

**Male or Female, who is better? Students' Perceptions of Mathematics Physics E-Module Based on Gender****Astalini<sup>1</sup>, Darmaji<sup>2</sup>, Dwi Agus Kurniawan<sup>3</sup>, Mashelin Wulandari<sup>4</sup>**<sup>1-4</sup>Faculty of Teacher Training and Education, Universitas Jambi, Indonesia

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Received: June 12<sup>nd</sup>, 2021. Revised: August 8<sup>th</sup>, 2021. Accepted: August 11<sup>st</sup>, 2021Available Online: August 18<sup>th</sup>, 2021. Published Regularly: September 1<sup>st</sup>, 2021**Abstract**

This study aims to determine student perceptions of the physics-mathematical e-module based on gender differences. This type of research is quantitative research. This research targets the students of the physics education study program at the Jambi University class of 2019, consisting of classes A, B, and C with a research sample of 120 people using simple random sampling. Data analysis was carried out descriptively and used normality, homogeneity, and ANOVA tests. The results of the Anova test showed that there were differences in perceptions based on gender, with a significance of 0.018 for females and 0.025 for males, which means that there are differences in student perceptions. Furthermore, this difference can be seen in the LSD follow-up test where there are two classes for the female gender, which have significant differences in perception in class A and class C with a significance of 0.044 and classes B and C with a significance 0.011 for the female gender. Meanwhile, in the male gender, only classes B and C have a significant difference with a significance value of 0.07. However, overall, students gave a good perception of this e-module so that this e-module can be used in learning mathematics and physics on partial differential material.

**Keywords:** e-module, gender, mathematical physics, students perception**Corresponding Author:***Dwi Agus Kurniawan, Faculty of Teacher Training and Education, Universitas Jambi, Indonesia**Email: dwiagus.k@unja.ac.id***1. Introduction**

Technology and education are two things that cannot be separated. One of the undeniable challenges in the 21st century is preparing human resources (HR) who can communicate and master science (Malik, 2019; Yaminah, Roemintoyo, & Kartikasari 2020; Silwana et al., 2021). These challenges include developing literacy in information and communication technology (ICT), critical thinking skills, problem-solving skills, and collaboration skills that will be useful in the field of education (Suarsana & Mahayukti, 2013; Hadinugrahaningsih, Rahmawati, & Ridwan, 2017; Hermansyah, 2020; van Laar et al., 2020). Education aims to educate the nation's life, prepare students

to become people who can contribute and have a positive impact on society now and in the future (Desstya, Novitasari, Razak, & Sudrajat, 2017; Kurniawan, Astalini, Darmaji, & Melsayanti, 2019; Mafudiansyah, Sari, & Arsyad, 2020; Syahmani et al., 2021). So that to achieve these goals, we need learning media in the form of teaching materials that can make it easier for students to understand a learning material.

Teaching materials are the most crucial part of the continuity of the teaching and learning process. Teaching materials are an alternative to support learning activities expected to provide a concrete picture of the material (Widodo, Darhim, & Ikhwanudin, 2018; Adisti, 2021; Hardiana & Aisah,

2021). Teaching materials can be in the form of a set of tools for learning that teachers use to provide material to students (Syafrijal & Desyandri, 2019; Faisal, Hotimah, Nurhaedah, AP, & Khaerunnisa, 2020; Rismaningtyas, Slamet, Kurniawati, & Pranoto, 2019). However, the problem that often arises in the teaching and learning process in schools is that the material for each book is different, and the material contained in the book is not under the characteristics of students (Sukerni, 2014; Henriksen, Richardson, & Mehta, 2017). So this needs to be overcome through innovations such as using electronic modules or e-modules.

E-Module is one of the teaching materials that utilize technology as an innovation. Because Modules following current developments are electronic-based modules or commonly known as e-modules (Putra, Irawan, & Pradnyana, 2017; Istikomah, Purwoko, & Nugraheni, 2020; Ustafiano & Purwanto, 2020). E-module is an abbreviation of the electronic module, which is an electronic-based module (Nalarita & Listiawan, 2018; Ramadhani & Fitri, 2020; Sofyan, Angereini, Muazzomi, & Larasati, 2020). This e-module is in the form of independent learning materials that are structured in order to achieve learning objectives (Afriyanti, Suyatna, & Viyanti, 2021; Ilmi, Arnawa, Yerizon, & Bakar, 2021; Ninawati, Burhendi, & Wulandari, 2021). The advantages of this e-module are that students are more interested in learning and are not bored with the usual teaching materials in understanding complicated and mathematical materials such as mathematical physics.

Mathematics physics is a combination of physics and mathematics and is a compulsory subject for physics education students at Jambi University. The topics discussed are related to advanced courses such as mechanics, modern physics, etc., which contain a

description of the problem and how to solve it (Saputri, Fadilah, & Wahyudi, 2016; Cape, 2018; Bustami, Ngadimin, & Farhan, 2020). However, in the physics education study program at the Jambi University, we rely on the book *Mathematical Methods in the Physical Sciences* by Mary L. Boas, which uses English, so it is pretty difficult for students (Ellianawati & Wahyuni, 2012; Rifan, 2018; Wilujeng & Permatasari, 2019). In comparison, the use of teaching materials such as e-modules serves as a tool to package learning materials and concepts well as well as to improve the quality of learning (Pathoni, Jufrida, Saoutri, & Sari, 2017; Jazuli, Azizah, & Meita, 2018; Darmaji, Astalini, & Kurniawan, 2019). Especially at this time, in the era of the Covid-19 pandemic.

The Covid-19 pandemic or coronavirus disease 2019 has become a severe problem and has spread to various sectors of life, such as education (Daniel, 2020; Dogar et al., 2020; Jena, 2020). This causes learning to be done with writing and requires updates such as images, animations, and videos (Jena, 2020; Setiawan et al., 2020). This is also needed in learning mathematical physics, so this mathematical physics e-module was created with the help of 3D Pageflip Professional software that can improve the quality of this e-module.

The quality of a product, namely e-modules, can be seen by measuring the perceptions of students. Perception is a person's perspective through a process of the five senses processed and then concluded to understand information (Qiong, 2017; Yodha, 2019; Yunita & Maisarah, 2020). This perception is used to see how students perceive an object or product, either in the form of a design or as a whole (Pathoni et al., 2017; Yunita & Maisarah, 2020; Hernanto, Atmojo, & Ardiansyah, 2021). This percep-

tion is carried out to determine how students view the e-module of mathematical physics on partial differential material using 3d page flip professional software. 3d pageflip professional software is an application used to create flipbooks or e-books, e-papers, and e-magazines, published in various formats (Bakri, Siahaan, & Permana, 2016; Apriyanto, Yusnelti, & Asrial, 2019; Syahrial, Arial, Kurniawan, & Piyana, 2019).

In addition, this perception will also see how students' perceptions are based on gender in each class, where gender differences are differences in characteristics, traits, and ways of thinking between men and women (Desiningrum, 2015; Anggoro, 2016; Rizkiyah, Susanto, & Nugroho, 2016). Gender belongs to a social category that refers to an individual's social, cultural, and biological meaning and identity (Vinlandari & Gunawan, 2020; Yuliani, 2019). This gender is divided into men and women, where women's ways of thinking are more apparent, and their emotions are more organized than men who are more realistic or use their minds more. (Anggoro, 2016; Xu & Waniganayake, 2018; Umaroh & Pujiastuti, 2020). This gender difference can be a factor in the differences in student perceptions.

Based on some of the descriptions above, then researchers are interested in conducting this research to answer the following questions: (1) How are the students' perceptions of the Regular A, B, and C classes on the physics-mathematical e-module on gender-based differential material; and (2) What are the differences in student perceptions based on gender differences in grades A, B, and C to the physics-mathematical e-module on gender-based differential material.

## **2. Method**

The type of research used is quantitative research with descriptive statistical type.

Quantitative research will produce data in the form of numbers about phenomena that are then analyzed using statistical data (Winarsunu, 2017; Sulfemi, 2018; Febriantini & Prayogo, 2020; Thambu et al., 2021). This type of research is conducted to describe or overview a phenomenon in a systematic and objective Malener based on facts in the field (Astalini et al., 2019; Prasko, Sutomo, & Santoso, 2016; Isnawati, Jalinus, & Risfendra, 2020). In addition, this quantitative descriptive study was used to see student perceptions where. This data came from a questionnaire, where students gave their assessment of the object under study. (Pathoni et al., 2017; Darmaji, Kurniawan, et al., 2019; Febriantini & Prayogo, 2020; Wulandari, Wirayuda, Aldila, & Wulandari, 2020). The quantitative data in this study were obtained from a student perception questionnaire.

The data collection instrument in this study was using a student perception questionnaire. A questionnaire or questionnaire is an evaluation tool that contains questions or statements that respondents will fill out to obtain information for quantitative data (Riany, Fajar, & LukMale, 2016; Irwansyah, Lubab Farida, & Ramdhani, 2017). This perception questionnaire uses a Likert scale of 4. The Likert scale itself is a scale developed by Likert and used to systematically measure things (Joshi, Kale, Chandel, & Pal, 2015; Maryuliana, Subroto, & Haviana, 2016; Beune et al., 2018). The Likert scale (1-4) is designed to measure the perception of a person or group of people where a score of 1 to 4 indicates that 4 = very good, 3 = good, 2 = not good, and 1 = very bad (Darmaji, Kurniawan, et al., 2019; Pranatawijaya & Priscilla, 2019; Supandi & Gymnastics, 2020). The student perception questionnaire instrument can be seen in the following table.

**Table 1. Student Perception Questionnaire**

Variable	Indicator	Items
Display	1. Text clarity	1
	2. Clarity of images, animations, videos, and simulations	2,3,4
	3. Draw pictures, animations, videos, and simulations	5
Theory	1. Presentation of material	6,7
	2. Clarity of sentences	8,9
	3. The suitability of the sample with the material	10
	4. Suitability of images, animations, videos, and simulations	11
Benefits	1. Ease of learning	12,13
	2. Interest in using e-modules	14
	3. Increased learning motivation	15

The student perception questionnaire grid in table 1 consists of 3 variables, namely the appearance of the e-module, the material of the e-module, and the benefits of the e-

module, with ten indicators and 15 positive statements. The range of scores is shown in the following table.

**Table 2. Perception Questionnaire Quantitative Criteria Score Range**

Range	Criteria
48,76 – 60,00	Very good
37,51 – 48,75	Good
26,26 – 37,50	Not good
15,00 – 26,25	Very Not Good

The range of students' perception questionnaire scores in table 2 consists of 4 ranges and 4 criteria.

The population in this study was the 2019 Jambi University physics education students who had contracted the mathematics physics course one as the research population. The population is everything studied and has specific characteristics important in research (Asiamah, Mensah, & Oteng-Abayie, 2017; Nasution, 2017; Jaya, 2019). At the same time, the sample represents the population but is considered to represent the data as a whole (Otzen & Maletterola, 2017; Duli, 2019; Sunaryono, 2019). The sample used in this study were 120 students from the Regular class A, B, and C consisting of 45 male students and 75 female students.

The sampling technique in this study used simple random sampling. Simple ran-

dom sampling is a sampling technique carried out randomly in the Management of the questionnaire (Purwanto, 2018; Maharani, Maupa & Aswan, 2020; Owusu-Fordjour, Koomson, & Hanson, 2020). In the simple random sampling technique, each population element has an equal chance, and members of the population are considered homogeneous (Ethics, 2017; Yazid, 2017; Arieska, 2018). The perception of this sample will be the object of research.

The data analysis technique used in this research is descriptive analysis and inferential analysis. The first is descriptive data analysis presented in a frequency distribution in the form of numbers such as mean, mode, median, standard deviation, minimum value, and maximum value (Winarsunu, 2017; Odhier et al., 2019). The second is inferential statistical data analysis which is carried out

with the ANOVA test to determine whether or not there are differences in perceptions in the three classes (Zhu, Srivastava, Ibrahim, Patro, & Love, 2019; Masni, Ralmugiz, & RukMale, 2020; Sherliwati, 2021). However, before the ANOVA test is carried out, the assumption test consists of normality and homogeneity tests (W. Kurniawan, Darmaji, Astalini, Kurniawan, & Hidayat, 2019; Huda et al., 2020; Widiyono, 2021).

According to Kurniawan et al. (2019) and Widiyono, the prerequisite or assumption test includes two tests: normality and homogeneity tests, while hypothesis testing consists of ANOVA tests.

#### a. Normality Test

The normality test was conducted to see whether the independent and dependent variables were normal or not, or in other words, whether the data used were normally distributed or not. Expected or not, the data can be seen from the significance value. The guideline for decision making is if the significant value is  $< 0.05$ , the data is not normal, and vice versa. On the other hand, if the significance value is  $> 0.05$ , the data is normal. The normality test was carried out with the help of SPSS by looking at the significance results of Kolmogorov Smirnov.

#### b. Homogeneity Test

After the data is declared to be normally distributed, then the homogeneity test is then

carried out. Finally, a homogeneity test is carried out to see the level of homogeneity of data. This homogeneity test was carried out using SPSS where the significant value on Levene's Test for Equality of Variance with the condition  $\text{sig} >$  with a level of  $= 0.05$  or, in other words, the significance was more significant than 0.05.

#### c. Hypothesis Testing

After the data is declared to meet the requirements of the assumption test, then the hypothesis test can then be carried out. This hypothesis test is done by ANOVA test. The test was carried out with a significance level of 5% or 0.05. Decision making on this hypothesis test is based on the following criteria:

1.  $H_0$  is accepted, and  $H_a$  has rejected if the value of  $\text{Sig} > 0.05$  means that there is no significant difference between students' perceptions of gender in classes A, B, and C.
2.  $H_0$  is rejected, and  $H_a$  has accepted if the value of  $\text{Sig} < 0.05$  means a significant difference between students' perceptions in classes A, B, and C.

The research process carried out can be seen in the following flow chart

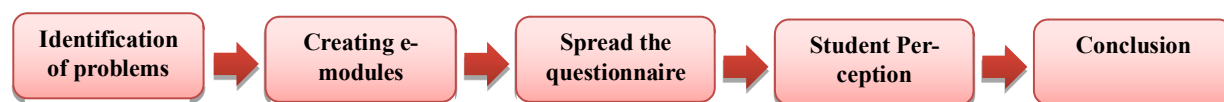


Figure 1. Research Flow Chart

### 3. Result and Discussion

This research was conducted by distributing perception questionnaires to students of physics education class A, class B, and class

C class 2019 via Google Form. The questionnaire used a 4-point Likert scale. The data that has been collected was analyzed descriptively using SPSS to see how students

perceive in classes A, B, and C. Perception is a person's perspective on an object he observes (Yodha, Abidin, & Adi, 2019; Anggoro, 2016). This perception can also be influenced by gender, where gender is the difference in the nature and way of thinking

between men and women (Rizkiyah, Susanto, & Nugroho, 2016).

This perception can be known by performing statistical and inferential data analysis. As for statistically, the data obtained can be seen in Table 3 below.

**Table 3. Description of Students' Perceptions in Class A on the Mathematics Physics E-Module**

Interval	Category	F	(%)	mean	median	Mode	Min	Max	Gender
15.00 – 26.25	Very Not Good	0	0						
26.25 – 37.50	Not good	0	0	47.96	47.00	42.00	42.00	58.00	female
37.51 – 48.75	Good	15	62.5						
48.76 – 60.00	Very good	9	37.5						
15.00 – 26.25	Very Not Good	0	0						
26.25 – 37.50	Not good	2	12.5	44.94	45.50	48.00	37.00	52.00	Male
37.51 – 48.75	Good	11	68.8						
48.76 – 60.00	Very good	3	18.8						

Table 3 provides descriptive information on students' perceptions of the physics-mathematics e-module for class A consisting of 40 students divided into 24 female students and 16 male students. For female students, 62.5% or 15 people said this e-module was good, and 37.5% or 9 people said this e-module was very good. Thus, the average value (mean) of perception is 47.96 with a median of 47, mode 42, a minimum value of 42, and a maximum of 58. As for male students, 12.5% or 2 people stated that this e-module is not good 68.8% or 11 people said it was good, and 18.8% or 3 people said it

was very good. Meanwhile, the average statistic is 44.94, the median is 45.50, the mode is 48.00, the minimum value is 37, and the maximum value is 52.

Based on these results, both female and male students in class A have a more dominant perception in the good category, but the average perception of female students is higher. So that this mathematical physics e-module can be used as a learning medium. Furthermore, it can be done to test the description of the perception results of students in class B based on gender. These results can be seen in Table 4.

**Table 4. Description of students' Perception in class B on the Mathematics Physics E-Module**

Interval	Category	F	(%)	mean	median	Mode	Min	Max	Gender
15.00 – 26.25	Very Not Good	0	0						
26.25 – 37.50	Not good	0	0	48.91	49.00	54.00	38.00	57.00	female
37.51 – 48.75	Good	11	50						
48.76 – 60.00	Very good	11	50						



Interval	Category	F	(%)	mean	median	Mode	Min	Max	Gender
15.00 – 26.25	Very Not Good	0	0						
26.25 – 37.50	Not good	3	16.7						
37.51 – 48.75	Good	14	77.8	42.83	43.00	43.00	36.00	54.00	Male
48.76 – 60.00	Very good	1	5.6						

Table 4 provides information on students' perceptions of the physics-mathematics e-module for class B, consisting of 40 students divided into 22 female students and 18 male students. For female students, it was found that 50% (11 people) said this e-module was good, and another 50% (11 people) said this e-module was very good. Meanwhile, in the perception of men, 16.7% (3 people) said this e-module was not good, 77.8% (14 people) said it was good, and 5.6% (1 person)

said it was very good. So based on the results of this perception, it can be seen that the dominant students stated that this e-module was good to use, but based on gender, female students had a higher average perception. After conducting descriptive tests in class A and B, descriptive tests in class C can be carried out to obtain information on student perceptions in class C. The results can be seen in Table 5.

**Table 5. Description of Students' Perception in Class C on the Mathematics Physics E-module**

Interval	Category	F	(%)	mean	median	Mode	Min	Max	Gender
15.00 – 26.25	Very Not Good	0	0						
26.25 – 37.50	Not good	1	4	44.80	43.00	40.00	36.00	54.00	female
37.51 – 48.75	Good	18	72						
48.76 – 60.00	Very good	6	24						
15.00 – 26.25	Very Not Good	0	0						
26.25 – 37.50	Not good	0	0	47.67	46.00	45.00	40.00	57.00	Male
37.51 – 48.75	Good	9	60						
48.76 – 60.00	Very good	6	40						

Table 5 provides information on students' perceptions of the physics-mathematics e-module for class C, which comprises 40 students divided into 25 female students and 15 male students. Based on table 5 above, 4% of female students (1 person) said this e-module was not good, 72% (18 people) said this e-module was good, and 24% (6 people) said it was very good. Meanwhile, 60% of male students (9 people) stated that this e-module was good, and 40% (6 people) stated that this e-module was very good. Thus, based on the

descriptive results of Class C, the dominant students gave a good perception of the e-module. However, male students have a higher average perception.

Based on the results of the descriptive tests in classes A, B, and C in table 3, table 4, and table 5, it can be seen that there are differences in perceptions based on gender, namely between male and female students. This gender difference is one of the factors that give different perceptions between male and female students. This is because women

are considered to have a more transparent and more efficient way of thinking so that the information obtained is processed and analyzed as well as possible, compared to men who are more realistic and use their minds (Umaroh & Pujiastuti, 2020). This is what causes perceptions between students based on gender can be different because there are differences in the way they receive information about an object.

After the data were analyzed descriptively, the data were analyzed using inferential statistics to determine the differences in perceptions of each gender in classes A, B, and C, which consisted of testing assumptions and hypotheses. This assumption test consists of a normality test and a homogeneity test (Widiyono, 2021). The results for the assumption test can be seen in the following table.

**Table 6. Normality Test by Gender**

Gender	Class	Sig	Distribute
Female	A	0.091	Normal
	B	0.073	Normal
	C	0.162	Normal
Male	A	0.462	Normal
	B	0.387	Normal
	C	0.390	Normal

Table 6 provides information on the distribution of data in classes A, B, and C by gender. In the normality test, the data is normally distributed when the sig value  $> 0.05$ . This significance value is seen from the results table Kolmogorov-Smirnov (Christidamayani & Kristanto, 2020). Based on the table, the female gender in classes A, B, and C, the significance values are 0.091, 0.073, and 0.162, respectively. This shows that the data is normally distributed on the

female gender. On the other hand, the significance values for the male gender in classes A, B, and C are 0.462, 0.387, 0.390, respectively. This means that the perception data of students with male gender is also normally distributed.

After the data is declared to be normally distributed, the homogeneity test is carried out as the second assumption test. The results of the homogeneity test can be seen in the following table.

**Table 7. Test For Homogeneity by Gender**

Gender	Levene Statistics	df1	df2	Sig.
female	1.075	2	68	0.347
Male	0.556	2	46	0.577

Table 7 provides information on the homogeneity of the data by gender. In this homogeneous test, the data is said to be homogeneous or have similarities if the significant value obtained is greater than 0.05. Based on the table, it is known that the significance value for the female gender is 0.347, and for the male gender, the significance value is

0.577. This shows that sig  $> 0.05$ , which means the data is homogeneous.

After the data is declared normal and homogeneous, the hypothesis can be tested using the ANOVA test. The results of the ANOVA test can be seen in the following table.



Table 8. ANOVA Test by Gender

Gender	ANOVA					
		Sum of Squares	df	Mean Square	F	Sig
Female	Between Groups	221.815	2	110,908	3.838	0.018
	Within Groups	1964,777	68	28,894		
	Total	2186,592	70			
Male	Between Groups	191.229	2	95.615	3.981	0.025
	Within Groups	1104.771	68	24.017		
	Total	1296,000	70			

Table 8 presents the results of the ANOVA test conducted using SPSS. For the female gender, the value of sig < 0.05 is 0.018. So  $H_0$  is rejected, and  $H_a$  is accepted, meaning that the average perception of female gender in classes A, B, and C has differences. As for the male gender, the significance value is also smaller than 0.05. So  $H_0$  is rejected, and  $H_a$  is accepted, meaning that in the male gender, there is also a difference in the average perception between boys in grades A, B, and C on the e-module of mathematics physics on partial differential material.

After the ANOVA test was carried out to see whether or not there were differences

in the class, it could also be seen which class had different perceptions through an advanced test or post hoc test. The post hoc test is a further test after it is known that there is a difference in the ANOVA test (Setyawati, Endrawati, Health, & Mulia, 2019). The post hoc test used in this study was the LSD test to find out the differences in more detail. This LSD test will provide detailed information about the differences in perceptions between groups (Noviyanto et al., 2020). The results of this test can be seen in the following table.

Table 9. LSD Post Post Hoc Test Results

Class (I)	Class (J)	Mean Difference (IJ)	Sig	Gender
A	B	-.951	0.551	Female
	C	3,158*	0.044	
B	A	.951	0.551	
	C	4.109*	0.011	
C	A	-3,158*	0.044	
	B	-4,109*	0.011	
A	B	2.104	.218	Male
	C	-2,729	.128	
B	A	-2.104	.218	
	C	-4,833*	.007	
C	A	2,729	.128	
	B	4,833*	.007	

Table 9 shows that almost all classes have significant differences in the female gender. However, those who meet the requirements with  $\text{sig} < 0.05$  are class A and class C with a significance of 0.044 and classes B and C with a significance level of 0.011. So it can be concluded that classes B and C have a very significant difference in the female gender. Meanwhile, when viewed from the male gender, only classes B and C have a significant difference with a significance value of 0.07. This means a significant difference in class A and C in male students, while the other classes are not.

Based on the research results, it turns out that gender does affect the differences in perceptions that occur, where the gender of women shows a more dominant difference than men. In line with previous research, which stated that Biological factors cause this difference in perception in the brain because women use their emotions more often or are more realistic than men, and women have verbal superiority in their brains. (Dilla, Hidayat, & Rohaeti, 2018; Darsini, Fahrurrozi, & Cahyono, 2019). However, overall, the students stated that the mathematics physics e-module on this partial differential material was good. Furthermore, the existence of this e-module is expected to improve student learning outcomes because this e-module has been designed as well as possible so that the process of understanding the material becomes more interesting for students.

The e-module is a form of a print module developed into electronics (Sugihartini dan Jayanta, 2017). The advantages of this electronic module can make it easier for students to obtain information and be used without dependence on place and time so that it is more effective and efficient (Fausih & Danang, 2015; Darmaji, Kurniawan, et al., 2019). In addition, technology-based

modules can help make learning more interactive and innovative, increasing student motivation (Subali & Handayani, 2012; Williamson et al., 2019). As in mathematics physics learning, understanding mathematical concepts is needed so that students can solve problems and train reasoning and logical thinking skills (Juliani et al., 2021). So that learning like this is needed now, wherein the Covid-19 era learning is more often done online.

The learning carried out during this pandemic is a challenge in education to create innovative learning because learning that changes suddenly makes learning less than optimal (Yadav, 2020). This will undoubtedly affect the learning process if it is allowed to continue. So to address this, one thing that can be done is to provide e-modules. The e-module used in this study is the physics-mathematical e-module developed using the 3D Pageflip Professional application. This e-module is carried out as a learning media innovation that can help students understand mathematics physics learning.

This research needs to be done because this perception can have an impact on future learning. For example, the implications of this perception result can make students understand the partial differential material and make students pass this course. Meanwhile, in the long term, this perception can help provide an overview of student understanding to help prepare students to become good teachers in the future, especially in mathematics and physics courses. However, this research is limited to looking at students' perceptions of the e-modules made. It is hoped that further researchers can examine these students' perceptions in the broader field, such as HOTS (High Order Thinking Skills), critical thinking, and others.

#### 4. Conclusion

Based on the research results on student perceptions of the physics-mathematical e-module, it can be concluded that gender is one of the factors that influence differences in perceptions between female and male students. This can be seen in the ANOVA test, which shows a significance value of 0.018 for the female gender and 0.025 for the male gender. This shows that  $\text{sig} < 0.05$ , which means there are differences in student perceptions. Furthermore, this difference can be seen in the LSD follow-up test where two classes for the female gender have significant differences, namely class A and C and class B and C. Meanwhile, for the male gender, there is the only difference between class B and class C.

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