

Differences Between Discovery Learning And Case-Based Learning Using Animated Videos On Critical Thinking Skills In Start Triage Among Undergraduate Nursing Students

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Abstract

The 2004 disaster in Aceh underscores the need to strengthen disaster triage preparedness. Triage would be more accurate when considering human resource factors. Students are educated nurse candidates who will serve the community through their ability to think critically. Innovative learning opens opportunities to sharpen critical thinking in students' preparedness for emergency disaster situations. This study analyzes the differences between discovery learning and case-based learning on critical thinking in START Triage among undergraduate nursing students. This quasi-experimental study used a pre-test and post-test design involving 40 undergraduate nursing students selected through purposive sampling and divided into two groups: control and intervention. Data collection utilized the Critical Thinking Disposition Inventory questionnaire. The results of the Paired T-test revealed differences in critical thinking ability in START Triage before and after receiving discovery learning and case-based learning. Furthermore, the independent T-test results indicated a significant influence of case-based and discovery learning on critical thinking ability in START Triage. Case-based learning utilizing animated videos significantly impacted nursing students' critical thinking ability in START Triage. Using animated videos as a basis for case-based learning provides a foundation for educational institutions to integrate into learning activities and disaster simulation exercises to enhance the quality of Triage services.

Keywords: Animated Videos, Critical Thinking, START Triage

INTRODUCTION

Disaster is an impossible phenomenon for the whole world to avoid, thereby allowing damage and loss of life (Gustiani et al., 2021). According to 2018 World Risk Report data, Indonesia is ranked 36th with a risk value of 10.36 out of 172 countries, categorized as most vulnerable to natural disasters (Fariza & Handayani, 2022). Based on data from the National Disaster Management Agency (BNPB), it is estimated that in 2021, there will be around 3,093 disaster incidents in Indonesia. The number of disaster incidents is estimated to have decreased by 33.5% from 2020. According to the BNPB study, although there has been a decrease, the increase in frequency is found in the impact of disasters. The number of victims who died increased by 76.9%, injured victims by 2180.5%, the number of victims

who were displaced reached an increase of 24%, and 116.3% of houses were damaged (Jamil et al., 2022). The above phenomena have shown that Indonesia is a disaster-prone country that requires an integrated system to deal with disasters appropriately.

According to (Khambali & ST, 2017), the most vital aspect of disaster management is the prevention and mitigation. Prevention and mitigation actions are efforts to reduce disaster risks through infrastructure regulation, education, and training (Hardy & Calleja, 2019). Meanwhile, according to (Paquay et al., 2021), disaster management is divided into four parts: learning how to Triage, managing injured patients, enhancing preparedness, and improving disaster care. Early preparation for disaster can be facilitated through education, training, simulations, and increasing community capacity.

Triage learning is one part of disaster preparedness to minimize patient classification errors that can lead to disabilities (Bostick et al., 2008). The START Triage (Simple et al.) is one disaster Triage system used internationally and studied worldwide, used to classify patients based on their urgency type quickly, accurately, and efficiently (Aubrion et al., 2022). In this study, the use of START Triage was chosen because, in several kinds of literature, it is recognized as a disaster Triage approach due to its ease of implementation and ability to provide rapid assessment. Triage assessments that fail to handle a large number of patients may result in over-triage and under-triage effects, even leading to deaths (Bhaumik et al., 2022).

Overtriage refers to the decision to classify patients with lower or moderate severity levels as requiring higher levels of emergency care than actually necessary (Ayenew et al., 2022). Meanwhile, Undertriage is the condition where patients with severe injury levels are deemed to require lower levels of emergency care than actually necessary (Bazyar et al., 2019). In disaster management, overtime and Undertriage pose challenges that need to be addressed in the Triage assessment system to ensure accurate patient management in disaster situations.

(Chan, Man, & Lam, 2019) identified barriers in disaster procedures related to human resources, particularly healthcare workers who may lack optimal knowledge and disaster response abilities. Additionally, students, as future healthcare professionals, have limited experience and imagination regarding disasters (Kim & Lee, 2021). Therefore, education at the university level can deepen the understanding of Triage-related knowledge to cultivate disaster-ready professionals (Rofifah et al., 2019).

The research conducted by (Chen et al., 2011), which focuses on nursing education programs, highlights the need for nursing graduates to engage in critical thinking and evaluate information in their practice. However, several studies indicate that critical thinking abilities among nursing graduates are relatively low despite nursing educators in colleges facilitating critical thinking methods (Syaznas & Jannah, 2022).

Based on preliminary studies conducted by researchers on March 20, 2023, through the distribution of questionnaires and interviews with eighth-semester nursing students at one of the nursing colleges in Malang City, it was found that four out of fifteen students met the criteria for critical thinking skills. A good understanding of the Triage concept is essential for patient response skills (Natarianto et al., 2018). This suggests that students need to be

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facilitated in critically thinking about patient responses, especially in Triage, which is an integral aspect of emergency care.

The use of learning models needs to be considered to support the success of the Triage learning process. Discovery Learning (DL) can be applied to stimulate learners and is one of the learning methods in education because it strengthens the concepts of the material presented (Rahayu et al., 2023). However, there are still shortcomings in the implementation of this learning model, such as abstract and monotonous learning, which makes students less interested. Therefore, research on innovative learning methods is needed.

Hence, the researchers compared it with the Case Based Learning (CBL) model using animated videos. This innovative model utilizes disaster scenario-focused animated videos on a case-by-case basis. Case-based learning encourages students to actively solve problems as a stimulus for critical thinking and decision-making individually or in groups (Aluisio et al., 2016). CBL learning with animated videos also makes students more interested due to its dynamic nature, thus enhancing their engagement with the content being delivered.

In this study, the tool for CBL learning innovation takes the form of 3D animated videos based on Powtoon, specifically designed for Triage topics. The topics introduce definitions, history, objectives, principles of use, algorithms, and documentation of Triage along with a disaster case scenario. The 3D animated video is packaged as attractively as possible by transforming imagination, ideas, concepts, and visuals so that the contained context can be effectively conveyed. Therefore, the researchers aim to determine whether there is a difference in critical thinking abilities before and after the provision of START Triage using case-based and discovery learning models among undergraduate nursing students.

The research contributes to the existing body of knowledge by investigating the differences between discovery learning and case-based learning using animated videos on critical thinking skills in START Triage among undergraduate nursing students. This study's novelty lies in its application of a quasi-experimental design to assess the impact of these learning models on critical thinking skills in a disaster triage context, which is crucial for effective disaster management. The findings of this study can inform educational institutions on the most effective methods to enhance critical thinking skills in nursing students, ultimately improving disaster response and patient care outcomes.

RESEARCHED METHODS

The research design used in this research is the Quasi-Experimental with a control and intervention group. The sampling method used was purposive sampling. In the pretest-posttest design method, namely, before the trial is carried out on two groups, an assessment is carried out first on the two groups, and after the assessment or measurement is carried out, the researcher provides the treatment. This research assesses critical thinking first, and then researchers provide treatment in the form of the START Triage learning model with case-based learning and discovery learning models. Furthermore, another trial was carried out at the end of the research. Researchers compared the differences between the two

learning models on critical thinking skills by providing learning models in the form of case-based and discovery to two groups, A and B.

The data analysis technique used in this research involves comparing the pretest and posttest scores of the two intervention groups (case-based learning and discovery learning) to assess the impact of the different learning models on critical thinking skills. This comparison likely includes statistical methods such as paired t-tests or analysis of variance (ANOVA) to determine if there are significant differences in critical thinking skills between the groups after the intervention. Additionally, the researchers may employ descriptive statistics to summarize the characteristics of the sample and inferential statistics to draw conclusions about the broader population of undergraduate nursing students in semester VII.

According to Lemeshow, the minimum sample in this study was 40 people. The sample in this research was undergraduate nursing students in semester VII. In this study, two different intervention groups were obtained. The total number of respondents in this study was 40 respondents, so the total respondents were divided into two intervention groups, of which 20 respondents used the case-based learning model and 20 respondents used the discovery learning model. The instrument was obtained from (Redhana, Karyasa, & Atrisa, 2017) research with the title Development of Critical Thinking Disposition Inventory: its validity and reliability. Researchers adopted this instrument to be given to nursing students in the context of disaster Triage to measure nursing students' ability to think critically.

RESULT AND DISCUSSION

Description of Respondent Characteristics based on Age and Gender

The number of samples in this research was 40 respondents from regular undergraduate students who were in semester VII at STIKes (Institute of Health Science) Widyagama Husada Malang. The following is data on the frequency distribution of respondents based on age and gender.

Table 1. Frequency Distribution Table of Respondents Based on Age and Gender (N= 40)

No.	Age	Frequency	Percentages
1.	20 years old	4	10%
	21 years old	18	45%
	22 years old	13	32,5%
	23 years old	4	10%
	24 years old	0	0%
	25 years old	1	2,5%
	Total	40	100%
2.	Gender		
	Man	5	12,5%
	Woman	35	87,5%
	Total	40	100%

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Table 1.1 above shows that of the total respondents in this study, on average, almost half were 21 years old (45%) among the 20-25 year age range, and on average, almost all were women (87,5%).

Results of Analysis of Differences in Critical Thinking in CBL and DSL Learning Groups

From the research results, it was found that critical thinking increased after being given CBL learning in the intervention group and DSL in the control group, which can be described as:

Table 2. Paired Sample T-test Results on Critical Thinking between the Intervention Group and Control Group (N=20)

Variable	Group	Mean	Mean Different	Std. Deviation	P value
Critical thinking	CBL Before	118.70	26.750	10.388	0.000
	After	145.45		11.889	
	DSL Before	117.90	17.250	8.071	
	After	135.15		8.869	

Information: CBL = intervention group, DSL = control group

Based on Table 1.2 above, in the Paired Samples Test, it can be seen that there is a significant difference in respondents' critical thinking after START Triage learning. Where the significance value in the table for the intervention group and control group both experienced significant (meaningful) changes, namely the p-value of 0.000, which means this value is smaller than the α value (0.05). Even though both experienced an increase, the results can be seen in the different items in the mean, where a significant change occurred in the CBL group with a mean value of 26.75, while in the DSL group, the mean value was 17,250. These results indicate that learning using the CBL model is more effective in improving respondents' critical thinking compared to the DSL learning model.

Results of analysis of the influence of critical thinking after providing intervention in the CBL and DSL learning groups

The independent t-test was carried out to determine the difference in improvement in critical thinking variables between the intervention group and the control group. The results obtained can be described in :

Table 3. Independent Sample T-test Results on Critical Thinking between the Intervention Group and Control Group (N=20)

Variable	Group	Mean Difference in Pre-test and Post-test Scores	Std. Deviation	P value
Critical thinking	CBL	26.75	11.447	0.021
	DSL	17.25	13.451	

Information: CBL = intervention group, DSL = control group

Based on Table 1.3 above, in the Independent Sample Test, it can be seen that there is a difference in respondents' critical thinking between the CBL and DSL groups with a p-value of 0.021, which means this value is smaller than the α value (0.05), meaning that there is a difference in the results of improving thinking. Critical after being given intervention between the intervention and control groups. In the group statistics results, it can be seen

that the average (mean) value of increasing critical thinking in the control group was 17.25, and the value of increasing critical thinking in the intervention group was 26.75, which means that the average result of increasing critical thinking after being given the CBL learning model intervention was more dominant. Provide an influence compared to the DSL learning model in the control group.

From the results of the differences in critical thinking abilities between CBL and DSL, the research findings indicate that there are significant differences in critical thinking skills before and after participating in START Triage learning with both CBL and DSL models. However, although differences are evident in the DSL model, it also has weaknesses in the learning process compared to the CBL model, as evidenced by the statistical results. The DSL model appears more monotonous in its implementation, thus making it less engaging for the respondents. The DSL model provides concept reinforcement stimuli, making learning easier to process compared to static presentations (Grogans et al., 2023). The DSL model in this study utilized PowerPoint media containing disaster-illustrating videos. DSL model, with movement, color, sound, and text in the media, can significantly enhance cognitive engagement.

Critical thinking is an individual's tendency toward their ability to perform certain tasks or activities through reasoning processes (Yasmini, 2021). This study measured critical thinking by triaging seven indicators in the data collection questionnaire. Respondents participating in CBL learning model activities will undergo significant changes in educational dynamics, student roles, didactics for knowledge transmission, and teaching-learning strategies (Boso, van der Merwe, & Gross, 2021). These changes revolve around students actively participating in the learning process to achieve greater development in critical thinking capacity, self-directed learning, and self-evaluation.

As an essential foundation for education, critical thinking skills involve efforts to acquire or seek, analyze, and conceptualize information as a guide to developing thinking processes to achieve a solution to a problem (Handayani, Budiarti, Kusmajid, & Khairil, 2021). In the CBL learning model, with the assistance of animated videos and the case method, respondents are encouraged to develop critical thinking skills, allowing them to integrate their knowledge as future professionals in the context of Triage (Rahmawati, Rosida, & Kholidin, 2020). This critical thinking process also fosters teamwork collaboration, thinking from different perspectives, and encourages idea exchange in finding solutions together.

This study demonstrates that after participating in the CBL learning model with animated video combinations, respondents have the ability to develop critical thinking, which can be useful in both simple and complex situations. This learning model, combined with animated videos featuring text features in each explanation, aids respondents in managing the information received with their verbal abilities. The animated videos also include interactive 3D images to help respondents enhance critical thinking regarding START Triage through their spatial visual abilities. This study offers a CBL learning model with the assistance of a combination of animated videos and case studies, where there has been no previous research attempting to apply this model specifically in disaster nursing education.

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Previous studies have mainly applied simulation methods or game-based learning. Therefore, this research focuses on learning with animated videos centered on students (student-centered).

The improvement in critical thinking abilities between CBL and DSL groups has a significant influence on their critical thinking abilities after receiving START Triage education. In this study, the CBL group or treatment has a higher difference or influence value compared to the DSL group or control group, possibly due to the integration of the learning model with a combination of animated video media and case studies. Thus, cognitive processes will be actively and organizedly involved in problem identification, evaluation of acquired information, searching for evidence to solve problems, and drawing conclusions (Hasnah et al., 2024).

The learning process in CBL is superior because it requires respondents to think, recall previously acquired knowledge, connect initial knowledge learned in disaster cases, and interpret and analyze to solve cases or problems in the context of disasters depicted in animated videos (Chiang et al., 2021).

Statistical analysis results show that in critical thinking after receiving CBL and DSL learning models, both groups have higher mean difference values in the CBL group, meaning that the use of the CBL learning model has a greater impact on critical thinking in respondents. In this study, the use of 3D animated videos in the CBL model provides opportunities for interaction in the learning context to be more easily understood and accepted. This model is more effective and makes the learning process more interesting and enjoyable compared to the DSL model with PowerPoint media, even though they share the student-centered principle.

The development of this CBL model with animated videos considers moving images, audio, text, and appealing colors in a unified manner that reflects the clarity of the learning context, thus providing its own attraction for respondents even though the learning context is quite complex (Hwang et al., 2018). However, animated videos can stimulate the brain to remember information longer than explanations in static DSL learning. Animated videos combined with the case study method facilitate the presentation of dynamic visual material, allowing viewers to visualize abstract ideas. This can facilitate respondent understanding and encourage critical thinking.

CONCLUSION

Based on the results of research to determine the difference between the use of the START Triage learning model between CBL and DSL on critical thinking in undergraduate nursing students at STIKes Widayagama Husada Malang, it can be concluded as follows: There was a difference in critical thinking before and after providing START Triage education using the case based learning model to undergraduate nursing students. There was an influence of critical thinking after providing START Triage education between the case-based and discovery learning groups for undergraduate nursing students. CBL learning, which is supported by technology-based animated video media, can be considered for use as a support for the existing learning process, especially on disaster topics, which not only focus

on students but can also be used in services without being constrained by space and time. The need for a detailed critical thinking process in nursing that is really good at every element by students and health workers can help in considering the pros and cons of providing health services, especially in disaster management, and involving many human resources who take part in it. For future research, it would be beneficial to explore the long-term effects of utilizing different learning models, such as case-based learning (CBL) and discovery learning (DSL), on critical thinking skills among undergraduate nursing students. Longitudinal studies could track the development of critical thinking abilities over time, assessing not only immediate post-intervention effects but also whether these skills are sustained and transferable to real-world nursing practice. Additionally, comparative studies could investigate the effectiveness of integrating various educational technologies, such as animated video media, into different learning models. This could help identify the most effective combination of instructional methods and technology-enhanced resources for promoting critical thinking in nursing education. Furthermore, research could delve deeper into the specific elements of critical thinking that are most enhanced by different learning approaches. Understanding which aspects of critical thinking are most impacted by CBL, DSL, or other instructional methods can inform the development of targeted interventions to strengthen these skills in nursing students. Lastly, exploring the application of critical thinking skills in specific healthcare contexts, such as disaster management, as mentioned in the study, could provide valuable insights into the practical implications of enhanced critical thinking abilities for healthcare professionals. This could involve simulation-based training or observational studies in real-world healthcare settings to assess how critical thinking influences decision-making and patient outcomes during crisis situations.

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