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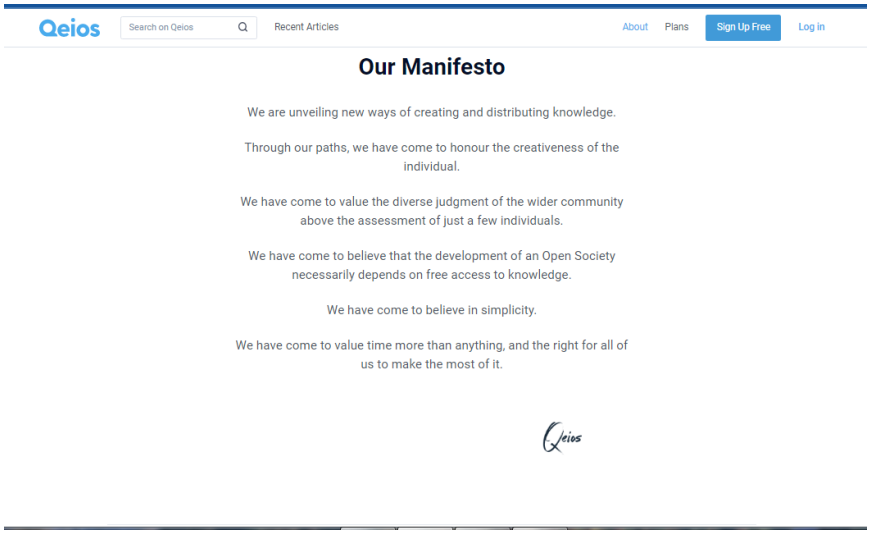

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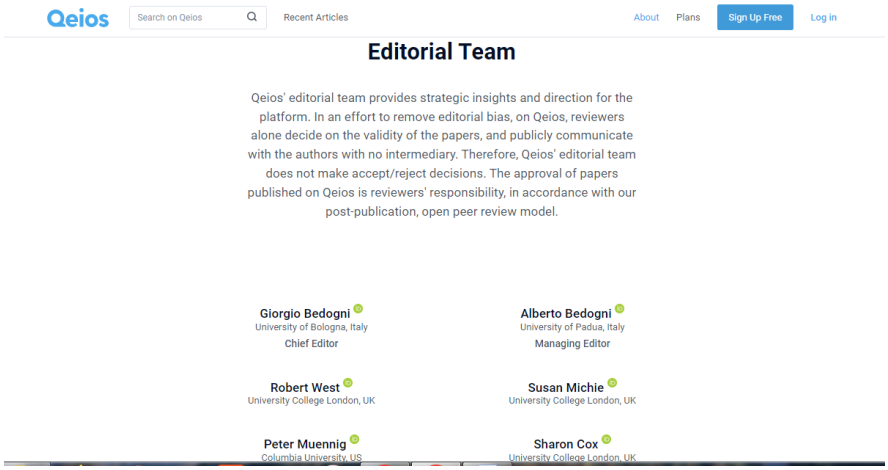

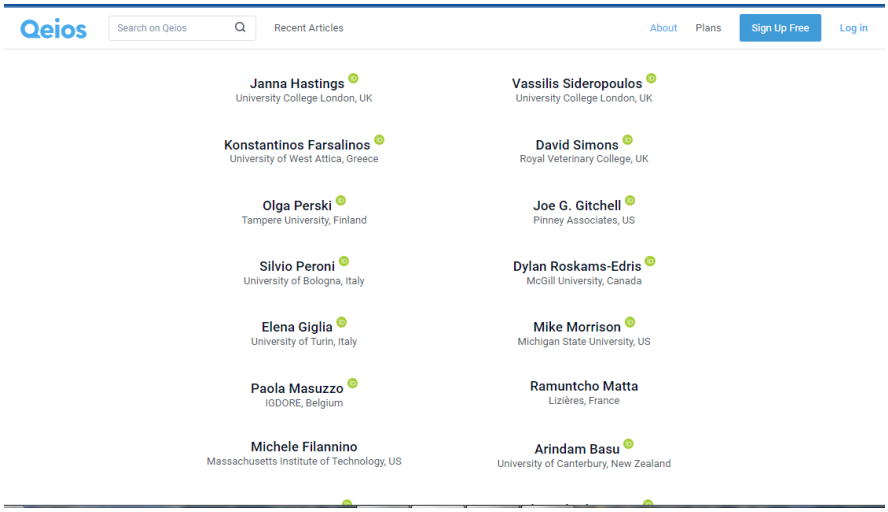

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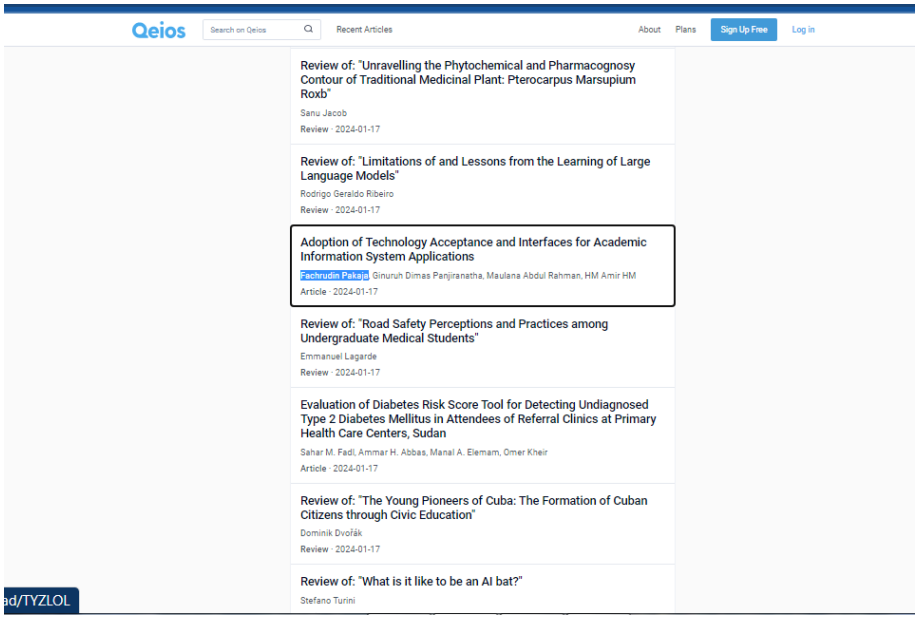

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Adoption of Technology Acceptance and Interfaces for Academic Information System Applications

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Abstract

Research Background. An academic information system (AIS) was built to provide convenience to students in online academic administration activities. **Objective**. To find out how information system technology can be accepted by students in supporting their academic and learning activities, we measure the adoption of educational information system acceptance through TAM theory and the user interface. **Method**. Using a quantitative approach based on positivism philosophy for health polytechnic students, we use regression analysis for the construction of research variables. **Results**. PU is the most significant predictor in driving technology adoption followed by interfaces and PEoU, it is important for higher education leaders to integrate this technology well through the design and implementation of technology that benefits students.

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1. Introduction

An academic information system (AIS) is an information system built to provide convenience to users in online campus academic administration activities, such as the process of admitting new students (ANS), making class schedules, filling in study plan cards (SPC), filling in grades, guardianship, management of lecturer & student data and implementation of the

SIA application also support the reporting of educational results. With the AIS application[2], it is expected that data processing between users, especially students and parts of the academic system that receive input from students as well as transactions of lecture activities and administrative activities between students and universities can take place properly.

One important element in implementing an information system is acceptance of the information system (Berdik, et al. 2021). The success of an information system is not only determined by how well the system can process input and produce information, but also how users want to receive and use it (Hoi, 2020), so that they are able to achieve organizational goals (Baiyere et al., 2020). Some literature discusses the adoption of educational information systems for students, for example: Bond, et al (2020) explains that many educational technologies are designed to be interactive and interesting, which can help students stay engaged and motivated in learning (Rajabalee & Santally, 2021). Muqorobin & Rais (2020) explain that educational information systems (SIP) usually provide communication facilities that allow students to interact with teachers, lecturers, and their peers. Adoption of technology supports the emergence of collaboration in learning activities (Cheung & Vogel, 2013) and provides an easy channel to get help or clarification on educational issues (Chang, et al., 2015). Measuring SIP adoption is a way to ensure that these tools are used properly and provide real benefits for students (Martins et al., 2019), besides understanding the extent to which students adopt and utilize AIS can assist educational institutions in identifying areas that need improvement in implementing educational technology (Alamary, et al., 2022) and providing a better educational experience (Tarhini, et al., 2019).

Another measure of the level of acceptance of information systems by users is influenced by interface design (Dillon 2001) and is the main way of establishing communication between users (in this case, students) and the system (Minichiello, et al., 2018). Gunawan, et al (2018) explained that good interface design can improve user experience. Students who feel comfortable and satisfied with the way they interact with SIP will be more likely to accept it and use it actively (Garcia & Revano, 2021; Szymkowiak et al., 2021). Furthermore, good interface design must consider accessibility needs (Miñón, et al., 2014), so that all students, including those with disabilities, can easily access and use this information system (Bergman & Johnson, 2001). Interfaces that allow students to customize their experience according to their preferences can increase technology acceptance (Eraslan Yalcin & Kutlu, 2019) and provide flexibility for students to set the appearance or features they need (Celdrán, et al. 2019). Measuring the user interface relationship in the system that is currently running in educational institutions can ensure that this system is more easily accepted by students (Samsudeen & Mohamed, 2019) and can provide greater benefits in an educational context (Farhan, et al., 2019).

This study aims to measure the adoption of acceptance of educational information systems through TAM theory (for example: perceived usefulness & perceived ease of use) and user interfaces on students' interest in using academic information systems. It is important for university management to know how this technology can be used well by students in supporting their academic and learning activities (Chang 2016; Rapanta, et al., 2020), the extent to which students can integrate this technology in supporting learning outcomes (See, et al., 2022) and their educational administration activities (Flecknoe, 2002), and whether the technology is actually capable of enhancing their educational experience (Ahmed & Opoku 2022). By understanding and measuring the adoption of this technology, university management can evaluate and

improve the use of educational technology and ensure that this system is more easily accepted by students in providing maximum benefits in supporting their educational outcomes.

2. The Art of Research

2.1. Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is a model that can be used to analyze the factors that affect the acceptance of a system / information system. This model was first introduced by Fred Davis in 1986 (Pakaja & Wava, 2021) using a measure of user behavior through perceived usefulness and perceived ease of use.

a. Perceived Ease of Use

A level where a person believes that using the system can improve his performance at work (Lee, et al., 2010). Perceived ease of use in technology acceptance is defined as a measure of one's trust in technological devices that are easy to understand and use (Al Shamsi, et al., 2022). If users find technology difficult to use, they may be reluctant to try it (Alabdulaziz, 2021). Perceptions of ease of use have a significant impact on the adoption and use of information systems (Chen & Aklikokou, 2020). In academic information systems, perceived ease of use is a very important concept because it refers to students' beliefs that the system is easy to use (Hamid, et al., 2020). Davis (in Pakaja & Wava, 2021) divides the size of the dimensions of Perceived ease of use into 6, namely: controllable, easy to learn, flexible, easy to use, easy to understand, easy to implement. We believe technology can help users achieve their goals and solve the problems they face (Pakaja & Wava, 2021), they are more likely to adopt it and use it actively, therefore the hypothesis in this research is:

- **H1**: Perceived Ease of Use is able to support students in accepting academic information system technology

b. Perceived Usefulness

A level where a person believes that using the system does not need to bother (Lee, et al., 2010). Perceived usefulness in using a technology is believed to bring benefits to people who use it (Sugandini, et al., 2018). If users do not see technology as useful, they may not be interested in using it (Orben, 2020). It is important to develop and implement an academic information system to ensure that this system is properly designed and managed (Gregor, et al., 2020) and is able to provide clear and measurable benefits to its users (Pan & Pee, 2020). Understanding and promoting Perceived Usefulness is one of the keys to success in ensuring the adoption and acceptance of academic information systems in academic environments by students (Al-Rahmi, et al., 2021). Davis (in Pakaja & Wava, 2021) divides the dimensions of perceived usefulness into 5, namely: facilitating work, increasing productivity, effective, useful and expediting work. When students interact with technology well, they will feel the ease of using access to academic information services (Gregor, et al., 2020), therefore the hypothesis in this research is:

- **H2**: Perceived usefulness can encourage students to accept academic information system technology

2.2. User Interface

The user interface (UI) is a face-to-face media between programs or applications and users (Pering, et al., 2005). The term user interface is widely used in describing HCI (Human Computer Interaction) (Carroll, 1997). HCI (Human Computer Interface) is all aspects of user and computer interaction, not just hardware (Si-Mohammed, et al., 2019). Everything that is seen on the screen, read in the documentation and manipulated with the keyboard (or mouse) is part of the UI (Williams & Shekhar, 2019). A good interface needs to consider accessibility (Usak, et al., 2020). The designed system must accommodate the needs of users with various levels of ability (Iancu & Iancu, 2020). An inclusive UI will ensure that everyone can access the system easily (Srivastava, et al., 2021). In addition, a good interface can also reflect the reputation of an academic institution and increase positive perceptions of the institution in the eyes of students, prospective students and staff (Kaushal & Ali, 2020). Galitz (2007) divides the size of interface design into 10, namely: visibility of system status, compatibility between system and reality, user control and freedom, consistency and standards, error prevention, reinvention, flexibility and efficiency of use, aesthetic and minimalist design, assistance user identification, diagnosis and recovery from errors, help and documentation. When the interface is well designed, students will easily use access to this information service to support their academic activities (Kaushal & Ali, 2020), therefore the hypothesis in this research is:

- **H3**: Good interface design can encourage acceptance of academic information system technology

2.3. Behavioral Intention to Use

The level of acceptance/use of a computer technology in a person can be predicted from the user's attentive attitude towards the technology, for example the desire to add supporting peripherals (Alabi & Mutula, 2020), motivation to keep using it (Lin & Lai, 2019), and the desire to motivate users others (Bukar & Bidin, 2014). Revythi & Tselios (2019) define behavioral intention to use technology (behavioral intention to use) as a person's interest (desire) to perform certain behaviors. It is important to understand that adoption intention is not a guarantee that users will actually adopt an educational information system (Lumor, et al., 2020). However, it is an important initial reference in the acceptance process (Shahbaz, et al., 2019). Therefore, it is important for information system providers to understand the factors that influence adoption intentions (Hung, et al., 2003), for example good interface design (Usak, et al., 2020; Kaushal & Ali, 2020) and strive to ensuring that users have sufficient interest to proceed to the next stage in successfully adopting the system (Eraslan Yalcin & Kutlu, 2019; Hsu, et al., 2014). Davis (in Jackson, et al., 1997) divides the size of intention to accept interest into 6, namely: liking, according to procedures, feeling helped, attractive, availability of information, and comfort. Therefore, this research proposes the following hypothesis:

- **H4**: Simultaneously PU, PeOU, Interface will be able to encourage acceptance of academic information system technology

3. Research methods

3.1. Research Information

In this study we used a quantitative approach based on the philosophy of positivism to examine the population in a particular sample. The population that we used in this study were students of the Health Polytechnic of Malang City. To obtain data for this study, we used a research questionnaire which we shared via online and offline links. We made an online link with the help of the Google form and the link from the questionnaire we sent to students and we also asked for help from the head of the nutrition department to help distribute this questionnaire. In order for the student data to suit research needs in the initial questions in this online survey, we first ask the choice of student majors and if it does not comply with the provisions of the sample (students majoring in nutrition), students can leave this survey directly. In the offline survey, we used question paper which we distributed to students majoring in nutrition that we know and meet at the university. It took me 10 minutes to be able to complete this whole set of questions. We compiled the question indicators based on existing literature and to get a good measurement, we used a Likert scale.

3.2. Research Analysis

In order to get the best results in this study, there were several stages of research analysis that we carried out, namely: First, we conducted validity and reliability tests to ensure that the data we obtained did not have a correlation between the question indicators and the reliability of the data from each research construction variable was met. Second, we perform classic assumption tests (multicollinearity test, heteroscedasticity test, and normality test) on the research data to seek certainty from the regression equation that we propose. We perform classical assumption tests to obtain accuracy, unbiased data estimation and data consistency. Third, at this stage we will conduct research data analysis (for example: partial test and simultaneous test) to find out the meaning of each regression coefficient of the research relationship that we propose partially or simultaneously.

4. Result

4.1. Validity and Reliability Test

The results of data collection both online and offline amounted to 182 respondents, of which we discarded 9 respondents' data because it did not comply with the provisions (respondents did not come from health polytechnics, lecturers and staff), thus leaving 171 respondents' data and we set it as the research sample. The first step to obtain the results of this research is to test the reliability and validity of the research. The requirements for the validity test on the question items in the research questionnaire are the corrected item-total correlation technique where if r is calculated ˃ r table (0.149) it means that the question items are declared valid (Torkian, et al., 2020). Meanwhile, we carried out the reliability test in this research to determine the consistency of variable measurement results with the condition that if the Cronbach Alpha value > 0.60 is obtained from research data analysis, the questionnaire or questionnaire is declared reliable or consistent.

Table 1. Validity and Reliability Test Results of Research Model

variable indicator	r count	cr. alpha	variable indivator	r-count	cr. alpha
Perceived Usefulness (X1)			**User Interface (X3)**		
PU1	0,831		ANT1	0,828	
PU2	0,911		ANT2	0,789	
PU3	0,932	**0.938**	ANT3	0,819	
PU4	0,777		ANT4	0,810	
PU5	0,949		ANT5	0,832	
PU6	0,840		ANT6	0,847	
Perceived ease of use (X2)			ANT7	0,814	
PEOU1	0,867		ANT8	0,902	
PEOU2	0,634		ANT9	0,833	
PEOU3	0,887	**0.887**	ANT10	0,860	
PEOU4	0,872		ANT11	0,848	**0.951**
PEOU5	0,657		ANT12	0,834	
PEOU6	0,861		ANT13	0,871	
Adoption Intentions (Y1)			ANT14	0,828	
Ad.Int1	0,849		ANT15	0,859	
Ad.Int 2	0,830		ANT16	0,878	
Ad.Int 3	0,955	**0.980**	ANT17	0,888	
Ad.Int 4	0,916		ANT18	0,871	
Ad.Int 5	0,876		ANT19	0,803	
Ad.Int 6	0,955		ANT20	0,801	
			ANT21	0,869	
			ANT22	0,823	

Based on the results of the validity and reliability tests as shown in table 1, all question items on the research construction variables have corrected item-total correlation r count ˃ r table (0.149) so that validity is met. Furthermore, for the value of Cronbach Alpha > 0.60 for each research construction variable and the reliability of the research data is met.

4.2. Classic assumption test

1. Normality test

We carried out the normality test for this study to ensure consistency in the research data. Research data can be said to be normal if the distribution of research data in plotting (the points in Figure 1) follows the diagonal line of the probability plot (Ghasemi & Zahediasl, 2012).

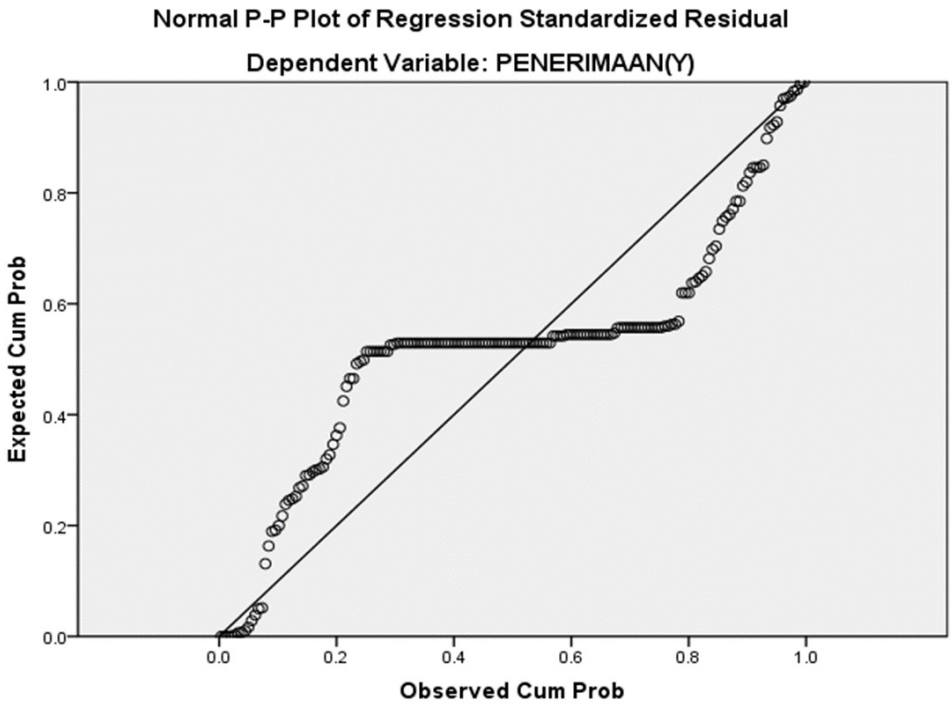

Figure 1. Image of data distribution from research regression results

The results shown in Figure 1 for the distribution of research data, the data points are spread around the diagonal line, so that the data distribution is assumed to follow or approach a normal distribution.

2. Multicollinearity Test

The multicollinearity test aims to test whether in the regression model a correlation is found between the independent variables and the dependent variable. The requirement for a research regression model to pass the multicollinearity test is to look at the results of the regression test for a tolerance value > 0.10 and a VIF value < 10 (Midi, et al., 2010).

Table 2. Research Multicollinearity Regression Test Results

Model		Coefficients[a]				
		Correlations			Collinearity Statistics	
		Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)					
	X1 (PU)	.928	.950	.180	.276	3.623
	X2 (PEOU)	.954	.941	.164	.199	5.018
	X3 (ANT)	.936	.947	.176	.251	3.980

[a] *Dependent Variable: Y (Ad.Int)*

The results shown in table 3 for the multicollinearity test results on all research construction variables have tolerance values and VIF values that are more than the provisions, where the VIF values X1 = 3.623, X2 = 5.018 and X3 = 3.980 (< 10) and the tolerance value = 0.199 and X3 0.251 (> 0.1), so it can be concluded that all research construction variables do not experience symptoms of multicollinearity.

3. Heteroscedasticity Test

We carried out a heteroscedasticity test in this study to find out whether there was an inequality of variance from the residuals of one observation to another. We carried out the Glejser test to test heteroscedasticity in research by looking at the regression of the absolute residual value against other independent variables with a significance probability value of 5% (Uyanto, 2022).

Table 3. Glejser Test Results of Research Model

Model		Coefficients[a]				
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.014	.014		1.043	.298
	PU(X1)	-.004	.006	-.106	-.726	.469
	PEOU(X2)	.008	.007	.205	1.194	.234
	ANT(X3)	-.003	.006	-.092	-.598	.551

[a] *Dependent Variable: Ad.Int (Y)*

The results of the Glejser test as shown in table 2 found that the values of all research construction variables had values greater than the probability, where (X1) 0.469 > 0.05 while (X2) 0.234 > 0.05 and (X3) 0.551 > 0, 05, so it can be concluded that heteroscedasticity does not occur in all research construction variables.

4.3. Research Data Analysis

1. Partial Test (t-test)

The t test was carried out to test the research hypothesis regarding the influence of each independent variable partially on the dependent variable. The t test is a statistical test to test the truth or falsity of a hypothesis between two randomly proposed sample means from the research population (De Winter, 2019). The requirement for partial test decision making in the research regression model is to look at the Sig value provided that the significance value is 5%.

Table 4. Partial Test Results of Research Regression Model

		Coefficients[a]				
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.010	.020		.495	.622
	X1 (PU)	.318	.008	.342	39.427	.000
	X2 (PEOU)	.358	.010	.368	36.071	.000
	X3 (ANT)	.321	.008	.350	38.516	.000

[a] *Dependent Variable: Y (Ad.Int)*

Based on the partial test results of the research regression model as shown in table 3, all research construction variables have a significance value below 5%. Perceived usefulness has a very strong, positive and significant influence (β = 0.318, t = 39.427, ρ < 0.000) on intention to accept technology. Furthermore, perceived ease of use has a strong, positive and significant influence (β =0.358, t =36.071, ρ <0.000) on interest in accepting technology and finally user interface has a strong, positive and significant influence (β =0.321, t =38.561, ρ < 0.000) on intention to accept technology.

2. Simultaneous Test

We carried out the F test in this research to find out whether the independent variables were simultaneously able to influence the dependent variable. The requirement for a simultaneous test is that all independent variables have a significant value of 5% and in the multiple analysis model the simultaneous test can be determined by looking at the Annova table (De Winter, 2019).

Table 5. Results of Simultaneous Hypothesis Testing of Research Models

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.711	3	9.570	16025.040	.000[a]
	Residual	.101	169	.001		
	Total	28.812	172			

[a] *Predictors: (Constant), X1 (PU), X2(PEOU), X3(ANT)*

[b] *Dependent Variable: Y(Ad.Int)*

Based on the results shown in table 4, the calculated F value is 16025.040 and the f-table requirement is 2.6584 (f-calculated > f-table). Meanwhile, the resulting significance value is 0.000, which is smaller than the significance value of 5%. The conclusion is that the independent variables which include PU (X1), PEOU (X2), and interface (X3) together have a positive and strong influence on the technology acceptance interest variable (Y).

5. Discussion

Consistent with several previous findings which explain attitude measures through perceived usefulness, perceived ease of use and interface in supporting interest in accepting technology. Perceived usefulness was found to have the strongest, positive and significant influence (β=0.318, t=39.427, ρ<0.000) in supporting interest in accepting academic information system technology by students majoring in nutrition. Sugandini, et al., (2018) explained the importance of the influence of perceived usefulness in the use of technology in bringing benefits to the people who use it. Understanding and promoting Perceived Usefulness is one of the keys to success in ensuring the adoption and acceptance of academic information systems (Al-Rahmi, et al., 2021). In the context of this research, students feel that by using AIS technology to support their learning activities, they will feel more productive, simplify academic administration activities and expedite the input process for their lecture activities. It is important for every university to ensure that the AIS system they develop can be managed well so that it provides clear benefits in student education administration activities so that the benefits can continue to be enjoyed by students.

Furthermore, the Perceived ease of use variable was found to have a strong, positive and significant effect (β=0.358, t=36.071, ρ<0.000) in supporting interest in accepting academic information system technology by students majoring in nutrition. According to Chen & Aklikokou, (2020) the perception of ease of use has a significant impact on the adoption and use of information systems. When the elements in an information system work in a predictable way and in accordance with the wishes of users, they will feel more comfortable in using the technology (Lukyanenko & Parsons, 2020). In this research, students trust AIS technology devices to support their academic activities because they are easy to run, have many interesting features and are easy to manage AIS applications to support their learning activities. AIS application administration managers need to maintain consistency in this application service and provide maximum technical support to make it easier for students to run this application. Apart from that, application usage guidelines must be maximized in

providing assistance to students when they experience problems with this application in order to facilitate educational administration activities.

The next results were that the user interface was found to have a strong, positive and significant effect (β=0.321, t=38.561, ρ<0.000) in supporting the interest in accepting academic information system technology by students majoring in nutrition. In line with the opinion of Iancu & Iancu, (2020) who explain that a well-designed system must be able to accommodate the needs of users with various levels of ability and ensure that everyone can access the system easily (Srivastava, et al., 2021). In this research, the interaction between students and computers via AIS can be carried out well because students are able to use the system efficiently in supporting their educational activities, apart from that the simplicity and functionality approach of AIS really supports students' desire to use this system and finally the openness of educational information contained in the system SIA really helps students in their educational administration activities. Managers and higher education leaders need to pay serious attention to interface design. A good UI is the key to making an academic information system an effective tool in the academic environment (Walling, E., & Vaneeckhaute, 2020).

Finally, the joint influence of PU, PEoU & user interface was found to encourage the intention to adopt AIS technology. When these three factors are well integrated in the design and implementation of technology, technology adoption by users tends to increase (Yang, et al., 2021). Additionally, when the three work together to shape a positive user experience and facilitate technology adoption. If PU is high, users are likely to see value in the technology (Kane, 2019). If PEoU is high, users feel more comfortable and confident in using the technology (Nangin, et al., 2020). A good UI plays a role in facilitating users' understanding of technology and minimizing barriers to use (Bharti, et al., 2020).

6. Conclusion

The academic information system (AIS) was built to provide convenience to users in online campus academic administration activities. To find out how this technology can be well received by students in supporting their academic and learning activities, we measured the adoption of acceptance of educational information systems through TAM theory and user interfaces on the intention to use AIS by nutrition students at the Malang Health Polytechnic. PU is the most significant predictor in encouraging technology adoption followed by interface and PEoU, it is important for health polytechnic leaders to integrate this technology well in the design and implementation of technology so that its benefits and goals are achieved.

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