Student Perception Review from Gender: Electronic Moduls of Mathematical Physics

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ABSTRAK

Peran teknologi yang terus berkembang di era globalisasi khususnya di bidang pendidikan menuntut berbagai inovasi dalam proses belajar mengajar dalam rangka meningkatkan kualitas pembelajaran di dunia pendidikan. Namun dalam pembelajaran beberapa siswa memiliki persepsi negatif yang dapat membuat siswa tidak bersemangat mengikuti pembelajaran sehingga siswa akan kesulitan memahami materi dan akan berdampak pada kurang optimalnya hasil belajar matematika fisika dalam pembelajaran. Penelitian ini bertujuan untuk menguji perbedaan persepsi siswa berdasarkan gender di kelas A dan B terhadap e-modul fisika-matematika. Jenis penelitian ini adalah kuantitatif dan dilakukan dengan survei. Instrumen pengumpulan data berupa survei persepsi dengan menggunakan skala likert. Data dianalisis secara statistik deskriptif (rata-rata, median, modus, frekuensi dan persen) dan statistik inferensial (uji hipotesis: uji normalitas dan uji homogenitas, serta uji hipotesis: uji-T independen). Teknik Sampel adalah total sampel 80 siswa berjenis kelamin dari 2 kelas. Hasil penelitian adalah terdapat perbedaan yang signifikan antara persepsi siswa perempuan dengan taraf signifikansi 0,049 dan taraf signifikansi 0,005 untuk laki-laki. Hasilnya, disimpulkan bahwa rata-rata perbedaan persepsi antara perempuan dan laki-laki lebih rendah. Laki-laki lebih rasional dalam penyisipan sesuatu, sedangkan perempuan lebih emosional dalam penyisipan sesuatu. Hasil penelitian ini diharapkan dapat memberikan kontribusi bagi para pendidik dalam meningkatkan kualitas pembelajaran di suatu lembaga pendidikan.

ABSTRACT

The role of technology that continues to develop in the era of globalization, especially in the field of education, demands various innovations in the teaching and learning process to improve the quality of learning in the world of education. However, in learning, some students have negative perceptions that can make students not enthusiastic about participating in learning. Students will have difficulty understanding the material and will impact less than optimal learning outcomes of mathematics and physics in learning. This study examines the differences in students' perceptions based on gender in grades A and B in the physics-mathematics e-module. This type of research is quantitative and is conducted by a survey. The data collection instrument is a perception survey using a Likert scale. Data were analyzed descriptively (mean, median, mode, frequency, and percent) and inferential statistics (hypothesis test: normality and homogeneity tests, and hypothesis tests: independent T-test). Technique The sample is a total sample of 80 students from 2 classes. The result of this research is that there is a significant difference between female students' perceptions with a significance level of 0.049 and a significance level of 0.005 for boys. The key is that the average difference in perception between women and men is lower. Men are more rational in inserting something, while women are more emotional. The results of this study are expected to contribute to educators in improving the quality of learning in an educational institution.

1. INTRODUCTION

The role of technology that continues to develop in the era of globalization, especially in the field of education demands various innovations in the teaching and learning process in order to improve the quality of learning in the world of education. The effectiveness of using technology (e-modules) in learning needs to be known by looking at the perceptions of students and paying attention to gender as an important factor

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(Mulyadi et al., 2020; Rahayu & Sukardi, 2020; Sofyan et al., 2019). Improving the quality of learning will be done after knowing the perceptions of these students. This is because education plays a significant and effective role in improving the progress of a country (Servitri & Trisnawaty, 2018; Syahrial et al., 2019; Sayuti, et al., 2020). One approach involves using learning media (Beniario & Sari, 2019; Ge, 2019; Sopacua et al., 2020). Learning media which are innovative in the teaching and learning process may take the form of teaching materials.

Innovative learning materials are required to support the seamless teaching and learning process. With innovative teaching materials, he may encourage students to learn more independently (Czajka & McConnell, 2019; Hendri & Setiawan, 2016). Students will obtain a variety of information, knowledge, and can improve the understanding of concepts to a learning material through independent teaching materials (Adi, 2017; Ardiansyah et al., 2017; Sundaygara et al., 2019). Teaching materials describe the full picture of learning competencies that are systematically organized and used in the teaching and learning process. One of the teaching and learning materials that may be used in the teaching and learning process is presented as a learning module (Asrial et al., 2021; Silalahi, 2020). However, some students have different perceptions about learning media so that it will have an impact on the lack of enthusiasm of students in participating in learning.

Now, modules can be developed using technology in the form of electronic modules or also known as e-modules. E-modules can make the teaching and learning process more interesting such as animation so as to make the teaching and learning process more interactive (Putri, Risdianto, & Rohadi, 2019; Agung, Suyanto, & Aminatun, 2020; Ummah, Suarsini, & Lestari, 2020). The learning process is also going to be more fun and not boring with the use of electronic modules. The e-modules are essential to learn one of them in the course of Physical Mathematics. Mathematical physics is a course that teaches basic mathematical analysis related to physical problem (Wahyuni, 2012; Ayu et al., 2017; Gunada et al., 2017). However, it remains unclear to many students (Natalia et al., 2017; Turşucu et al., 2018). This is because it is too complex/ many mathematical calculations that exist in the study of mathematical physics whereas every student has different mathematical skills. Therefore, the role of e-modules is needed to help students improve their skills in solving problems of mathematical physics and also need the response of students to the e-module of mathematical physics by conducting perception tests.

The positive perception of learning mathematics can affect the learning processes and results of students. So that the learning results achieved by a person will increase in line with the positive perception that a person has (Amin et al., 2017; Indrawati & Hartati, 2017; Erin & Maharani, 2018). While negative perceptions can make students not eager to follow the learning so that students will have difficulty understanding the material and will affect the less optimal learning outcomes in the study of mathematical physics (Anggoro, 2016; Gani, 2015; Zulfa et al., 2017). Differences in perception of gender are inseparable from the existence of one's basic knowledge and way of thinking where each individual has his own basis in giving a perception of something so as to give rise to different perceptions (Warliah, 2017).

The findings of previous studies stated that e-modules can make it easier for students to learn independently (Asrial et al., 2019; Aufa et al., 2021). Other research findings also state that e-modules will improve student learning outcomes and interest in learning (Asrial et al., 2020; Ilmi et al., 2021; Sriyanti et al., 2021). Furthermore, other research on the development of basic physics teaching materials based on e-modules with research results that the developed e-modules are feasible to use and students can learn independently (Agphin, Handoyo, & Alfarisi, 2020). Based on several existing studies, there has been no research conducted related to the study of student perceptions of the e-module for the Mathematics Physics (FISMAT) course, and there is no perception assessment based on gender differences. Because of differences in gender can provide different perceptions. Both types of human sex (male and female) are important to be involved in comparing their respective perceptions of the perceived object (Setyaningsih et al., 2018). Therefore, to complete the lack of research conducted by previous researchers, the researcher took the initiative to conduct research to examine student perceptions of the FISMAT e-module by taking into account the differences in a person's gender. Given the importance of knowing the perceptions of students, the researchers conducted this study which aims to examine the differences in the perceptions of students with the female gender in classes A and B towards the physics-mathematical e-module and examine the differences in the perceptions of students with male gender in classes A and B to the e-module of mathematical physics.

2. METHOD

The research used by the researcher is a quantitative research method with the type of survey research. Quantitative research method is a research method conducted on a collection of samples using certain instruments to collect data and analyze quantitatively. Quantitative data is generally in the form of

information presented in numerical or numerical form and can be calculated for statistical analysis (Perdana et al., 2020). The data from this study were obtained by using a data collection instrument. The data collection instrument used in the study was in the form of a questionnaire. Questionnaire is defined as a collection of written statements with the aim of obtaining information from the respondents. The questionnaire used is a closed questionnaire where respondents can directly choose the answer choices that have been provided. The questionnaire given in the form of a perception questionnaire totaled 15 positive statements measured using a Likert scale with 4 available answer choices. The Likert scale is a scale used for an object ranging from very negative to very positive (Fauzan & Rahdiyanta, 2017; Kinanti & Putri, 2017). Questionnaires are then given to respondents who are samples from a population.

The population is all members or research subjects with their own characteristics for research by researchers so that conclusions can be drawn from a study. The population of this study were all physics education students FKIP Jambi University class of 2018 as many as 80 students consisting of two classes, namely 40 class A students (25 girls & 15 boys) and 40 B grade students (25 girls & 15 boys) . In a study, the population is closely related to the sample. The sample is a member of the population to be studied and is expected to represent the population (Mazen & Tong, 2020). Sampling in this study needs to be done by determining the sampling technique.The sampling technique used by this researcher is using the total sampling technique. Total sampling technique is a technique used in research where the number of research population is the same as the number of samples studied. This technique was used because the population in the study was less than 100 people. The total sampling technique is considered the most accurate and can be free from the influence of sample errors because the more samples used, the smaller the error rate (Putri, Maison, & Darmaji, 2018; Ruswati, 2018). Therefore, the researcher used a total sampling technique because it was considered the most suitable and appropriate with a total population of 80 people to be given a questionnaire.

The questionnaire was given to students of physics education FKIP University of Jambi through a google form link. The number of poll statements consists of 15 positive statement items. The perception questionnaire was given to all students of physics education FKIP University class 2018. For the level of categorization of the student perception questionnaire on the physics mathematics e-module, the guidelines on the Likert scale table can be used, namely 15,00 – 26,25 (Not very good), 26,26 – 37,50 (Not good), 37,51 – 48,75 (Good), and 48,76 – 60,00 (Very good). After all the data or information has been collected, the researcher then analyzes the quantitative data using descriptive statistics and inferential statistics. Descriptive statistics is a data analysis technique by describing all data or information obtained while inferential statistics is a data analysis technique by making a generally accepted research conclusion. As for the activities carried out on descriptive statistical analysis such as finding the mean, mode, median, standard deviation, and so on. While inferential statistical analysis, its activity is to test hypotheses with the previous prerequisites that must be met, namely the data are normal, normal and homogeneous.

The normality test used by the researcher was Kolmogorof-Smirnof using the IBM SPSS 23 program while the homogeneity test used the Levene Test (Test of Homogeneity of Variances). In this study, the normality test and homogeneity test used a significance level of 0.05. The data will be normally and homogeneously distributed if the significance level value is > 0.05 and not normally distributed and not homogeneous if the significance level value is < 0.05 (Sulman et al., 2015). After the data has been normally distributed and homogeneous, the researcher then conducted an inferential statistical analysis using the T test (difference test), which is to determine the differences in the perceptions of students with the female gender in class A and class B, and to determine the differences in the perceptions of students with male gender in class A and B.

3. RESULT AND DISCUSSION

Result

The novelty of this study is that gender differences are reviewed to look at students' perceptions of the e-module of mathematical physics. Gender differences affect each individual's differences in terms of roles, behavior, and emotional characteristics (Rahmawaty, 2015). So that one's ability is also different in solving a problem mathematically with the existence of gender differences (Musriliani & Anshari, 2015). Male gender is seen as a strong and rational individual in the preparation of something, while female gender is seen as an emotional and unstable individual in the preparation of something (Warliah, 2017).

Analysis of data with descriptive statistics in this study will be obtained mean, mode, median, minimum value, maximum value, frequency and percentage. The results obtained from the perception questionnaire in physics education students of FKIP University of Jambi class 2018 against the e-module of mathematical physics using descriptive statistical tests in class A.

Based on da analysis, that students with female gender give an excellent perception of e-module mathematical physics with a percentage of 44% as well as students with male gender gives an excellent perception of e-module physics mathematics with a percentage of 53.3%. The perception given by students will certainly affect the continuity of the teaching and learning process. for students' perception of e-module of mathematics physics class A physics education FKIP University of Jambi class 2018 as a whole provides an excellent perception of e-module physics mathematics. It is also known that the average perception of students with female gender is 44.44 with a minimum score of 37.00 and a maximum value of 50.00, while the average perception of students in the male gender is 47.67 with a minimum value of 37.00 and a maximum value of 58.00. The median value in students with female gender is 48.00 with a perception value that appears a lot is 50.00, and in students with male gender obtained a median value of 49.00 with a perception value that appears a lot is 49.00. Furthermore, students' perception of the e-module of mathematical physics in grade B in Table 1.

Table 1. Description of the Perception of Class B Students on the FISMAT e-Module from the Results of the Perception Questionnaire

Gender	Category	f	%	mean	median	mode	min	max
Female	Not very good	0	0 %					
	Not good	2	8 %	50,64	49,00	60,00	37,00	60,00
	Good	10	40 %					
	Very good	13	52 %					
Male	Not very good	0	0 %					
	Not good	2	13,3%	49,00	48,00	48,00	37,00	60,00
	Good	6	40,0%					
	Very good	7	46,7%					

Based on the Table 1, it can be seen that students with female gender give an excellent perception of e-module physics mathematics with a percentage of 52% and students with male gender also give an excellent perception of e-module physics mathematics with a percentage of 46.7%. The perception given by students will certainly affect the continuity of the teaching and learning process. for students' perception of e-module of mathematics physics class B physics education FKIP University of Jambi class 2018 overall provides an excellent perception of e-module physics mathematics. Based on analysis data it is also known that the average perception of students with female gender is 50.64 with a minimum score of 37.00 and a maximum value of 60.00, while the average student perception score in the male gender is 49.00 with a minimum value of 37.00 and a maximum value of 60.00. The median value in students with female gender is 49.00 with a perception value that appears a lot is 60.00, and in students with male gender obtained a median value of 48.00 with a perception value that appears a lot is 48.00.

In this study, inferential statistical tests were also conducted using t test. Before the t test, the assumption test is first conducted, namely normality test and homogeneity test. Based on the data analysis, class A has a significance value of 0.200 greater than the signification level of 0.05 then the data is normally distributed. Similarly, in class B obtained a significance value of 0.200 greater than the level of signification of 0.05 then the data is normally distributed. Once the data has been distributed normally, the next step is to conduct a homogeneity test to find out if the data comes from a population with the same variant or not.

Homogeneity test results in students with female gender grade A and B with a significance of more than 0.05 which is 0.535, it can be said that the variants of the two sample groups (class A and class B) in this study are homogeneous (the same) or can be said that both samples came from the same population. After the normality test and homogeneity test in students with female gender, then also conducted normality test and homogeneity test for students with male gender. Based on data analysis, class A obtained a significance value of 0.143 greater than the signification level of 0.05, so the data is normally distributed. Similarly, class B obtained a significance value of 0.200 greater than the level of signification of 0.05, the data is distributed normally. Once the data has been distributed normally, the next step is to conduct a homogeneity test to find out if the data comes from a population with the same variant or not.

Homogeneity test results in students with male gender with a significance of more than 0.05 which is 0.283 so it can be said that the variants of the two sample groups (class A and class B) in this study are homogeneous (the same) or it can be said that both samples come from the same population. Once it is known that the data is normal and homogeneous distribution, next is to conduct a difference test using the t test to find out if there is a significant difference between the perception of students with female gender in class A and class B against the e-module of mathematical physics and to find out if there is a significant difference between the perception of students with the male gender in class A and class B against the e-module of mathematical physics.

Based on analysis data shown the results of the analysis of t indpendent samples test that indicates that there is a significant difference between the perception of female students in class A and the perception of female students in class B. This is seen from the probability value = 0.049 < 0.05, so Ha was accepted and Ho rejected. Based on data analysis, shown the results of the analysis of t indpendent samples test that indicates that there is a significant difference between the perception of male students in class A and the perception of male students in grade B. This is seen from the probability value = 0.005 < 0.05, so Ha was accepted and Ho rejected.

Discussion

Perspesi can be interpreted as an evaluation/response to something, so everyone's perception is different and not always the same which can be either negative perception or positive perception. The positive perception of mathematical learning may affect the learning processes and outcomes of students. So that the learning results achieved by a person will increase in line with the positive perception that a person has (Indrawati & Hartati, 2017; Erin & Maharani, 2018; Amin et al., 2019). While negative perceptions can make students not eager to follow the learning so that students will have difficulty understanding the material and will affect the less optimal learning outcomes in the learning process of mathematical physics (Gani, 2015; Anggoro, 2016; Zulfa et al., 2017).

Previous research also stated that students have very good perceptions of e-modules (Agphin et al., 2020; Andani, 2020; Nadori & Hoyi, 2020; Pathoni et al., 2017). Differences in perception may also differ from differences between men and women. There will be a difference in gender, there will be a difference in behaviour, role, emotional characteristics, mindset, and in the preparation of something (Rahmawaty, 2015). Thus, in terms of gender differences, an individual's ability to resolve a problem is also mathematically different (Musriliani & Anshari, 2015). The masculine gender is considered a strong and rational figure in the insertion of something, whereas the feminine gender is considered an emotional and unstable figure in the insertion of something (Warliah, 2017). The learning process will determine how successful the learning outcomes will be. Therefore, it is necessary to play an active role of learners in each learning process by applying the knowledge that has been possessed, as well as conducting concept exhibitions so as to influence the increasing achievement of one's learning outcomes (Kazempour, 2014). With the e-module, students will have interactive learning media and more interesting and can learn independently, the academic ability of students will also improve with the teaching materials in the form of e-modules (Komikesari et al., 2020; Lumbantobing et al., 2019; Mulyadi et al., 2020).

The use of mathematical physics e-module is very useful for students in the teaching and learning process to be more interesting. By knowing the perception of students who are diverse tehadap e-module will help an educator to make the teaching materials more interesting for the learning process. With the perception of students who are very good towards the e-module of mathematical physics, it can help students to be able to learn independently and more easily understand various concepts and problem solving physics mathematically so that it will improve the quality of learning outcomes and in the future one can apply his knowledge to others, especially as a future educator of the nation who will participate in educating the children of the nation. The results of this study can be used as a source of knowledge and a reference for further research with various updates provided. This study has limitations, because this study only discusses students' perceptions of the Mathematics Physics E-Module in terms of gender and does not yet know whether the Mathematics Physics E-Module will have an impact on the learning outcomes of these students. The results of this study are expected to contribute to educators in identifying students' perceptions of e-modules or learning media that are used to improve the quality of learning at a university as well as at the elementary, junior high, and high school levels.

4. CONCLUSION

Based on the study results, it can be concluded that there is a significant difference between students' perceptions of the female gender in class A and class B and between student's perceptions of the male gender in class A and class B. Students' perceptions of the female gender in class A and female students in class B obtained a significance level. Likewise, the perception of the male gender in class A and the perception of the male student in class B on the physics-mathematics e-module has a significant average difference. This means that the male gender has an average difference in perception that is greater than the female gender.

5. REFERENCES

Adi, S. S. (2017). Pengembangan Bahan Ajar Bahasa Inggris Dengan Media Audio Untuk Sekolah Menengah

Pertama. *Jurnal Kwangsan*, *5*(1), 1. https://doi.org/10.31800/jurnalkwangsan.v5i1.36.

Agphin, R. M., Handoyo, S. S., & Alfarisi, M. M. (2020). Pengembangan Bahan Ajar Mekanika Tanah Berbasis E-Modul Pada Program Studi Pendidikan Teknik Bangunan, Universitas Negeri Jakarta. *JPTS*, *11*(2), 117–123. https://doi.org/10.21009/jpensil.v9i1.11987.

Agung, F. P., Suyanto, S., & Aminatun, T. (2020). E-Modul Gerak Refleks Berbasis Pendekatan Kontekstual untuk Meningkatkan Pemahaman Konsep Siswa SMA. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, *5*(3), 279–289. https://doi.org/10.17977/jptpp.v5i3.13238.

Amin, A. M., Corebima, A. D., Zubaidah, S., & Mahanal, S. (2017). Analisis Persepsi Mahasiswa Dan Dosen Terhadap Motivasi Belajar. *Jurnal Penelitian Pendidikan Matematika Dan Sains*, *2*(2), 1689–1699. https://doi.org/10.26740/jppms.v1n2.p%25p.

Amin, Astuti, M., Corebima, A. D., Zubaidah, S., & Mahanal, S. (2019). Analisis Persepsi Mahasiswa Dan Dosen Terhadap Motivasi Belajar Pada Perkuliahan Fisiologi Hewan. *Journal of Chemical Information and Modeling*, *53*(9), 1689–1699. https://doi.org/10.26740/jppms.v1n2.p%25p.

Andani, M. (2020). E-Modul Fisika Dasar I Berbasis 3D Pageflip Professional. *Schrodinger Journal of Physics Education*, *1*(2), 44–47. https://doi.org/10.37251/sjpe.v1i2.79.

Anggoro, B. S. (2016). Analisis Persepsi Siswa SMP terhadap Pembelajaran Matematika ditinjau dari Perbedaan Gender dan Disposisi Berpikir Kreatif Matematis. *Al-Jabar : Jurnal Pendidikan Matematika*, *7*(2), 153–166. https://doi.org/10.24042/ajpm.v7i2.30.

Ardiansyah, R., Corebima, A. D., & Rohman, F. (2017). Pengembangan Bahan Ajar Mutasi Genetik Pada Matakuliah Genetika. *Jurnal Pendidikan : Teori, Penelitian, Dan Pengembangan*, *2*(7), 927–933. https://doi.org/10.17977/jptpp.v2i7.9646.

Asrial, A., Syahrial, S., Kurniawan, D. A., & Zulkhi, M. D. (2021). The Relationship Between the Application of E-Modules Based on Mangrove Forest Ecotourism on The Peace-Loving Character of Students. *Journal of Education Technology*, *5*(3), 331. https://doi.org/10.23887/jet.v5i3.34043.

Asrial, Syahrial, Kurniawan, D. A., Chan, F., Septianingsih, R., & Perdana, R. (2019). Multimedia innovation 4.0 in education: E-modul ethnoconstructivism. *Universal Journal of Educational Research*, *7*(10), 2098–2107. https://doi.org/10.13189/ujer.2019.071007.

Asrial, Syahrial, Maison, Kurniawan, D. A., & Piyana, S. O. (2020). Ethnoconstructivism E-Module to Improve Perception, Interest, and Motivation of Students in Class V Elementary School. *JPI (Jurnal Pendidikan Indonesia)*, *9*(1), 30–41. https://doi.org/10.23887/jpi-undiksha.v9i1.19222.

Aufa, M. N., Rusmansyah, R., Hasbie, M., Jaidie, A., & Yunita, A. (2021). The Effect of Using e-module Model Problem Based Learning (PBL) Based on Wetland Environment on Critical Thinking Skills and Environmental Care Attitudes. *Jurnal Penelitian Pendidikan IPA*, *7*(3), 401–407. https://doi.org/10.29303/jppipa.v7i3.732.

Ayu, H. D., Pratiwi, H., K, S., & Muhardjito. (2017). Pengembangan E-Scaffolding untuk Meningkatkan Kualitas Proses dan hasil Belajar. *Jurnal Kependidikan*, *1*(2), 334–347. https://doi.org/10.21831/jk.v1i2.14863.

Beniario, & Sari, I. (2019). The development of English reading materials integrated into character values on English subject through scientific approach at grade XI of MA KM.M Padang Panjang. *KnE Soc. Sci*, *3*(14), 111–124. https://doi.org/10.18502/kss.v3i14.4302.

Czajka, C. D., & McConnell, D. (2019). The adoption of student-centered teaching materials as a professional development experience for college faculty. *International Journal of Science Education*, *41*(5), 693–711. https://doi.org/10.1080/09500693.2019.1578908.

Ellianawati, & Wahyuni, S. (2012). Pengembangan Bahan Ajar Fisika Matematika Berbasis Self Regulated Learning Sebagai Upaya Peningkatan Kemampuan Belajar Mandiri. *Jurnal Pendidikan Fisika Indonesia*, *8*(1), 33–40. https://doi.org/10.15294/jpfi.v8i1.1992.

Erin, E., & Maharani, A. (2018). Persepsi Mahasiswa Pendidikan Matematika terhadap Perkuliahan Online. *Mosharafa: Jurnal Pendidikan Matematika*, *7*(3), 337–344. https://doi.org/10.31980/mosharafa.v7i3.39.

Fauzan, M. A., & Rahdiyanta, D. (2017). Pengembangan Media Pembelajaran Berbasis Video pada Teori Pemesinan Frais. *Jurnal Dinamika Vokasional Teknik Mesin*, *2*(2), 82–88. https://doi.org/10.21831/dinamika.v2i2.15994.

Gani, A. (2015). Pengaruh Model Pembelajaran dan Persepsi Tentang Matematika Terhadap Minat dan Hasil Belajar Matematika Siswa SMP Negeri di Kecamatan Salomekko Kabupaten Bone. *Jurnal Daya Matematis*, *3*(3), 337–343. https://doi.org/10.26858/jds.v3i3.1700.

Ge, Z. G. (2019). Does mismatch between learning media preference and received learning media bring a negative impact on Academic performance? An experiment with e-learners. *Interactive Learning Environments*, 1–17. https://doi.org/10.1080/10494820.2019.1612449.

Gunada, I. W., Rokhmat, J., Hikmawati, H., & Kesipudin, K. (2017). Pengembangan Bahan Ajar Kompilasi

Fisika Matematika Ii Pokok Bahasan Persamaaan Diferensial Untuk Meningkatkan Penalaran Matematis. *Jurnal Pendidikan Fisika Dan Teknologi*, *3*(2), 216. https://doi.org/10.29303/jpft.v3i2.414.

Hendri, S., & Setiawan, W. (2016). *Pengembangan Bahan Ajar Tema Gempa Bumi Menggunakan Four Step Teaching Materials Development. 12*(1), 65–76. https://doi.org/10.15294/jpfi.

Ilmi, R., Arnawa, I. M., Yerizon, & Bakar, N. N. (2021). Development of an Android-Based for Math E-Module by using Adobe Flash Professional CS6 for Grade X Students of Senior High School. *Journal of Physics: Conference Series*, *1742*(1). https://doi.org/10.1088/1742-6596/1742/1/012026.

Indrawati, F., & Hartati, L. (2017). Peran Penguasaan Dasar Matematika dan Persepsi Mahasiswa Terhadap Kemampuan Pemahaman Konsep Mata Kuliah Kalkulus I. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, *7*(2), 107–114. https://doi.org/10.30998/formatif.v7i2.2226.

Kazempour, M. (2014). The interrelationship of science experiences, beliefs, attitudes, and self-efficacy: A case study of a pre-service teacher with positive science attitude and high science teaching self-efficacy. *European Journal of Science and Mathematics Education*, *1*(3), 106–124. https://doi.org/10.30935/scimath/9391.

Kinanti, S. P., & Putri, B. P. S. (2017). Pengaruh Media Sosial Instagram @Zapcoid Terhadap Brand Equity Zap Clinic. *Jurnal Komunikasi*, *9*(1), 53–64. https://doi.org/10.24912/jk.v9i1.164.

Komikesari, H., Mutoharoh, M., Dewi, P., Utami, G., Anggraini, W., & Himmah, E. (2020). Development of e-module using flip pdf professional on temperature and heat material Development of e-module using flip pdf professional on temperature and heat material. *Journal Of Physics Conference Series*. https://doi.org/10.1088/1742-6596/1572/1/012017.

Lumbantobing, M. A., Munadi, S., & Wijanarka, B. S. (2019). Pengembangan E-Modul Interaktif untuk Discovery Learning pada Pembelajaran Mekanika Teknik dan Elemen Mesin. *Jurnal Dinamika Vokasional Teknik Mesin*, *4*(1), 1–8. https://doi.org/10.21831/dinamika.v4i1.24275.

Mazen, J. A. ., & Tong, X. (2020). Bias Correction for Replacement Samples in Longitudinal Research. *Multivariate Behavioral Research*, *0*(0), 1–23. https://doi.org/10.1080/00273171.2020.1794774.

Mulyadi, Syahrul, Atmazaki, & Agustina. (2020). The Development Of E-Modules Based on Adobe Flash For Indonesian Subjects At IAIN Bukittinggi. *Journal Of Physics Conference Series*, *1471*, 1–9. https://doi.org/10.1088/1742-6596/1471/1/012002.

Musriliani, C., & Anshari, B. I. (2015). Pengaruh Pembelajaran Contextual Teaching Learning (CTL) terhadap Kemampuan Koneksi Matematis Siswa SMP Ditinjau dari Gender. *Jurnal Didaktik Matematika*, *2*(2), 49–58. https://doi.org/10.24815/dm.v2i2.2814.

Nadori, S., & Hoyi, R. (2020). Pengembangan Media Pembelajaran Fisika Menggunakan Software Aurora 3D Materi Pengukuran. *Journal Evaluation in Education (JEE)*, *1*(3), 78–82. https://doi.org/10.37251/jee.v1i3.138.

Natalia, D., Handhika, J., & Huriawati, F. (2017). Pengembangan Instrumen Tes Diagnosis Konsep IPA Fisika. *Momentum: Physics Education Journal*, *1*(2), 103. https://doi.org/10.21067/mpej.v1i2.1966.

Pathoni, H., Jufrida, Saputri, I., & Sari, W. (2017). Persepsi Mahasiswa Terhadap E-modul Pembelajaran Mata Kuliah Fisika Atom dan Inti. *Jurnal Eksakta Pendidikan (JEP)*, *1*(1), 55–62. https://doi.org/10.24036/jep/vol1-iss1/35.

Perdana, I., Saragi, R. E. S., & Aribowo, E. K. (2020). Students ' Perception of Utilizing Kahoot In Indonesian Language Learning. *Kwangsan: Jurnal Teknologi Pendidikan*, *08*(02), 290–306. https://doi.org/10.35445/alishlah.v13i3.1115.

Putri, A. R., Maison, & Darmaji. (2018). Kerjasama dan Kekompakan Siswa dalam Pembelajaran Fisika di Kelas XII MIPA SMAN 3 Kota Jambi. *Jurnal Pendidikan Fisika*, *3*(2), 32–40. https://doi.org/10.22437/edufisika.v3i02.5552.

Putri, R. M., Risdianto, E., & Rohadi, N. (2019). Pengembangan Media Pembelajaran Interaktif dengan Menggunakan Adobe Captivate Pada Materi Gerak Harmonik Sederhana. *Jurnal Kumparan Fisika*, *2*(2), 113–120. https://doi.org/10.33369/jkf.2.2.113-120.

Rahayu, I., & Sukardi. (2020). The Development Of E-Modules Project Based Learning for Students of Computer and Basic Networks at Vocational. *Journal Of Education Technology*, *4*(4), 398–403. https://doi.org/10.23887/jet.v4i4.29230.

Rahmawaty, A. (2015). Harmoni dalam Keluarga Perempuan Karir : Upaya Mewujudkan Kesetaraan dan Keadilan Gender dalam Keluarga. *Palastren*, *8*(1), 1–34. https://doi.org/10.21043/palastren.v8i1.932.

Ruswati, I. (2018). Faktor Eksternal Dan Faktor Internal Terhadap Pendidikan Islam Darussalam Cerme Gresik. *JRE: Jurnal Riset Entrepreneurship*, *1*(2), 38–52. https://doi.org/10.30587/jre.v1i2.415.

Sayuti, O. A., Adetiba, A. A., Tukur, M. A., & Abubakar, L. A. (2020). Quality assurance mechanisms and universal basic education goal achievement in public secondary schools of Kwara State, Nigeria.

Journal of Education and Learning (EduLearn), *14*(1), 1–7. https://doi.org/10.11591/edulearn.v14i1.14304.

Servitri, M. O., & Trisnawaty, W. (2018). The Development of Inquiry Science Worksheet to Facilitate the Process Skills. *Journal of Education and Learning (EduLearn)*, *12*(4), 575–580. https://doi.org/10.11591/edulearn.v12i4.8937.

Setyaningsih, N. H., Febriani, M., & Zuliyanti, Z. (2018). Persepsi Dosen dan Mahasiswa terhadap Pembelajaran Apresiasi Sastra Berperspektif Gender. *Jurnal Pendidikan Bahasa Indonesia*, *6*(2), 138–151. https://doi.org/10.30659/j.6.2.138-151.

Silalahi, M. V. (2020). Development of E-Modules Based on Exe-Learning on Topics of Reaction Rate Against Student Learning Outcomes Mechanical Engineering. *International Journal of Education and Curriculum Application*, *3*(2), 114–120. https://doi.org/10.31764/ijeca.v3i2.2672.

Sofyan, H., Anggrereini, E., & Saasiah, J. (2019). Development of E-Modules Based on Local Wisdom in Central Learning. *European Journal of Education Research*, *8*(4), 1137–1143. https://doi.org/10.12973/eu-jer.8.4.1137.

Sopacua, J., Fadli, M. R., & Rochmat, S. (2020). The history learning module integrated character values. *Journal of Education and Learning (EduLearn)*, *14*(3), 463–472. https://doi.org/10.11591/edulearn.v14i3.16139.

Sriyanti, I., Almafie, M. R., Marlina, L., & Jauhari, J. (2021). The effect of Using Flipbook-Based E-modules on Student Learning Outcomes. *Kasuari: Physics Education Journal (KPEJ)*, *3*(2), 69–75. https://doi.org/10.37891/kpej.v3i2.156.

Sulman, S., Adlim, A., & Ilyas, S. (2015). Peningkatan Motivasi dan hasil Belajar Siswa SMP pada Materi Getaran dan Gelombang dengan Menggunakan Media TIK Slide Powerpoint dan Demonstrasi Alat Sederhana. *Jurnal Pendidikan Sains Indonesia*, *3*(2), 122–130.

Sundaygara, C., Pratiwi, H. Y., & Hudha, M. N. (2019). Pengembangan bahan ajar media pembelajaran fisika dengan pendekatan multi representasi untuk meningkatkan kemampuan pembuatan alat-alat praktikum calon guru fisika. *Momentum: Physics Education Journal*, *2*(2), 86–93. https://doi.org/10.21067/mpej.v2i2.2709.

Syahrial, Asrial, Kurniawan, D. A., & Piyana, S. O. (2019). E-Modul Etnokontruktivisme: Implementasi Pada Kelas V Sekolah Dasar Ditinjau Dari Persepsi, Minat Dan Motivasi. *JTP - Jurnal Teknologi Pendidikan*, *21*(2), 165–177. https://doi.org/10.21009/jtp.v21i2.11030.

Turşucu, S., Spandaw, J., Flipse, S., Jongbloed, G., & de Vries, M. J. (2018). Teachers' beliefs systems about improving transfer of algebraic skills from mathematics into physics in senior pre-university education. *International Journal of Science Education*, *40*(12), 1493–1519. https://doi.org/10.1080/09500693.2018.1486520.

Ummah, R., Suarsini, E., & Lestari, S. R. (2020). Pengembangan E-modul Berbasis Penelitian Uji Antimikroba pada Matakuliah Mikrobiologi. *Jurnal Pendidikan: Teori , Penelitian, Dan Pengembangan*, *5*(1), 572—579. https://doi.org/10.17977/jptpp.v5i5.13432.

Warliah. (2017). Pendidikan Berbasis Gender Awareness: Strategi Meminimalisisr Bias Gender di Pondok Pesanter. *Jurnal Islam Nusantara*, *1*(2), 118–130. https://doi.org/10.33852/jurnalin.v1i2.30.

Zulfa, M. Y., Daharnis, D., & Syahniar, S. (2017). Hubungan antara Locus of Control dan Persepsi Siswa tentang Pendidikan dengan Motivasi Belajar serta Implikasinya dalam Pelayanan Bimbingan dan Konseling. *JPPI (Jurnal Penelitian Pendidikan Indonesia)*, *3*(1), 1–11. https://doi.org/10.29210/02017103.