Creating interactive animation media training as a digital literacy for junior high school teachers

Pelatihan pembuatan media animasi interaktif sebagai sarana literasi digital bagi guru SMP

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ABSTRACT

The COVID-19 pandemic carried an impact on the world of education. As a policy, an online learning system is carried out, where digital literacy has an important role. Digital literacy skills for a teacher is being able to present interesting learning media. Learning media which is the best alternative is interactive multimedia, which can increase students' learning motivation. Teaching and learning activities in SMP Aswaja are dominated by conventional method. It is still dominated by lectures and has not used varied learning media, especially the use of digital learning media. To improve the teachers' understanding and skills in this regard, workshops and training activities for Aswaja Junior High School teachers were carried out which were attended by 27 teachers. The training activities were divided into pre-test, digital literacy and digital learning media materials, training for making digital learning media, and post-test. The average value of the pre-test is 73.33, while the average value of the post-test is 86.3. Paired Sample T-Test analysis showed that there was a significant difference between the pre-test and post-test. Thus the training activities were able to improve understanding and skills in making digital learning media for teachers of SMP Aswaja Kunir Wonodadi.

1. INTRODUCTION

During pandemic COVID-19, teaching and learning activities must be forced to be transferred to online activities. Therefore, digital literacy has a very important role. Digital literacy is a term that refers to knowledge and skills in using digital media, communication devices, and networks to find, create, and evaluate information, and use it wisely, intelligently, carefully, precisely, healthily, and obey the law in order to establish interactions in life daily (Yuliawati et al, 2020). Learning media is something that must exist in the learning process in the classroom, both online and offline. The development of information and communication technology in the world of education is quite rapid, which is marked by

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the presence of applications or platforms that are able to package digital-based learning media, into an attractive and communicative display. Which is able to increase students' concentration on the material. So that it is expected to make students more active. In addition, digital learning media can be a solution when teaching and learning activities must switch into online. However, if we look closely, the COVID-19 pandemic does not always have a bad impact because it slowly encourages all activities that are in synergy with the 4.0 education era (Sari et al, 2021).

In BSNP (2006) it is stated that one of the principles of implementing the curriculum is through a multi-strategy and multimedia approach, as well as adequate learning media and technology. Based on this, multimedia has an important role in learning (Widayat et al., 2014). Multimedia is a media that combines images, sound, animation and writing. In various studies, it is stated that multimedia can increase students' learning motivation. Especially multimedia that can create interaction with its users, which is called interactive multimedia. Interactive multimedia can be used as a learning media that plays a role in increasing student understanding and has a positive effect on improving student learning outcomes. Thus it can be said that interactive multimedia-based learning media is the best alternative in creating a pleasant learning atmosphere and can increase students' concentration on the material.

Aswaja Junior High School (SMP) is one of the private junior high schools in the western part of Blitar district, precisely on Jl. Raya Pesantren Kunir Village, Wonodadi District, Blitar Regency. The majority of teaching and learning activities use the lecture method, without the support of interesting and interactive learning media for students. So that the interaction between teachers and students tends to run in the same direction, without any feedback from students. Digital literacy activities are still very minimal when delivering material in class, especially the use of interactive digital media. Digital media is still limited only in the form of power point which is most often used. The learning process in the classroom tends to use learning methods that have not developed optimal use of digital learning media in achieving learning objectives. Whereas the media has a fairly important role, namely as a means of communication so that material messages can be conveyed. According to Widjayanti et al. (2018) and Wahyuni (2019), students like the learning process by using interactive learning media applications because they are able to present an interactive learning process in the classroom, where students can interact directly with the application and explore the entire material presented in this application.

Digital literacy is still quite minimal. Especially the provision of digital-based learning media in the form of "eye-catching" animations, which can become a magnet of interest to want to concentrate on being involved in learning. Especially the interactive animation media. Digital literacy learning needs to be applied because it is a practical solution to build digital literacy competencies for teachers and students, in order to form human resources who have character in advancing education in Indonesia (Asari et al, 2019). The majority of Aswaja Middle School teachers have limited skills in making digital learning media, especially learning media in the form of interactive animation. When delivering material in class, the average teacher already has or prepared learning media. However, for digital learning media packaged in the form of interactive animation, it is not yet available. From various studies, it is stated that interactive animation media is able to present material more attractively. Indirectly, this application is able to increase student interest in learning, and make learning more meaningful. As stated by Panjaitan et al (2021) that interactive multimedia can be used as a learning media that plays a role in increasing student understanding and has a positive effect on improving student learning outcomes.

Offline teaching and learning activities in SMP Aswaja still encounter have many obstacles, they can be seen from the student's low interest in learning. The process of teaching and learning activities

is monotonous and conventional, which is dominated by lectures, making students reluctant to pay attention to the material given by the teacher. It is not uncommon to find some students sleepy or asleep during the teaching and learning process. Several problems, especially in the field of learning methods, have been mutually agreed upon by the two partners. The solutions that have been offered include the provision of interactive animation media that is able to present interesting learning materials and motivate students to be involved in it, as well as being able to increase student learning focus (Lukma et al, 2018). In order to be able to design an attractive learning media, the next solution is to improve the skills of the teachers at SMP Aswaja so that they are able to develop a good learning media that makes learning activities in the classroom take place in two directions (Figure 1). Both from teacher to student, and vice versa, from student to teacher, through interactive animation media. This skill improvement activity is provided through training. So it is hoped that through efforts to improve skills in making an interactive animated learning media this can improve students' understanding of the material, which in the future will also improve student learning outcomes. Interactive animation media is a means of digital literacy, which can be applied both in online and offline learning. Indirectly, it provides a kind of demand for teachers to improve skills and creativity in terms of presenting material. Seeing such conditions, the training activities for making interactive animation learning media are deemed necessary to be carried out. This is in line with what was conveyed by Setiawati (2016) that using multimedia-based learning media, especially the use of animation media, can increase student learning motivation and improve the quality of the teaching and learning process in daily activities.

Figure 1. The Process of teaching and learning activities in class

According to Fanani et al (2021) that digital literacy training activities provide positive feedback for teachers, becoming one of the basics for carrying out this activity. Through this activity, it is hoped that Aswaja Middle School teachers' understanding of the importance of learning media that can increase students' interest in learning is growing, as well as preparation for the rapid development of information and communication technology. In addition, through this training activity, the skills of Aswaja Junior High School teachers in preparing digital-based learning media can develop better. Through interesting learning media, it can increase student learning focus. So that in the future it can improve students' understanding and grades. Training that is oriented towards increasing digital literacy needs to be carried out, as a practical solution to build digital literacy competencies for teachers and students, in order to form human resources with character in advancing education in Indonesia (Asari et al., 2019). This is in line with the demands for competence from the development of Indonesian education in today's digital era.

2. METHODS

The training activity for making interactive animation learning media was carried out at Aswaja Junior High School, Kunir Village, Wonodadi District, Blitar Regency. The participants of this activity were all Aswaja Junior High School teachers from various disciplines, with a total of 27 participants. This activity was held for 2 days, namely July 2, 2022 and July 5, 2022, located in the multipurpose room of SMP Aswaja. The activity was carried out in accordance with the COVID-19 health protocols. The training activities were carried out in 5 stages, namely: (1) Pre-test; (2) Material on the importance of digital literacy; (3) Material for digital learning media; (4) Training on making interactive animation learning media; (5) Post-test. The first activity is a pre-test, which aims to determine the extent of participants' understanding and skills regarding digital literacy and digital learning media before getting the material. The preparation of questions is done by formulating a grid of questions using a Likert scale, as did Febliza & Okatariani (2020). Indicators and items of pre-test-posts questionnaire are presented in Table 1.

Table 1. Indicators and items of pre-test-posts questionnaire

Indicator	Question Items	Items/Questions
Using the internet to get information	1, 3, 8, 12	I prioritize the use of the internet in obtaining information sources I get a lot of reference sources from the internet The development of the industrial revolution 4.0 focuses on the application of ICT in learning Digital skills are a demand for teachers in the face of the industrial revolution 4.0
ICT in learning	2, 4, 5, 6, 16, 21	Good learning media are learning media that involve visual, audio, and kinesthetic Technology has a very important role in learning Every teacher should master technology in learning Digital-based learning media is more attractive to students Learning media applications provided by the government can be easily accessed by teachers for free Powtoon, Toontastic, flash player, etc. are examples of applications for creating interactive learning media
Barriers to the use of ICT in learning	7, 9, 11, 19	I never use WI-Fi internet access at school, because there is no access/access is very slow. I always use digital learning media when learning The learning media that I have used so far is only Power Point I am very interested in participating in training on improving skills in the field of learning technology
Support in the application of ICT in schools	10, 13, 15, 17	Wi-Fi internet network must be owned by every school I always use the school internet network when preparing learning materials When at school in my spare time, I often surf (browse) looking for the latest information about learning technology I often discuss with fellow teachers how to create PAIKEM learning by utilizing technology

Teacher skills in making ICT-based learning media	14, 18, 20, 22, 23, 24	Teachers must be able to make good learning media Teachers should have skills in compiling digital learning media Teacher skills in utilizing technology in learning, have a major influence in improving student understanding I have never made a learning media that utilizes certain applications In my opinion, animated learning media that are displayed interactively are better able to increase students' focus on the material Digital literacy is one of the main skills of teachers in entering the era of the industrial revolution 4.0
Total Questions	**24**	

The second stage was the delivery of material that was packaged in the form of activities in the form of workshops. The workshop material was divided into two. The first material was the importance of digital literacy. At this stage, the speakers provided material about the importance of digital literacy for the world of education in the era of the industrial revolution 4.0. The next material was about learning media in the digital era, including the platforms used in making digital-based learning media. Workshop materials were presented in the form of powerpoints and also in the form of material kits that made it easier for participants to learn.

After getting material about digital literacy and digital learning media, and then participants took part in the 4th stage of the activity which was training on making interactive animation learning media. The training activities were divided into 3 stages. The first was the delivery of introductory material, followed by displaying ready-made interactive animated learning media as a reference in training activities. The next stage was the practice of making and compiling interactive animation learning media by utilizing the Powtoon platform in its preparation. The stages of manufacture had been presented in the module that guided the participants in this activity. The last stage of the training stage was the assignment where participants were required to collect the results of the work according to the assigned task. Participants were asked to create a simple interactive animation learning media using the Powtoon platform. Participants were given the freedom to develop learning media in an attractive and interactive way, adapted to the subjects taught by each teacher.

After the training phase was completed, participants were asked to fill out a post-test, with the same determination scale as the determination scale at the time of the pre-test. Post-test was used as a benchmark to determine the extent to which the level of understanding and skills of participants after receiving digital literacy materials and digital learning media.

In the implementation of the community service program in the form of this training, there were three criterias that will be the basic benchmarks for the achievement of the training activities. The first benchmark, in terms of the success of the implementation of activities, is to carry out activities according to the time, number of meetings and predetermined achievement targeted, so that there was a need for good cooperation between implementers and participants. The second benchmark, in terms of the success of the participants, was that participants' understanding of digital literacy materials and digital learning media increases, and was able to practice them in making a simple interactive animation learning media. The third success benchmark, viewed from the implementer's perspective, was being able to provide an explanation of the importance of understanding digital literacy, as well

as providing mentoring assistance for participants who had difficulty creating interactive animation learning media. In addition, the success of the implementing team can also be measured by good service in communicating during the implementation of activities, as well as the suitability of the number of implementing teams present with the specified number of meetings.

3.   RESULTS AND DISCUSSION

Activity Preparation

Preparation for training activities was begun with surveying the location of the activity. The location of the activity was SMP Aswaja, Wonodadi District, Blitar Regency. The location survey was carried out in order to find out firsthand the condition of the location and potential participants. From the survey activities, it was expected to be able to provide a description of the condition of partners, as well as coordinate with partners to prepared everything needed, so that the implementation of service activities can run well. The process of surveying the location of the activity began with requesting permission from the school. After obtaining permission, the service team conveyed their intentions and discussed with the school the activity plan and schedule of activities. After a mutual agreement was made, the service team took care of administrative matters related to the planned implementation of service activities.

After the site survey, the service team prepared the equipment and supplies needed for the implementation of training activities for making interactive animation learning media. Furthermore, the team will check the room that will be used and ensure that it is representative enough to be used as a place of activity, in terms of feasibility and capacity, as well as provisions in accordance with the COVID-19 health protocol. After it was deemed sufficient, the service team prepared the necessary equipment and supplies such as tables, chairs, LCD projectors, screens, sound systems, as well as needs in relation to the COVID-19 health protocol, such as the provision of masks, hand sanitizers, and thermo guns for checking. body temperature.

Opening

The training activity for making interactive animation learning media for SMP teachers at SMP Aswaja Wonodadi was carried out according to a mutually agreed date. The activity began with a series of direct training openings by the Principal of SMP Aswaja (Figure 2). In his remarks, the Principal expressed his pleasure and gratitude for the presence of the service team who had initiated training activities for making learning media for teachers at SMP Aswaja Wonodadi. He hoped that through these kinds of activities, teachers can provide great benefits and impact for improvements in classroom learning activities, as well as improving skills in managing learning in the classroom, especially in terms of learning media. At the opening ceremony, the service team also introduced themselves, both from the lecturers and students, and conveyed the goals and expectations of the implementation of training activities for making interactive animation learning media for Aswaja Middle School teachers, namely to increase understanding of the importance of digital literacy in the world of education, and able to improve the skills of making digital-based literacy media.

Pre-Test

Before the training was carried out, it was necessary to measure the teacher's initial understanding of digital literacy and measure initial knowledge about the application of digital-based learning media. The pre-test was conducted as an effort to determine the understanding and initial skills of digital literacy and digital learning media, between before and after receiving the material (Figure 2).

The score categorization of the pre-test results was divided into 3 categories according to the maximum score benchmark, which is 120 (Table 2). This maximum score was based on the number of questions that must be filled out (24 items), multiplied by the maximum answer choice score (score 5). So for the category the scores were low category (score 0-40), medium category (score 41-80), and high category (score 81-120). The results of the analysis of filling out the pre-test questions by 27 training participants showed that the average score (empirical mean) was in the good category, namely 73.33 from a maximum score of 120. From this it can be concluded that the understanding of digital literacy materials and learning media for Aswaja Middle School teachers is within good category.

Figure 2. Activities opening ceremony and pre-test

Table 2. Description of pre-test results

N	Pre-Test	
	Mean	**SD**
27	73,33	6,504

The Importance of Digital Literacy Material

The activity of delivering material on the importance of digital literacy was begun with an explanation of the development of the industrial revolution, starting from the industrial revolution 1.0 to what was happening now, namely the era of the industrial revolution 4.0. The rapid development of information and communication technology was a marker of this era. And it was undeniable that the massive development of information and communication technology had touched various lines of life, including the field of education. In this era of disruption, education was required to be able to equip both teachers and students with critical thinking skills can solve problems, act and think creatively and innovatively, as well as skills in terms of communication and collaboration. Other skills were the skills to search, manage, and convey information and were proficient in using technology and information.

It was also stated that entering this era of the industrial revolution, teachers must prepare students to enter an era full of uncertainty, change, and full of technology. So that competence was needed, especially in terms of information, media, and technology. as a provision in industrial competition. Even UNESCO released the UNESCO ICT Competency Framework for Teachers, in which there are 3 main keys, namely technological literacy, deepening knowledge, and creating knowledge. If a student had technological literacy skills, for example looking for good learning resources from the internet, then they will gradually be able to deepen their knowledge. So that indirectly, students were also able to create knowledge based on the information that had been collected.

After the presentation about the current era and its challenges in the world of education, it was also presented about digital literacy, starting from the definition, application, components, to the benefits of digital literacy, among others, being able to increase independence, increase insight, critical attitude, improve verbal skills, and increase focus.

Digital Learning Media Material

After getting material about the importance of digital literacy for the world of education, the next material presented to participants is applications that can be applied in the world of education, in supporting digital literacy, especially in terms of compiling and making learning media (Figure 3). A teacher should have the skills and abilities in managing the class so that the class becomes "alive". One of the important elements in the process of teaching and learning activities in the classroom was the presence of learning media that will help students understand the material. The concept of interesting learning media certainly had its own place for students. Their focus and concentration will be more easily directed. And in the end, the mastery of the material will be more optimal.

Moreover, there are various platforms or applications that teachers can use in designing a digital-based learning media. Each of course with advantages and disadvantages. Which one is chosen, can be adjusted to the needs and level of mastery of the teacher. There is a complicated platform, because the preparation of learning media must involve a programming language. Like the Adobe Flash application. There is a Kinemaster that can be used to edit videos. Microsoft Power Point is also available which can be used as a presentation medium. There are also applications that are very easy to use. An example can be taken, such as the Powtoon application for example. This is one of the reasons Powtoon was chosen as the application used in this training activity. Easy to manufacture and provides an attractive appearance in the form of animation equipped with audio media.

Figure 3. Material presentation

Training on Making Interactive Animation Learning Media

After getting complete materials ranging from digital literacy to applications that can be used to compose and create a learning media, the activities enter the training (Figure 4). Before the training activity began, examples of digital learning media that are ready to be used in the classroom are presented, as a reference for participants when they practice making similar learning media. The examples of learning media shown use 2 different applications, namely Adobe Flash and Powtoon, as a comparison, so that participants know the advantages and disadvantages of each application.

Furthermore, the participants did a practical exercise in making interactive animation learning media using the Powtoon application. Each participant got a module that contains guidelines for making interactive animation learning media. Participants were asked to make according to the directions in

the module. The last session, the participants carried out the practice of making and compiling learning media according to the subjects of each teacher participant. Participants were given the freedom to develop the learning media as much as possible. And at the end of the event, the practical assignments must be collected.

Figure 4. Practice time: Creating learning media

Figure 5. Participants' practice results

Post-Test

The learning media creation training activity ended with a post-test. Participants were asked to fill out the questionnaire that had been distributed. Filling in this scale aims to determine understanding and skills of digital literacy and digital learning media after receiving the scale used is the same as the scale used during the pre-test, and is divided into 3 categories based on the maximum score, which is 120. The maximum score is based on the number of question items that must be answered. (24 items), then multiplied by the maximum score per answer choice (score 5). So that the categories are divided into low category (score 0-40), medium category (score 41-80), and high category (score 81-120). The average result of the post-test measurement score is in the high category, which is 86.30, from the maximum score of 120. Thus, it can be said that the understanding and skills of learning media and digital literacy are in the very good category.

Table 3. Description of post-test results

N	Post-Test	
	Mean	**SD**
27	86,30	5,817

Closing

After the entire series of training activities was complete, participants were asked to fill out a participant satisfaction sheet with the activity process. The participant's response was as a reference for the service team whether the participants can get optimal benefits from the entire activity process, as well as evaluation material for the next activity. After the participants filled out the satisfaction sheet, the last activity was a closing ceremony, which was attended by all participants and the service team. On this occasion, the head of the service team expressed his gratitude to the principal and all participants who had been willing to attend the service activities from beginning to end. Then the closing ceremony ended with the reading of a prayer led by one of the participants.

Based on the evaluation of the satisfaction sheet filled out by the participants, it was found that the enthusiasm of the participants was very high, and they admitted that they were very happy with the material and training provided. Through this activity, the participants felt that their understanding of the importance of digital literacy today is growing. And participants are also able to apply it in learning through the creation of interactive animated learning media.

Figure 6. Closing and reading of prayers

Output and Outcome

This training activity basically invited Aswaja Middle School teachers to be aware of the increasingly massive development of information and communication technology, if they didn't not want to be disrupted. Through increasing understanding and self-debriefing through soft skills, about digital literacy, it will be applied in learning that leaded to increasing student focus and motivation. So that it can have implications for increasing students' understanding of the material and achieving learning objectives.

Activity Effectiveness Analysis

Based on the results of descriptive statistical analysis of the results of the pre-test and post-test (Table 4), the average value of the pre-test was 73.33. While the average value of the post-test is 86.3. After doing the correlation test of the pre-test and post-test values   to determine whether there was a relationship between the two, the correlation test results are 0.822 (sig. 0.000). This value indicated that there was a relationship between the pre-test and post-test scores.

Table 4. Results of analysis of Paired Sample T-Test

N	Pre-Test		Post-Test		Correlation	Sig. (2-tailed)
	Mean	**SD**	**Mean**	**SD**		
27	73,33	6,504	86,30	5,817	0,822	0,000

The Table 4 is the result of the analysis using the Paired Sample T-Test, to find out the significant difference between the pre-test and post-test scores. From the table, it is known the value of Sig. (2 tailed) of 0.000 < 0.05. That is, there is a significant difference between the results of the pre-test, which is when before participants get digital literacy materials and digital learning media compared to the post-test, which is when participants have received digital literacy materials and digital learning media. So it can be concluded that there is a significant effect of training in making learning media as an effort to improve digital literacy for Aswaja Junior High School teachers, Kunir Village, Wonodadi District. These results are in accordance with what Subawa et al (2021) stated that training and mentoring activities for making learning media with Powtoon are able to make a positive contribution to junior high school teachers because they are able to open up teachers' insight about learning in the era of the industrial revolution 4.0.

The development of teacher professionalism needed to be continuously improved, including through training activities like this. This was in line with what was conveyed by Rosmallah et al (2021) that professional abilities in the field of technology which are characterized by skills in developing, managing, and integrating various supporting media can be done by providing training related to digital literacy to develop the professional ability of teachers in carrying out their duties. The world of education which was full of dynamics is a challenge for teachers as educators to compensate by increasing competence. The main competencies that must be possessed by a teacher are pedagogic competence, professional competence, social competence, personality competence, and the last was competence in mastering digital literacy (Kholid, 2021). Digital literacy, including mastery of learning media which of course is also digital-based. According to Mardhika & Normawati (2017) learning media as a tool for distributing messages and learning information. A well-designed learning media will greatly assist students in digesting and understanding the subject matter.

Training activities for making digital learning media were also a form of developing teacher skills in this digital era in developing an innovative learning strategy. As stated by Wigita et al. (2019) that the development of teacher skills had a positive impact on learning so that it can provide better learning outcomes. So that the development of similar learning media must continue to be innovated in order to provide more optimal benefits. This is also in line with what was conveyed by Hartono et al (2018) that refers to the role of multimedia-based learning media, every teacher and those related to learning development problems should try to improve and develop learning by utilizing multimedia-based learning media in an effort to increase learning effectiveness. Teachers gain new skills in making animation-based learning media, so they can be implemented during the learning process which can make it easier for teachers to teach, so as to improve the quality of learning in the classroom (Feladi et al, 2017). Nasrullah et al (2021) stated that training through an approach through the application of digital literacy for learning English with various digital applications was very effective and able to improve the teaching skills of teachers.

4. CONCLUSION AND RECOMMENDATIONS

The conclusions from community serviced activities at partner institutions include the first, training activities for making interactive animation learning media can be carried out properly according to the schedule and stages of the activity plan. Second, Aswaja Junior High School teachers as participants in the activity got additional insight and information about the importance of digital literacy in today's digital era. Knowledge and skills increased and developed after participating in digital literacy training activities and making digital learning media, namely being able to develop skills in making interactive animation-based learning media by utilizing digital applications. Third, the participants were enthusiastic

and satisfied with the implementation of the training activities, and hoped that similar activities could be held again in the future.

Knowledge and skills in making learning media, especially in this day and age, are indispensable for a teacher. Especially the creation of digital-based learning media. So similar activities need to be carried out so that teachers have the opportunity to always "upgrade" their knowledge. Activities are also carried out for a longer duration so that the material can be well received by participants and training activities can provide more optimal results.

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REFERENCES

Asari, A., Kurniawan, T., Ansor, S., & Putra, A. B. N. R. (2019). Kompetensi literasi digital bagi guru dan pelajar di lingkungan sekolah Kabupaten Malang. *BIBLIOTIKA: Jurnal Kajian Perpustakaan Dan Informasi*, *3*(2), 98-104.98–104.

BSNP. (2006). *Kurikulum Tingkat Satuan Pendidikan (KTSP)*. Jakarta: Departemen Pendidikan Nasional.

Fanani, M. I., Yuliantari, M., Cahyono, M. A. D., Al Kori, U., & Safii, M. (2021). Pelatihan literasi digital pembelajaran jarak jauh untuk seluruh guru SD Negeri Sumbersekar Dau Malang. *BIDIK: Jurnal Pengabdian Kepada Masyarakat*, *2*(1), 20–30. https://doi.org/10.31849/bidik.v2i1.8089

Febliza, A., & Okatariani, O. (2020). Pengembangan instrumen literasi digital sekolah, siswa dan guru. *Jurnal Pendidikan Kimia Universitas Riau*, *5*(1), 1-10. https://doi.org/10.33578/jpk-unri.v5i1.7776

Feladi, V., Arpan, M., & Verawardina, U. (2017). Pelatihan pembuatan media pembelajaran berbasis animasi di SMP Negeri 2 Siantan Kabupaten Mempawah. *GERVASI: Jurnal Pengabdian kepada Masyarakat*, *1*(1), 32-42. https://doi.org/10.31571/gervasi.v1i1.597

Hartono, H., Permana, R., & Matsun, M. (2018). Pelatihan dan pendampingan pembuatan media pembelajaran berbasis multimedia interaktif untuk guru SMP Negeri 1 Sungai Kakap. *Al Khidmah, 1*(2), 61-66. http://dx.doi.org/10.29406/al-khidmah.v1i2.1216

Kholid, K. (2020). Pentingnya literasi digital bagi guru pada lembaga pendidikan tingkat dasar dan implikasinya terhadap penyelenggaraan kegiatan belajar mengajar. *Horizon Pedagogia, 1*(1), 22-27.

Lukma, H. N. (2018). Rancang bangun media animasi Pictorial Riddle sebagai media pembelajaran fisika bangunan mahasiswa Teknik Sipil. *Jurnal Qua Teknika, 8*(2), 53-61. https://doi.org/10.35457/quateknika.v8i2.500

Mardhika, M. M., & Normawati, D. (2017). Pelatihan pembuatan media pembelajaran berbasis TIK (Animasi Flash) di SMP Muhammadiyah se-kota Wonosari Kab. Gunungkidul. *Jurnal Pemberdayaan: Publikasi Hasil Pengabdian Kepada Masyarakat*, *1*(2), 473-480. https://doi.org/10.12928/jp.v1i2.331

Nasrullah, N., Mu'in, F., & Mariani, N. (2021). Pelatihan peningkatan kemampuan literasi digital untuk guru-guru Bahasa Inggris Sekolah Menengah Pertama (SMP) di Kabupaten Kotabaru. *Bubungan Tinggi: Jurnal Pengabdian Masyarakat, 3*(3), 183-189.

Panjaitan, R. G. P., Titin, T., & Putri, N. N. (2020). Multimedia interaktif berbasis game edukasi sebagai media pembelajaran materi sistem pernapasan di Kelas XI SMA. *Jurnal Pendidikan Sains Indonesia*, *8*(1), 141–151. https://doi.org/10.24815/jpsi.v8i1.16062

Sari, A. R. P., Sidauruk, S., Meiliawati, R., & Anggraeni, M. E. (2021). Development of digital literacy assessment scale to measure student's digital literacy. *Jurnal Ilmiah Kanderang Tingang, 12*(02), 137-143. https://doi.org/10.37304/jikt.v12i02.128

Setiawati, L. (2016). Penerapan media animasi sebagai inovasi dalam pembelajaran di Sekolah Dasar Ciledug 2 Kecamatan Ngamprah Kabupaten Bandung Barat. *Jurnal Penelitian Pendidikan*, *16*(1). https://doi.org/10.17509/jpp.v16i1.2487

Subawa, I. G. B., Agustini, K., & Mertayasa, I. N. E. (2020). Pelatihan dan pendampingan pembuatan media pembelajaran menggunakan Powtoon untuk guru-guru SMP Negeri 4 Singaraja. *Proceeding Senadimas Undiksha,* 381-387.

Yuliawati, S., Suganda, D., & Darmayanti, N. (2021). Penyuluhan literasi digital bagi guru-guru SMP di Kota Sukabumi. *Kumawula: Jurnal Pengabdian Kepada Masyarakat, 3*(3), 477. https://doi.org/10.24198/kumawula.v3i3.29604

Wahyuni, R. (2019). Aplikasi media pembelajaran sistem gerak manusia pada pelajaran IPA Terpadu di SMP Pondok Pesantren Babusalam. *Jurnal Ilmu Komputer*, *7*(2), 79–91. https://doi.org/10.33060/jik/2018/vol7.iss2.87

Widayat, W., Kasmui, & Sukaesih, S. (2014). Pengembangan multimedia interaktif sebagai media pembelajaran IPA Terpadu pada tema sistem gerak pada manusia. *Unnes Science Education Journal*, *3*(2), 535–541.

Widjayanti, W. R., Masfingatin, T., & Setyansah, R. K. (2018). Media pembelajaran interaktif berbasis animasi pada materi statistika untuk siswa kelas 7 SMP. *Jurnal Pendidikan Matematika, 13*(1), 101-112. https://doi.org/10.22342/jpm.13.1.6294.101-112