Creative Gamification In Kahoot! For Worker’s Health And Safety Learning Assessment

Wegig Murwonugroho, Syaifudin

Abstract: The Kahoot! game application is used to determine differences in the level of understanding of mining workers, between before and after watching the safety video on the topic of “fatigue”. Data shows cognitive improvement between before and after the Occupational Health and Safety (OHS) video was shown. However, the results of increased knowledge of this video material are not accompanied by keeping safety commitments at work. Therefore this research is important to do with the aim of finding indicators of collecting material in the Kahoot! game which can increase workers’ awareness and commitment to safety at work. This research method uses a quasi-experimental method on 60 people who are not mining workers that is analysed using t-test and ANOVA test. The results showed that Kahoot! creative gamification must fulfill the criteria of preparing questions and answer choices that are capable of: 1) stimulating players to apply their knowledge in the real world; 2) relating aspects of memory, perception, and action; 3) having dramatic, antagonistic, witty, and affective qualities. Implications of this study, the creative gamification of Kahoot! as an instrument of learning assessment should put more emphasis on the content of OHS guidelines, and further can be applied to the workers that will translate them into practicing safety at work consistently.

Index Terms: Creative Gamification, OHS Video, Kahoot!, Learning Assessment.

1 INTRODUCTION

The document majority of work accidents are avoided through the continuous campaign of the Occupational Health and Safety (OHS) program (Samosamo, Marais, and Joubert, 2014). The greater the workers’ awareness of OHS, the lower the risk of work-related accidents and vice versa (Mbanu, 2005). This also increases productivity and savings in expenditure (Mutwale-ziko, Lushinga, and Akakandelwa, 2017). Therefore, the mining company, PT. XYZ, ideally designs comprehensive program on OHS to create awareness on self-protection guidelines for workers including through OHS videos. This research, therefore, focuses on safety videos regarding fatigue for mining vehicle drivers, with an overview of its effects and causes, as well as major accidents. Hot mining environment, the existence of a target production amount, as well as other physical and social conditions are some fatigue types experienced by drivers and tend to create a fatal impact on the body and brain. Therefore, although work safety education has been carried out through videos, the following results are an evaluation of its content, which indicates that OHS learning has not been successful optimized. Cognitive test results using the game of Kahoot! shows that respondents actually understand safe work procedures according to the video content. The use of the Kahoot! game is based on various studies that prove and explain its effectiveness as a quiz-based test instrument (Lin, Ganapathy, and Kaur, 2018; Ningrum, 2018; Sabandar, Supit, and Suryana, 2018; Tewthanom, 2019; Wibisono, 2019). However, miners’ understanding of self-protection guidelines is not consistent with work practices in the field, as they tend to ignore the risks involved. This fact differs from Dale’s (1969) study, which reported that learning using video shapes the competency to practice or demonstrate what is shown in the video.

gap arose because the content creator (maker of questions and answer choices) failed to carefully consider the level of intelligence, perception, and background of the game player as well as the inaccuracy in choosing the appropriate approach. In fact, as a measure of learning success (Bawa, 2018), the content of questions and choice of answers need to be designed according to the characteristics of miners, or that of workers in any field, and delivered using an andragogy approach such as Kahoot! for school students and not a pedagogical approach (Noor, Harun, and Aris, 2012). Therefore, it is necessary to conduct an experimental study on the use of Kahoot! with specific content modification and as an instrument for OHS learning outcomes test. The purpose of this study further is to determine new elements (i.e indicators) that supports the achievement of OHS learning outcomes and not to confirm the results of its effectiveness. The game is involved as a test instrument because the digitization learning technique in the form of quiz increases students’ motivation, and improves learning outcomes, in terms of knowledge, attitude, and practice (Lin, Chen, and Liu, 2017; Park, Kim, Kim, and Yi, 2019; Troussas, Krouska, and Sgouropoulou, 2020). The results of this study ultimately contributed to the development of Kahoot! game, which was in accordance with the characteristics of mine workers.

2 THEORETICAL FRAMEWORK

According to Dale (1969), people tend to capture 50% of information through visuals and audio (i.e using video), which also enables students to demonstrate or practice. To achieve optimal results, Dale (1969) suggested the implementation of a simulation-dominant learning (80% information) or direct experience (90% information) technique for easy analysis and evaluation. The competency built through this study is the ability to analyse, to evaluate, and to create. This assumption underlies the company in choosing video as an OHS learning media, to encourage workers to practice what they have learned from safety videos. Theoretically, workers achieve practical competence and demonstration when learning using video. However, the experience at PT. XYZ (for confidential purpose) showed a different result because Kahoot! as an instrument for measuring the learning, success was compiled with a pedagogical approach, instead of the andragogy (Burnard, 1989; Sälävåstru, 2014). It means that the
assessment of competency achievement for workers does not have the ability to perform other learning functions such as strengthening understanding of concepts and self-awareness according to the material (Nikto and Brookhart, 2011). The preparation of questions and answer choices using the pedagogical approach is more suitable for students in the game of Kahoot! Pink, Lingard, and Harley (2016) confirmed that the use of pedagogical approaches to measuring the achievement of OHS competencies in workers strengthens knowledge compared to practical awareness. Therefore, its achievement in adults needs to be measured by the andragogy approach due to the psychological differences between students and workers (Knowles, 1978). Furthermore, Knowles, Holton, and Swanson (2005) identified these differences in terms of various aspects, as shown in Table 1.

**TABLE 1**
PEDAGOGICAL AND ANDRAGOGICAL ASSUMPTION ABOUT LEARNERS

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Pedagogical model</th>
<th>Andragogical model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need to know</td>
<td>Learners need to have an idea of what the teacher explains</td>
<td>Learners need to know why something is important prior to learning it</td>
</tr>
<tr>
<td>Learner's self-concept</td>
<td>A learner has a dependent personality</td>
<td>Learners are responsible for their own decisions</td>
</tr>
<tr>
<td>The role of learner's experience</td>
<td>The learners' experience is of little worth</td>
<td>The learner's experience has great importance</td>
</tr>
<tr>
<td>Readiness to learn</td>
<td>Learners are ready to learn what the teacher requires</td>
<td>Learners become ready to learn when they see content as relevant to their lives</td>
</tr>
<tr>
<td>Orientation to learning</td>
<td>Learners expect subject-centered content</td>
<td>Learners expect life centered content</td>
</tr>
<tr>
<td>Motivation</td>
<td>Learners are motivated by external forces</td>
<td>Learners are primarily motivated by internal forces</td>
</tr>
</tbody>
</table>

The measuring instruments for achieving learning outcomes need to use quiz-based gamification. According to Blacker, Curby, Klobusicky, and Chein (2014), the use of games increases the capacity of Visual Working Memory (VWM). The visual appearance in games lasts longer in the minds and memories of its players. This is happens because working memory is closely related to visual perception of brain performance. The occurrence of impulse delivery makes people to always remember the game and reflect it to the real world (Agam and Secular, 2008). In other words, gamification in Kahoot! has the ability to accommodate various psychological aspects. Wiggins (2016) stated that gamification requires the use of game design elements. However, the basic criteria that need to be considered to make gamification in Kahoot! effective is the fulfillment of short and long-term memories. It means that the impressions arising while playing the game are stored in long- and short-term memories and reflected in the real world (Ishai and Sagi, 2014; Potter, 2012) (Ishai and Sagi, 2014; Potter, 2012). Therefore, questions and answer choices need to be accompanied by images or video illustrations because most people are visual learners, and 90% of the information transmitted to the brain is visual (Bedrina, 2018; Medina, 2014). In addition, video is an effective strategy for disseminating health information in developing countries (Hubley, 2006). According to research at a hospital in London, it significantly increases the knowledge and attitude of the audience (Latif, Ahmed, Amin, Syed, and Ahmede, 2016). Similarly, other studies showed that visual animation information combined with spoken text is the best way to communicate complex health messages to the illiterates. (Meppelink, Weert, Haven, and Smith, 2015).

3 RESEARCH METHODOLOGY
This is field research utilized the quantitative approach, with a quasi-experimental research design. This is due to its inability to allow the control of foreign variables that affected the subject's behavior (Creswell, 2012). The Kahoot! application test is shown in HSE training programs before then applied to mining workers. The total sample was 60 people (36 women, and 2 men) between the ages of 22-52 years. Their respective educational levels include 12 senior high school students, 10 diploma holders, 30 Bachelor degree students, and 8 Master degree students. The independent variables were in the age group, gender, and education level, while the dependent was in the accuracy scores of knowledge before and after watching the video, which was measured using the Kahoot!. The age groups were divided into generations, such as X (born 1960-1979), Y (born 1980-1994), and Z (born 1995-2010). At first, a pre-test was conducted using Kahoot! with 10 questions to determine the level of knowledge. Then, the subjects were shown an OHS video for 3 minutes, followed by a post-test using Kahoot! with the same questions randomly selected. During the study, researchers also conducted field observations on the subject to determine the extent of consistency or commitment of their behavior to the answers. Some of the steps above need to be carried out to answer the research questions below.

1. What types of questions and answer choices remind workers on the dangers of fatigue?
2. What types of questions and answer choices encourages workers to maintain safe behavior (no risk of fatigue)

The data used in this study were obtained directly to determine the effectiveness of using Kahoot! as an evaluation instrument for the promotion of OHS in the workplace. The collected data were analyzed through SPSS 23, using ANOVA and dependent T-tests. The ANOVA was used to test the hypothesis, while the t-test was used to determine the relationship between the average knowledge before and after seeing the video.

4 CREATIVE GAMIFICATION
In the beginning, workers were shown a video with the following description.

**TABLE 2**
SCRIPT IN THE FATIGUE PREVENTION CAMPAIGN VIDEO
Have you ever heard of the term fatigue?

Fatigue is a feeling of being very tired, fatigued, lethargic, sleepy which does not disappear even after sleeping.

Fatigue is very important for us to know, because fatigue causes an increased risk of accidents.

Many workplace accidents occur because of fatigue. Examples of major accidents caused by fatigue: tanker collisions, nuclear plant explosions, spaceship explosions.

So that we can manage fatigue, let’s find out what causes it?

The cause can come from the workplace or from outside the workplace.

Causes of fatigue in the workplace include long working hours, lots of overtime, night shift work, work environment that is too hot or cold, noisy.

It can also be due to working on tedious or repetitive tasks or prolonged physical work. Long working hours and night shift work cause less sleep.

Have you ever heard the term fatigue? Fatigue is a feeling of being very tired, fatigued, lethargic, sleepy which does not disappear even after sleeping.

Fatigue is very important for us to know, because fatigue causes an increased risk of accidents.

Based on the results of the processed data, an increase score and p-value were obtained between the pre-test and post-test. These scores are shown in Tables 4 and 5.

### TABLE 3
**SAMPLE OF KAHoot GAME APPLICATION QUESTION**

1. **What do you know about fatigue?**
   - Feeling sluggish because of having no money
   - Feeling of sleepy, tiredness that does not disappear even after sleeping
   - Not excited because of a breakup
   - Feeling jaded because of debt

2. **Why fatigue is important to know?**
   - Increases the risk of promotion
   - Increases the risk of heartbreak
   - Reducing the risk of a salary raise
   - Increases the risk of accidents

3. **What an example of a big accident due to fatigue?**
   - Tanker collision
   - The explosion of a nuclear plant
   - Blast a spaceship
   - All right

4. **What must be done to prevent fatigue at home?**
   - Play the game until morning
   - Take care of fussy children until morning
   - Ask your partner to look after a fussy child
   - Take strong medicine

5. **What causes fatigue at work?**
   - Boss is fierce
   - Night shift work
   - Fighting with coworkers
   - Less overtime

### TABLE 4
**COGNITIVE TEST RESULTS USING KAHoot!**

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>81.13</td>
<td>90.93</td>
</tr>
<tr>
<td>Min.</td>
<td>50</td>
<td>83</td>
</tr>
<tr>
<td>Max.</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### TABLE 5
**EFFECT OF INDEPENDENT VARIABLES ON COGNITIVE SCORES BEFORE TREATMENT**

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.951</td>
</tr>
<tr>
<td>Level of education</td>
<td>0.000</td>
</tr>
<tr>
<td>Age group</td>
<td>0.142</td>
</tr>
</tbody>
</table>

Because the level of education is more than three groups, it is necessary to conduct further analysis using Bonferroni (ANOVA test). This is used to determine the level of education that most influenced knowledge scores. The results can be shown in Table 6.

### TABLE 6
**EFFECT OF EDUCATION LEVEL ON KNOWLEDGE SCORES BEFORE TREATMENT**

The Kahoot Game application is used to assess before and after video playback. Here is the Kahoot Game Question List.

1. *What do you know about fatigue?*
   - Feeling sluggish because of having no money
   - Feeling of sleepy, tiredness that does not disappear even after sleeping
   - Not excited because of a breakup
   - Feeling jaded because of debt

2. *Why fatigue is important to know?*
   - Increases the risk of promotion
   - Increases the risk of heartbreak
   - Reduces the risk of a salary raise
   - Increases the risk of accidents

3. *What an example of a big accident due to fatigue?*
   - Tanker collision
   - The explosion of a nuclear plant
   - Blast a spaceship
   - All right

4. *What must be done to prevent fatigue at home?*
   - Play the game until morning
   - Take care of fussy children until morning
   - Ask your partner to look after a fussy child
   - Take strong medicine

5. *What causes fatigue at work?*
   - Boss is fierce
   - Night shift work
   - Fighting with coworkers
   - Less overtime

Based on the results of the processed data, an increase score and p-value were obtained between the pre-test and post-test. These scores are shown in Tables 4 and 5.
At first, a pre-test was conducted using Kahoot! with 10 questions to determine the level of knowledge. Then, the subjects were shown an OHS video for 3 minutes, followed by a post-test using Kahoot! with the same questions randomly selected. During the study, researchers also conducted field observations on the subject to determine the extent of consistency or commitment of their behavior to the answers. Some of the steps above need to be carried out to answer the research questions below. Based on the results of the processed data, an increase score and p-value were obtained between the pre-test and post-test. These scores are shown in Tables 1 and 2. The table shows that there are significant differences in knowledge scores between senior high school/Diploma, and Bachelor/Masters students. However, the education level between Diploma, Bachelor, and Masters showed no significant difference in knowledge scores. While after treatment, the effect of the independent variables on the knowledge score is shown in Table 7.

**TABLE 7**

**EFFECT OF INDEPENDENT VARIABLES ON KNOWLEDGE SCORES AFTER TREATMENT**

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.679</td>
</tr>
<tr>
<td>Level of education</td>
<td>0.000</td>
</tr>
<tr>
<td>Age group</td>
<td>0.004</td>
</tr>
</tbody>
</table>

The results clearly show that gender does not influence knowledge scores, while education level and age groups affect knowledge scores. Because the level of education is more than three groups, it is necessary to conduct further analysis using the ANOVA test. The results are shown in Table 5.

**TABLE 5**

**EFFECT OF EDUCATION LEVEL ON KNOWLEDGE SCORES AFTER TREATMENT**

<table>
<thead>
<tr>
<th>Level of education</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior High school or equivalent</td>
<td>0.000</td>
</tr>
<tr>
<td>Diploma</td>
<td></td>
</tr>
<tr>
<td>Bachelor</td>
<td>0.001</td>
</tr>
<tr>
<td>Master</td>
<td>0.000</td>
</tr>
<tr>
<td>Diploma</td>
<td></td>
</tr>
<tr>
<td>Bachelor</td>
<td>0.172</td>
</tr>
<tr>
<td>Master</td>
<td>0.453</td>
</tr>
<tr>
<td>Bachelor</td>
<td></td>
</tr>
<tr>
<td>Master</td>
<td>0.001</td>
</tr>
</tbody>
</table>

The table above also confirms that there is a significant difference between the level of education between senior high school and master's degree. This is similar to the level of education between Diploma and Bachelor, as well as Bachelor and Masters. While the scores between senior high school/Diploma/Bachelor, and Diploma/Masters, showed no significant differences. The effect of age groups on knowledge scores after treatment is shown in Table 8.

**TABLE 8**

**EFFECT OF AGE GROUPS ON KNOWLEDGE SCORES AFTER TREATMENT**

<table>
<thead>
<tr>
<th>Age group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen X</td>
<td></td>
</tr>
<tr>
<td>Gen Y</td>
<td>0.003</td>
</tr>
<tr>
<td>Gen Z</td>
<td>0.082</td>
</tr>
</tbody>
</table>

According to the results, the scores of generation Y with Y showed a significant difference. The knowledge score between X with Z, and Y with Z, showed no significant difference. Furthermore, the results also found several qualitative findings, is shown in Table 9. The subjects showed clear tendency patterns after conducting quizzes. This is to increase self-awareness associated with the importance of following the OHS protocol to overcome fatigue.

**TABLE 9**

**LIST OF KAHOOT QUESTIONS THAT ARE MOST REMEMBERED**

<table>
<thead>
<tr>
<th>No</th>
<th>The Most Remember Question</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What is known about fatigue</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>What causes fatigue</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>What causes fatigue in the workplace</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Why fatigue needs to be known</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>What accidents are caused by fatigue</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>How to prevent fatigue</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No</th>
<th>The Most Remembered Picture</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A broken leg due to an explosion</td>
<td>42</td>
</tr>
<tr>
<td>2</td>
<td>Image tab contents of the game</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>People are sleeping</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Car accident</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No</th>
<th>Does The Scary Picture Make You Become More Compliance With Regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Based on the survey, it is known which questions are more remembered and correlated with changes in attitude and behavior to keep the body from getting tired. Whether at work, at home, and how to condition the environment so as not to cause bodily fatigue. After reviewing the types of questions and answer choices, it was realized that the change in behavior was more influenced by the typical questions and answer choices that are antagonistic, humorous, and effective. Affective questions and answer choices remind players of loved ones, for example, family (wife/children/parents). The types of questions and sentence choices that are funny, antagonistic, and other unusual sentences tend to activate long and short-term memory, then affect one's behavior (Matthews, 2011). Therefore, there are three basic criteria that need to be met by the question maker and Kahoot! answer choices. Firstly, it needs to be able to stimulate the player to practice their knowledge as a form of response. The research by leading behaviorists (i.e Skinner, 1938; Thorndike, 1924, 1932) showed that when the response triggered by a stimulus occurs many times, it becomes a habit. Furthermore, the result is similar when the response receives social approval.
(Bandura, 1977). Secondly, the questions and answer choices in Kahoot! need to be developed to connect memory, perception, and action. This criterion is in accordance with Wahlheim and Zacks (2018) research, which showed that the brain continuously compares memory input with ongoing experience. Past memories guide the processing and perceptions of current events, which, in turn, determines the kind of action or behavior carried out by someone. It means the memories obtained form perceptions and ultimately encourages actions. One of the features of the question and choice of answers that meet this criteria is related to events known to the public, such as: accidental death, amputation, memory loss, and so forth. General knowledge of such events is segmented into ongoing experiences, and will activate the coding process of memory, perception, and action (Zacks, 2019). As stressed in the event coding theory developed by Hommel and Müsseler (2001), perceptions of events are not only related to memory and logical reasoning, but are also closely related to actions or behaviors, such as: action planning, finding new alternatives, and efforts to avoid danger. In order to realize the two criteria above, it is necessary to pay attention to the third criterion, which states that questions and answer choices need to be antagonistic, witty, effective, and relevant to remind the player of loved ones. Witty and antagonistic questions and answer choices encourage people to recall memory, form perceptions, which is followed by action (Badli and Dzulkifi, (2013), Stoyanova, (2016), Summerfelt, Lippman, and Hyman, (2010)). While questions and answer choices that touch effective emotions are generally followed by fear, sadness, and a comparison of risks and costs (Zadra and Clore, 2011). Therefore, effective questions and answer choices related to loved ones encourage people to look after themselves (Brosch, Scherer, Grandjean, and Sander, 2013). In this section, the dominant memory is no longer the cognitive domain, but the affective domain. Therefore, effective questions and answer choices related to loved ones will encourage someone to tend to take care of themselves, for the sake of the pleasure of these people (Brosch, Scherer, Grandjean, and Sander, 2013). In this section, the dominant memory is no longer the cognitive domain, but the affective domain. According to Bloom (1956), when learning that involves cognitive, affective, and psychomotor dimensions as above is carried out consistently, the process of student experience (in this case is the worker) will lead to the habituation of life and habit of thinking (habits of mind). This is what Marzano & Pickering (1997) refers to as the stages of the development of behavior change as a result of learning. In the initial stages of learning, a person will enter the dimensions of attitude and perception (attitude and perception). In this phase, learning is limited to forming psychological attitudes and internal perceptions. That is, if workers view the work environment as an undisciplined and disorganized place, workers will not be motivated to obey company regulations (especially OSH protection procedures). Likewise, when workers look negatively on their duties or work, workers are more likely to underestimate the various regulations that should be obeyed. This first dimension emphasizes the necessity that the work environment must be conducive. In the dimension of acquiring and integrating knowledge, workers will recall old knowledge they already have to then be linked to new knowledge (obtained during treatment with safety video and Kahoot!). There are two types of knowledge integrated in this phase, namely declarative knowledge and procedural knowledge. Declarative knowledge includes facts, concepts, and principles. The procedural knowledge includes skills and processes (skills and processes). For workers in general, according to the perspective of andargogi Knowles (1978), they no longer deal with declarative knowledge, but rather on procedural knowledge. A person who is absorbing procedural knowledge must first be confronted with models (examples) of skills, and then be practiced independently. Therefore, the subject's behavior in this study will only change when safety videos are shown. While in the phase of developing knowledge (extending and refining knowledge), students will synthesize the new knowledge they already have. Generally, the synthesis carried out by workers is to make new alternatives to obey OHS procedures. The discovery of this new alternative is done through the process of comparing, classifying, and inductive thinking. The new alternative resulting from this synthesis will in turn be used in carrying out new activities. The use of new knowledge into new activities is what is referred to as use knowledge meaningfully. This phase is characterized by observance of self-protection and consistency in maintaining safety at work, even if it is not under the supervision of superiors or working alone. Workers who have reached this phase will be more skilled in solving problems, making decisions, and in conducting experiments. When the above phase enters the stage which experts call the perfect phase, the learning process with video safety can end. Because, that perfect phase is considered a habit of mind. Knowledge and skills at the level of habits of mind (as habits of thought), do not take long to manifest in safe work behavior. In fact, if the workers no longer work in companies, safe work behavior will still be carried out by these people as humans who have attained the habits of mind. When the above phase enters the stage which experts call the perfect phase, the learning process with video safety can end. Because, that perfect phase is considered a habit of mind. Knowledge and skills at the level of habits of mind (as habits of thought), do not take long to manifest in safe work behavior. In fact, if the workers no longer work in companies, safe work behavior will still be carried out by these people as humans who have attained the habits of mind.

4 CONCLUSION
The use of video safety media has a significant impact on providing OHS education to workers. Its effectiveness encompasses according to existing categories, such as age group, education level, and gender. Apart from the effectiveness of video media in increasing workers’ knowledge of OHS, Kahoot! which acts as an assessment instrument during the pre-test and post-test also shows a significant and solutive contribution. Psychologically, the forms of questions and choice of answers in the game have a positive effect on the behavior of workers’ compliance with the OHS protocol. The implication of this research is the disclosure that the game of Kahoot! is effectively used to measure and increase workers’ awareness by fulfilling the following three basic criteria: 1) need to be able to stimulate the player to apply knowledge in the real world; 2) develop to link memory, perception, and action; and 3) antagonist, witty, or affective.

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journal.

6 REFERENCES


