Influence of K2DAV and K3DAV Animation Media on Learning Motivation Reviewing from the Academic Ability of Students

Wulan Tricahyani[1], Slamet Santosa[2]

[1,2] *Faculty of Teacher Training and Education, Universitas Sebelas Maret, Indonesia*
wulantricahyani@student.uns.ac.id, slametsantosa@staff.uns.ac.id

Abstract

The purpose of this study was to determine the effect of K2DAV and K3DAV animation media on learning motivation in terms of the academic abilities of students in class X MIPA SMA N 1 Sukoharjo. The focus of the biological material studied is the component material, interactions, and energy flow in the ecosystem. This research is a quasi-experimental study with a post-test-only non-equivalent group design. The population consists of 7 classes, and the sample is taken by simple random sampling of as many as three classes. Class X MIPA 1 is an experimental class with K2DAV media. Class X MIPA 3 as experimental class 2 with K3DAV media. Class X MIPA 6 as a control class. Data collection is done through documentation, questionnaires, and observations. The research instrument was a student learning motivation questionnaire and an observation sheet on implementing discovery learning syntax. The data analysis technique was carried out by testing prerequisites and testing hypotheses. The prerequisite test was carried out for normality, homogeneity, regression, and linearity. In contrast, the hypothesis test used the Anacova test. The study results explain that discovery learning combined with K2DAV and K3DAV media affects learning motivation in terms of academic ability, and academic ability affects learning motivation.

I. Introduction

Education is one of the most crucial things regarding human resources. Quality human resources can be formed from a well-executed learning process. One of the learning processes is supported by existing learning facilities in schools (Alannasir, 2016). The facilities provided must meet usage standards and be adapted to current technological advances. Education is a very important human need because education has a duty to prepare Human Resources (HR) for the development of the nation and state (Pradana et al, 2020). According to Astuti et al (2019) Education is an obligation of every human being that must be pursued to hold responsibilities and try to produce progress in knowledge and experience for the lives of every individual. Education is one of the efforts to improve the ability of human intelligence, thus he is able to improve the quality of his life (Saleh and Mujahiddin, 2020). Education is expected to be able to answer all the challenges of the times and be able to foster national generations, so that people become reliable and of high quality, with strong characteristics, clear identities and able to deal with current and future problems (Azhar, 2018). Education and skills are the main keys in gaining social status in community life (Lubis et al, 2019).

Technological progress will continue to advance along with advances in science. People who live in an era with all-digital activities will experience technological lag if they

26445

do not follow the flow of technological developments. Technology has both negative and positive sides that can have a significant impact on everyday life. The world of education is a real example that can be observed directly. The internet has had a positive impact on the implementation of the learning process in Indonesia (Sudiarta & Sadra, 2016).

The learning process is a system consisting of several interconnected and mutually influencing sub-systems (Hadi, 2017). The sub-systems include students, teachers, learning media, learning methods, learning objectives, learning resources, infrastructure, and the environment. Incomplete sub-systems make the learning process non-optimal. Examples that can be taken, for example, in learning media. A teacher who cannot choose, provide, or present effective media in the learning process causes the information conveyed through these media to be challenging to receive well by students. Students who have difficulty in receiving the information will have an impact on student learning outcomes. Learning media can also affect students' enthusiasm, learning motivation and learning outcomes (Halidi & Saehana, 2015). Learning media in the form of videos that are considered effective in supporting learning encourages authors to find out the effect of discovery learning models combined with video media made with the Kinemaster application on students' learning motivation. The media is named K2DAV, namely Kinemaster 2 Dimension Animated Video and K3DAV, Kinemaster 3 Dimension Animated Video. The two learning videos are made independently and are intended to make learning activities easier. The learning videos used are in 2-dimensional and 3-dimensional forms. The comparison of the two learning media will show the level of student's learning motivation in terms of the academic abilities of each student. Learning videos have benefits, one of which can increase the interest and interest of students in studying independently (Puryono, 2020). The success of the learning process is also influenced by the learning model used (Purnama, 2008).

One of the learning models that are often used by teachers because it is considered to be able to actively involve students, including the discovery learning model (Fitri & Derlina, 2015). model Discovery learning is a learning model that emphasizes the activeness of students in terms of structural understanding or a series of essential ideas in a discipline. The application of discovery learning encourages teachers to act as mentors and provides opportunities for students to play an active role in learning activities. Activeness is considered to increase students' learning motivation. Discovery learning has several stages in its implementation, which consist of orientation, hypothesis generation, hypothesis testing, conclusion and regulation (Veermans, 2003).

This study was conducted to determine how the influence of K2DAV and K3DAV media on learning motivation in terms of students' academic abilities. By knowing the effect, researchers can find out which learning model is better for teaching students. With learning methods that are easy to understand, it is hoped that students' motivation can increase.

II. Research Method

The research was conducted at SMA N 1 Sukoharjo. The research population is class X SMA N 1 Sukoharjo. In contrast, the research sample is class X MIPA 1, X MIPA 3, and X MIPA 6. Class X MIPA 6 is a control class, while class X MIPA 1 and 3 are practical classes 1 and 3, respectively. 2.

The research to be carried out is quasi-experimental. A quasi-experiment is a form of quasi-experimental research because it is not possible to control external variables that can affect the experimental results. The research design was a post-test-only non-equivalent

control group design because this study only used tests after being treated and seeing the consequences. This study used two experimental classes and one control class. Experimental class 1 is a class that is treated with discovery learning combined with K2DAV media. Experimental class 2 is a class treated with discovery learning combined with K3DAV media. The control class is a class that is taught with learning videos taken directly from the internet. Each experimental class will be given a post-test to determine whether an effect affects students' learning motivation.

The data obtained were then processed using SPSS 24 to determine the effect on each research variable.

III. Result and Discussion

The results of testing the hypothesis of the effect of discovery learning combined with K2DAV media on learning motivation in terms of students' academic abilities with the Ananova test can be seen in Table 1.1.

Table 1. Results of Testing the Effect of Discovery Learning Combined with K2DAV Media on Learning Motivation on Learning

Motivation	Data	Sig.	Terms	Note.
	The *discovery learning* combined with K2DAV	0.000	Sig media. <0.05	$H0_{on}$ is rejected. There is an effect

Results of the ANCOVA test listed in table 1 shows that the value of sig. of $0.000 < 0.050$, so H0 is rejected. The test results show an influence between the *discovery learning* and K2DAV media on learning motivation regarding students' academic abilities.

The results of hypothesis testing using ANOVA reflect a significant influence between the discovery learning model and K2DAV media on learning motivation. The data from the analysis showed a difference in the average value of learning motivation between the control class and the experimental class 1 or the class taught using K2DAV media. The control class has an average motivation value of 81, while the experimental class 1 has an average motivation value of 84. The calculation results show that the average motivation value of the class that was treated with *discovery learning* combined with K2DAV media is higher than the control class. . The difference in the calculation results is due to the combination of *discovery learning* with K2DAV media can increase interest in learning, enthusiasm, and provide a sense of fun in the learning process. The results of calculations in the control class illustrate that using discovery learning without K2DAV media has not been effective in increasing students' learning motivation. The results of the comparison of the average motivational value of the control class and the experimental class can be seen in Figure 1.

Figure 1. *Histogram of Average Student Motivation Values in Discovery Learning and Discovery Learning Classes Combined with K2DAV Media*

Figure 1 explained that the average value of learning motivation in the *discovery learning* combined with K2DAV media was higher when compared to the control class, which was only given the *discovery learning* without K2DAV. The *discovery learning* combined with K2DAV media has an average value of 84 motivation. In contrast, the discovery learning class without K2DAV has a value of 81. The value of both classes is included in the category of high learning motivation values. The value of high learning motivation illustrates that students have the impetus to score an achievement (Hendrayana et al., 2014). The average value of class motivation with K2DAV media is higher, meaning that K2DAV media can be used to increase students' learning motivation.

Discovery learning is a learning model that emphasizes students' activeness regarding structural understanding or a series of essential ideas in a scientific discipline. The application of *discovery learning* encourages teachers to act as mentors and provides opportunities for students to play an active role in learning activities (Iswati & Dwikoranto, 2015). The learning model with *discovery learning* provides opportunities for students to be directly involved in learning activities so that they have the potential to increase students' learning motivation (Putri et al., 2017).

Research data explains that the application of *discovery learning* combined with K2DAV media is better in terms of increasing learning motivation when compared to discovery learning without K2DAV media. The application of K2DAV media in learning is expected to increase students' interest in learning and understanding material so that learning motivation can increase. K2DAV is a 2D animated video created using the Kinemaster application.

K2DAV media is shown to students in 2 stages. The first video is shown at the core stage of *discovery, learning* the *orientation*. The K2DAV media shown in the *orientation* aims to provoke students to build concepts, identify problems, and connect the knowledge they already have with the information provided (Veermans, 2003). Another purpose of providing K2DAV media in the orientation section is to increase focus, stimulate, and increase the level of interest of students in learning (Rahmawati et al., 2017). The second video is shown the core stage of *discovery and learning* the *regulation*. The K2DAV media shown in the *regulation* intended to confirm the results of discussions and conclusions made during learning. The second K2DAV video contains comprehensive coverage of the learning material that day so that students can receive it in its entirety.

Table 2. Results of Testing the Effect of Discovery Learning Combined with K3DAV Media on Learning Motivation in terms of Academic Ability

Learning Motivation	Data	Sig.	Terms	Note.
	The *discovery learning* is combined with K3DAV	0.000	Sig media. < 0.05	H_0 is rejected; there is an effect

Results of the ANCOVA test listed in table 1.2. shows that the value of sig. of 0.000 < 0.050, so H0 is rejected. The test results show an influence between the *discovery learning* combined with K3DAV media on learning motivation in terms of students' academic abilities.

The results of hypothesis testing using anokova reflect a significant influence between *discovery learning* and K3DAV media on learning motivation. The data from the analysis showed a difference in the average value of learning motivation between the control class and the experimental class 2 or the class that was taught using K3DAV media. The control class has an average motivation value of 81, while the experimental

class 2 has an average motivation value of 87. The calculation results show that the average motivation value of the class treated with *discovery learning* combined with K3DAV media is higher than the control class. . The difference in the calculation results is due to the combination of *discovery learning* with K3DAV media can increase interest in learning, enthusiasm, and provide a sense of fun in the learning process. The results of calculations in the control class illustrate that using *discovery learning* without K3DAV media has not been effective in increasing students' learning motivation. The results of the comparison of the average motivational values of the control class and experimental class 2 can be seen in Figure 2.

Figure 2. Histogram of Average Student Motivation Values in Discovery Learning and Discovery Learning Classes Combined with K3DAV Media

Figure 2. explained that the average value of learning motivation in the *discovery learning* combined with K3DAV media was higher when compared to the control class, which was only given the *discovery learning* without K3DAV. The *discovery learning* combined with K3DAV media has an average motivation value of 85, while the *discovery learning* without K3DAV has a value of 81. The average value of the discovery learning class combined with K3DAV media is included in the category of very high learning motivation values. The average value of learning motivation in *discovery learning* without K3DAV is included in the category of high learning motivation value. High learning motivation value describes students having the impetus to score an achievement (Hendrayana et al., 2014). The average value of class motivation with K3DAV media is higher, meaning that K3DAV media can be used to increase students' learning motivation.

The *discovery learning* combined with K3DAV media makes students' learning motivation higher than *discovery learning* without K3DAV media. Using K3DAV animation media increases students' interest because it is impressive as entertainment (Kumar, 2019). The syntax in *discovery learning* guides students to be actively involved in learning to reduce boredom and encourage students to solve problems in each group.

Higher learning motivation is caused by the use of learning media that is appropriate to the needs of students. K3DAV media is one of the suitable media when combined with *discovery learning* in generating students' learning motivation. Animation-based media can motivate students to learn and increase knowledge (Rosen, 2009).

The results of the hypothesis testing the effect of *discovery learning* combined with K2DAV and K3DAV media on learning motivation in terms of students' academic abilities can be summarized in Table 1.3.

Table 3. Results of Testing the Effect *Discovery Learning* Combined with K2DAV and K3DAV Media on Learning Motivation in terms of Academic Ability

Learning Motivation	Data	Sig.	Terms	Note.
	The *discovery learning* is combined with K2DAV and K3DAV	0.000	Sig media. < 0.05	H_0 is rejected. There is an effect

Results of the ANCOVA test listed in table 1.3. shows that the value of sig. of 0.000 < 0.050, so H0 is rejected. The test results show an influence between the *discovery learning* combined with K2DAV and K3DAV media on learning motivation in terms of students' academic abilities.

The results of hypothesis testing using ANCOVA show a significant effect between the *discovery learning* combined with K2DAV and K3DAV media on learning motivation. The data analysis results show a difference in the average value of learning motivation between the control class, experimental class 1, and experimental class 2. The control class is a class with discovery learning. In contrast, experimental class 1 is a class with *discovery learning* combined with K2DAV media, and experimental class 2 is a class with *discovery learning* combined with K3DAV media. The control class has an average motivation value of 81.

In contrast, experimental classes 1 and 2 have an average motivation value of 84 and 85, respectively. The results of the calculation show that the average value of the motivation of the class treated with the *discovery learning* combined with K3DAV media is the highest when compared to the control class and experimental class 1. The next highest average value was in the experimental class 1 which was treated with *discovery learning* combined with K2DAV media. The lowest average value is in the control class. The difference in the calculation results is due to the combination of *discovery learning* with K3DAV and K2DAV media can increase interest in learning, enthusiasm, and provide a sense of fun in the learning process. The results of calculations in the control class illustrate that the use of *discovery learning* without K3DAV and K2DAV media has not been effective in increasing students' learning motivation. The results of the comparison of the average motivational values of the control class, experimental class 1, and experimental class 2 can be seen in Figure 1.3.
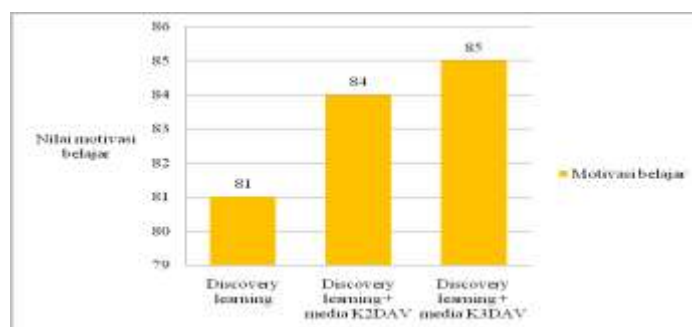

Figure 3. *Histogram of Average Student Motivation Values in Discovery Learning, Discovery Learning Combined with K2DAV Media, and Discovery Learning Combined* with K3DAV Media

Figure 1.3. explained that the average value of learning motivation in the *discovery learning* combined with K3DAV media was higher than the control class which was only given the *discovery learning* without media and the experimental class 1 with K2DAV

media. The discovery learning class combined with K3DAV media has an average motivation value of 85, while the *discovery learning* without media has a value of 81 and the class with K2DAV media has an average of 84. The average value of the learning motivation in the *discovery learning* combined with K3DAV media includes into the category of very high learning motivation value. The average value of learning motivation in *discovery learning* classes and classes with K2DAV is included in the category of high learning motivation scores. The value of high learning motivation illustrates that students have the impetus to score an achievement (Hendrayana et al., 2014). The average value of class motivation with K3DAV and K2DAV media has a higher average than the control class meaning that both media can be used to increase students' learning motivation.

The *discovery learning* combined with K3DAV and K2DAV media makes students' learning motivation higher when compared to the *discovery learning* without media. Learning to use animated media, either in 2D or 3D, makes students' interest increase because it is impressed as entertainment (Kumar, 2019). The syntax contained in *discovery learning* guides students to be actively involved in learning so as to reduce boredom and encourage students to solve problems in each group (Ramadanti et al., 2014).

Higher learning motivation is caused by the use of learning media that is appropriate to the needs of students. K3DAV and K3DAV media are suitable media when combined with the *discovery learning* in generating students' learning motivation. Animation-based media can motivate students to learn and increase knowledge (Rosen, 2009).

The results of hypothesis testing the influence of academic ability on students' learning motivation can be summarized in Table 1.4.

Table 4. Results of Testing the Effect of Academic Ability on Students' Learning

Motivation on Learning Motivation	Data	Sig.	Terms		Note.
	Academic Ability	0.000	Sig. 0.05	<	H_0 is rejected, there is an effect

Results of the anacova test listed in table 1.4. shows that the value of sig. of 0.000 < 0.050, so H0 is rejected. The test results show that there is an influence between academic ability on students' learning motivation.

The results of hypothesis testing using ANOVA show a significant influence between the level of academic ability on learning motivation. Students with low academic abilities have low levels of motivation, students with moderate academic abilities have moderate levels of motivation, and students with high academic abilities have relatively high levels of motivation. The data on the average value of motivation with the level of academic ability can be traced from Figure 1.4.
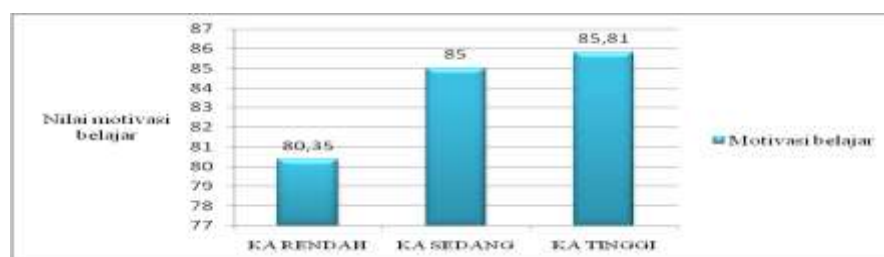

Figure 4. Histogram of the Average Value of Motivation on the Level of Academic Ability

Figure 4. reflects the average value of motivation seen from the level of academic ability. The average value of students' motivation with high, medium, and low academic abilities, respectively, is 85.81, 85, and 80.35. The motivation value of 85.81 on the KAT is the highest motivation value among the average values of other motivations and is included in the category of very high motivation values. Students with KAR have a motivation value of 80.35 which is included in the high category, while students with KAS have a motivation value of 85 which is included in the very high category. The results of the study reflect that the level of students' academic abilities is in line with the value of their motivation. Students with low abilities have a lower level of motivation when compared to students with moderate and high academic abilities.

The results of the study are in line with the research conducted by Rizkiana, Dasna, & Marfu'ah (2016) which found that higher learning motivation was found in high academic students than low academic students. High academic students are possible to be more active when participating in learning so that their motivation can be awakened (Hasrida & Salempa, 2018). Students with high academic abilities are better in terms of study habits when compared to students with moderate and low academic abilities. Habits in terms of learning is one of the factors that determine the level of learning motivation of students. Good habits in terms of learning can lead to an urge to learn so as to spur high learning motivation and vice versa (Rohman & Karimah, 2018).

Academic ability is one of the things used to measure the level of learning motivation of students. This measurement can occur because basically, students who are enthusiastic and have enthusiasm or in other words have high motivation can learn the subject matter well. Students who can study learning materials well will have good academic achievements (Lutfiwati, 2020).

Students with low academic ability (KAR) have the lowest motivation scores when compared to the motivation scores on KAS and KAT. Low learning motivation can affect the learning process (Lutfiwati, 2020). The learning process can be seen from the academic achievement inherent in students. Students with low learning motivation mostly have difficulty in learning and this situation affects academic achievement which is classified as poor (Emda, 2017). This is in line with the results of the study which obtained the results that the lowest value of learning motivation in students was attached to students with low academic abilities.

Students with moderate academic ability (KAS) have a motivation value that is almost the same as KAT. The motivation value on KAS and KAT is indeed classified as very high motivation based on the criteria for grouping learning motivation conducted by Hendrayana, Thai, and Rosnenty in 2014. Students with high motivation scores, one of which can be seen from good academic ability because they have good behavior. good behavior in learning. The slight difference in the resulting motivational value is caused by several factors that also affect the level of learning motivation in students. Factors that can make learning motivation up and down in students include the beliefs students have in mastering learning materials, the need to realize goals in learning, and various motivations that arise from the environment (Lutfiwati, 2020).
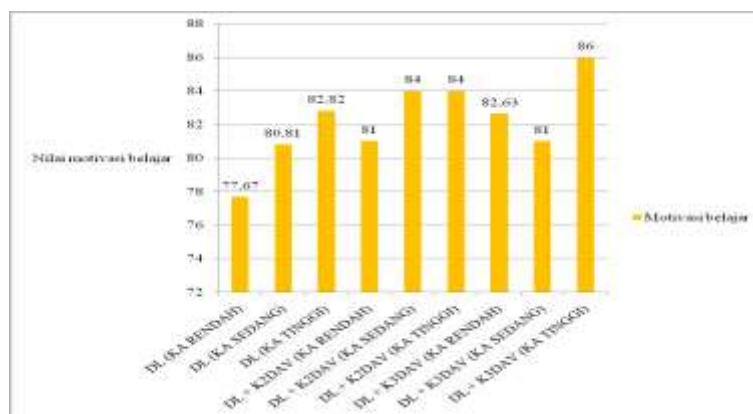
Figure 5. *Histogram of the Average Value of Motivation from the Learning Model Viewed from Academic Ability*

Figure 1.5. shows that there are various differences in the results of learning motivation scores for KAR, KAS, and KAT students in classes treated with *discovery learning*, *discovery learning* combined with K2DAV media, and *discovery learning* combined with K3DAV media.class *Discovery learning* with KAR occupies the smallest motivation value, followed by *discovery learning* with KAS and *discovery learning* combined with K2DAV with KAR. The *discovery learning* combined with K3DAV and KAT occupies the greatest motivation value, followed by the *discovery learning* combined with K3DAV and KAS, and *discovery learning* combined with K2DAV and KAT.

average value of *discovery learning* with KAR is 77.67 which is the smallest average of all classes.average value of *discovery learning* combined with K2DAV media with KAR is 81, while the average value of *discovery learning* combined with K3DAV media with KAR is 82.63. These data reflect that students in *discovery learning* with KAR have relatively low learning motivation. Students with KAR mostly have difficulty in learning something, especially when taking lessons in class which causes their academic scores to be relatively low. The data on the histogram also reflects that students with KAR have relatively low motivation when viewed in a class that is treated with the same learning model. Relatively low motivation can have an impact on unsatisfactory academic scores (Lutfiwati, 2020).

average value of *discovery learning* with KAS is 80.81, while the average discovery learning class combined with K2DAV media with KAS is 84, and the average *discovery learning* combined K3DAV media with KAS is 81. The average value of motivation for students with KAS is based on value categories The motivation used by Hendrayana, Thai, and Rosnenty in 2014 is in the high category. This category is not much different from the class average for students with KAT. Students with KAT are considered to be more prepared in obtaining learning so that they can easily understand the material provided. The convenience obtained by students with KAT can trigger higher learning motivation than students with KAS. Students with KAT have more activeness in learning so that it triggers higher motivation (Hasrida & Salempa, 2018).

average value of *discovery learning* with KAT is 82.82, while the average discovery learning class combined with K2DAV media with KAT is 84, and the average *discovery learning* combined K3DAV media with KAT is 86. The data on the histogram reflects that students with KAT have scores motivation that is classified as high to very high when viewed based on the category of values used by Hendrayana, Thai, and Rosnenty in 2014. This high motivation can be obtained from the already high initial academic ability so that students become more assisted in understanding the learning material, which results in on

learning motivation which is classified as high. The data obtained are in line with research conducted by Lin, Lin, & Huang (2011), which states that the academic abilities inherent in students are classified as good and will lead to good learning motivation as well.

IV. Conclusion

Based on the research that has been done, it can be seen that the use of K2DAV and K3DAV media has an influence on students' learning motivation when viewed from students' academic abilities. The research that has been done also shows that students' academic abilities affect students' learning motivation in teaching and learning activities in the classroom.

References

Alannasir, W. (2016). The Effect of Using Animation Media in Social Science Learning on Learning Motivation of Class IV Students at Mannuruki State Elementary School. Journal of Educational Science and Technology (EST), 2(2), 81. https://doi.org/10.26858/est.v2i2.2561

Astuti, R.W., Waluyo, H.J., and Rohmadi, M. (2019). Character Education Values in Animation Movie of Nussa and Rarra. Budapest International Research and Critics Institute-Journal (BIRCI-Journal). P. 215-219.

Azhar,A. (2018). Students' Trends in Islamic Communication Postgraduate in2010-2016 State Islamic University of North Sumatera (UINSU). Budapest International Research and Critics Institute (BIRCI-Journal), P.206-214.

Emda, A. (2017). The Position of Student Learning Motivation in Learning. Lanthanide Journal, 5(2), 93–196. https://doi.org/10.22373/lj.v5i2.2838

Fitri & Derlina. (2015). The Influence of the Discovery Learning Learning Model on Student Learning Outcomes on the Subject Matter of Temperature and Heat. INPAFI (Innovation for Learning Physics), 3(2), 89–96. https://doi.org/10.24114/inpafi.v3i2.5130

Hadi, S. (2017). The Effectiveness of Using Video as a Learning Media for Elementary School Students. Proceedings of TEP & PDs, 1(15), 96–102.

Halidi, HM, & Saehana, SNH and S. (2015). The Effect of ICT-Based Learning Media on Motivation and Science Learning Outcomes of Class V Elementary School Students in Madani Palu. Journal of Science Partners, 3(1), 53–60.

Hasrida, MD, & Salempa, P. (2018). Pengaruh Model Pembelajaran dan Kemampuan Awal terhadap Pemahaman Konsep dan Motivasi Belajar Peserta Didik Kelas X SMA Negeri 1 Maniangpajo (Studi Pada Materi Pokok Larutan Elektrolit dan Nonelektrolit). Chemistry Education Review (CER), Pend. Kimia PPs UNM, 1(2), 44–57.

Hendrayana, AS, Thaib, D., & Rosnenty, R. (2014). Motivasi belajar, kemandirian belajar dan prestasi belajar mahasiswa beasiswa bidikmisi di UPBJJ UT Bandung. Jurnal Pendidikan Terbuka Dan Jarak Jauh, 15(2), 81–87.

Iswati, DA, & Dwikoranto. (2015). Penerapan Model Pembelajaran Discovery Learning Terhadap Hasil Belajar Siswa Pada Materi Fluida Statis Di Sman 1 Mojosari. Inovasi Pendidikan Fisika, 04(03), 83–87.

Kumar, MAS (2019). Use of VideoScribe application in teaching : A comparative study. International Journal of Clinicopathological Correlation, 3(1), 19–21. https://doi.org/10.4103/ijcpc.ijcpc

Lin, Y., Lin, Y., & Huang, Y. (2011). Development of a diagnostic system using a testing-based approach for strengthening student prior knowledge. Computers & Education, 57(2), 1557–1570. https://doi.org/10.1016/j.compedu.2011.03.004

Lubis, R., et al. (2019). Survival Strategy for Lokan Seekers in Paya Pasir Village, Kec. Marelan, Medan, Indonesia. Budapest International Research and Critics Institute-Journal (BIRCI-Journal). Volume 2, No 1, Page: 293-303.

Lutfiwati, S. (2020). Motivasi Belajar Dan Prestasi Belajar Matematika. Al-Idarah: Jurnal Kependidikan Islam, 10(1), 53–63.

Nurrohmah, F., Putra, FG, & Farida. (2018). Development of Sparkol Video Scribe Assisted Learning Media. Formatif: Jurnal Ilmiah Pendidikan MIPA, 8(3), 233–250. https://doi.org/http://dx.doi.org/10.30998/formatif.v8i3.2613

Pradana, D. A., et al. (2020). Nasionalism: Character Education Orientation in Learning Development. Budapest International Research and Critics Institute-Journal (BIRCI-Journal) Volume 3, No 4, Page: 4026-4034.

Purnama. (2008). MODEL PEMBELAJARAN KREATIF DAN PRODUKTIF Pendahuluan. 1–15.

Puryono, DA (2020). Pelatihan Pembuatan Video Pembelajaran Untuk Guru Sd Kristen Terang Bagi Bangsa Pati Menggunakan Kinemaster. Jurnal Pengabdian Vokasi, 01(04), 242–247. https://ejournal2.undip.ac.id/index.php/jpv/article/view/8821

Putri, RH, Lesmono, AD, & Aristya, PD (2017). Pengaruh Model Discovery Terhadap Motivasi Belajar Dan Hasil Belajar Fisika Siswa Man Bondowoso. Jurnal Pembelajaran Fisika, 6(2), 168–174.

Rahmawati, F., WW, S., & Kardi, S. (2017). Pengembangan Perangkat Pembelajaran Fisika Model Inkuiri Terbimbing Berbantuan Videoscribe Pada Materi Kalor Untuk Meningkatkan Hasil Belajar Siswa Sman 1 Kedungwaru. JPPS (Jurnal Penelitian Pendidikan Sains), 5(2), 1039. https://doi.org/10.26740/jpps.v5n2.p1039-1047

Ramadhanti, G., Nuriman, & Khutobah. (2014). Penerapan Strategi Discovery untuk Meningkatkan Motivasi dan Hasil Belajar Siswa Kelas Vb Pokok Bahasan Pesawat Sederhana di SDN Ajung 03. Artikel Ilmiah Mahasiswa, 03, 1–5.

Rizkiana, F., Dasna, IW, & Marfu'ah, S. (2016). Pengaruh Praktikum dan Demonstarasi dalam Pembelajaran Inkuiri Terbimbing terhadap Motivasi Belajar Siswa Pada Materi Asam Basa Ditinjau dari Kemampuan Awal. Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan, 1(3), 354–362.

Rohman, AA, & Karimah, S. (2018). Faktor-faktor yang Mempengaruhi Rendahnya Motivasi Belajar Siswa Kelas XI. Jurnal At-Taqaddum, 10(1), 95–108.

Rosen, Y. (2009). The effects of an animation-based on-line learning environment on transfer of knowledge and on motivation for science and technology learning. Journal of Educational Computing Research, 40(4), 1–28.

Saleh, A., Mujahiddin. (2020). Challenges and Opportunities for Community Empowerment Practices in Indonesia during the Covid-19 Pandemic through Strengthening the Role of Higher Education. Budapest International Research and Critics Institute-Journal (BIRCI-Journal). Volume 3, No 2, Page: 1105-1113

Sudiarta, IGP, & Sadra, IW (2016). Pengaruh Model Blended Learning Berbantuan Video Animasi Terhadap Kemampuan Pemecahan Masalah Dan Pemahaman Konsep Siswa. Jurnal Pendidikan Dan Pengajaran, 49(2), 48. https://doi.org/10.23887/jppundiksha.v49i2.9009

Veermans, K. (2003). Intelligent Support for Discovery Learning. Twente University Press.