Gmail andi citra pratiwi <andicitra.pratiwi@gmail.com>

Abstrak Prof firdaus

Committee ICSMTR 2019 FMIPA UNM <icsmtr2019@unm.ac.id> Tue, Oct 8, 2019 at 9:05 PM
To: andi citra pratiwi <andicitra.pratiwi@gmail.com>

Dear Mrs. Andi Citra Pratiwi

Thank you for sending us your abstract. Please find the LoA as attached

Regards,
The Committee

On Tue, Oct 8, 2019 at 3:35 PM andi citra pratiwi <andicitra.pratiwi@gmail.com> wrote:

LETTER of Acceptance_Abstract_128_Firdaus_ICSMTR2019.pdf
129K

Gmail characteristics of disaster

Compose

Inbox 6,210
Starred
Snoozed
Important
Sent
Drafts 207
Categories
Social 4,417
Updates 5,497
Forums 6
Promotions 8,108
More

Labels

[Imap]/Drafts
Notes
Personal
More

Abstrak Prof firdaus

Inbox ×

andi citra pratiwi <andicitra.pratiwi@gmail.com>
to icsmtr_2019

Abstrak_FIRDAUS..

Committee ICSMTR 2019 FMIPA UNM <icsmtr2019@unm.ac.
to me

Dear Mrs. Andi Citra Pratiwi

Thank you for sending us your abstract. Please find the LoA as a

Regards,
The Committee

On Tue, Oct 8, 2019 at 3:35 PM andi citra pratiwi <andicitra.prati

LETTER of Accep..

The 3rd International Conference on Statistics, Mathematics, Teaching and Research 2019

FACULTY OF MATHEMATICS AND NATURAL SCIENCE
UNIVERSITAS NEGERI MAKASSAR
Office: Kampus UNM Parangtambung, Jalan Daeng Tata Makassar
Phone: +62-411-864936 Fax. 0411-880568
Website: http://icsmtr.conf.unm.ac.id

Tuesday, October 08, 2019

Dear Prof./Dr./Mr./Mrs. **F. Daud, Adnan, A. Bahri, A. N. Arifin and A. C. Pratiwi**

May God bless you with good health.

Congratulations. On behalf of the committee, we are pleased to inform that your abstract is **ACCEPTED** to be presented at The 3rd International Conference on Statistics, Mathematics, Teaching, and Research (ICSMTR) 2019, scheduled on October 9-10, 2019 at Claro Hotel, Makassar, Indonesia.

Ref. Num : ICSMTR/2019/128
Title : **Characteristics of Disaster Mitigation Training Model in South Sulawesi**

Here are some important things we would like you to do in relation to the abstract's acceptance:

1. Please kindly complete the payment of:
   - **IDR3.000.000** (Indonesian participants)
   - **$325** (Non-Indonesian participants)

   (due date October 09, 2019)

   The payment should be transferred to the following bank account:
   Account Name : Wahida Sanusi
   Account Number : 174-0-000865840
   Bank Name : Bank Mandiri (Persero)
   Bank Address : Makassar
   Swift code : BMRIIDJA (only applicable for international transaction)
2. Confirm your payment through our email on: icsmtr2019@unm.ac.id by sending the scan of the payment proof, your name, and title of the paper, **with Subject**: Fee-ICSMTR/2019/128.
3. Full papers should be submitted no later than **October 09, 2019**.
4. All papers will be blind reviewed and will be published in **Journal of Physics: Conference Series (JPCS)** indexed by **Scopus**. We will inform you about where your paper will be published after we have reviewed your paper.
5. The maximum number of the full paper is **8 (eight)**. If your paper exceeds 8 (eight) pages you are charged additional fee as much as **$50 per page**.
6. The reviewing process will check the grammar and plagiarism. We suggest you to use Professional Translation Services, ***not using Google Translate***, and using Mendeley or EndNote to manage your citation and references..
7. You can submit your full paper by sending it to the email: icsmtr2019@unm.ac.id with Subject: Fullpaper-Submission Number.
   Example: Fullpaper- ICSMTR/2019/128.

Thank you very much for your participation and we are looking forward to seeing you in Makassar on October 9-10, 2019.

Your sincerely,
Chairman of Committee,

Dr. Ruliana, S.Pd., M.Si.

Note:

- Download Fullpaper Template in:
  http://icsmtr.conf.unm.ac.id/wp-content/uploads/sites/8/2019/08/JPCSExampleWordDocument.docx

Characteristics of Disaster Mitigation Training Model in South Sulawesi

F Daud[1*], Adnan[1], A Bahri[1], A N Arifin[1], and A C Pratiwi[1]

[1]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar, Jl Daeng Tata, Parang Tambung, Tamalate, Kota Makassar, Sulawesi Selatan 90224

*e-mail: firdaus5759@yahoo.com

Abstract. The objective of this research is to assess the characteristics of a Disaster Mitigation Training Model in South Sulawesi. A Disaster Mitigation Training Model has been developed by researchers and has been subjected to content validity assessment by two validators. The model development is carried out to produce a disaster mitigation training in South Sulawesi which is suitable with disaster characteristics in South Sulawesi. Thus, it can serve as an answer to the need of target community on an efficient and effective disaster mitigation training. The characteristics of Disaster Mitigation Training Model discussed in this study including the syntax, principle of reaction, social system, supporting system, instructional impact, and companion impact.

Keyword: Characteristics, disaster mitigation training, south sulawesi

1. Introduction

The low capacity in handling disaster among its society has been one of the contributing factors to the increasing risk of disaster in its region [1,2,3]. South Sulawesi is one of disaster prone region with a high frequency of disaster occurred in the region, which generally occurred due to geological phenomena and hydrometeorology phenomena. Among all types of disaster occurred in South Sulawesi, floods is the most pervasive hazards affecting the region [1]. While floods had caused large amounts of damage, the affected area would also at risk of secondary hazards, including landslides and disease outbreaks [1,2,3].

Indonesian government has been promoting the importance of disaster mitigation for the society. However, the effort to conduct disaster mitigation have not been well implemented among the society. It is reflected by the high number of fatalities and damaged after the occurrence of natural hazards in many areas, including in South Sulawesi [3]. The occurrence of various disaster in their region, should have been a lesson for the society. Thus, each individual in the society should be well prepared to face the occurrence of disaster, particularly the type of disaster commonly occurred in their region. Disaster preparedness is defined as "actions taken to effectively anticipate, respond to, and recover from the impact of likely or current hazard events or conditions." Preparedness in this case refers to the ability to anticipate and reduce the impact caused by disasters. Disaster preparedness is an initiative to increase preparedness and knowledge of the community about a disaster, or at least the types of disasters most likely to occur in the local area [1,4].

The importance of improving disaster preparedness among the society has put an urge for the development of a Disaster Mitigation Training Model which is in accordance with the characteristics of regional disaster as well as the characteristics of local community. In order to assure the suitability of the developed training model in enhancing high school students' ability to perform disaster mitigation, it is deemed important conduct the study which mainly aims to assess the construct validity of the developed Disaster Mitigation Training Model. Furthermore, the characteristics of the developed Disaster Mitigation Training Model is also discussed.

2. Methods

A Disaster Mitigation Training Model has been validated by two validators. The validity of the developed Disaster Mitigation Training Model is assessed by using a construct validity assessment which assess several aspects, including: (1) theoretical background, (2) learning syntax, (3) principle of reaction, (4) social system, (5) supporting system, (6) instructional and companion impacts, (7) training activity, (8) training management, and (9) evaluation. The items for each aspect were given score by validators, ranged from 1 to 5. The average scores provided by the two validators for each aspect were then categorized into five categories, namely valid (4.1 – 5), fairly valid (3.6 – 4.0), less valid (2.6 – 3.5), invalid (1.6 – 2.5), and very invalid (1.0 – 1.5). The validation sheet is used to collect the validity data of the developed Disaster Mitigation Training Model. If the data showed that it is valid, it means that the intervention is logically designed.

3. Results and Discussions

The result of data analysis on validity of the developed Disaster Mitigation Training Model showed an average validity scores above 4.1. Thus, all components the Disaster Mitigation Training Model is categorized as valid. This means that the model has been logically developed to enhance trainee understanding on disaster mitigation. The Disaster Mitigation Training Model developed in this study particularly aims to improve high school students' ability in taking actions to prevent or reduce the risk of commonly occurred natural hazards in their region, particularly in South Sulawesi. Theoretical background supporting the learning model consisting of several learning theories, including cognitive theories of learning, behavioural theories of learning, and motivation theories of learning. The learning process within Disaster Mitigation Training Model support the trainee to actively construct their understanding on how to take actions before, during, and after the occurrence of certain natural hazards.

Table 1. Construct Validity of Disaster Mitigation Training Model

No	Component of Disaster Mitigation Training Model	Validity Score	Validity
1	Theoretical background	4.42	Valid
2	Learning Syntax	4.29	Valid
3	Principle of Reaction	4.08	Valid
4	Social System	4.28	Valid
5	Supporting System	4.25	Valid
6	Instructional and companion aspects	4.50	Valid
7	Training activity	4.29	Valid
8	Training management	4.25	Valid
9	Evaluation	4.25	Valid

The syntax of Disaster Mitigation Training Model developed in this study consists of six phases, Each phase is a sequence of activities carried out by instructors and trainees during the learning process. In the first phase, participants were motivated about the importance of understanding disaster mitigation, especially potential disasters in the participant's home environment. Motivation is done by displaying several disaster events in Indonesia, ranging from national scale

disasters to disasters at the local level. In this case, the loss and damage caused by each disaster is the focus of attention, including damage to infrastructure that affects various areas of community life, material losses, to death victims. Departing from the facts about the adverse effects of disasters, the focus of attention will then be directed to the question "Can the negative impacts that may be caused by disasters be minimized?" Based on these questions, participants are directed to express their opinions. Various opinions from the participants were then linked to the paradigm of an epidemic in the early 19th century. At the beginning of the emergence of the epidemic in society, science and research on the causes of various types of disease were scarce. Research in the field of microbiology and molecular also has not developed as rapidly as it is today. Consequently, the epidemic at that time was considered as something that could not be avoided by the society. As the development of science related to physiology and molecular factors improved, the causes of the emergence of epidemics can be unveiled. Thus, the community began to understand the importance of prevention efforts through sanitation and healthy live style. The same thing happened for disaster management efforts. Understanding the characteristics of disasters can help minimize losses when disasters occur. One example is the tsunami disaster that occurred in 2004, which claimed hundreds of thousands of lives in Aceh, but only killed seven people in Simeuleu island [7,8]. Furthermore, this phase closes with the delivery of training objectives.

The second phase of the Disaster Mitigation Training Model is organizing participants, where participants are divided into groups with 3-5 members per group. This phase is based on Vygotsky's theory of social interaction which states that learning is a process that takes place socially [9, 10]. In other words, the learning process cannot be separated from social interaction. The third phase of the Disaster Mitigation Training Model is Brainstorming. In this phase, problems related to disasters that have occurred in the surrounding environment of participants are displayed to stimulate the interest and awareness of participants about the potential for disasters in their immediate environment. In response to this, trainees were asked to express their opinions, comments, or express experiences related to disasters. Next, each group member tries to gather ideas about various alternative solutions related to problem solving efforts aimed at minimizing losses when disasters occur and increasing community preparedness for disasters.

The fourth phase of the Disaster Mitigation Training Model is the construction of knowledge / skills. In this phase, the trainees are assigned to compile the solutions they offer in disaster mitigation efforts in more detail. In the process of preparing solutions, participants are directed to conduct studies of various types of literature and also interviews if possible. The results of the process of preparing this solution are made in the form of reports and presentation materials. At this stage, if participants find it difficult to complete the task, the instructor can do the scaffolding. The fifth phase of the Disaster Mitigation Training Model is presentation. Participants are directed to present the solutions they offer. Participants' presentations must contain the following items: factors that influence the occurrence of disasters, preparedness before a disaster occurs, actions during a disaster, and post-disaster actions. Each group was given the opportunity to make a presentation, and the instructor facilitated other trainees' responses to the results of the construction presented by the other groups. At the end of the presentation, the Instructor helps participants make conclusions and application of disaster mitigation efforts in daily life. The sixth phase of the Disaster Mitigation Training Model is training, follow-up, and awarding. In this phase, the instructor gives an evaluation which can be a case example related to disaster preparedness and events for the trainees to work on. At this stage, the instructor rewards participants who can do their assignments well. The six syntaxes in this Disaster Mitigation Training Model are developed by referring to seven basic principles of constructivist learning, namely: learning personalization, reflective thinking, problem-solving and investigation, relevance to daily life, collaborative learning, discussion, and teacher scaffolding [11,12]

Interaction is a dynamic social relationship that occurs between individuals, between individuals and groups, and between groups with other groups. In the learning process through the Disaster Mitigation Training Model, a reciprocal relationship occurs between instructor and trainee. This interaction naturally forms a social system in the classroom. The most prominent social system in this training model is working cooperatively. Working cooperatively begins in the Organizing phase of Training

Participants, Knowledge/Skills Construction, Presentations, and also Training and Follow Up. Therefore, the structure of learning objectives is packaged in a cooperative objective setting, but does not neglect individual work, especially in the construction phase of knowledge and skills.

In the organizing phase of the trainees, the instructor groups the trainees in heterogeneous ways in various ways, but still in democratic principles. Through this activity, it is hoped that training participants can accept each other to work together as a team. In the knowledge and skills construction phase, the instructor distributes the tasks to the trainees and then provides guidance and direction for the trainees or groups in need. The principle of scaffolding is an emphasis that must be carried out by the instructor in the knowledge construction process. In the presentation phase, the instructor will invite the training participants to present the results of their group work in various ways, where each group member is expected to be a presenter as a form of responsibility towards the group. In this process, other trainees respond to presentations made by other groups, and then class discussions are conducted through the instructor's direction as a facilitator. Next, in the training and follow-up phases, the instructor reconfirms the assignments carried out by groups of trainees.

The instructional impact that can arise from the application of the Disaster Mitigation Training Model is the increased motivation and cognitive abilities of trainees. Common ways that can increase the motivation of trainees through the application of the training model including: (1) explaining to participants about the learning objectives and their relationship with the life of the trainees is described in the first syntax of the model, (2) striving for an environment conducive to learning, is described in the second and third syntax, (3) gives participants the opportunity to actively participate while attending the lesson, (4) gives participants the feedback on the progress of their learning and their mistakes during the training process, , all of which can be a reinforcement for the trainee, (5) provide tasks that can be a challenge for the trainee according to his ability, and (6) ask the trainee to make notes about the results of their learning. Sections 3, 4, 5, and 6 are described in the phase 4, 5, and 6 PMB model syntax. This is in line with the nine steps of learning that can increase motivation according to Gagne, namely gaining attention, informing learners of the objectives, stimulating recall of prior learning, providing learning guidance, eliciting performance, reinforcement, and enhancing retention and transfer. These nine things can be found in every syntax in the Disaster Mitigation Training Model that has been developed [13, 14, 15].

The accompanying impact that can arise from the developed Disaster Mitigation Training Model includes an increase in learning activities and time, as well as increased learning independence and discipline. Increased learning activities are possible because the training model is designed in a way that training participants are facilitated to construct knowledge from the start, whether it is done personally, or socially in their respective groups [14, 15]. Independence and learning discipline among the trainee can also be formed along with the application of the training model. Independence and discipline in managing and obeying work time assignments characterize each of the syntax in Disaster Mitigation Training Model.

4. Conclusion

The validation result of Disaster Mitigation Training Model showed that the developed training model is categorized as valid, which means that the training model has been logically developed to enhance trainee understanding on disaster mitigation. The characteristics of the developed Disaster Mitigation Training Model is consistent with the principles of constructivist learning, including learning personalization, reflective thinking, problem-solving and investigation, relevance to daily life, collaborative learning, discussion, and scaffolding. The social system of the model put the trainer as facilitator, whilst the trainee as an active learner.

References

[1] Daud, F., Adnan, Bahri, A., Arifin, A. N., and Pratiwi, A. C. 2019. Need Assessment for The Development of Disaster Mitigation Training Model in South Sulawesi. ICAMR 2018.

[2] Center For Excellence in Disaster Management and Humanitarian Assistance. 2015. *Indonesia Disaster Management Reference Book.* Hawai: Center for Excellence in Disaster Management and Humanitarian Assistance.

[3] BNPB. 2011. *Rencana Penanggulangan Bencana Provinsi Sulawesi Selatan.* Makassar: Pemerintah Provinsi Sulawesi Selatan.

[4] Hapsari, R. I., Zenurianto, M. 2016. View of Flood Disaster Management in Indonesia and the Key Solutions. *American Journal of Engineering Research,* Vol. 5, Issue 3, pp.140-151

[5] United Nation. 2008. *Disaster Preparedness for Effective Response.* Geneva: UNISDR

[6] Dube, E. 2018. Using Models to Deal with Hazards and Disaster: A Trajectory toward Effective Disaster Management in Zimbabwe. *People: International Journal of Social Sciences,* Vol. 4, Issue 1, pp. 111-132.

[7] Gaillard, J., Clavé, E., Vibert, O. et al. 2008. Ethnic groups' response to the 26 December 2004 earthquake and tsunami in Aceh, Indonesia. *Nat Hazards* 47, 17–38.

[8] Suciani A, Islami Z R, Zainal S, Sofiyan, and Bukhari. 2017. *IOP Conf. Series: Earth and Environmental Science,* Vol. 148.

[9] Glassman, M. 2001. Dewey and Vygotsky: Society, Experience, and Inquiry in Educational Practice. *Educational Researcher,* Vol. 30. No.40, pp. 3-14.

[10] Many H and John-Steiner V. 2012. Vygotsky and Sociocultural Approaches to Teaching and Learning. *Educational Psychology,* Vol. 7.

[11] Bhattacharjee J. 2015. Constructivist Approach to Learning— An Effective Approach of Teaching Learning. *International Research Journal of Interdisciplinary & Multidisciplinary,* Vol I, Issue VII, pp. 65-74.

[12] Bada, S. O. 2015. Constructivism Learning Theory: A Paradigm for Teaching and Learning. *IOSR Journal of Research & Method in Teaching.* Vol. 5, Issue 6, pp. 66-70.

[13] Wrenn J and Wrenn B. 2009. Enhancing Learning by Integrating Theory and Practice. *International Journal of Teaching and Learning in Higher Education*. Vol. 21 No.2 pp. 258-265

[14] Buscombe C. 2013. Using Gagne's Theory to Teach Procedural Skills. *The Clinical Teacher*, Vol. 10, Issue 5.

[15] Khadjool K., Rostami K., and Ishaq S. 2011. How to Use Gagne's Model of Instructional Design in Teaching Psychomotor Skill. *Gastroenterology Hepatol Bed Bench,* Vol. 4, Issue 3. Pp.116-119.

Characteristics of Disaster Mitigation Training Model in South Sulawesi

F Daud[1*], Adnan[1], A Bahri[1], A N Arifin[1], and A C Pratiwi[1]

[1]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar, Jl Daeng Tata, Parang Tambung, Tamalate, Kota Makassar, Sulawesi Selatan 90224

*e-mail: firdaus5759@yahoo.com

Abstract. The objective of this research is to assess the characteristics of a Disaster Mitigation Training Model in South Sulawesi. A Disaster Mitigation Training Model has been developed by researchers and has been subjected to content validity assessment by two validators. The model development is carried out to produce a disaster mitigation training in South Sulawesi which is suitable with disaster characteristics in South Sulawesi. Thus, it can serve as an answer to the need of target community on an efficient and effective disaster mitigation training. The characteristics of Disaster Mitigation Training Model discussed in this study including the syntax, principle of reaction, social system, supporting system, instructional impact, and companion impact.

Keyword: Characteristics, disaster mitigation training, south sulawesi

1. Introduction

The low capacity in handling disaster among its society has been one of the contributing factors to the increasing risk of disaster in its region [1,2,3]. South Sulawesi is one of disaster prone region with a high frequency of disaster occurred in the region, which generally occurred due to geological phenomena and hydrometeorology phenomena. Among all types of disaster occurred in South Sulawesi, floods is the most pervasive hazards affecting the region [1]. While floods had caused large amounts of damage, the affected area would also at risk of secondary hazards, including landslides and disease outbreaks [1,2,3].

Comment [1]: The position of Indonesian regions related to disaster region

Indonesian government has been promoting the importance of disaster mitigation for the society. However, the effort to conduct disaster mitigation have not been well implemented among the society. It is reflected by the high number of fatalities and damaged after the occurrence of natural hazards in many areas, including in South Sulawesi [3]. The occurrence of various disaster in their region, should have been a lesson for the society. Thus, each individual in the society should be well prepared to face the occurrence of disaster, particularly the type of disaster commonly occurred in their region. Disaster preparedness is defined as "actions taken to effectively anticipate, respond to, and recover from the impact of likely or current hazard events or conditions." Preparedness in this case refers to the ability to anticipate and reduce the impact caused by disasters. Disaster preparedness is an initiative to increase preparedness and knowledge of the community about a disaster, or at least the types of disasters most likely to occur in the local area [1,4].

The importance of improving disaster preparedness among the society has put an urge for the development of a Disaster Mitigation Training Model which is in accordance with the characteristics of regional disaster as well as the characteristics of local community. In order to assure the suitability of the developed training model in enhancing high school students' ability to perform disaster mitigation, it is deemed important conduct the study which mainly aims to assess the construct validity of the developed Disaster Mitigation Training Model. Furthermore, the characteristics of the developed Disaster Mitigation Training Model is also discussed.

2. Methods

A Disaster Mitigation Training Model has been validated by two validators. The validity of the developed Disaster Mitigation Training Model is assessed by using a construct validity assessment which assess several aspects, including: (1) theoretical background, (2) learning syntax, (3) principle of reaction, (4) social system, (5) supporting system, (6) instructional and companion impacts, (7) training activity, (8) training management, and (9) evaluation. The items for each aspect were given score by validators, ranged from 1 to 5. The average scores provided by the two validators for each aspect were then categorized into five categories, namely valid (4.1 – 5), fairly valid (3.6 – 4.0), less valid (2.6 – 3.5), invalid (1.6 – 2.5), and very invalid (1.0 – 1.5). The validation sheet is used to collect the validity data of the developed Disaster Mitigation Training Model. If the data showed that it is valid, it means that the intervention is logically designed.

3. Results and Discussions

The result of data analysis on validity of the developed Disaster Mitigation Training Model showed an average validity scores above 4.1. Thus, all components the Disaster Mitigation Training Model is categorized as valid. This means that the model has been logically developed to enhance trainee understanding on disaster mitigation. The Disaster Mitigation Training Model developed in this study particularly aims to improve high school students' ability in taking actions to prevent or reduce the risk of commonly occurred natural hazards in their region, particularly in South Sulawesi. Theoretical background supporting the learning model consisting of several learning theories, including cognitive theories of learning, behavioural theories of learning, and motivation theories of learning. The learning process within Disaster Mitigation Training Model support the trainee to actively construct their understanding on how to take actions before, during, and after the occurrence of certain natural hazards.

Table 1. Construct Validity of Disaster Mitigation Training Model

No	Component of Disaster Mitigation Training Model	Validity Score	Validity
1	Theoretical background	4.42	Valid
2	Learning Syntax	4.29	Valid
3	Principle of Reaction	4.08	Valid
4	Social System	4.28	Valid
5	Supporting System	4.25	Valid
6	Instructional and companion aspects	4.50	Valid
7	Training activity	4.29	Valid
8	Training management	4.25	Valid
9	Evaluation	4.25	Valid

The syntax of Disaster Mitigation Training Model developed in this study consists of six phases. Each phase is a sequence of activities carried out by instructors and trainees during the learning process. In the first phase, participants were motivated about the importance of understanding disaster mitigation, especially potential disasters in the participant's home environment. Motivation is done by displaying several disaster events in Indonesia, ranging from national scale

Comment [2]: Mention each phase

disasters to disasters at the local level. In this case, the loss and damage caused by each disaster is the focus of attention, including damage to infrastructure that affects various areas of community life, material losses, to death victims. Departing from the facts about the adverse effects of disasters, the focus of attention will then be directed to the question "Can the negative impacts that may be caused by disasters be minimized?" Based on these questions, participants are directed to express their opinions. Various opinions from the participants were then linked to the paradigm of an epidemic in the early 19th century. At the beginning of the emergence of the epidemic in society, science and research on the causes of various types of disease were scarce. Research in the field of microbiology and molecular also has not developed as rapidly as it is today. Consequently, the epidemic at that time was considered as something that could not be avoided by the society. As the development of science related to physiology and molecular factors improved, the causes of the emergence of epidemics can be unveiled. Thus, the community began to understand the importance of prevention efforts through sanitation and healthy live style. The same thing happened for disaster management efforts. Understanding the characteristics of disasters can help minimize losses when disasters occur. One example is the tsunami disaster that occurred in 2004, which claimed hundreds of thousands of lives in Aceh, but only killed seven people in Simeuleu island [7,8]. Furthermore, this phase closes with the delivery of training objectives.

The second phase of the Disaster Mitigation Training Model is organizing participants, where participants are divided into groups with 3-5 members per group. This phase is based on Vygotsky's theory of social interaction which states that learning is a process that takes place socially [9, 10]. In other words, the learning process cannot be separated from social interaction. The third phase of the Disaster Mitigation Training Model is Brainstorming. In this phase, problems related to disasters that have occurred in the surrounding environment of participants are displayed to stimulate the interest and awareness of participants about the potential for disasters in their immediate environment. In response to this, trainees were asked to express their opinions, comments, or express experiences related to disasters. Next, each group member tries to gather ideas about various alternative solutions related to problem solving efforts aimed at minimizing losses when disasters occur and increasing community preparedness for disasters.

The fourth phase of the Disaster Mitigation Training Model is the construction of knowledge / skills. In this phase, the trainees are assigned to compile the solutions they offer in disaster mitigation efforts in more detail. In the process of preparing solutions, participants are directed to conduct studies of various types of literature and also interviews if possible. The results of the process of preparing this solution are made in the form of reports and presentation materials. At this stage, if participants find it difficult to complete the task, the instructor can do the scaffolding. The fifth phase of the Disaster Mitigation Training Model is presentation. Participants are directed to present the solutions they offer. Participants' presentations must contain the following items: factors that influence the occurrence of disasters, preparedness before a disaster occurs, actions during a disaster, and post-disaster actions. Each group was given the opportunity to make a presentation, and the instructor facilitated other trainees' responses to the results of the construction presented by the other groups. At the end of the presentation, the Instructor helps participants make conclusions and application of disaster mitigation efforts in daily life. The sixth phase of the Disaster Mitigation Training Model is training, follow-up, and awarding. In this phase, the instructor gives an evaluation which can be a case example related to disaster preparedness and events for the trainees to work on. At this stage, the instructor rewards participants who can do their assignments well. The six syntaxes in this Disaster Mitigation Training Model are developed by referring to seven basic principles of constructivist learning, namely: learning personalization, reflective thinking, problem-solving and investigation, relevance to daily life, collaborative learning, discussion, and teacher scaffolding [11,12]

Interaction is a dynamic social relationship that occurs between individuals, between individuals and groups, and between groups with other groups. In the learning process through the Disaster Mitigation Training Model, a reciprocal relationship occurs between instructor and trainee. This interaction naturally forms a social system in the classroom. The most prominent social system in this training model is working cooperatively. Working cooperatively begins in the Organizing phase of Training

Participants, Knowledge/Skills Construction, Presentations, and also Training and Follow Up. Therefore, the structure of learning objectives is packaged in a cooperative objective setting, but does not neglect individual work, especially in the construction phase of knowledge and skills.

In the organizing phase of the trainees, the instructor groups the trainees in heterogeneous ways in various ways, but still in democratic principles. Through this activity, it is hoped that training participants can accept each other to work together as a team. In the knowledge and skills construction phase, the instructor distributes the tasks to the trainees and then provides guidance and direction for the trainees or groups in need. The principle of scaffolding is an emphasis that must be carried out by the instructor in the knowledge construction process. In the presentation phase, the instructor will invite the training participants to present the results of their group work in various ways, where each group member is expected to be a presenter as a form of responsibility towards the group. In this process, other trainees respond to presentations made by other groups, and then class discussions are conducted through the instructor's direction as a facilitator. Next, in the training and follow-up phases, the instructor reconfirms the assignments carried out by groups of trainees.

The instructional impact that can arise from the application of the Disaster Mitigation Training Model is the increased motivation and cognitive abilities of trainees. Common ways that can increase the motivation of trainees through the application of the training model including: (1) explaining to participants about the learning objectives and their relationship with the life of the trainees is described in the first syntax of the model, (2) striving for an environment conducive to learning, is described in the second and third syntax, (3) gives participants the opportunity to actively participate while attending the lesson, (4) gives participants the feedback on the progress of their learning and their mistakes during the training process, , all of which can be a reinforcement for the trainee, (5) provide tasks that can be a challenge for the trainee according to his ability, and (6) ask the trainee to make notes about the results of their learning. Sections 3, 4, 5, and 6 are described in the phase 4, 5, and 6 PMB model syntax. This is in line with the nine steps of learning that can increase motivation according to Gagne, namely gaining attention, informing learners of the objectives, stimulating recall of prior learning, providing learning guidance, eliciting performance, reinforcement, and enhancing retention and transfer. These nine things can be found in every syntax in the Disaster Mitigation Training Model that has been developed [13, 14, 15].

The accompanying impact that can arise from the developed Disaster Mitigation Training Model includes an increase in learning activities and time, as well as increased learning independence and discipline. Increased learning activities are possible because the training model is designed in a way that training participants are facilitated to construct knowledge from the start, whether it is done personally, or socially in their respective groups [14, 15]. Independence and learning discipline among the trainee can also be formed along with the application of the training model. Independence and discipline in managing and obeying work time assignments characterize each of the syntax in Disaster Mitigation Training Model.

Comment [3]: Principle reaction was not clear

Comment [4]: Give more explanation/reason why?

4. Conclusion

The validation result of Disaster Mitigation Training Model showed that the developed training model is categorized as valid, which means that the training model has been logically developed to enhance trainee understanding on disaster mitigation. The characteristics of the developed Disaster Mitigation Training Model is consistent with the principles of constructivist learning, including learning personalization, reflective thinking, problem-solving and investigation, relevance to daily life, collaborative learning, discussion, and scaffolding. The social system of the model put the trainer as facilitator, whilst the trainee as an active learner.

References

[1] Daud, F., Adnan, Bahri, A., Arifin, A. N., and Pratiwi, A. C. 2019. Need Assessment for The Development of Disaster Mitigation Training Model in South Sulawesi. ICAMR 2018.

[2] Center For Excellence in Disaster Management and Humanitarian Assistance. 2015. *Indonesia Disaster Management Reference Book.* Hawai: Center for Excellence in Disaster Management and Humanitarian Assistance.

[3] BNPB. 2011. *Rencana Penanggulangan Bencana Provinsi Sulawesi Selatan.* Makassar: Pemerintah Provinsi Sulawesi Selatan.

[4] Hapsari, R. I., Zenurianto, M. 2016. View of Flood Disaster Management in Indonesia and the Key Solutions. *American Journal of Engineering Research,* Vol. 5, Issue 3, pp.140-151

[5] United Nation. 2008. *Disaster Preparedness for Effective Response.* Geneva: UNISDR

[6] Dube, E. 2018. Using Models to Deal with Hazards and Disaster: A Trajectory toward Effective Disaster Management in Zimbabwe. *People: International Journal of Social Sciences,* Vol. 4, Issue 1, pp. 111-132.

[7] Gaillard, J., Clavé, E., Vibert, O. et al. 2008. Ethnic groups' response to the 26 December 2004 earthquake and tsunami in Aceh, Indonesia. *Nat Hazards* 47, 17–38.

[8] Suciani A, Islami Z R, Zainal S, Sofiyan, and Bukhari. 2017. *IOP Conf. Series: Earth and Environmental Science,* Vol. 148.

[9] Glassman, M. 2001. Dewey and Vygotsky: Society, Experience, and Inquiry in Educational Practice. *Educational Researcher,* Vol. 30. No.40, pp. 3-14.

[10] Many H and John-Steiner V. 2012. Vygotsky and Sociocultural Approaches to Teaching and Learning. *Educational Psychology,* Vol. 7.

[11] Bhattacharjee J. 2015. Constructivist Approach to Learning— An Effective Approach of Teaching Learning. *International Research Journal of Interdisciplinary & Multidisciplinary,* Vol I, Issue VII, pp. 65-74.

[12] Bada, S. O. 2015. Constructivism Learning Theory: A Paradigm for Teaching and Learning. *IOSR Journal of Research & Method in Teaching.* Vol. 5, Issue 6, pp. 66-70.

[13] Wrenn J and Wrenn B. 2009. Enhancing Learning by Integrating Theory and Practice. *International Journal of Teaching and Learning in Higher Education*. Vol. 21 No.2 pp. 258-265

[14] Buscombe C. 2013. Using Gagne's Theory to Teach Procedural Skills. *The Clinical Teacher*, Vol. 10, Issue 5.

[15] Khadjool K., Rostami K., and Ishaq S. 2011. How to Use Gagne's Model of Instructional Design in Teaching Psychomotor Skill. *Gastroenterology Hepatol Bed Bench,* Vol. 4, Issue 3. Pp.116-119.

Characteristics of Disaster Mitigation Training Model in South Sulawesi

F Daud[1*], Adnan[1], A Bahri[1], A N Arifin[1], and A C Pratiwi[1]

[1]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar, Jl Daeng Tata, Parang Tambung, Tamalate, Kota Makassar, Sulawesi Selatan 90224

*e-mail: firdaus5759@yahoo.com

Abstract. The objective of this research is to assess the characteristics of a Disaster Mitigation Training Model in South Sulawesi. A Disaster Mitigation Training Model has been developed by researchers and has been subjected to content validity assessment by two validators. The model development is carried out to produce a disaster mitigation training in South Sulawesi which is suitable with disaster characteristics in South Sulawesi. Thus, it can serve as an answer to the need of target community on an efficient and effective disaster mitigation training. The characteristics of Disaster Mitigation Training Model discussed in this study including the syntax, principle of reaction, social system, supporting system, instructional impact, and companion impact.

Keyword: Characteristics, disaster mitigation training, south sulawesi

1. Introduction

The regular occurrence of disaster in Indonesian regions has put Indonesia as one of the most disaster-prone country in the world. The low capacity in handling disaster among its society has been one of the contributing factors to the increasing risk of disaster in its region [1,2,3]. South Sulawesi is one of disaster prone region with a high frequency of disaster occurred in the region, which generally occurred due to geological phenomena and hydrometeorology phenomena. Among all types of disaster occurred in South Sulawesi, floods is the most pervasive hazards affecting the region [1]. While floods had caused large amounts of damage, the affected area would also at risk of secondary hazards, including landslides and disease outbreaks [1,2,3].

Indonesian government has been promoting the importance of disaster mitigation for the society. However, the effort to conduct disaster mitigation have not been well implemented among the society. It is reflected by the high number of fatalities and damaged after the occurrence of natural hazards in many areas, including in South Sulawesi [3]. The occurrence of various disaster in their region, should have been a lesson for the society. Thus, each individual in the society should be well prepared to face the occurrence of disaster, particularly the type of disaster commonly occurred in their region. Disaster preparedness is defined as "actions taken to effectively anticipate, respond to, and recover from the impact of likely or current hazard events or conditions." Preparedness in this case refers to the ability to anticipate and reduce the impact caused by disasters. Disaster preparedness is an initiative to increase preparedness and knowledge of the community about a disaster, or at least the types of disasters most likely to occur in the local area [1,4].

The importance of improving disaster preparedness among the society has put an urge for the development of a Disaster Mitigation Training Model which is in accordance with the characteristics of regional disaster as well as the characteristics of local community. In order to assure the suitability of the developed training model in enhancing high school students' ability to perform disaster mitigation, it is deemed important conduct the study which mainly aims to assess the construct validity of the developed Disaster Mitigation Training Model. Furthermore, the characteristics of the developed Disaster Mitigation Training Model is also discussed.

2. Methods

A Disaster Mitigation Training Model has been validated by two validators. The validity of the developed Disaster Mitigation Training Model is assessed by using a construct validity assessment which assess several aspects, including: (1) theoretical background, (2) learning syntax, (3) principle of reaction, (4) social system, (5) supporting system, (6) instructional and companion impacts, (7) training activity, (8) training management, and (9) evaluation. The items for each aspect were given score by validators, ranged from 1 to 5. The average scores provided by the two validators for each aspect were then categorized into five categories, namely valid (4.1 – 5), fairly valid (3.6 – 4.0), less valid (2.6 – 3.5), invalid (1.6 – 2.5), and very invalid (1.0 – 1.5). The validation sheet is used to collect the validity data of the developed Disaster Mitigation Training Model. If the data showed that it is valid, it means that the intervention is logically designed.

3. Results and Discussions

The result of data analysis on validity of the developed Disaster Mitigation Training Model showed an average validity scores above 4.1. Thus, all components the Disaster Mitigation Training Model is categorized as valid. This means that the model has been logically developed to enhance trainee understanding on disaster mitigation. The Disaster Mitigation Training Model developed in this study particularly aims to improve high school students' ability in taking actions to prevent or reduce the risk of commonly occurred natural hazards in their region, particularly in South Sulawesi. Theoretical background supporting the learning model consisting of several learning theories, including cognitive theories of learning, behavioural theories of learning, and motivation theories of learning. The learning process within Disaster Mitigation Training Model support the trainee to actively construct their understanding on how to take actions before, during, and after the occurrence of certain natural hazards.

Table 1. Construct Validity of Disaster Mitigation Training Model

No	Component of Disaster Mitigation Training Model	Validity Score	Validity
1	Theoretical background	4.42	Valid
2	Learning Syntax	4.29	Valid
3	Principle of Reaction	4.08	Valid
4	Social System	4.28	Valid
5	Supporting System	4.25	Valid
6	Instructional and companion aspects	4.50	Valid
7	Training activity	4.29	Valid
8	Training management	4.25	Valid
9	Evaluation	4.25	Valid

The syntax of Disaster Mitigation Training Model developed in this study consists of six phases, namely: (1) Providing motivation and conveying training objectives, (2) Organizing training participants, (3) Brainstorming, (4) Construction of Knowledge / skills, (5) Presentation, and (6) Training and follow up. Each phase is a sequence of activities carried out by instructors and trainees during the learning process. In the first phase, participants were motivated about the importance of understanding disaster mitigation, especially potential disasters in the participant's home environment. Motivation is done by displaying several disaster events in Indonesia, ranging from national scale

disasters to disasters at the local level. In this case, the loss and damage caused by each disaster is the focus of attention, including damage to infrastructure that affects various areas of community life, material losses, to death victims. Departing from the facts about the adverse effects of disasters, the focus of attention will then be directed to the question "Can the negative impacts that may be caused by disasters be minimized?" Based on these questions, participants are directed to express their opinions. Various opinions from the participants were then linked to the paradigm of an epidemic in the early 19th century. At the beginning of the emergence of the epidemic in society, science and research on the causes of various types of disease were scarce. Research in the field of microbiology and molecular also has not developed as rapidly as it is today. Consequently, the epidemic at that time was considered as something that could not be avoided by the society. As the development of science related to physiology and molecular factors improved, the causes of the emergence of epidemics can be unveiled. Thus, the community began to understand the importance of prevention efforts through sanitation and healthy live style. The same thing happened for disaster management efforts. Understanding the characteristics of disasters can help minimize losses when disasters occur. One example is the tsunami disaster that occurred in 2004, which claimed hundreds of thousands of lives in Aceh, but only killed seven people in Simeuleu island [7,8]. Furthermore, this phase closes with the delivery of training objectives.

The second phase of the Disaster Mitigation Training Model is organizing participants, where participants are divided into groups with 3-5 members per group. This phase is based on Vygotsky's theory of social interaction which states that learning is a process that takes place socially [9, 10]. In other words, the learning process cannot be separated from social interaction. The third phase of the Disaster Mitigation Training Model is Brainstorming. In this phase, problems related to disasters that have occurred in the surrounding environment of participants are displayed to stimulate the interest and awareness of participants about the potential for disasters in their immediate environment. In response to this, trainees were asked to express their opinions, comments, or express experiences related to disasters. Next, each group member tries to gather ideas about various alternative solutions related to problem solving efforts aimed at minimizing losses when disasters occur and increasing community preparedness for disasters.

The fourth phase of the Disaster Mitigation Training Model is the construction of knowledge / skills. In this phase, the trainees are assigned to compile the solutions they offer in disaster mitigation efforts in more detail. In the process of preparing solutions, participants are directed to conduct studies of various types of literature and also interviews if possible. The results of the process of preparing this solution are made in the form of reports and presentation materials. At this stage, if participants find it difficult to complete the task, the instructor can do the scaffolding. The fifth phase of the Disaster Mitigation Training Model is presentation. Participants are directed to present the solutions they offer. Participants' presentations must contain the following items: factors that influence the occurrence of disasters, preparedness before a disaster occurs, actions during a disaster, and post-disaster actions. Each group was given the opportunity to make a presentation, and the instructor facilitated other trainees' responses to the results of the construction presented by the other groups. At the end of the presentation, the Instructor helps participants make conclusions and application of disaster mitigation efforts in daily life. The sixth phase of the Disaster Mitigation Training Model is training, follow-up, and awarding. In this phase, the instructor gives an evaluation which can be a case example related to disaster preparedness and events for the trainees to work on. At this stage, the instructor rewards participants who can do their assignments well. The six syntaxes in this Disaster Mitigation Training Model are developed by referring to seven basic principles of constructivist learning, namely: learning personalization, reflective thinking, problem-solving and investigation, relevance to daily life, collaborative learning, discussion, and teacher scaffolding [11,12]

Interaction is a dynamic social relationship that occurs between individuals, between individuals and groups, and between groups with other groups. In the learning process through the Disaster Mitigation Training Model, a reciprocal relationship occurs between instructor and trainee. This interaction naturally forms a social system in the classroom. The most prominent social system in this training model is working cooperatively. Working cooperatively begins in the Organizing phase of Training

Participants, Knowledge / Skills Construction, Presentations, and also Training and Follow Up. Therefore, the structure of learning objectives is packaged in a cooperative objective setting, but does not neglect individual work, especially in the construction phase of knowledge and skills.

The principles of reaction relate to how the instructor pays attention and treats the trainee and responds to stimuli that come from the trainee such as questions, answers, responses or other activities. In general, the principle of reaction is a guide for an instructor on how to appreciate and how to respond to what a trainee does. Based on this general understanding, the principle of reaction in this Disaster Mitigation Training Model emphasizes student-centered learning patterns, where the instructor acts as the facilitator, motivator and administrator of the training, while the trainee acts as the learner. The role of the instructor in this model is clearly visible from the initial training activities to the closing activities. The first phase of the model aims to motivate training participants and to convey training objectives. In this phase, the instructor does apperception and the trainees will follow it carefully. Through instructors' guidance, it is hoped that the participants can find problems and opinions related to disaster.

In the organizing phase of the trainees, the instructor groups the trainees in heterogeneous ways in various ways, but still in democratic principles. Through this activity, it is hoped that training participants can accept each other to work together as a team. In the knowledge and skills construction phase, the instructor distributes the tasks to the trainees and then provides guidance and direction for the trainees or groups in need. The principle of scaffolding is an emphasis that must be carried out by the instructor in the knowledge construction process. In the presentation phase, the instructor will invite the training participants to present the results of their group work in various ways, where each group member is expected to be a presenter as a form of responsibility towards the group. In this process, other trainees respond to presentations made by other groups, and then class discussions are conducted through the instructor's direction as a facilitator. Next, in the training and follow-up phases, the instructor reconfirms the assignments carried out by groups of trainees.

The instructional impact that can arise from the application of the Disaster Mitigation Training Model is the increased motivation and cognitive abilities of trainees. Common ways that can increase the motivation of trainees through the application of the training model including: (1) explaining to participants about the learning objectives and their relationship with the life of the trainees is described in the first syntax of the model, (2) striving for an environment conducive to learning, is described in the second and third syntax, (3) gives participants the opportunity to actively participate while attending the lesson, (4) gives participants the feedback on the progress of their learning and their mistakes during the training process, , all of which can be a reinforcement for the trainee, (5) provide tasks that can be a challenge for the trainee according to his ability, and (6) ask the trainee to make notes about the results of their learning. Sections 3, 4, 5, and 6 are described in the phase 4, 5, and 6 PMB model syntax. This is in line with the nine steps of learning that can increase motivation according to Gagne, namely gaining attention, informing learners of the objectives, stimulating recall of prior learning, providing learning guidance, eliciting performance, reinforcement, and enhancing retention and transfer. These nine things can be found in every syntax in the Disaster Mitigation Training Model that has been developed [13, 14, 15].

The accompanying impact that can arise from the developed Disaster Mitigation Training Model includes an increase in learning activities and time, as well as increased learning independence and discipline. Increased learning activities are possible because the training model is designed in a way that training participants are facilitated to construct knowledge from the start, whether it is done personally, or socially in their respective groups [14, 15]. Independence and learning discipline among the trainee can also be formed along with the application of the training model. This is possible because in the learning activities of the trainees, especially in the construction phase of knowledge and skills, the model emphasizes the pattern of working on individual tasks before they work in groups within a certain timeframe. Independence and discipline in managing and obeying work time assignments characterize each of the syntax in Disaster Mitigation Training Model.

4. Conclusion

The validation result of Disaster Mitigation Training Model showed that the developed training model is categorized as valid, which means that the training model has been logically developed to enhance trainee understanding on disaster mitigation. The characteristics of the developed Disaster Mitigation Training Model is consistent with the principles of constructivist learning, including learning personalization, reflective thinking, problem-solving and investigation, relevance to daily life, collaborative learning, discussion, and scaffolding. The social system of the model put the trainer as facilitator, whilst the trainee as an active learner.

References

[1] Daud, F., Adnan, Bahri, A., Arifin, A. N., and Pratiwi, A. C. 2019. Need Assessment for The Development of Disaster Mitigation Training Model in South Sulawesi. ICAMR 2018.

[2] Center For Excellence in Disaster Management and Humanitarian Assistance. 2015. *Indonesia Disaster Management Reference Book.* Hawai: Center for Excellence in Disaster Management and Humanitarian Assistance.

[3] BNPB. 2011. *Rencana Penanggulangan Bencana Provinsi Sulawesi Selatan.* Makassar: Pemerintah Provinsi Sulawesi Selatan.

[4] Hapsari, R. I., Zenurianto, M. 2016. View of Flood Disaster Management in Indonesia and the Key Solutions. *American Journal of Engineering Research,* Vol. 5, Issue 3, pp.140-151

[5] United Nation. 2008. *Disaster Preparedness for Effective Response.* Geneva: UNISDR

[6] Dube, E. 2018. Using Models to Deal with Hazards and Disaster: A Trajectory toward Effective Disaster Management in Zimbabwe. *People: International Journal of Social Sciences,* Vol. 4, Issue 1, pp. 111-132.

[7] Gaillard, J., Clavé, E., Vibert, O. et al. 2008. Ethnic groups' response to the 26 December 2004 earthquake and tsunami in Aceh, Indonesia. *Nat Hazards* 47, 17–38.

[8] Suciani A, Islami Z R, Zainal S, Sofiyan, and Bukhari. 2017. *IOP Conf. Series: Earth and Environmental Science,* Vol. 148.

[9] Glassman, M. 2001. Dewey and Vygotsky: Society, Experience, and Inquiry in Educational Practice. *Educational Researcher,* Vol. 30. No.40, pp. 3-14.

[10] Many H and John-Steiner V. 2012. Vygotsky and Sociocultural Approaches to Teaching and Learning. *Educational Psychology,* Vol. 7.

[11] Bhattacharjee J. 2015. Constructivist Approach to Learning— An Effective Approach of Teaching Learning. *International Research Journal of Interdisciplinary & Multidisciplinary,* Vol I, Issue VII, pp. 65-74.

[12] Bada, S. O. 2015. Constructivism Learning Theory: A Paradigm for Teaching and Learning. *IOSR Journal of Research & Method in Teaching.* Vol. 5, Issue 6, pp. 66-70.

[13] Wrenn J and Wrenn B. 2009. Enhancing Learning by Integrating Theory and Practice. *International Journal of Teaching and Learning in Higher Education*. Vol. 21 No.2 pp. 258-265

[14] Buscombe C. 2013. Using Gagne's Theory to Teach Procedural Skills. *The Clinical Teacher*, Vol. 10, Issue 5.

[15] Khadjool K., Rostami K., and Ishaq S. 2011. How to Use Gagne's Model of Instructional Design in Teaching Psychomotor Skill. *Gastroenterology Hepatol Bed Bench,* Vol. 4, Issue 3. Pp.116-119.