

## Analysis of Hazard Risk Understanding Using "Safety-Uno" Education Media for Batik Workers in Batik X and the General Public

Athiyah Qurrotu'ain Hasibuan<sup>1</sup>, Aura Sasi Mei<sup>1</sup>, Farhan Dani Amrullah<sup>1</sup>, Fitra Aulia Rahma<sup>1\*</sup>, Mohamad Hanif Rasyad<sup>1</sup>, Muhammad Shah<sup>2</sup>

<sup>1</sup>Department of Public Health Science, Faculty of Medicine, Universitas Negeri Semarang, Indonesia

<sup>2</sup>National University of Modern Languages, Islamabad, Pakistan

\*Correspondence to: [fitraauliarhm25@students.unnes.ac.id](mailto:fitraauliarhm25@students.unnes.ac.id)

**Abstract:** Batik is the art of drawing on cloth using *canting* with small ends and batik wax. The process of making batik can cause work accidents and occupational diseases that occur because of equipment failure and human errors that do work not according to procedures. However, in the informal batik industry, there still needs to be more knowledge and awareness related to potential hazards and controls that must be carried out. Therefore, it is necessary to conduct education to increase workers' understanding and create a safe and comfortable work environment. This research method is a quantitative study using the Wilcoxon Test to compare observations before and after treatment and determine the effectiveness of treatment. Based on the observations and analysis that have been carried out, it can be concluded that there is a significant relationship between the use of safety cards.

**Keywords:** uno card, educational media, safety work

## INTRODUCTION

On October 2, 2009, batik was designated as an Indonesian Cultural Heritage, i.e., intangible cultural heritage, by the United Nations Educational, Scientific and Cultural Organization (UNESCO). Batik comes from the Javanese language, namely '*amba*', which means write, and '*nitik*', which means point. Batik is the art of drawing on cloth using *canting* with small ends and batik wax (Iskandar & Kustiyah, 2016). In making batik, there are four stages, namely the *molani* process or drawing pattern, the *canting* process, the coloring process, and the *nglorot* process or the process of removing batik wax. Making batik can cause work accidents and occupational diseases because the equipment fails and human errors do not work according to procedures.

Unsafe action can pose a risk of chemical and ergonomic hazards (Situmorang et al., 2021). These chemical hazards can occur due to using materials such as batik wax, synthetic dyes such as *naphthol*, *indigosol*, *remasol*, waterglass, and soda ash, where these ingredients are irritants and allergens that can cause skin and respiratory irritation (Febriana et al., 2023). Ergonomic hazards can arise due to repetitive movements, wrong work positions, or sitting positions that are not ergonomic, which can cause complaints such as low back pain and carpal tunnel syndrome (Rina Mustika, 2019). With various potential hazards arising in the batik process, it is necessary to use appropriate personal protective equipment to prevent workers from occupational diseases and work accidents. However, in the informal batik industry, there is still a lack of knowledge and awareness related to potential hazards and controls that must be carried out. Therefore, training is necessary to increase workers' knowledge and create a safe and comfortable working environment.

The learning media used is games. The reason for using games is that they will naturally motivate and attract participants. It is also one of the most effective ways to increase understanding (Arum & Ismaya, 2021). In addition, according to Sadiman's research, games bring advantages because students can actively participate in learning in a fun and entertaining way, make the learning process more effective, and enhance students' ability to apply concepts in real situations. One of the most popular games is the UNO game. UNO game is a game that uses specially printed cards that are played by prioritizing the equation of numbers and colors listed on the card. In the UNO cards, there are action cards that have special rules. This UNO card game is excellent for relaxation and offers a multi-directional experience (Tutriani et al., 2023).

Based on the description above, the researchers developed the UNO card game as a learning medium related to potential hazards and proper control in the batik industry. This study was conducted to determine the

effectiveness of using UNO card games in increasing workers' and the general public's knowledge of the potential dangers in the batik industry and its control.

## METHODS

This research was conducted in one of the batik industries in Semarang and on several students of Universitas Negeri Semarang using development research methods. Development research involves creating and developing products that are tested for effectiveness. The resulting product is a modified UNO card game. The development model used is the ADDIE model, which consists of analysis, design, development, implementation, and evaluation. This model is suitable for use in learning media in the form of printed media and games. The stages of the ADDIE development model can be seen in the following table:

| Stages of development | Activities  |
|-----------------------|---|
| Analysis              | Analysing the problems found in the home batik industry and the appropriate solutions                                   |
| Design                | Determining the media to be used, making learning media designs, preparing materials and questions, drafting game rules |
| Development           | Developing media that is ready to be applied to the learning process  |
| Implementation        | Implementing the learning process using UNO card learning media to workers and the general public                       |
| Evaluation            | Assessing the effectiveness of learning media and the learning process before and after using media                     |

Data collection techniques use questionnaire methods in the form of pre-tests and post-tests. Learning outcomes are measured by comparing the results of pre-test scores and post-test scores. It can be concluded that the application of card media is successful if the results of the post-test value show a higher number.

## RESULT AND DISCUSSION

In this study, the learning media used was the "Safety Card" game, which, before implementation, first went through several stages, namely the analysis, design, development, and the last evaluation stage, which is further explained as follows.

The first stage is problem analysis, where we identify potential and risk hazards in the batik production process, including chemical, physical, and ergonomic hazards. Based on our analysis using the HIRADC method, it was found that the most significant source of danger is chemical hazards. Chemical hazards are the biggest and riskiest hazards because the batik industry is closely related to textile dyes. In this case, Batik X Industry uses natural dyes such as foliage as the primary dye. However, it does not free the X batik production process from risks and dangers. These risks and dangers come from the night, soda ash, waterglass, etc.

The second stage is design, where we start with preparing the material. The preparation of materials aims to provide workers with knowledge related to hazards in a simple and easy-to-understand manner. Next, we plan the design of learning media. We use Canva as editing software to create learning media designs because it is free from copyright and license infringement. The final step is to draw up the rules of the game. Making the rules of the game aims to provide rules to the players, making it easier for players to understand the steps of the game. To understand the players' level of understanding, we create practice questions on the appropriate topics. The topics we include in this learning media are diseases that can be caused in the batik-making process, the use of proper Personal Protective Equipment (PPE), and the types of chemicals and their dangers used in the batik-making process.



The third stage is development, which consists of making products, developing practice questions, and testing the validity of practice questions. In the process of making products, we use the services of third parties to print cards according to the agreed size. We used 260gr art cartoon material with the ends of our cards made slightly curved to avoid players getting hurt while playing the game. We also conduct the validity test stage on the questions made to state that the data we produce provides conclusions from the actual situation.

The next stage is implementation. The learning media is then tested in small and large group trials. This test is carried out to determine whether the learning media in the form of a "Safety Card" game is valid and effective in increasing one's knowledge about the potential dangers in the batik-making process and its control. A small group trial was conducted on nine batik workers, which was conducted on Saturday, May 25, 2024, and a large group trial was conducted on 32 Semarang State University students. Before and after conducting learning media trials, respondents were given practice questions in pre-tests and post-tests to determine their knowledge level.

The final stage is evaluation. This evaluation stage is carried out by evaluating the results obtained from the implementation results. The evaluation is related to the results of trials in small groups to determine the product's practicality and the product's effectiveness in learning about the risk of harm in the batik industry in large group trials.



Table 1. Analysis of Workers' Knowledge Level Before and After Intervention Using Learning Media

| Variable | Mean | N | SD     | P Value |
|----------|------|---|--------|---------|
| Pretest  | 58   | 9 | 4.667  | 0.016   |
| Posttest | 72   | 9 | 10.297 |         |

Table 2. Analysis of the Level of Knowledge of the General Public Before and After Intervention Using Learning Media

| Variable | Mean | N  | SD     | p Value |
|----------|------|----|--------|---------|
| Pretest  | 57   | 32 | 16.606 | 0.001   |
| Posttest | 90   | 32 | 14.485 |         |

The results of the pre-test and post-test show a significant relationship between the use of safety cards and the Wilcoxon test using SPSS. The Wilcoxon test is used to compare observations before and after treatment and determine the effectiveness of the treatment (Windi et al., 2022). In the test results, the value of Asymp.Sig is obtained. (2-tailed) in the small group is 0.016 and in the large group is 0.001. On the Wilcoxon test itself, if the value of Asymp.Sig. (2-tailed) is smaller than 0.05, then the "Ha is accepted," and it can be said that there are differences in respondents' knowledge before and after being given learning media.

These results are also reinforced by a study conducted by Defita and Rufaida (2022), showing that there is an increase in children's abilities after being given interventions using game media (UNO), initially the ability of children with good categories as much as 11 (34.4%) to 32 (100%). From the Wilcoxon test, the p-value results of  $0.000 < 0.05$  show that game media (UNO) influences children's ability to assess the risk and prevention of injury (Purwaningsih, 2022). Using UNO cards as a learning medium can be effective in helping the ability to think systematically (Concepts, 2024). Similarly, a study conducted by Ni Luh Putu Yuniarti Suntari and friends (2023) showed an increase in understanding of sexual security and safety after the previous paired card game intervention had a good understanding of 62.5%, an increase to 87.5% (Luh et al., 2023).

## CONCLUSION

Based on the results of observations and analysis that have been carried out, it can be concluded that there is a significant relationship between the use of safety cards, shown by the results of the Wilcoxon test using SPSS. In the test results, the value of Asymp.Sig. (2-tailed) in the small group is 0.016 and in the large group is 0.001. In the Wilcoxon test itself, if the value of Asymp.Sig. (2-tailed) smaller than 0.05, then "Ha is accepted," and it can be said that there are differences in respondents' knowledge before and after being given learning media.

## REFERENCES

- Arum, F., & Ismaya, E. A. (2021). Penggunaan Metode Permainan "Uno Matematika" Pada Materi Bilangan Pecahan. *Jurnal Pendidikan Dan Pembelajaran*, 4(2), 61–66.
- Concepts, P. (2024). *Desain Pembelajaran pada Teori Dasar Peluang Menggunakan Permainan UNO: Usaha Meningkatkan Pemahaman Konsep Peluang*. 287–297.
- Febriana, S. A., Ridora, Y., Indrastuti, N., Dewi, K., Erdina, Oginawati, K., Tanziha, I., Prakoeswa, C. R. S., Waskito, F., & Schuttelaar, M. L. (2023). Hazard identification and the prevalence of occupational skin disease in Indonesian Batik workers. *Scientific Reports*, 13(1), 1–12. <https://doi.org/10.1038/s41598-022-17890-w>
- Iskandar, & Kustiyah, E. (2016). *Batik Sebagai Identitas Kultural Bangsa Indonesia Di Era Globalisasi*. 2456–2472.
- Luh, N., Yuniarti, P., Ketut, I. G., Ngurah, G., Putu, N., & Parmitha, D. (2023). *Increasing the Knowledge of Personal Safety Skills of Elementary School Students with Paired Card Games*. 6, 9–15. <https://journal.ilinstitute.com/index.php/caradde/article/view/1845>
- Purwaningsih, D. D. (2022). *Pengaruh Media Permainan (UNO) Terhadap Kemampuan Anak Dalam Mengenal Risiko Dan Pencegahan Cedera Di SD Negeri 1 Pandean*. 000, 1–10. [http://eprints.ukh.ac.id/id/eprint/3510/1/NASPUB\\_DEFITA\\_PURWANINGSIH.pdf](http://eprints.ukh.ac.id/id/eprint/3510/1/NASPUB_DEFITA_PURWANINGSIH.pdf)
- Rina Mustika, M. E. A. (2019). Analisis Risiko Keselamatan Dan Kesehatan Kerja Dengan Metode Hazard Identification, Risk Assessment, And Risk Control (Hirarc) Pada Batik Tulis Sri Kuncoro Imogiri Barat Yogyakarta. *Universitas Ahmad Dahlan*, 1–10.

- Situmorang, H. N., Nursanni, B., & Ulgari, S. (2021). Pelatihan Penerapan Keselamatan Dan Kesehatan Kerja Kepada Siswa Sekolah Menengah Kejuruan. *Jurnal Pengabdian Kepada Masyarakat, 27(3)*, 204–208.
- Tutriani, N., Apriani, F., & Vebrian, R. (2023). Pengembangan Permainan Kartu Uno pada Pembelajaran Matematika Materi Bilangan Bulat Positif. *Journal on Education, 5(2)*, 5460–5472. <https://doi.org/10.31004/joe.v5i2.1297>
- Windi, W. A., Taufiq, M., & Muhammad, T. (2022). Implementasi Wilcoxon Signed Rank Test Untuk Mengukur Efektifitas Pemberian Video Tutorial Dan Ppt Untuk Mengukur Nilai Teori. *Produktif: Jurnal Ilmiah Pendidikan Teknologi Informasi, 5(1)*, 405–410. <https://doi.org/10.35568/produktif.v5i1.1004>