Birlesik Dünya Arastırma BD CENTER Innovasyon ve Yayıncılık Merkezi

World Journal on Educational Technology: Current Issues

Volume 14, Issue 2, (2022) 356-368

www.wj-et.eu

Interactive multimedia based on cultural diversity to improve the understanding of civic concepts and learning motivation

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Suggested Citation:

Sartono, E. K. E., Sekarwangi, T., & Herwin, H. (2022). Interactive multimedia based on cultural diversity to improve the understanding of civic concepts and learning motivation. *World Journal on Educational Technology: Current Issues*. *14*(2), 356-368. https://doi.org/10.18844/wjet.v14i2.6909

Received from December 13, 2021; revised from February 02, 2022; accepted from March 25, 2022.
Selection and peer review under responsibility of Prof. Dr. Servet Bayram, Yeditepe University, Turkey.

Abstract

This study aims to produce appropriate interactive multimedia for elementary school students and determine the effectiveness of interactive multimedia to improve understanding of civic concepts and learning motivation of elementary school students. This study applies the research and development steps of the Borg and Gall model. The subjects in this study were fourth-grade elementary school students. Data collection in the initial study was carried out through interviews, observations and questionnaires. Product validation was carried out by material experts and media experts, as well as teacher and student responses. Data analysis used independent samples t-test and paired samples t-test with prerequisite tests, namely normality and homogeneity tests, and continued with the MANOVA test with multivariate normality test prerequisites and covariance variance homogeneity test, with a significance level of 0.05. The results showed that interactive multimedia was feasible to use, based on the results of validation by material and media experts as well as the results of teacher and student response questionnaires. Interactive multimedia is effective in increasing the understanding of civic concepts and learning motivation of elementary school students.

Keywords: Interactive multimedia, motivation, understanding civic concepts.

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1. Introduction

Civics subject equips students to face the challenges of life by looking for concepts from the results of investigations in problems that exist in the community, both regionally and globally. Muleya (2017) explains that citizenship education is a collection of appropriate knowledge and must be taken by every citizen to socialise in society. Civics, which contains the values of Pancasila as a paradigm used in the life of the nation and state (Kristanto, 2019), is the spearhead in creating democratic citizens, which means that every citizen understands their rights and obligations to become intelligent, skilled citizens and have the character/personality of Pancasila (Erliasari, 2016).

The era that has shifted to the digital era certainly has its own impact on teachers in teaching civic learning concepts. Information that is so fast and technological sophistication are currently shifting the old teaching methods of teachers in schools. Currently, students' views on civics subject are that it is still a boring subject, plus the teacher's method of delivering civic learning uses the lecture method. The variety of methods and learning media that teachers use to teach civics subject is still limited; and students tend to learn civics by memorising only and so the material being studied cannot be conceptualised properly. This also triggers a decrease in students' motivation to learn civic concepts.

The emergence of problems regarding the stigma of civics subject as a boring subject makes it not much in demand by students with low motivation among students to learn civic concepts. In addition, students also find it difficult to understand the concept of civics (Wuryandani & Herwin, 2021). Furthermore, with the emergence of the Indonesian government's policy in March 2020, school closures were replaced with online-based learning because of the emergence of the coronavirus pandemic (Herwin et al., 2020; Pujiastuti et al., 2021; Saptono et al., 2021; Astuti et al., 2022; Herwin et al., 2022). Students are not ready for online-based learning activities and do not focus on carrying out learning activities carried out at home; students are more interested in playing. Students' learning activities have become irregular; there is even a case where student assignments are completed by other people. In addition, the availability of facilities for conducting online learning, as well as the limited mastery of technology among teachers, makes online-based learning less effective. Learning activities carried out at home also have an impact on students' learning motivation. When learning online, students feel that they are not doing learning like in class (Dong et al., 2020). Therefore, adults (parents) need to accompany students, directing students to concentrate throughout online learning activities. In addition, the absence of peers during learning activities also makes students' motivation to learn in learning decrease compared to previous activities. Therefore, the lack of a conducive learning atmosphere causes students to become bored and always wanting to play and cannot learn well.

During this distance learning activity, the teacher becomes overwhelmed (Ambarwati et al., 2022). On average, teachers give assignments to students. Civics learning materials are taken from the available textbooks, namely student books and student worksheets. However, the material contained in the student's book is felt by the teacher to be less extensive. Likewise, with the worksheets used by students, sometimes the learning materials are not in accordance with the indicators in the student books. This was done by the teacher because the teacher did not have time to provide learning material through videos. This method is considered by the teacher as an effective way to do it during this pandemic situation. In the interview, the teacher explained that during distance learning they had not used learning media that were in accordance with the current situation. Teachers also do not know

much about learning media that can be used during online learning. On average, teachers use social media in the form of WhatsApp groups for collective task collection.

In distance learning activities, sometimes teachers share learning videos downloaded from YouTube. This is considered practical and easy, and even then, not all learning materials are fully available on YouTube. The use of learning media in accordance with distance learning has not been widely used in schools. Teachers also realise that learning during this pandemic is not optimal. The material conveyed is not able to be understood by students; especially, civics material is felt by the teacher to need an interactive media to help students understand the existing material.

The results of interviews with students showed that students were bored with learning at home; students were not able to understand the material in the textbook or the assignments given by the teacher. Students also feel that they do not understand studying with their parents. Therefore, learning media is needed that is able to increase motivation and understanding of civics learning concepts during a pandemic situation and is fun for students and can be accessed by students through smartphone devices. Learning media that is suitable for the current situation is interactive multimedia. Interactive multimedia is a medium that is able to present text, images, videos and animations simultaneously in one application (Deliyannis, 2012; Ussher et al., 2014). The use of interactive multimedia in learning activities can increase students' interest in learning (Dousay, 2016), create a positive atmosphere in learning activities (Chipangura & Aldridge, 2017) and improve students' cognitive outcomes (Ramdani, 2016).

Needs analysis given to 94 fourth-grade elementary school students shows that in students' responses to the need for learning media, out of 93 students, 44% strongly agreed and 49% agreed that they need learning media for learning activities in the classroom. Student responses to the general characteristics of learning media needed showed that, out of 93 students, 53% strongly agreed and 43% agreed that they like learning media that can combine videos, images, animations, texts and practice questions. Student responses to the characteristics of images in the required learning media showed that, out of 93 students, 43% strongly agreed and 48% agreed that they prefer to learn while looking at pictures that support the subject matter. Student responses to the characteristics of colour in the required learning media showed that, from 93 students, 50% strongly agreed and 43% agreed that they like learning media that have attractive colours.

Based on the results of this needs questionnaire, it can be concluded that students need interesting media and support the subject matter. The learning media needed according to the desired characteristics of students is interactive multimedia. Interactive multimedia is made in accordance with learning and with the 2013 curriculum by emphasising on understanding civic concepts and learning motivation.

2. Methods

2.1. Research model

The approach used in this research is the research and development approach. This study aims to produce interactive multimedia products and determine their effectiveness. The development model used to produce the product in this research is the Borg and Gall model.

2.2. Participants

The subjects of this study were elementary school students and teachers who were determined by choosing class IV as the participants. The selection of class IV as the participants was due to the

multimedia content being developed which consisted of class IV material. Participants in this study were obtained from 5 elementary schools with a total of 107 students. The selection of many students as participants was done randomly. In addition, this research also involves experts as participants to assess the quality of the products that have been developed. The number of experts used was two from the field of educational technology and civic education.

2.3. Data collection tools

The data collection instruments used in this study were media and material validation questionnaires by experts, teacher and student response questionnaires to the media, learning motivation questionnaires and civic concept understanding tests. The test referred to in this instrument is a learning outcome test that contains civics material.

2.4. Data collection process

The process of collecting research data was carried out first by submitting the initial design product to the expert. At this stage, the expert assesses the quality of interactive multimedia in terms of the feasibility and content of the material loaded. After getting the results of the assessment from the experts and revising the improvements, the next data collected is student learning motivation which is measured through questionnaires and student learning outcomes are measured through learning outcomes tests. This data is used for the purpose of testing the effectiveness of the product.

2.5. Data analysis

The data analysis technique used in this research is quantitative analysis. The data obtained in this study were then analysed using independent samples *t*-test, paired samples *t*-test and MANOVA test. The data obtained from the results of expert assessments were analysed descriptively. The rejection criterion for H_0 is when the significance value is less than 0.05 (Saputri & Herwin, 2020; Cindy et al., 2022).

3. Findings and Discussion

3.1. Findings

This research produces interactive multimedia. Multimedia is composed of several media elements. These elements include images, text, video and audio. The media elements are collected from books and the Internet. Each media element is stored according to its type. After the media elements are collected, the next stage is the preparation of the initial product. The initial product preparation was carried out using the help of the Adobe Flash application. The results of this initial product development are in the form of files with .exe format and android applications. Files with .exe format can be opened using a computer/laptop, while android applications can be installed on android devices. Preparation of the initial interactive multimedia product begins with creating an interactive multimedia start page.

Figure 1. Interactive multimedia start page

Figure 1 shows an example of a developed product start page. After the start page is complete, the next step is to create a page that contains the main menu. The main menu consists of instructions for using media, core competencies (KI) and basic competencies (KD), learning materials, media developer profiles and background music icons. Instructions for use of media contain guidelines for using media. KI and KD contain a brief description of KI and KD to be achieved. The learning material contains the subject to be studied. The media developer profile contains a brief description of the media developer profile. In this main menu, there is also a text that explains the subject matter and the target class of media users guided by the narrator. The display of the interactive multimedia main menu is shown in Figure 2.

Figure 2. Interactive multimedia main menu display

Figure 2 shows the main product page. The interactive multimedia produced from this research consists of four learning materials. To be able to go to this learning, students can select the button for learning materials to display the learning materials presented. If one of the materials is clicked, students will be presented with icons that will explain the material. For example, if students click on one of the

maps of Indonesia, the cultural diversity in that area will appear. The interactive multimedia in this study was designed with practice questions to train students' understanding of civic concepts. Practice questions are contained in the quiz sub-menu contained in the interactive multimedia. After the multimedia has been developed, the next step is for it to be validated by experts. The results of the validation by experts are presented in Table 1.

Table 1. Product validation results by media experts

No	Aspect	Scores	Average Score	Classification
1	Appearance	11	3.7	Very feasible
2	Text	18	3.6	Very feasible
3	Videos	13	3.3	Very feasible
4	Animation	6	3.0	Feasible
5	Audio	10	3.3	Very feasible
6	Games	11	3.7	Very feasible
7	Programming	22	3.7	Very feasible
8	Navigation	8	4.0	Very feasible
9	Use	4	4.0	Very feasible
10	Packaging	6	3.0	Feasible
	Total Score	109	3.5	Very feasible

The experts' assessment presented in Table 1 basically shows that it is generally positive that it is appropriate to use based on the experts' assessment. The interactive multimedia that has been produced shows an average result of 3.5. These results are classified as very feasible so that from the initial product development they are ready to be tested. Another thing that is assessed in the initial product is product validation carried out by content experts for the material presented in the developed multimedia. The Table 2 presents the results of the assessment.

Table 2. Material expert product validation results

No	Aspect	Scores	Average score	Classification
1	Quality of learning materials	38	3.5	Very feasible
2	Learning design quality	40	3.6	Very feasible
3	Display quality	14	3.5	Very feasible
	Total Score	92	3.5	Very feasible

The results presented in Table 2 show that the material aspect obtained a validation score of 38, with an average validation score of 3.5. So based on this score, the material aspect in interactive multimedia has a very feasible classification. Then, in the design aspect, a validation score of 40 was obtained with an average validation score of 3.5. So based on this score, the learning aspect in interactive multimedia has a very feasible classification for use. Then, the aspect of display quality obtained a score of 14, with an average score of 3.5. So based on this score, the display quality aspect is very feasible. The results of this validation indicate that interactive multimedia that has been produced from the initial product development is ready to be tested.

After the product is validated by the expert, the media is revised according to the advice of the expert. Then, the media is tested in the initial field trial, which is the main field trial. This trial was conducted with the aim of knowing the practicality of using drill and practice-based interactive multimedia based on the results of teacher and student responses. Tables 3 and 4 show the results of teacher and students' responses to the media, respectively.

Table 3. Teacher's response to the product in the field trial

No	Uji Coba	Average total score	Classification
1	First	3.0	Feasible
2	Second	3.4	Very feasible

Table 4. Student responses to products in field trials

No	Uji Coba	Average total score	Classification
1	First	3.2	Very feasible
2	Second	3.6	Very feasible

Tables 3 and 4 are the results of measuring teacher and students' responses to the media. The data in the tables were obtained through initial field trials and main field trials. The media was revised according to input from teachers and students. Based on the results of the response questionnaire, it can be concluded that the interactive multimedia generated from this study is suitable for use according to the responses of teachers and students. The next stage is an operational field test to determine the effectiveness of interactive multimedia on increasing the understanding of civic concepts and student motivation. The results of the effectiveness tests that have been carried out in this study used independent samples t-test, paired samples *t*-test and MANOVA test.

Tabel 5. The results of the Independent Samples *t*-test on understanding the concept of Civics

No	Data	Group	Value of Sig.	Decision
1	Pre-test	Experiment and control	0.182	H_0 Accepted
2	Post-test	Experiment and control	0.000	H_0 Rejected

Based on Table 5, the significant value of the independent samples t-test on the pre-test data is 0.182. The result of this test indicates that the significance value is 0.505 > 0.05, with the decision that H_0 is accepted. Thus, it can be concluded that there is no difference between understanding the concept of early civics in the experimental group and the control group. Then, the results of the independent samples *t*-test on the post-test data obtained a significance value of 0.000, with the decision that H_0 is rejected. So, it can be concluded that there are differences in understanding the concept of civics in the experimental group and the control group.

Tabel 6. Independent samples t-test results for students' learning motivation

No	Data	Group	Value of sig.	Decision
1	Pre-test	Experiment and control	0.655	H_0 Accepted
2	Post-test	Experiment and control	0.000	H_0 Rejected

Based on Table 6, the results of the independent samples *t*-test of learning motivation can be obtained. In the pre-test data obtained, the significance value is 0.655, with the decision that H_0 is accepted. These results indicate that there is no difference in the initial motivation of students in the experimental group and the control group. Then, the post-test data obtained a significance value of 0.000, with the decision that H_0 is rejected. These results indicate that there are differences in the post-test of students' learning motivation between the experimental group and the control group.

Tabel 7. Paired samples *t*-test results

No	Data	Value of sig.	Decision
1	Pre-test - post-test understanding of Civics concept	0.000	H_0 Rejected
2	Pre-test - post-test student learning motivation	0.000	H_0 Rejected

Based on the data from the paired samples t-test (Table 7), the significance value of the pre-test–post-test understanding of the civic concept was 0.00 < 0.05. The results of this hypothesis test indicate that there are differences in understanding the concept of civics before and after using interactive multimedia. Then, the learning motivation data also obtained a significance value of 0.000 < 0.05. Based on the results of this hypothesis test, it can be concluded that there are differences in student learning motivation before and after using interactive multimedia.

Tabel 8. Manova test results

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	0.995	5090.329[b]	2.000	51.000	0.000
	Wilks' Lambda	0.005	5090.329[b]	2.000	51.000	0.000
	Hotelling's Trace	199.621	5090.329[b]	2.000	51.000	0.000
	Roy's Largest Root	199,621	5090.329[b]	2.000	51.000	0.000
Class	Pillai's Trace	0.474	23.018[b]	2.000	51.000	0.000
	Wilks' Lambda	0.526	23.018[b]	2.000	51.000	0.000
	Hotelling's Trace	0.903	23.018[b]	2.000	51.000	0.000
	Roy's Largest Root	0.903	23.018[b]	2.000	51.000	0.000

Based on Table 8, it can be seen that Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root have a significance value of 0.000 < 0.05. The results of the MANOVA hypothesis test indicate that H0 is rejected. So, it can be concluded that there are differences in understanding the concept of civics and simultaneous learning motivation between students who use interactive multimedia and students who do not use interactive multimedia. Thus, interactive multimedia can increase the understanding of civic concepts and student learning motivation simultaneously.

3.2. Discussion

Learning is one of the most important aspects of education. Learning is said to be successful when students can achieve learning objectives well (Tjabolo & Herwin, 2020). Learning activities will be meaningful if students in learning obtain adequate learning facilities. One of the learning facilities is learning media. The use of learning media can support effective learning (Johnson et al., 2015). The use of appropriate learning media can increase understanding and trigger students' motivation to achieve learning goals (Ikhsan et al., 2019).

The use of media in learning activities is something that must be considered, especially for elementary school students. In cognitive development, elementary school students are in the concrete operational stage, namely at the age of 7–11 years. At this stage, students learn from real life. Ghazi et al. (2016) state that, children at the concrete operational stage can solve various problems that are relevant to concrete actions or things. Based on this, learning activities should be more related to everyday experiences. The goal is that students can more easily understand the subject matter. For this, it can be done using learning media.

The effectiveness of learning media needs to be adjusted to the problems and needs that exist in the field. Therefore, the activity of analysing the need for learning media needs to be carried out first so that the learning media is right on target. Thus, the suitability of the media developed with the problems and learning needs of students will attract more students' attention when studying. This is very important because the role of the media is needed for both teachers and students in learning activities (Senen et al., 2021). The media developed from this research is in the form of interactive multimedia.

Multimedia development is based on the needs and problems that occur. Analysis of the needs and problems occur is the initial stage to develop learning media (Rahmat & Arnawa, 2019). The results of the needs analysis show that students need interactive multimedia.

The development of interactive multimedia is carried out through several stages of development and testing. This is done to get quality interactive multimedia so that it is suitable for use in learning activities. In the early stages of development, materials or media elements are collected, such as images, videos, audio and text and animated images. Then, this multimedia was developed using the Adobe Flash application. After the initial product has been developed, it is validated by media experts and materials experts. Media validation needs to be carried out with the aim of knowing the feasibility and suggestions for improvement (Shabri et al., 2017). Likewise, material expert validation is needed to determine the suitability of the learning objectives and characteristics of elementary school students.

The research conducted Novitasari (2016) showed that the use of interactive multimedia was effective in improving students' understanding of concepts in the experimental class. Furthermore, the use of technology in learning activities can make it easier for students to learn abstract learning materials (Jacobsen et al., 2009). In addition, the integration of technology in learning can facilitate the task of teachers in managing learning (Herwin et al., 2021). Interactive multimedia can display learning materials by combining image, sound, video and animation formats in one platform so that students do not feel bored in learning activities, be it at home or at school. This is in accordance with the cognitive theory of multimedia learning that the use of multimedia has the potential to produce deep learning and understanding, rather than presentations that are presented in one format (Mayer, 2009).

The results of this study are in line with the research by Firmansyah (2018) with the findings that the use of multimedia can increase learning motivation. The use of ICT can motivate student learning (Das, 2019). The development of interactive multimedia applied in learning will make learning more interesting (Pujawan, 2018). The use of multimedia makes learning activities more interesting and fun (Lauc et al., 2020). Multimedia refers to the computer intermediary software or interactive applications that integrate text, colour, graphic images, animations, audio sounds and full motion video in one application (Gilakjani, 2012). Interactive multimedia, in this study, was developed by providing subject matter supported by pictures, animations and learning videos that will make learning activities more attractive to students to learn. The presence of attention in learning activities shows that students are motivated to learn (Park, 2015).

Learning carried out with multimedia can increase motivation and learning achievement (Tsai et al., 2017). One of the functions of the media is being able to increase attention and learning outcomes. The interactive multimedia, in this study, was developed by combining various media elements that will make learning activities more interesting and encourage students to understand the learning material. In relation to learning motivation, it plays an important role in learning activities. Motivation is an important element in learning activities and motivation plays an important role in learning success (Filgona et al., 2020). Motivation plays an important role in improving learning performance (Bakar, 2014). To improve the quality of learning can be done by increasing student motivation in learning. The use of multimedia or digital learning resources helps students process the information obtained (Abdulrahaman et al., 2020). Interactive multimedia makes learning activities more meaningful.

4. Conclusion

The interactive multimedia produced from this research is suitable to be used to improve the ability to understand civic concepts and students' learning motivation based on the results of assessments by

material and media experts. The results of the analysis of the practicality of using the product indicate that interactive multimedia is feasible to use to improve the understanding of civic concepts and student motivation in accordance with the responses of teachers and students. Based on the results of hypothesis testing that has been carried out on research data, it shows that interactive multimedia is effectively used to improve critical reading skills and students' learning motivation significantly. The findings of this study recommend the application of interactive multimedia products in learning activities to improve the understanding of civic concepts and students' learning motivation. This interactive multimedia product is very suitable and is recommended to be applied to all types of learning, in both distance learning and conventional face-to-face learning.

Acknowledgements

The authors would like to express their deepest gratitude to Universitas Negeri Yogyakarta, Indonesia, for supporting this research and publication.

References

Abdulrahaman, M. D., Faruk, N., Oloyede, A. A., Surajudeen-Bakinde, N. T., Olawoyin, L. A., Mejabi, O. V., Imam-Fulani, Y. O., Fahm, A. O., & Azeez, A. L. (2020). Multimedia tools in the teaching and learning processes: A systematic review. *Heliyon*, *6*(11), e05312. https://doi.org/10.1016/j.heliyon.2020.e05312

Ambarwati, D., Herwin, H., & Dahalan, S. C. (2022). How elementary school teachers assess students' psychomotor during distance learning? *Jurnal Prima Edukasia*, *10*(1), 58–65. https://doi.org/10.21831/jpe.v10i1.45040

Astuti, B., Purwanta, E., Ayriza, Y., Bhakti, C. P., Lestari, R., & Herwin, H. (2022). School connectedness instrument's testing with the Rasch model for high school students during the COVID-19 pandemic. *Cypriot Journal of Educational Sciences, 17*(2), 410–421. https://doi.org/10.18844/cjes.v17i2.6828

Bakar, R. (2014). The effect of learning motivation on student's productive competencies in vocational high school, West Sumatra. *International Journal of Asian Social Science*, *4*(6), 722–732. https://archive.aessweb.com/index.php/5007/article/view/2672

Chipangura, A., & Aldridge, J. (2017). Impact of multimedia on students' perceptions of the learning environment in mathematics classrooms. *Learning Environments Research*, *20*(1), 121–138. https://doi.org/10.1007/s10984-016-9224-7

Cindy, A. H., Sugiyono, S., Usman, H., & Herwin, H. (2022). Factors that affect the optimisation of vocational high school facilities and infrastructure. *Cypriot Journal of Educational Sciences, 17*(2), 586–600. https://doi.org/10.18844/cjes.v17i2.6847

Das, K. (2019). Role of ICT for better mathematics teaching. *Shanlax International Journal of Education*, *7*(4), 19–28. https://doi.org/10.34293/education.v7i4.641

Deliyannis, I. (2012). *Interactive multimedia*. InTech. https://libgen.is/book/index.php?md5=6C04A7847EE336947B78D02D12542926

Dong, C., Cao, S., & Li, H. (2020). Young children's online learning during Covid-19 pandemic: Chinese parents' beliefs and attitudes. *Children and Youth Services Review*, *118*, 105440. https://doi.org/10.1016/j.childyouth.2020.105440

Dousay, T. A. (2016). Effects of redundancy and modality on the situational interest of adult learners in multimedia learning. *Educational Technology Research and Development*, *64*(6), 1251–1271. https://doi.org/10.1007/s11423-016-9456-3

Erliasari, S. (2016). Peningkatan pemahaman konsep Pendidikan Kewarganegaraan menggunakan model pembelajaran Wordsquare pada siswa Kelas III SD Negeri Tanjungharjo Nanggulan Kulonprogo [Improved understanding of the concept of citizenship education using the wordsquare learning]. *Trihayu*, *2*(3), 402–

405. https://doi.org/10.30738/trihayu.v2i3.755

Filgona, J., Sakiyo, J., Gwany, D. M., & Okoronka, A. U. (2020). Motivation in Learning. *Asian Journal of Education and Social Studies*, 16–37. https://doi.org/10.9734/ajess/2020/v10i430273

Firmansyah, A. (2018). *The use of multimedialearning to improve motivation of the students at primary school teacher education study program in learning social science* (pp. 456–462). Proceedings of the First Indonesian Communication Forum of Teacher Training and Education Faculty Leaders International Conference on Education 2017 (ICE 2017). https://doi.org/10.2991/ice-17.2018.97

Ghazi, S. R., Ullah, K., & Jan, F. A. (2016). Concrete operational stage of Piaget's cognitive development theory: An implication in learning mathematics. *Gomal University Journal of Research*, *32*(1), 9–20. http://www.gomal.pk/GUJR/JUNE_ 2016_ PDF/2_ Karim_ Concrete Operational Stage of Piagets Cognitive Development Theory.pdf

Gilakjani, A. P. (2012). The significant role of multimedia in motivating EFL learners' interest in English language learning. *International Journal of Modern Education and Computer Science*, *4*(4), 57–66. https://doi.org/10.5815/ijmecs.2012.04.08

Herwin, H., Fathurrohman, F., Wuryandani, W., Dahalan, S. C., Suparlan, S., Firmansyah, F., & Kurniawati, K. (2022). Evaluation of structural and measurement models of student satisfaction in online learning. *International Journal of Evaluation and Research in Education, 11*(1), 152-160. https://doi.org/10.11591/ijere.v11i1.22115

Herwin, H., Hastomo, A., Saptono, B., Ardiansyah, A. R., & Wibowo, S. E. (2021). How elementary school teachers organized online learning during the Covid-19 Pandemic? *World Journal on Educational Technology: Current Issues*, *13*(3), 437–449. https://doi.org/10.18844/wjet.v13i3.5952

Herwin, H., Jabar, C. S. A., Senen, A., & Wuryandani, W. (2020). The evaluation of learning services during the Covid-19 Pandemic. *Universal Journal of Educational Research*, *8*(11B), 5926–5933. https://doi.org/10.13189/ujer.2020.082227

Ikhsan, J., Akhyar, M., & Nais, M. K. (2019). The effects of science-on-web learning media on junior high school students' learning independency levels and learning outcomes. *Journal of Turkish Science Education*, *16*(2), 231–239. https://www.tused.org/index.php/tused/article/view/185

Jacobsen, D. A., Eggen, P., & Kauchak, D. (2009). *Methods for teaching*. Pearson Education. http://library.lol/main/AFE07765169ABA7C16FAB346DF836F11

Johnson, A. M., Ozogul, G., & Reisslein, M. (2015). Supporting multimedia learning with visual signalling and animated pedagogical agent: Moderating effects of prior knowledge. *Journal of Computer Assisted Learning*, *31*(2), 97–115. https://doi.org/10.1111/jcal.12078

Kristanto, K. (2019). Meningkatkan pemahaman konsep PKn pada materi keputusan bersama dengan strategi pembelajaran debat aktif [Improve understanding of Civics concepts in decision materials together with active debate learning strategies]. *Prosiding Seminar Nasional Pendidikan FKIP UNTIRTA*, *2*(1), 350–356. https://jurnal.untirta.ac.id/index.php/psnp/article/view/5631/4036

Lauc, T., Jagodic, G. K., & Bistrovic, J. (2020). Effects of multimedia instructional message on motivation and academic performance of elementary school students in Croatia. *International Journal of Instruction*, *13*(4), 491–508. https://doi.org/10.29333/iji.2020.13431a

Mayer, R. E. (2009). *Multimedia learning*. Cambridge University Press. http://library.lol/main/DFA084ECC828BDA261A6ECC1014CBC58

Muleya, G. (2017). The conceptual challenges in the conceptualisation of civic education. *Journal of Lexicography and Terminology*, *1*(1), 59–81. https://alumni.unza.zm/index.php/jlt/article/view/71

Novitasari, D. (2016). Pengaruh penggunaan multimedia interaktif terhadap kemampuan pemahaman konsep

Matematis siswa [The effect of using interactive multimedia on students' ability to understand mathematical concepts]. *FIBONACCI: Jurnal Pendidikan Matematika Dan Matematika*, *2*(2), 8–18. https://doi.org/10.24853/fbc.2.2.8-18

Park, S. (2015). The effects of social cue principles on cognitive load, situational interest, motivation, and achievement in pedagogical agent multimedia learning. *Journal of Educational Technology & Society*, *18*(4), 211–229. https://www.jstor.org/stable/jeductechsoci.18.4.211

Pujawan, K. A. H. (2018). The development of interactive multimedia with drill and practice model on multimedia ii (two dimention animation) course in Politeknik Ganesha Guru. *Journal of Education Research and Evaluation*, *2*(1), 22–27. https://doi.org/10.23887/jere.v2i1.13142

Pujiastuti, P., Herwin, H., & Firdaus, F. M. (2021). Thematic learning during the pandemic: CIPP evaluation study. *Cypriot Journal of Educational Sciences*, *16*(6), 2970–3980. https://doi.org/10.18844/cjes.v16i6.6481

Rahmat, H., & Arnawa, I. M. (2019). Development of learning media based on interactive multimedia in mathematics learning for Class VIII junior high school in Indonesia. *International Journal of Scientific and Technology Research*, *8*(12), 2592–2594. https://www.ijstr.org/final-print/dec2019/Development-Of-Learning-Media-Based-On-Interactive-Multimedia-In-Mathematics-Learning-For-Class-Viii-Junior-High-School-In-Indonesia.pdf

Ramdani, D. (2016). Pengaruh multimedia pembelajaran interaktif (MPI) terhadap hasil belajar kognitif peserta didik [Effect of interactive learning multimedia on students' cognitive learning outcomes]. *Bioedusiana*, *4*(2), 89–97. https://doi.org/10.34289/277888

Saptono, B., Herwin, H., & Firmansyah, F. (2021). Web-based evaluation for teacher professional program: Design and development studies. *World Journal on Educational Technology: Current Issues*, *13*(4), 672–683. https://doi.org/10.18844/wjet.v13i4.6253

Saputri, D. I., & Herwin, H. (2020). The effect of the spirit of nationalism and cinta tanah air on the self independence of elementary school students. *JMIE (Journal of Madrasah Ibtidaiyah Education)*, *4*(1), 114. https://doi.org/10.32934/jmie.v4i1.162

Senen, A., Sari, Y. P., Herwin, H., Rasimin, R., & Dahalan, S. C. (2021). The use of photo comics media: Changing reading interest and learning outcomes in elementary social studies subjects. *Cypriot Journal of Educational Sciences*, *16*(5), 2300–2312. https://doi.org/10.18844/cjes.v16i5.6337

Shabri, M., Hajar, I., & Setiawan, D. (2017). Learning media assessment by media expert validator on social science learning based on learning model of examples non examples to improve critical thinking ability on v grade students at primary school 1 Jangka District, Bireuen Regency, Indonesia. *International Journal of Education, Learning and Development*, *5*(8), 18–29. https://www.eajournals.org/journals/international-journal-of-education-learning-and-development-ijeld/vol-5-issue-8-september-2017/learning-media-assessment-media-expert-validator-social-science-learning-based-learning-model-examples-non-examples-improve-

Tjabolo, S. A., & Herwin, H. (2020). The influence of teacher certification on the performance of elementary school teachers in Gorontalo Province, Indonesia. *International Journal of Instruction*, *13*(4), 347–360. https://doi.org/10.29333/iji.2020.13422a

Tsai, C.-H., Cheng, C.-H., Yeh, D.-Y., & Lin, S.-Y. (2017). Can learning motivation predict learning achievement? A case study of a mobile game-based English learning approach. *Education and Information Technologies*, *22*(5), 2159–2173. https://doi.org/10.1007/s10639-016-9542-5

Ussher, J., Damoah, D., Ansong, E. D., Quarshie, H., Adjetey, C., & Poakwah, G. (2014). The effectiveness of interactive multimedia courseware as instructional medium for teaching. *British Journal of Education*, *2*(5). https://www.eajournals.org/wp-content/uploads/The-Effectiveness-of-Interactive-Multimedia-Courseware-as-Instructional-Medium-for-Teaching.pdf

Sartono, E. K. E., Sekarwangi, T., & Herwin, H. (2022). Interactive multimedia based on cultural diversity to improve the understanding of civic concepts and learning motivation. *World Journal on Educational Technology: Current Issues*. *14*(2), 356-368. https://doi.org/10.18844/wjet.v14i2.6909

Wuryandani, W., & Herwin, H. (2021). The effect of the think-pair-share model on learning outcomes of civics in elementary school students. *Cypriot Journal of Educational Sciences*, *16*(2), 627–640. https://doi.org/10.18844/cjes.v16i2.5640