model reached 135,375 teachers in 67 provinces by the 567 trainer teachers in a relatively short time with the cascade training system. This project has brought a documented nationwide disaster risk reduction training experience for Turkey with its economic and sustainable structure.

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Introduction

In Hyogo Declaration, regarding the first fundamental component, primary strategies and activities are education activities in disaster risk reduction (UNISDR, 2005). It is necessary to systematically, adequately, and professionally inform society and individuals on possible dangers and risks that put their lives in danger. Schools are essential institutions since the outcomes of education programs can get the parents and local community through children (UNDRR, 2006). Besides, children are a more vulnerable population during disasters; thus, making schools more critical in disaster education (Shaw & Kobayashi, 2001). Around 66.5 million children were affected by the devastating consequences of disasters every year until the end of the 20th century (Penrose & Takaki, 2006). Studies on children exposed to disasters show that children do not forget the memories of these painful experiences and their fears for a long time, and they have some problems like post-traumatic stress disorder (Ronan & Towers, 2014). However, some other studies also showed that people who have experienced the disaster demonstrate more motivated behaviors on disaster preparedness (Becker, Paton, Johnston, Ronan, & McClure, 2017; Shaw, Shiwaku, Kobayashi, & Kobayashi, 2004).

Disaster risk reduction (DRR) education is not only about raising the awareness of the public through school-based initiatives in the field of education, but it is also a field that includes family and community learning, adult education, and popular culture (Preston, 2012). This field consists of sub-fields such as (1) human values and attitudes towards disaster risk; (2) understanding of disaster risk and motivation; (3) disaster prevention knowledge and skills both individually and collectively; and (4) emergency response capability (Winarni, 2016). Disaster risk reduction education is not limited to students and school time in supporting these sub-fields. It can be defined as a lifelong learning area (Thayaparan, Malalgodaa, Keraminiyagea, & Amaratungab, 2014). Accordingly, developing the attitudes of students who will work effectively on environmental protection and disaster prevention depends on many factors, but it includes two main components: (1) education process at school and (2) students' relations and communications with their family and community they live in (Bernal, 2019; Paton, Smith, Daly, & Johnston, 2008).

The main purpose of the present study is to develop a sustainable, economic, and effective teacher training program. More specifically, as an exemplar for the other highly populated disaster-prompt countries, this report aimed to provide information on selecting the teacher training program's instructional design model, the implementation practices, and the activities being performed during the second phase. To reach the purpose, the following research questions guided the study:

1. Which instructional design model and teacher training system should be selected to develop the SBDE (School-Based Disaster Education) program?
2. What is the existing situation in Turkey in terms of DRR teacher training?
3. What should necessary knowledge and skills be required for teachers to teach for DRR?
4. What are the statistical outcomes of the applied instructional design model and teacher training system?

Literature Review

The rationale behind the disaster risk reduction programs is "preparing predisaster risk reduction and resiliency building, including 'preparing to respond,' require motivation, knowledge, skills, and DRR-focused behaviors, including planning and practice" (Ronan et al., 2015, p.2). Teachers have the most crucial role in establishing the relationship between school and society via disaster risk reduction education and, by this way, in the enhancement of the resistance of community because students are the most critical communicators between school and society. They carry the knowledge, attitudes, and skills towards disaster risk reduction they gain to the other community members (Izadkhah, Hosseini, & Heshmati, 2012). This view gives a critical mission to children and young people as well as teachers. In "Let Our Children Teach Us!" volume published by The International Strategy for Disaster Reduction (ISDR), Wisdom (2006) emphasized the transformational role of children, thereby education, in the development of innovative and critical strategies, and the changing attitude, knowledge, and behavior of society. Studies also showed that an effective disaster risk reduction education increases awareness, preparedness, and community's resistance together with students (Amri, 2015; Haulle & Rugumamu, 2015; Mitchell & Borchard, 2014; Yu et al., 2017). Over the last decades, studies on educational processes at schools have proven the appropriateness of this strategy. Accordingly, studies indicated that individuals receiving effective training show appropriate behaviors after disasters (Hosseini & Izadkhah, 2006; Muttarak & Potihisiri, 2013; Özmen, 2006; Shaw et al., 2004; Shiwaku et al., 2007). Many recent studies focused mostly on disaster risk reduction (Revet, 2012) showed that effectively developed disaster risk reduction programs increase students' awareness, preparedness, and perception of risk (Mamoni Suba & Son, 2017; Ronan et al., 2010). The common characteristics of these programs are that they use participatory learning techniques, many regular exercises, simulations, reminders of past events, and scenario animation exercises (Benadusi, 2013; Chakrabarty, 2010; Lakoff, 2008; Muzenda-Mudavanhu et al., 2016; Shaw et al., 2011). For effective DRR training of students regarding prevention, management, and response, Selby and Kagawa (2012) suggest six

teaching and learning techniques: interactive, surrogate experiential, field experiential, affective, inquiry, and action. Furthermore, Petal and Izadkhah (2008) also took the attention to informal learning settings in supporting effective DRR education; such as dissemination of written materials; creative educational materials; cultural and performing arts; after school safety clubs, scouting badges, and project activities; projects that bring students into contact with the local community and local government; competitions, awards and commendations; involving parents and local community; community partners; and disaster drills.

Shaw et al.'s work (2004) in Japan concluded that traditional school education could not enhance awareness. After establishing the Environment and Disaster Mitigation course, the significant results on mitigation, preparedness, response, recovery, and understanding of the environment were reported (Shiwaku & Shaw, 2008). A museum-based disaster education in New Zealand was found an effective way of preparing students and teachers for disasters by increasing their knowledge and appropriate behavior (MacDonald, Johnson, Gillies, & Johnston, 2017). The school disaster education program in Nepal showed that lecture-based training might raise the risk perception. Still, unlike the active learning approach, this method did not lead participants to take action for risk reduction (Shiwaku et al., 2007). The studies also explored teacher training as a facilitating factor in the use of disaster preparedness resources in New Zealand (Johnson, 2011; Renwick, 2012). Chinese teachers reported that their disaster education lacks attractiveness and local features, which could not affect the students' awareness and capabilities (Zhu & Zhang, 2017).

Similarly, Apronti et al. (2015) suggested that a low number of teacher training programs in Gana caused weaknesses in transferring the DRR knowledge in the classroom, thus effectively training the students. When teachers' professional development on DRR was examined, the UNICEF (2012) report showed that there were different models in the literature; (1) guide-driven DRR professional development observed in Nicaragua, Egypt, Bangladesh, and Nepal, (2) website-led teacher support in Japan, New Zealand, and Peru, (3) a professional journal with features on best practices and local experiences in DRR teaching in the Russian Federation, (4) at the pilot or pre-scale level in Armenia, Cambodia, Fiji, Lao PDR, the Philippines, Japan, and Costa Rica, (5) at-scale cascade training in Kazakhstan, Turkey, Indonesia, and Madagascar. The forms of delivery in these models differed according to the nature and purposes of the training. In most cases, DRR teacher training lacked aftercare and monitoring.

Context

Teachers undoubtedly assume the most critical task in the education dimension of disaster risk reduction management. Since the teachers are accepted as the fundamental actors in implementing education and training activities as in the whole world, and their success means success in disaster risk reduction, the efforts to improve their competencies are significant. However, prospective teachers do not take any must or elective courses on DRR training at the education faculties in Turkey. The graduates of education faculties have to pass the Public Personnel Selection Examination with high grades to be assigned as a teacher. After assigning to the position, the teacher candidates have to participate in the first year's candidacy training program. This program includes a variety of courses and seminars, including "Disaster Education." This seminar is given to 60 candidates in the conference halls. Instructors of the seminars are generally the school principals, who do not have a certificate on the mastery of disaster training. The course has only four learning objectives without any defined program goals. This theoretical course is generally criticized for insufficient instructor competencies and practical applications' inadequacy about the newly learned topics (Ekinci, Bozan, & Sakız, 2019).

Furthermore, the literature firmly confirms that the main problems are arisen by the implementation and the supervision of the program (İlyas, Coşkun, & Toklucu, 2017; Tunçbilek & Tunay, 2017; Ulubey, 2017). Candidate teachers who participated in the seminars also reported that they did not participate every single hour of the program owing to the lack of supervision and control

(Özçınar & Özkan, 2019). The studies conducted with the teachers in mainstream education indicate that even if teachers are aware of the necessity of disaster education at schools, they lack comprehensive knowledge and practical experience on how to teach concepts of disaster education in the classrooms (Kırıkkaya et al., 2011).

Depending on these findings derived from the literature, the Ministry of National Education (MoNE) decided to fill the gap arisen from the pre-service and candidate teacher education program, which cannot serve congruent and comprehensive programs on disaster education. Therefore, the MoNE had started a project named the "School-Based Disaster Education Project" granted by JICA (Japan International Cooperation Agency). In the first phase, 3600 teachers from pilot provinces have attended training for 18 hours. Nevertheless, these studies' statistical data were not recorded with an appropriate method; evaluation and monitoring of the studies could not be carried out, and phase I could not reach most of the teacher population. To meet this requirement and provide country-wide spread, the continuation of this project, "School-Based Disaster Education Project Phase II" started in 2018. Within the project's scope, it was planned that all teachers would participate in this training program, perform activities in the classroom, and monitor and evaluate the project. However, the project team was expected to develop a more sustainable and economic teacher training model due to the second phase's lack of budget.

Method

A mixed-method research design, which refers to the combination of qualitative and quantitative approaches into the research methodology of this multiphase study including selecting more than one types of research questions, manner, sampling procedures, data collection, analysis methods and conclusions in different phases of the study (Bryman, 2006; Tashakkori & Creswell, 2007; Tashakkori, Teddlie, & Teddlie, 1998; Teddlie & Yu, 2006), was preferred to manage the project. To find answers to the first, second, and third research questions, a series of review studies aim to "synthesize research findings to determine the true state of knowledge in relation to the phenomena in question" (Krathwohl, 1998, p.553), were utilized. Within this frame, the reviews' objective was to compose a clear interpretation of the research for the ministerial policymakers and researchers interested in the current situation of DRR education in Turkey, Turkish teachers' needs, and their in-service training design preferences. Furthermore, to enhance the data's validity, researchers suggest using multiple methods and sources, called triangulation (Mathison, 1988). In this perspective, researchers collected data via survey and interview to explore the current situation and the need to determine the program's content.

The online survey on the existing situation was prepared by researchers and located in the professional development section of the teachers' official web portal of the MoNE. This survey consisted of a five-point Likert scale, structured, multiple-response, and short answer questions. The expert opinions were taken from four academics specialized in curriculum and instruction, social studies education, disaster management, and earthquake engineering departments for both this 30-question survey and interview questions. 29,322 teachers responded to the survey, which included basic questions; such as "Have you ever participated in an in-service training course on DRR education?", "Do you feel ready for a future disaster?" "Has your school prepared for a future disaster?" Descriptive statistical methods were used to analyze the data.

Semi-structured interviews with senior ministry bureaucrats ($N=4$) were conducted. These bureaucrats were responsible for the teachers' professional development and training in the MoNE. The interviews lasted between 10-20 minutes. The participants were asked ten questions on the current situation of the disaster training of teachers, such as "Is there a systematic teacher training program developed before? If yes, is the content of the current program up-to-date? Does the content of the current program address teachers' needs and interests? Are there enough budgets to implement

the newly developed/revised program? Is there a sufficient number of experts and/or trainers who will participate in teachers' training in Turkey? What characteristics do teachers report in-service training programs as effective? What kind of approach does the new Education Vision 2023 suggest about teachers' professional development?" The interviews were recorded, and data were transcribed word by word. After cleaning the data, descriptive analysis was utilized. Each interview was coded using the open coding method, and then themes were created based on the codes that emerged in the data. Four researchers cross-checked the coded themes and categories to ensure the reliability of the data.

The documents of the significant partners and reference institutions or foundations for the Turkish policy system were reviewed to determine the program's content. The selected reports of ADRC, JICA, UNDRR, UNICEF, Sendai Framework, Hyogo Framework, AFAD (Disaster and Emergency Management Presidency), and TRC (Turkish Red Crescent) were examined in terms of overarching purposes, and content that they suggested primarily should be considered in the design of any DRR program.

The project was carried out within the scope of the assignment letter dated 25.12.2019 and numbered 97470333-903.07.01-E.25779087. During the study, the "Law on the Establishment of the Public Servants Ethics Board and Amending Some Laws," "The Code of Ethical Behavior of Public Officials and Application Procedures and Principles," "Ministry of National Education Ethical Commission Working Procedures and Principles" were taken into consideration. The ethical principles have been adhered to throughout the entire process. This study is limited with the disasters often experienced in Turkey since the program was developed for Turkish teachers. The program will be revised in the near future to compensate for this limitation with the content of the program. Furthermore, different measurement and evaluation techniques can be utilized in future research. The budget limitation affected most decisions regarding the duration and schedule of the face-to-face program and the design of remote training.

Results

Situation Analysis and Instructional Design Decisions

To describe the existing situation about DRR teacher training in Turkey, teachers' needs were examined as the first step. The survey results showed that 87.90% of the teachers (25 786) did not participate in DRR education before. Furthermore, among these teachers, 87.46% did not feel ready for a future disaster, 82.47% did not think that their school was prepared for a future disaster, and 82.92% thought their colleagues in the school were not prepared for a future disaster. Nearly half of them also reported they did not know what the possible disasters where they live (48.95%), whether there is a local warning system where they live (85.31%), what to do during a disaster (69.86%), where and how to get help in case of a disaster (65.57%), how to take measures (69.23%), what they need in the first 72 hours (66.53%), what to add to the disaster and emergency bag (58.62%), how to continue teaching after a major disaster (77.86%), and how to support traumatized students (76.29%).

This data was triangulated with the interview data collected from senior ministry bureaucrats. The findings showed that there were some attempts for DRR training of teachers in the past. However, these attempts cannot be called as a comprehensive course or a DRR program. The attempts do not have a written rationale, learning objectives, outcomes, methodology, and philosophical approach. Furthermore, even the project's phase I did not have progress and evaluation reports. The participants' responses revealed no systematic curriculum effort without the disaster education seminar under the candidacy training course. When the seminar's learning objectives are analyzed, it can be confirmly said that the seminar is not a comprehensive one compared with the UNISDR (2005, 2007)'s general framework and strategies proposed for disaster reduction and resilient communities. The definition and the learning objectives of the course follow (MoNE, 2020, Appx 6, p.1):

"This seminar is organized locally in order to increase the knowledge and skills on 'Disaster Education' of the candidate teachers newly appointed to schools/institutions affiliated to our Ministry. Every participant who successfully completed this activity:

- Understands basic disaster knowledge.
- Comprehends the danger hunt.
- Knows the position of teachers in disaster management.
- Knows school disaster and emergency management plan."

Furthermore, since this seminar has been statutory only since 2015, not all teachers have been benefitted. Therefore, it was not possible to speak about comprehensive DRR training for all teachers in the system. The interview participants also confirmed that the budget of the project was consumed in phase I of SBDE. The official statutory documents confirmed this data. There was not a new budget allocated for the second phase. Even if the project's budget was consumed in the first phase, none of the bureaucrats know about the behavioral change of the teachers who participated in the training.

To design the content and materials of the program, it was essential to hire experts. However, phase II did not have a budget to hire experts. The researchers were attempted to examine the archives to reach the available trainer teachers already trained in the first phase. However, there was no statistical data or demographic information about the trainers. Therefore, the project group was composed of only the minister advisors who have Ph.D. degrees in Curriculum and Instruction, Educational Management, Administration and Leadership, Social Studies Education, and Measurement and Evaluation departments. This means that ministerial officers became the researchers simultaneously. The project group call for the volunteer participation of university academicians who had DRR expertise. A small group of ($N=2$) university academicians confirmed voluntarily participating in the content development process by devoting effort to the final revision of the program content document.

Considering the limited number of volunteer experts; not having a comprehensive and updated SBDE program, and the new Education Vision 2023 document demands the learner-centered and efficient learning approaches for teacher training, and no allocation of a budget, it was decided to design a program that would be implemented in a short time, efficient, challenging, and exciting for the teachers, could be related with the learning objectives of the school curricula, support the activity-based and active learning, and give a continuous revision opportunity with a flexible approach. Thus, a blended learning approach, in which theoretical knowledge would be represented with distance learning tools; and practices would be done in face-to-face education situation, was adopted within the cascade teacher training model. A cascade training model or multiplier approach is often preferred to transfer the trainer teachers' knowledge and skills to the local teachers within a limited time (Griffin, 1999). This model is described as a cost-effective professional development model which is generally preferred by the developing countries with high populations (Dichaba and Mokhele, 2012; Kennedy, 2005).

Development of the SBDE

Program outcomes and learning objectives. During the program's development process, one of the most comprehensive phases of the SBDE project was the development of program outcomes and learning objectives based on literature. Because it is impossible to get any findings on the program outcomes and learning objectives of the in-service teacher disaster training programs implemented by the MoNE, the respected national and international literature was examined in detail. The document analysis helped to draw a framework and understanding of the SBDE program. Based on the review, 43 learning objectives and three learning outcomes were developed. The content was divided into six units named (1) Disasters and emergencies- basic concepts, (2) Mitigation and preparedness behaviors, (3) Response behaviors, (4) Post-disaster recovery behaviors, (5) Disasters and emergencies at school, and (6) Psychological first aid.

Materials. The next stage was to develop materials based on the learning objectives. At first, the learning objectives were classified to determine whether they will be given through a face-to-face training or distance training method, or both. Considering the limited budget, it was decided to collaborate with the country's most prominent stakeholders, AFAD, TRC, and TJV (Turkish Japanese Foundation). Firstly, during the content development stage, some of the AFAD animations of their Basic Disaster Awareness for Individuals and Families module and some of the TRC videos were approved to be used in the remote SBDE.

Moreover, to meet the rest of the objectives, the project team wrote storyboards of the animations. Since MoNE allocated no budget to meet all the online program's objectives, an educational technology company developed some of the animations for free of charge; further, the company gave immediate and prompt feedback to the animations developed by the volunteer Computer and Information Technology teachers. Finally, the project team of MoNE prepared the face-to-face training program contents and activities.

The project team wrote two books containing theoretical knowledge and activity/lesson plan samples being performed depending on learning outcomes in all subject areas and all grade levels. The teacher handbook (academic) book content was parallel with the flow of online training content. Books were shared with trainers of trainees in print and were presented to teachers who attend distance training in PDF format from the learning portal. Alternative readings published by the TRC and AFAD were provided to the trainer and local teachers. A triple puzzle and disaster way outdoor play carpet designed by classroom teachers to improve the basic knowledge of the right behaviors before, during, and after disasters was produced and distributed to all the trainers of trainees by the TJV. Trainer teachers used the puzzle and carpet as teaching materials in their local teacher training.

Delivery of the SBDE (Implementation)

Online training program. Distant education module was put into practice for volunteer teachers and school administrators across all subject areas and grade levels from 81 provinces in May 2019. A week was allowed to complete the online program. The number of trainees completing the training was 19,790 in June 2019. (This number changes day by day since the online training program has still been open).

Training the trainer teachers. Volunteer teachers who have a maximum of fifteen years of teaching experience, complete the distance program successfully have attended the face-to-face program to be able to the trainer teachers. The master trainers who had experience in school-based disaster education in Japan (with JICA teacher scholarship program 2018) carried out the face-to-face program courses. The two-day training was completely activity-based, stimulated the cooperative tasks, and followed the experiential learning approach. During the program, simulation techniques were employed in the Bursa Disaster Training Center trip to reach the desired behaviors. Besides, trainees participated in the activities and developed their lesson plans on raising public awareness, constructing disaster preparedness culture, and mitigation after disasters within the next two days. Face-to-face training was implemented in classes designed for 25-30 trainees in the inservice training center of MoNE. 595 teachers from 67 provinces completed the face-to-face training program and certified as a trainer of SBDE.

First dissemination program (Local teacher training). 595 trainers were assigned to the dissemination program in September 2019 to reach all the teachers. The design of these courses was parallel to the program they attended in June 2019. This program was planned to be open until no teacher left behind. The first dissemination of training was practiced between September and December 2019, with the participation of 135,375 teachers from 67 provinces.

Second dissemination program. To reach more provinces, the additional trainer teacher program was held in February 2020 with 117 teachers. With these additional trainers, the program has 712

trainer teachers from 77 provinces in total. The second dissemination program was planned to start in March 2020; however, it had to be postponed to a future date owing to the Coronavirus outbreak.

Attainment of the Program Objectives

Reflection papers and post-training evaluation forms were conducted during and after training. All the works or studies being performed by trainees were received as a portfolio at the end of the training program. The portfolio assessment was conducted to certified trainer teachers at the end of the face-to-face trainer teacher program.

The attainment of the objectives was also examined by the final examination for the remote learning program. This final exam includes 50 questions targeted 43 learning objectives. A table of specifications was prepared to check for the content validity of the test. Table 1 summarized the least attained objectives at the final exam.

Table 1. *The Least Attained Objectives at the Final Exam*

<i>Concepts</i>	<i>Objectives</i>	<i>N</i>	<i>%</i>
Disasters and emergencies- basic concepts	Explain hazard hunting.	59	.29
Behavior patterns (Mitigation and preparedness, response, and post-disaster recovery behaviors)	Explain the types of human and technology-based disasters.	92	.46
Disasters and emergencies at school	(All the objectives were reached.)	-	-
Psychological first aid	Explain psychological first aid after a disaster.	1281	6.47
<i>Total</i>		<i>19,790*</i>	

* The data is from the teachers who participate in the online program in June 2019.

19,790 of 21,000 participants passed the final examination. The rest of the teachers did not complete the program and did not enter the exam. Among 19,790 teachers, only three learning objectives could not be reached: (1) .29% of the teachers could answer the question about hazard hunting; (2) .46% could find the correct answer to biological hazards, and (3) only 6.47% could reach the learning objective on psychological first aid.

Furthermore, the portfolio assessment was made to judge the extent to which the program attained the determined outcomes and objectives of the face-to-face training program. The evaluation process was carried out according to the rubric evaluation criteria, which were prepared before, in which the trainees could get the lowest 0 and the highest 100 points with the benchmark of 70 points. As a result of the evaluation, 567 (76%) of 746 people who participated in the face-to-face training program were successful. The average of the scores obtained by the successful ones from the rubric is 94.72.

Furthermore, since the SBDE is a professional development program, trainers' carrying out local training courses in their provinces was one of the program's expected outcomes. This data set consisted of the information entered into the inservice training module by the coordinators in the provinces. According to the data obtained from 67 provinces, there is an average of 8 trainers per province. Approximately 79 trainings were organized in each province, and an average of 2020 trainees (local teachers) attended. A trainer gave an average of 9 trainings, and the average class size of training is 24. The percentage of trainees among the teachers and school administrators working in the provinces varies between 0.5 and 95.7. 15 percent of teachers in Turkey participated in the training program. The 10 provinces with the highest number of trainers and the statistics with the local training program are included in Table 2.

Table 2. Descriptive Statistics on the Number of Training Courses (First Dissemination)

Province	Number of trainers	%	Number of training	%	Number of trainees	%	Training/Trainer (Average number of training given by a trainer)	Trainee/Training (Average class size of training)
Istanbul	74	13.05	572	10.79	14,339	10.59	7	25
Bursa	45	7.94	438	8.26	12,052	8.90	9	27
Kocaeli	37	6.53	239	4.51	5,581	4.12	6	23
Ankara	34	6.00	99	1.87	2,465	1.82	2	24
Balikesir	31	5.47	178	3.36	4,032	2.98	5	22
Izmir	25	4.41	335	6.32	8,309	6.14	13	24
Antalya	19	3.35	320	6.04	9,693	7.16	16	30
Sakarya	17	3.00	193	3.64	3,892	2.87	11	20
Isparta	15	2.65	238	4.49	5,571	4.12	15	23
Mersin	14	2.47	288	5.43	6,609	4.88	20	22
Total	67	100	5 302	100	135 375	100	9	24
<i>Provinces</i>								

All the process on the SBDE phase II project is presented in Figure 1.

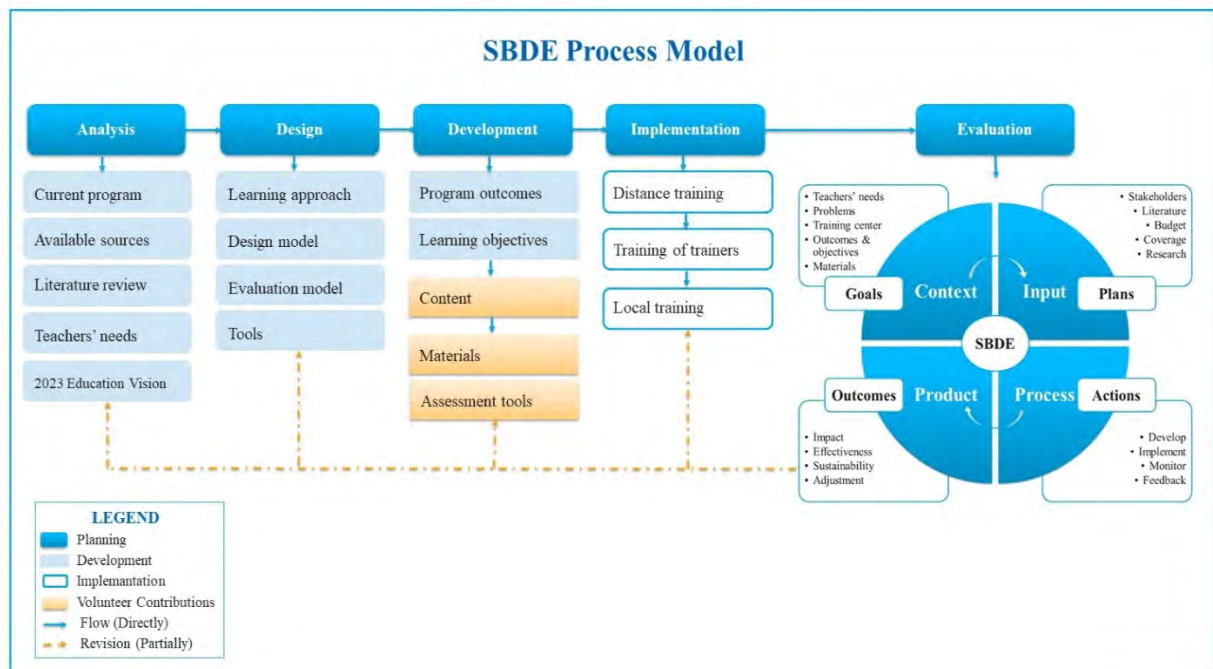


Figure 1. The Model of the SBDE Phase II Project

Discussion, Conclusion, and Implications

Turkey is one of the natural hazard-prone countries. It is assumed that there are approximately 52 types of disasters; around 21 of them took place in Turkey (Isik et al., 2012). While 93% of Turkey's lands are under the earthquake risk, it is seen that 98% of the population (appx. 80 million in total) and industrial enterprises are located in areas of high seismic risk (Union Chambers of Turkish Engineers and Architects [TMMOB], 2012). According to Bahadır and Ucku (2018), between 1923 and 2016, 51% of 313 disasters in Turkey were nature-based, and 48% were technology-induced hazards. More than 200 earthquakes have occurred since the beginning of the 1900s, caused the death of approximately 86,000 people (Altun, 2018).

This paper reports the processes of the SBDE project implemented by Turkish MoNE to support of different volunteer foundations. The primary task of the project was to improve teachers' knowledge and competencies in disaster risk reduction. Two teacher training programs were designed, developed, and implemented by blending the remote and face-to-face training approaches, two books were written, and teaching-learning materials were developed. By employing the cascade teacher training system, the project reached 135,375 teachers within a short time. In this system, master trainers trained the trainer teachers, and then these trainer teachers trained the local teachers. The final expectation is to make local teachers teach their students and parents. Although the size of the dissemination was statistically monitored, there are some limitations to the evaluation of the project quality. First, this report was exploratory in nature, and more research is needed to draw conclusions. Second, this paper reported short-term outcomes and could not gauge the long-term impacts of the program. More research is necessary to identify causal relationships between teachers' training programs and improvements in individual and school disaster resilience. Therefore, the researchers plan to design a mixed methodology curriculum evaluation study, including quasi-experimental one-group pretest-posttest research and qualitative research methods for the second dissemination program. The project team needs to monitor the training impact consisting of the changes in the belief and behaviors on teachers' disaster preparedness and teachers' behavioral change in terms of reflecting these competencies in their classroom teaching practices. The cascade training model is an economical and time-saving way of teacher professional development model. It is highly recommended that MoNE ask, "What is being cascaded in the classrooms?" to understand the merit and the worth of the cascade teacher training program.

Besides these limitations, the project has some strengths. The project team's opening the project on the collaboration of different institutions and organizations working on this subject made SBDE can be called one of the exemplary projects in Turkey. In this way, effective communication and cooperation among institutions were established, and in turn, the MoNE could carry out the project even though the limited budget for the content and material development. Another cost-effective decision was integrating the Computer and Information Technology teachers to develop distance learning materials. Furthermore, instead of hiring academicians or field experts during the content and material development, and the implementation processes, the MoNE assigned its capacity –JICA scholar-master teachers– to each step of the project. This contributed not only to reduce the costs but also make qualified teachers visible and more motivated.

Curriculum cannot be stable; it should be a living document (Alsubaie, 2016). Therefore, programs need to change/revise regularly. These changes should be done on scientific results and consider the users' needs. Only this way, the curriculum can meet learners' needs, society, and subject area (Tyler, 1949). The initial data showed that the teachers could not reach three of 43 objectives. More activities and examples for hazard hunting, biological hazards, and psychological first aid were added for the second dissemination program. When considering the attained 40 learning objectives, the SBDE seems an important way to reduce disaster risk.

In summary, the SBDE project is a significant effort to provide a national disaster risk reduction experience, contributing to the literature on DRR studies in Turkey. This paper reports program development efforts and its preliminary evaluation results. The program seems to help teachers to increase their DRR knowledge. However, this does not mean that improving the teachers' knowledge and skills is enough to ensure their DRR training in the classroom. It is necessary to support teachers in terms of materials and lesson plan ideas for the activities they practice in and out of the classroom. Accordingly, many studies in the literature indicated that course materials, toys, table and garden games, posters, websites, computer, augmented reality application software and mobile apps have a statistically significant effect on DRR education (Mani et al., 2016; Petal, 2007; Winarn and Purwandari, 2018). The MoNE plans to arrange a lesson plan and course materials development and write children's book workshops in the near future. The activities and lesson plans are planned to be developed with an interdisciplinary approach since the disaster risk reduction education is a harmony of the fields like society organization, organizational behavior, sustainable development, environmental management, public health, geography, mathematics, social studies, science, psychology, sociology, public administration, and safe life (Petal, 2007). Considering the year 2020, Turkey faced many hazards based on earthquakes, floods, storms, fires, and virus; the need for developing an institutional base for DRR education has been felt more than ever. To ensure the cascading of the SBDE to students and the school community, the Ministry needs to propose a white paper on DRR education, ultimately focusing on the sustainable development of DRR education in the country. This paper may aim to integrate the policy for systematic planning of the DRR education, to motivate local administrative units to achieve the plans for their schools, to develop curriculum and materials which will not only emphasize the knowledge but also skills and attitudes, to monitor teacher qualifications and practices, to raise awareness of all stakeholders, and to establish a resilient school community by encouraging parent involvement. Without taking such steps, it is impossible to make a sustainable program, and the future of the project efforts will be limited to the term of office of the project coordinators.

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TÜRKÇE GENİŞ ÖZET

Afet Eğitiminde Kademeli Bir Öğretmen Yetiştirme Modeli: Türkiye Örneği

Giriş

Bireylerin ve toplumların hayatlarını tehdit eden afetler karşısında önlem alabilmeleri için sistematik ve profesyonel bir şekilde bilgilendirilmeleri gerekmektedir. Okullar, afet önleme becerilerinin ve kültürünün geliştirilmesi ve afet azaltma eğitimlerinin verilmesi için en uygun yerler olarak görülmektedir (Zhu & Zhang, 2017). Çünkü eğitim programlarının çıktıları çocuklar aracılığıyla velilere ve yerel topluma ulaşabilmektedir (UNISDR, 2006). Bu nedenle okullar afet eğitimi açısından vazgeçilmez kurumlardır. Nitelikli bir afet eğitimi; bireylerde tutum ve davranış değişikliği gerçekleştirmeye, afetlere karşı daha dirençli bir toplum oluşturmaya ve afet riskinin azaltılmasına önemli bir katkı sağlamaktadır (Shiwaku vd., 2007). Ancak Shaw ve diğerlerinin Japonya'daki çalışmaları (2004), geleneksel okul eğitiminin farkındalığı artıramayacağı bulgusuyla sonuçlanmıştır.

Okullar aracılığıyla verilen afet eğitimi, bu endişeyi ortadan kaldırmaya yönelik kritik bir süreç olmasına rağmen ülkemizde, öğretmenlere yönelik afet eğitiminin planlama, geliştirme, uygulama ve değerlendirme aşamalarının tasarımına ilişkin az sayıda çalışmaya rastlanmaktadır. Türkiye'de Millî Eğitim Bakanlığı ile Japon Uluslararası İşbirliği Ajansı arasında gerçekleştirilen işbirliği protokolü çerçevesinde afet riskinin azaltılması eğitimi konusunda "Okul Tabanlı Afet Eğitimi Projesi" (OTAE) yürütülmektedir. Bu çalışmanın amacı, OTAE II. fazında tasarlanan öğretmen eğitimi kursları ve bu kapsamda gerçekleştirilen faaliyetler hakkında bilgi vermektir. Projede belirlenen temel amaca ulaşmada aşağıdaki araştırma soruları tasarımcıları yönlendirmiştir:

1. OTAE programını geliştirmek için hangi öğretim tasarım modeli ve öğretmen yetiştirme yaklaşımı tercih edilmelidir?
 - a. Afet riski azaltmada öğretmen eğitimi açısından Türkiye'deki mevcut durum nedir?
 - b. Öğretmenlerin afet riski azaltmayı öğretmesi için kazanmaları gereken önemli bilgi ve beceriler neler olmalıdır?
 - c. Uygulanan öğretim tasarımı modeli ve öğretmen yetiştirme sisteminin istatistiksel sonuçları nelerdir?

Yöntem

Proje kapsamında karma yöntem araştırma deseni kullanılmıştır. Buna göre her üç araştırma sorusunun yanıtlanmasında nicel ve nitel araştırma desenlerinden yararlanılmıştır. Mevcut duruma ilişkin çevrimiçi anket araştırmacılar tarafından hazırlanmış ve devlet okullarında görevli öğretmenlere yönelik resmi web portalının mesleki gelişim bölümünde yer almıştır. Bu anket; beşli likert tipi sorular, yapılandırılmış, çoktan seçmeli ve kısa yanıtlı sorulardan oluşmaktadır. Hem 30 soruluk bu anket hem de görüşme soruları için Eğitim programları ve Öğretim, Sosyal Bilgiler Eğitimi, Afet Yönetimi ve Deprem Mühendisliği bölümlerinde uzmanlaşmış dört akademisyenden uzman görüşleri alınmıştır.

Temel soruları içeren ankete 29,322 öğretmen dönüş sağlamıştır. Verilerin analizinde betimleyici istatistiksel yöntemler kullanılmıştır.

Üst düzey bakanlık bürokratlarıyla (N=4) yarı yapılandırılmış görüşmeler gerçekleştirilmiştir. Bu bürokratlar, MEB'de öğretmenlerin mesleki gelişiminden ve eğitiminden sorumlu yöneticilerdir. Katılımcılara öğretmenlere yönelik afet eğitiminin mevcut durumu hakkında sorular sorulmuştur. Veriler temizlendikten sonra betimsel analiz yöntemi ile değerlendirilmiştir.

Türk politika sistemi için önemli ortakların ve referans kurumların, derneklerin ve vakıfların belgeleri, programın içeriğini belirlemek için doküman analizi yöntemi ile gözden geçirilmiştir. ADRC, JICA, UNDRR, UNICEF, Sendai Çerçevesi, Hyogo Bildirgesi, AFAD ve Türk Kızılayının raporları kapsayıcı sürdürülebilir program amaçları açısından incelenmiş ve öncelikli olarak önerdikleri içerikler OTAE programının tasarımında dikkate alınmıştır.

Geliştirilen OTAE programının içeriği, Türk öğretmenler için geliştirilmiş olması nedeniyle Türkiye'de sıklıkla karşılaşılan afetlerle sınırlıdır. Bu sınırlamayı telafi etmek için programın içeriği yakın gelecekte revize edilecektir. Ayrıca, gelecekteki araştırmalarda farklı ölçme ve değerlendirme teknikleri kullanılabilir, programın izlenmesi yapılabilir. Çalışmanın sınırlılıklarından biri de bütçe kısıtıdır. Bütçe sınırlaması yüz yüze programın süresini, takvimini ve uzaktan eğitimin tasarımına ilişkin kararların çoğunu etkilenmiştir. İleride yürütülecek çalışmalarda bu kısıtların göz önünde bulundurulması yeni çalışmaların verimi açısından önemli hususlardır.

Bulgular

Kurs tasarımının ilk aşamasında öncelikle var olan durumun tespiti yapılmıştır. Bulgular; geliştirilecek OTAE programının proje kapsamında bütçesinin tükendiğini, projede görev alacak gönüllü alan uzmanı ile eğitmen ve formatör sayısının kısıtlı olduğunu, Bakanlık bünyesinde mevcut güncel bir OTAE programının olmadığını, süreçte açılmış olan eğitimlerin yalnızca içerik/akış şeması olarak hazırlandığını ve bu içeriklerin de öğretmenlerin ilgi ve gereksinimlerine yanıt veremeyecek düzeyde olduğunu, Eğitim Vizyonu 2023 Belgesi'nin mesleki gelişimde öğrenen merkezli ve etkin öğrenme yaklaşımlarını işaret ettiğini, öğretmenlerin geleneksel olarak yürütülen hizmet içi eğitim anlayışını etkili bulmadıklarını, öğretmenlerin temel afete hazırlık konusunda yeterince bilgi sahibi olmadıklarını ortaya koymuştur. Bu veri bürokratlarla yapılan yarı yapılandırılmış görüşmeler ile çeşitlenmiştir. Bulgulardan yola çıkılarak kısa zamanda uygulanacak, etkili, öğretmenin ilgisini çekip merak uyandıracak, okulda kazanımlarla ilişkilendirilebilecek, etkinlik temelli ve aktif öğrenmeyi destekleyen, esnek bir yaklaşımla sürekli güncelleme olanağı tanıyan bir programın tasarlanmasına karar verilerek teorik bilgilerin kısa video ve animasyonlarla anlatıldığı, uygulamaların ise yüz yüze eğitim ortamında verileceği harmanlanmış bir eğitim yaklaşımı benimsenmiştir. Formatör eğitimlerine ek olarak bütçe kısıtları göz önünde bulundurulduğunda mahalli eğitimlerin şelale yöntemi olarak da tanımlanan kademeli bir eğitim modeli ile gerçekleştirilmesi kararlaştırılmıştır.

OTAE programının geliştirilme sürecinin en kapsamlı çalışmalarından birini programın alanyazına bağlı olarak çıktı ve kazanımlarının yazılması oluşturmaktadır. Çünkü ülkemizde daha önce uygulanmış olan programlarda kazanımlara dair herhangi bir bulguya ulaşmak mümkün olmamıştır. Bu nedenle uluslararası alanyazın detaylı olarak incelenmiş; Sendai Çerçevesi ve Hyogo Bildirgesi, UN Office for Disaster Risk Reduction raporları ve e-kitapları, UNICEF Child-Centred DRR raporları, AFAD ve Türk Kızılayı içerikleri ve yaygın bir şekilde çalışılmış olan okul güvenliği alan yazını taranmıştır. Ayrıca, konuyla ilgili ülkemizde faaliyet gösteren dernek ve vakıfların da erişilebilir kaynakları (varsa web sayfası, rapor ya da sunuları) incelenmiştir. Bu taramadan hareketle programın çıktıları ve kazanımları belirlenmiştir.

Kazanımlara bağlı olarak içerik ve materyallerin geliştirilmesi bir sonraki adımı oluşturmuştur. Öncelikle, kazanımların uzaktan eğitim ya da yüz yüze eğitim yoluyla verilmesine yönelik bir

sınıflandırma yapılmıştır. Buna göre bazı kazanımların hem uzaktan hem de yüz yüze eğitim ile kazandırılması öngörüldükten bazı kazanımların yalnızca uzaktan veya yalnızca yüz yüze eğitimde yer alması gerektiğine karar verilmiştir.

Program süresince kullanılacak yazılı materyaller olarak teorik bilgileri içeren ve okul programlarının kazanımlarına bağlı olarak uygulanabilecek her branş ve sınıf seviyesine yönelik örnek etkinlikler öneren iki kitap yazılmasına karar verilmiştir. UNESCO ve UNICEF metinleri ile Hyogo Bildirgesi'ndeki içerikler dikkate alınarak eğitim içeriğindeki akışla paralel bir içeriğin hazırlanması planlanmıştır. Bu doğrultuda Okul Tabanlı Afet Eğitimi öğretmen el kitabı ile etkinlik kitabı geliştirilmiştir.

Uzaktan eğitim modülü; Haziran 2019 tarihinde, 81 ildeki her branştan ve her kademededen gönüllü tüm öğretmen ve okul yöneticilerinin kullanımına açılmıştır. 2019 yılında MEBBİS üzerinden uzaktan Okul Tabanlı Afet Eğitimi Kursu'na başvuranlar arasından, portaldan yararlanan ve eğitimi başarı ile tamamlayan katılımcı sayısı 19,790 kişidir. Uzaktan eğitimi başarı ile tamamlayan öğretmen ve okul yöneticileri arasından 1-15 yıl öğretmenlik tecrübesine sahip gönüllüler yüz yüze eğitici eğitimine katılmışlardır. Yüz yüze eğitimler, JICA bursu ile Japonya'da Okul Tabanlı Afet Eğitimi programlarında eğitim görmüş, usta eğitici olarak tanımlanan öğretmen ve okul yöneticilerimiz tarafından yürütülmüştür. İki gün süren eğitimler; tamamen etkinlik temelli, grup çalışmaları ile ilerleyen ve deneyimsel öğrenme yaklaşımına dayanan bir yapıdadır. Kursiyerlerin bu eğitim kapsamında Bursa Afet Eğitim Merkezinde çeşitli afetlerin simülasyonlarına girerek afet sırası doğru davranışı deneyimsel öğrenme yolu ile kazanmaları amaçlanmıştır. Sonuç olarak 67 ilden 595 öğretmen ve okul yöneticisi yüz yüze eğitici eğitimini başarı ile tamamlamıştır.

İllerde mahalli eğitim yolu ile OTAE içeriğinin tüm öğretmen ve okul yöneticilerine yaygınlaştırılması amaçlanarak Eylül 2019'da konu ile ilgili detayları içeren bir talimat ile 595 formatör görevlendirilmiştir. 2019 yılında, OTAE 67 ilde 135,375 öğretmen ve okul yöneticisine ulaşmıştır. Bu çalışmada program değerlendirme yapılırken Stufflebeam'in Bağlam, Girdi, Süreç ve Ürün (CIPP) modelinden yararlanan bir yaklaşım uygulanmıştır.

Tartışma, Sonuç ve Öneriler

Okul Tabanlı Afet Eğitimi projesi gönüllü kişi, kurum ve kuruluşların destekleriyle Millî Eğitim Bakanlığı tarafından yürütülen bir projedir. Bu proje temelde öğretmen eğitimi yolu ile okullarda öğrencilerin ve dolayısıyla velinin afete yönelik hazırlık eğitimini hedeflemektedir. Bu hedef kapsamında uzaktan ve yüz yüze olmak üzere iki öğretmen eğitimi kurs tasarımı gerçekleştirilmiş; iki kitap yazılmış ve oyun materyalleri geliştirilmiştir. Proje içerikleri şelale yöntemi de denilen usta eğiticinin formatör öğretmene eğitim verdiği; formatör öğretmenin diğer öğretmenlere eğitim verdiği; öğretmenlerin sınıflarındaki öğrencilere ve onların velilerine bu bilgileri kazandırdığı bir sistem ile 3 ay gibi kısa bir zaman zarfında 135,375 bin öğretmene yayılmış durumdadır. Her ne kadar bu proje ile öğretmen eğitimlerinin yayılımı istatistiksel olarak takip edilse de bu eğitimlerin kalitesinin sorgulanması bu kadar hızlı olamamaktadır.

OTAE, proje ekibinin Türkiye'de konu ile ilgili çalışan farklı kurum ve kuruluşları iş birliğine davet etmesi bakımından örnek projelerden biridir. Bu yolla, yalnızca kurumlar arası etkin bir iletişimin ve iş birliğinin kurulması sağlanmamış; aynı zamanda içerik ve materyal geliştirme gibi süreçlerde yeni bir çalışma yapılmayarak duplikasyondan kaçınılmış ve Bakanlığa fazladan bir maliyet getirilmemiştir.

Bu proje kapsamında, formatör öğretmen eğitimlerinde akademisyen veya alan uzmanını dışarıdan istihdam ederek Bakanlığa maliyet getirmek yerine Bakanlığın kendi kapasitesinin kullanılması sağlanmıştır. Daha önce Japonya'da yoğun bir afet riskini azaltma eğitimine katılmış JICA bursiyeri öğretmenlerimizden gönüllü olanların usta eğitici olarak bilgi ve deneyimlerinden yararlanılmıştır. Bu maliyetin azaltılmasının yanı sıra eğitimi kalifiye öğretmenlerimizin de görünür hâle getirilmesine katkıda bulunmuştur.

Program durağan olamaz; yaşayan bir belge olmak zorundadır (Alsubaie, 2016). Bu nedenle, programlar sürekli değişime uğrar. Bu değişimler, kullanıcının gereksinimleri ve şartların gerekliliklerinden yola çıkılarak bilimsel bir temelde yapılmalıdır. Ancak bu yolla, program öğrenenin, toplumun ve konu alanının gereksinimlerini karşılar (Tyler, 1949). Okul Tabanlı Afet Eğitimi afet riskini azaltmada önemli bir yol olarak görülmektedir. Pek çok bilim insanı sürekli afet riskini azaltma ve afet yönetimi üzerine araştırmalar yapmakta ve yeni bilgi ve yöntemlere ulaşmaktadır. Bu nedenle, OTAE durağan bir program olmayıp yeni bilgiler ışığında sürekli revizyondan geçmelidir. Bu revizyonların da ilgili alan yazının taranması ve kullanıcı görüş, öneri ve gereksinimlerine bağlı olarak yapılması gerekmektedir. Bakanlık tarafından yürütülen bu projede, süreç içerisinde yapılan tüm değişimler gereksinimlerin bilimsel süreçlerle analizi ve ilgili alan yazın bağlamında yapılmıştır.

Özetle, OTAE Bakanlığımıza önemli bir ulusal Afet Riskini Azaltma Eğitimi proje deneyimi kazandırması ile ülkemizin afet riski azaltma çalışmaları adına alan yazına katkıda bulunan önemli bir çabadır. Ancak bu demek değildir ki öğretmen eğitimi afet riskini azaltma eğitimi için yeterli bir ön koşuldur. Eğitimin yanı sıra öğretmenlerin sınıf içinde ve derslik dışında yapacakları etkinliklerde materyal ve etkinlik fikri bakımından desteklenmeleri etkili olacaktır. Bununla ilişkili olarak alan yazındaki pek çok çalışma; ders araç gereçlerinin, oyuncakların, masa ve bahçe oyunlarının, posterlerin, web sitelerinin, bilgisayar, artırılmış gerçeklik yazılımlarının ve mobil uygulamaların öğrencilerin afet riski azaltma eğitiminde istatistiksel olarak anlamlı sonuçlar gösterdiğini ifade etmektedir (Mani, Cole & Stewart, 2016; Petal, 2007; Winarn, & Purwandari, 2018). Konuyla ilgili olarak Bakanlık yakın gelecekte gerçekleştirilmesi planlanan materyal geliştirme, etkinlik geliştirme ve okuma kitapları yazımı çalıştaylarının ön hazırlığını yapmaktadır. Geliştirilecek olan etkinlik ve ders planlarının disiplinler arası bir yaklaşımla hazırlanması amaçlanmaktadır. Çünkü afet riskini azaltma eğitiminin kökleri, toplum organizasyonu, örgütsel davranış, sürdürülebilir kalkınma, çevresel yönetim, halk sağlığı, coğrafya, matematik, sosyal ve fen bilimleri, psikoloji, sosyoloji, kamu yönetimi ve güvenli yaşam gibi disiplinlere dayanan bir uygulama alanıdır (Petal, 2007).