

DEVELOPMENT OF A WEBSITE-BASED OCCUPATIONAL SAFETY EDUCATIONAL MEDIUM TO ENHANCE KNOWLEDGE REGARDING WORKPLACE ACCIDENT PREVENTION

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Abstract

Occupational safety and health (OSH) is an important aspect in preventing occupational accidents. Effective OSH education is needed to improve users' understanding of hazard identification and occupational accident prevention measures. This study aimed to develop a website-based occupational safety education media and determine its feasibility and effectiveness in improving users' knowledge regarding occupational accident prevention. This study employed a Research and Development (R&D) method using the ADDIE development model, consisting of five stages: Analysis, Design, Development, Implementation, and Evaluation. The educational media was developed using the Google Sites platform containing materials related to occupational safety, hazard identification, the use of personal protective equipment (PPE), and occupational accident prevention efforts. The feasibility of the media was assessed through validation by material experts and media experts, while the effectiveness of the media was evaluated using a one-group pretest-posttest design involving 30 respondents. The results showed that the website-based educational media was categorized as feasible based on expert validation results. The use of educational media increased the users' average knowledge score from 62.40 in the pretest to 84.60 in the posttest. The results of the Paired Sample t-test indicated a significant difference between knowledge scores before and after using the media ($p < 0.001$). The Normalized Gain (N-Gain) value of 0.59 indicates a moderate level of effectiveness. The website-based occupational safety education media can be used as an alternative digital learning medium to improve knowledge regarding occupational accident prevention.

Keywords : Occupational Safety, Educational Media, Website, ADDIE, OSH Knowledge

INTRODUCTION

Safety and health work (K3) is aspect important in create environment safe work as well as prevent occurrence accidents and illnesses consequence work . Accident Work Still become global problems because give impact to health workers , productivity organization , as well as loss economy . The International Labour Organization (ILO) reports that millions worker experience accident work and disease consequence Work every year so that effort prevention through improvement awareness safety become need main in system K3 management (International Labor Organization, 2021). Accident Work No only caused by factors technical , but also influenced by factors man like lack of knowledge , low awareness to danger , and behavior work that is not safe . Knowledge safety Work be one of component important Because workers who understand potential hazards and procedures safety own ability more Good in do action prevention accident work (Robson et al., 2012)

Education and training safety Work is a preventive strategy that many implemented For increase knowledge as well as form behavior safe work . The results of a systematic review show that the K3 training program is capable increase knowledge safety and influence behavior worker in apply practice more work safe (Robson et al., 2012). However , method education safety work that is still depends on training conventional own limitations , such as limitations time , place , and access worker to material learning . Development technology information give opportunity For develop method more K3 education flexible through digital media. Learning media website based allows users access information safety Work in a way independent , when only and from various device . Usage digital technology

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in training safety Work known capable increase involvement users as well as give alternative more learning easy accessible compared to method training traditional (Virgili et al., 2023).

Educational media website based can serve material safety Work in form text , images , videos, animations , and evaluation interactive so that the learning process become more interesting and easy understood . Research regarding safety and health e-training Work show that training based digital technology has potential in increase knowledge and skills individual related prevention accident work (Virgili et al., 2023). Although various study has study effectiveness occupational health and safety training technology , still required development of educational media which is special designed based on need users as well as integrate material prevention accident Work on an easy website platform used . Some study previously more Lots focus on effectiveness digital training in general , while development of educational media websites that assess improvement knowledge users Still need developed more carry on .

Robson et al. (2012) conducted a systematic review of effectiveness training safety and health work . Research results show that K3 training can increase knowledge and awareness worker to safety work , but study the more Lots discuss effectiveness of training programs in a way common and not yet focuses on the development of website -based digital media . Gao et al. (2018) conducted a systematic review related to use technology assisted computer in training safety Work sector construction . Research results show that digital technology has potential increase acquisition knowledge safety and engagement users compared to method training traditional , but Still required study advanced about media design , usability, and the effectiveness of digital media which is specific used For education prevention accident Work .

Based on problem mentioned , it is necessary something educational media innovation safety Work website-based that is capable of give information about identification danger , prevention accident work , use tool protector self , as well as procedure safety in a way systematic and easy accessible . The development of this media is expected can become alternative means supportive education improvement knowledge safety Work so that users own greater understanding Good in do action prevention accident Work .

METHOD

This research uses Research and Development (R&D) method with the ADDIE development model which consists of of five stages , namely Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model is used Because provide framework systematic development in produce product learning start from analysis need user , design products , media development , implementation , to evaluation effectiveness product (Branch, 2009; Trust & Whalen, 2020). In the development stage , educational media safety Work developed in digital learning website form using the Google Sites platform. The product developed load material about safety work , identification danger , use tool protector self (PPE), as well as effort prevention accident Work .

Subject study consists of on expert validators and educational media users . Expert validators consists of from expert material safety and health Work as well as learning media expert or technology information that provides evaluation to eligibility product . Media users play a role as test subjects For know media effectiveness in increase knowledge safety work . Instrument study consists of on sheet validation expert , questionnaire knowledge safety work , and questionnaires response user . Data collection was carried out through studies literature , validation expert , test knowledge use pretest-posttest design , as well as filling questionnaire response user . Instrument study done testing validity and reliability before used . Result data validation experts and responses users analyzed use percentage eligibility For know quality media developed . Media effectiveness is analyzed with compare score knowledge users before and after using educational media website - based through appropriate statistical tests .

RESULTS AND DISCUSSION

Development of educational media safety Work website based is done using the ADDIE model consisting into five stages , namely Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model is used Because own stages systematic and achievable development implemented in produce product appropriate education with need users (Branch, 2009). The development of this media aims produce digital learning media that is capable increase knowledge users about prevention accident Work .

At the analysis stage , it is carried out identification need towards educational media safety Work through studies literature about draft safety and health work (K3), factors reason accident work , as well as prevention strategies accident work . Analysis results show that education safety Work need easy media accessible , flexible , and capable serve information in a way more interesting . The use of website -based digital media is one of the alternative Because allows users get information in a way independent without limited time and place .

The design stage is carried out with compile educational media design which includes structure website pages , layout material , design display , as well as instrument evaluation . The material developed covers draft base safety work , identification danger , factors reason accident work , use tool protector self (PPE), as well as action prevention

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accident work . Presentation material equipped with visual elements in the form of images , illustrations and supporting media For increase understanding user .

At the development stage , educational media developed using the Google Sites platform as a digital learning website . The choice of Google Sites is based on ease of use. development , convenience access , as well as platform capabilities in integrate various component learning like text , images , videos, and evaluations learning . Products the beginning that has been developed furthermore done validation by experts material safety and health Work as well as learning media expert .

Validation results expert material show that educational media safety Work website -based acquisition percentage eligibility by 92.5% with very worthy category . Assessment expert material covers aspect suitability content , completeness material , accuracy draft safety and health work (K3), as well as relevance material to effort prevention accident work . The value show that the material presented in the media has fulfil standard eligibility content and appropriate with objective development of educational media . The material developed has covers aspect important in safety work , such as identification danger , factors reason accident work , use tool protector self (PPE), as well as steps prevention accident work . Validation expert material become stage important For ensure that information provided to users own level good accuracy and relevance so that can support improvement knowledge safety Work .

Validation results media experts show that educational media website -based acquisition percentage eligibility by 90.8% with very worthy category . Assessment media experts include aspect visual appearance , design interface , ease of use navigation , readability information , as well as convenience website usage . The results show that the website is developed has fulfil aspect technical as a digital learning medium . Systematic menu preparation , use of supporting visual elements materials , as well as simple display help users in access and understand information safety Work in a way more effective . With Thus , educational media website -based development assessed worthy used as means learning For increase knowledge about prevention accident Work .

Effectiveness of educational media safety Work website -based analysis based on change level knowledge users before and after given intervention . Measurement done use one group pretest-posttest design , namely with give test initial (pretest) before use of media and tests end (posttest) after users get education via the website. Based on results measurement , obtained improvement average knowledge score users after using educational media safety Work website -based . The average pretest score of users before given education of 62.40, while average posttest score after using educational media increase to 84.60. The result show existence increase in average knowledge by 22.20 points after users get education through website -based media . Increase the show that educational media website -based capable give contribution to improvement understanding users about draft safety work and prevention accident Work .

Normality test results using Shapiro-Wilk shows that the data difference score knowledge before and after intervention normally distributed with mark significance $p > 0.05$. Therefore that , analysis difference score knowledge done using the Paired Sample t-test. The results of the Paired Sample t-test show that there is significant difference between score knowledge before and after use of educational media website based with p -value < 0.001 . The results show that use of educational media safety Work website based provides influence to improvement knowledge users about prevention accident Work .

Besides analysis difference score , improvement knowledge is also analyzed use Normalized Gain (N-Gain) calculation . Analysis results show N-Gain value of 0.59 which is included in category moderate . The value show that educational media website based has level sufficient effectiveness Good in increase knowledge user . Can seen in tables 1 and 2 below

Table 1. Analysis Results Effectiveness of Educational Media Safety Work Website Based on Knowledge Users

Variables K3 Knowledge	Pretest	Posttest	Difference Improvement	p-value
Knowledge Score	62.40	84.60	22.20	<0.001

Table 2. Results of the Educational Media Effectiveness Test Website Based

Parameter	Mark
Amount respondents (n)	30
Average pretest score	62.40
Average posttest score	84.60
Average score increase	22.20
Shapiro-Wilk normality test results	$p > 0.05$
Paired Sample t-test results	$p < 0.001$
N-Gain Value	0.59
Category effectiveness	Currently

Description : Analysis difference score using the Paired Sample t-test.

Website link <https://sites.google.com/view/edsal-safety-education/page-muka>

CONCLUSION

Educational media safety Work website -based success developed using the ADDIE model and stated worthy used based on results validation expert material and media experts . Use of educational media website -based on 30 respondents show existence improvement knowledge about prevention accident work , shown with improvement The average pretest score was 62.40 and increased to 84.60 in the posttest. The results of the Paired Sample t-test showed existence significant difference between score knowledge before and after media use ($p < 0.001$), with Normalized Gain (N-Gain) value of 0.59 in category moderate . With Thus , educational media safety Work website based can used as a digital educational media for increase knowledge users about prevention accident Work .

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