The Effect of the Emergence of Artificial Intelligence on Student Motivation: A Study on FIA UB 2022 Students

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Abstract. This research aims to determine the influence of the emergence of Artificial Intelligence on student learning motivation, especially FIA UB 2022 students. The method used in this research is a descriptive research method with a quantitative approach. This research shows that Artificial Intelligence generally influences students' learning motivation in the Faculty of Administrative Sciences Class of 2022. Based on the results of simple linear regression analysis, it can be seen that there is a significant relationship between Artificial Intelligence and learning motivation as evidenced by tcount 11.308 > ttable 1.986. This is also supported by the grand mean value of 2.85 (agree). On the other hand, Artificial Intelligence causes their low appreciation for learning. This is proven by their low satisfaction with the answers produced by Artificial Intelligence and their suitability for achieving achievements. This research provides an understanding of how Artificial Intelligence influences student learning motivation. Artificial Intelligence can increase motivation to learn and search for information, both to increase knowledge and understanding.

Keywords: artificial intelligence, learning motivation, students, faculty of administrative sciences

1   Introduction

Information technology is a science used by humans to support many different types of things. With existing developments, information technology really helps humans in creating many things, including opportunities that will occur, one of which is the emergence of applications that help human activities. One of the results of the development of information technology is AI (Artificial Intelligence). AI is an Artificial Intelligence system in a computer designed to interact with the world through specific abilities and intelligent behavior similar to humans [1]. ChatGPT, a tool brought to you by OpenAI, is an artificial intelligence-based technology that aims to generate text based on user requests. With its ability to understand natural language, ChatGPT is designed to provide thoughtful and appropriate responses to user requests. The ChatGPT tool has received great attention: two months after its launch in November 2022, it reached 100 million users [2]. This technology can potentially revolutionize various human activities, including educational environments.

However, when using ChatGPT, there is concern that students may copy and paste text without carefully analyzing what has been highlighted or selected in a source, without citing the source. and not admitting the possibility of plagiarism [3]. These problems make the text generated by ChatGPT unsuitable for academic writing [4]. The question of detecting plagiarism in articles generated by ChatGPT was raised, as well as how to distinguish actual text from created fictional text [5]. However, Chat GPT has excellent power to advance academia and librarianship in new ways [6]. However, it should be noted that Chat GPT needs to be addressed wisely and responsibly, even though Chat GPT provides all the conveniences that can be obtained as students must have a good understanding of moral values so that students who use Chat GPT in education do not become complacent which can erode students' critical abilities.

ChatGPT can erode students' critical abilities. In actual practice, ChatGPT can also reduce student learning motivation; previously, students could spend three hours working on assignments with ChatGPT and one hour the duration of the task [7]. This indirectly shows that ChatGPT offers many conveniences that make students complacent with all these conveniences so that student motivation to learn will decrease. Therefore, the researcher conducted pre-research, where the researcher distributed questionnaires through social media, by including five questions that represented how and to what extent students knew ChatGPT and how influential ChatGPT was on student learning motivation.

Based on questions regarding the use of ChatGPT by students in increasing knowledge, learning motivation, and self-confidence it is evidenced by the results of pre-reconnaissance data with 40 respondents. The results showed that the majority of students agreed that ChatGPT could increase their knowledge, with a percentage of 65% of students agreeing and 27.5% strongly agreeing. Then, in the next two questions, the majority of students agreed that ChatGPT increased their motivation to learn, with a percentage of 37.5% of students agreeing and 17.5% of students strongly agreeing. This is following the statement that if someone feels confident that they can face challenges, then usually, the person is encouraged to do these activities; in this case, the challenge in question is learning, and ChatGPT is a driving factor that can indirectly convince students to face the challenge itself [8].

The same condition also occurs in the next question regarding students' ability to achieve learning goals and task completion with the help of ChatGPT. Students can achieve learning goals themselves through ChatGPT, as evidenced by the pre-research data, with a percentage of 55% agreeing and 15% strongly agreeing. This is consistent with the assertion that achievement propensity is determined by several factors, including motivation, opportunity, and intensity [9]. Vice versa, with the tendency to fail. This is also supported by [10] that AI-based tutoring programs can improve student performance and motivation in the learning environment. With the motivation, opportunities, and incentives in place, students have the potential to complete their assignments well. This is supported by the preliminary research data, where 52.5% agreed and 20% strongly agreed that ChatGPT could provide valuable assistance for students completing their assignments. Based on the description above, the authors conducted the present study. This study, therefore, aims to provide a comprehensive overview and in-depth understanding of the drivers of learning motivation among students enrolled at the Faculty of Administrative Sciences of Universitas Brawijaya in 2022, with particular emphasis on the contribution of Artificial Intelligence

2 Literature Review

2.1 Artificial Intelligence (AI)

Artificial Intelligence (AI) is a computer system that interacts with the world using human-like capabilities and intelligent behavior [11]. However, Shang et al [27] state that some technologies, such as deep learning, can enhance human activities and drive decision-making using complex artificial neural networks. Therefore, the literature defines AI as machine learning, neural networks, and decision trees. There are four indicators of the AI dimension, according to [12], namely:

    i.   Acting humanly: Artificial Intelligence's ability to interact and behave like humans is tested through turning tests to evaluate whether a system can "fool" human.

    ii.   Thinking humanly: Artificial Intelligence can think like humans in solving problems and making decisions by applying a cognitive modeling approach (connecting, assessing, and considering an event).

    iii.   Thinking rationally: Artificial Intelligence can think rationally like humans, using mathematical logic and a logical approach (the laws of thought).

    iv.   Acting rationally: Artificial Intelligence can behave and act optimally by using existing resources with the agent approach (the rational agent)

2.2 The Role and Application of Artificial Intelligence in Education

AI applications in education can be found in four major domains: learning, teaching, assessment, and administration. The subject output produced in AI-based learning, one of which is students [13].

2.2.1 Four Major Educational Domains

1. Learning: AI has been used to provide tasks that depend on individual abilities, provide human-machine communication, examine student work for feedback, and improve interactivity and adaptability in digital environments.
2. Teaching: AI can help provide adaptive teaching, improve teachers' ability to teach, and enhance teacher professionalism.
3. Assessment: AI has assisted teachers in assessment tasks by offering automated scoring and predicting student performance.
4. Administration: AI has been used to improve the performance of management platforms, provide convenient and personalized services (both non-academic and academic), and provide evidence-based support for educational decision-making.

2.2.2 Student Learning Outcomes

AI in education plays a role in student motivation and engagement in learning, academic achievement, 21st-century skills, and non-cognitive aspects. Some of the roles and outcomes

associated with AI in education indicate that research should include interdisciplinary scholars from other fields [14].

2.3 ChatGPT

ChatGPT (Generative Pre-Trained Transformer) is a robot or chatbot that uses AI to interact and assist people in various tasks. ChatGPT can summarize information to save time, generate text, improve the quality of work, and create outlines [15]. In addition, ChatGPT can detect errors in grammar and style, making written content easier to understand [16[. By providing resources and information on a particular subject, showing previously unknown viewpoints, and introducing them to new research topics, ChatGPT can assist students in honing their research skills by helping them understand and assess the subject matter more fully [17]. However, there are concerns that students may use ChatGPT to copy and paste materials without critically evaluating what has been highlighted or selected from a source and without providing citations from the original author [15]. This means that the text generated by ChatGPT is unsuitable for academic writing [18]. This has raised the question of whether the writing generated by ChatGPT can be detected as plagiarism and how factual and fictional texts can be distinguished [19].

2.4 Learning Motivation

According to [20], motivation is a physiological and psychological state in a person that encourages him to perform certain activities to achieve goals and needs. [21] reveals that motivation is a psychological condition that encourages someone to do something from the factors of need, encouragement, and impulse (mental strength oriented towards fulfilling expectations and achieving goals). Learning motivation is a non-intellectual psychological factor that promotes learning thinking in each individual [22]. According to [8], motivation and learning influence each other. Learning is a relatively permanent behavior change resulting from practice or reinforcement to achieve a target. Motivation can arise from intrinsic desires and extrinsic encouragement, such as a conducive learning environment and interesting activities. Several indicators are used to measure how far a person's motivation level is in learning:

1. The desire to succeed: Motivation to succeed in performing a task and work or creating perfection is an element of human behavior and personality that comes from "within" the individual concerned. The achievement motive is a learned action that can be improved and developed through the learning process. Someone who has a high achievement motive tends to try to complete their tasks thoroughly without procrastinating.
2. The existence of encouragement and needs in learning: A desire to avoid failure stems from the fear of failure. A student may appear to work diligently because if he cannot complete his assignment well, then he will get embarrassed by his lecturer, made fun of by his friends, or even punished by his parents. From the above information, it can be seen that a student's "success" is due to encouragement or stimulation from outside themselves.

3. The existence of future hopes and aspirations: When explaining the outcome of a person's actions, expectations are based on the beliefs that influence their emotions. Someone seeking a promotion, for example, will do well if they believe that good performance will be recognized and rewarded when they get the promotion.
4. Rewards in learning: Verbal or other forms of appreciation for students' good behavior or good academic performance are the simplest and most effective ways to increase students' motivation to achieve better academic results.
5. The existence of exciting learning activities: One of the most engaging processes for students is simulation. A fun place helps the learning process. Everything significant will be remembered, appreciated, and understood for all time.
6. A conducive learning environment: An individual's basic motivation appears in an individual's actions after being shaped by the environment. Environmental influences: A good learning environment is one of the factors that encourage student learning. It allows students to get the right help to overcome problems and obstacles in their learning.

Based on the formulation of the problem and references to previous research, the framework of thinking in this study is formulated as follows:
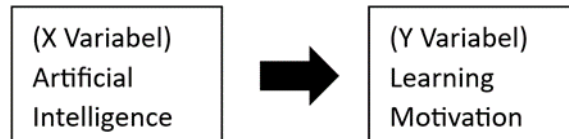

Figure 1: Relationship Between Variables

According to [24], a hypothesis is a prediction of the results that will be found by conducting a study, namely empirical statements that are verified and based on observations. The hypothesis is then tested for truth through the results of the study. Based on the above understanding, the hypotheses in this study are as follows:

H0: Knowledge of Artificial Intelligence (AI) does not affect respondents' learning motivation
H1: Artificial Intelligence (AI) affects respondents' learning motivation

3 Research Method

This study employed a descriptive research method with a quantitative approach. Distribution of questionnaires with questions that can be given to a person or group of people in the organization to acquire answers or comments that will be received by the parties being evaluated with a specified goal is a data collection strategy. The research location chosen is the Faculty of Administrative Sciences, Universitas Brawijaya. The main reason the researcher chose this

location is referring to the results of pre-research conducted by researchers on students of the Faculty of Administrative Sciences (FIA), Universitas Brawijaya Class of 2022.

The measuring scale used in this study is a Likert measuring scale. The Likert scale we use in this study is a 1-4 (1 is Strongly Disagree, 2 is Disagree, 3 is Agree, and 4 is Strongly Agree). The variables we use in this study are Artificial Intelligence (AI) as the independent variable and learning motivation as the dependent variable. In this study, the population was determined to be students of the Faculty of Administrative Sciences at Universitas Brawijaya class of 2022. The population members were selected using the purposive sampling method. In calculating the sample size, this study uses the Slovin Formula as follows:

In this study, the total population (N) was 1,377 people. The population used is FIA Brawijaya University students, Class of 2022.

n=1,377/ (1+(1,378x 0.01))

n=1.377/ 1+(13,78) n=1.377/14,78 n=93.1 or 93

Based on the calculations above, the sample size is 93.1, rounded to 93 persons. A questionnaire is used to obtain data. A questionnaire is a method of collecting data or information using forms that contain questions that can be addressed to a person or group of people in an organization to elicit replies or answers that will be analyzed by those with a specific goal [25]. The descriptive statistical analysis technique was applied in this study. Descriptive statistical analysis techniques are used as an initial step to tidy up the data before further analysis is carried out. They can stand as an analysis itself that can present data and provide various information about the data [26]. The data analysis techniques used are descriptive statistical analysis techniques, basic assumption tests, heteroscedasticity tests, regression tests, and simple linear regression tests.

4 Results and Discussion

4.1 Validity Test

The validity test in this study was performed by correlating the variables in the IBM SPSS Statistics 29 application using the Pearson correlation coefficient of two-tailed significance. The value of the r-table is obtained with N = 94 at 5% or 0.05 significance in the distribution of the value of r-statistical tables. Based on the table, it can be seen that r-count> from r-table. Then, when analyzed by comparing the Pearson Correlation score with Sig. (2-tailed) 0.05, it is known that the Pearson Correlation score is smaller than 0.05. Thus, it can be concluded that the items in this research questionnaire are valid.

4.2 Reliability Test

The Cronbach's Alpha statistical test was used for the reliability test, and a variable is said to be reliable or consistent if the alpha value> r-table. Based on the following table, it can be seen that 0.928> 0.207. Thus, all items in this research questionnaire are reliable or consistent.

4.3 Normality Test

The normality test is one of the basic assumption tests carried out with the intention of testing the spread or distribution of residuals based on the variables studied. A regression model is said to be good if the residual value is normally distributed. In this study, the researchers used the IBM SPSS Statistics 29 application to test the data's normality with the One-Sample Kolmogorov- Smirnov Test.

The basis for decision-making that shows normal residual distribution is if the significance value > 0.05. Conversely, the residual value is declared not normally distributed when the significance value <0.05. Referring to the table of normality test results can be seen in the Asym. Sig. (2-tailed) that the significance value is 0.200> 0.005. Thus, it can be concluded that variable X and variable Y are normally distributed.

One-Sample Kolmogorov-Smirnov Test

		Unstandardiz ed Residual
N		93
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	3.45839140
Most Extreme Differences	Absolute	.070
	Positive	.070
	Negative	-.065
Test Statistic		.070
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Figure 2: One-Sample Kolmogorov-Smirnov Test

4.4 Linearity Test

The linearity test is used to determine whether the relationship between the two variables under consideration, namely variable X (Artificial Intelligence (AI) and variable Y (Learning Motivation), is linear or non-linear. The linearity test was carried out to be further used as a requirement for conducting linear regression analysis. The basis for decision-making in interpreting the linearity test results is that the two variables are declared to have a linear relationship if the Sig value. Deviation from Linearity > 0.05. Conversely, if the Sig. Deviation from Linearity < 0.05, the two variables are declared not to have a linear relationship. Based on the table of linearity test results, it can be seen that the Sig. Deviation from Linearity 0.087>

0.05. Thus, it can be concluded that there is a significant linear relationship between (Artificial Intelligence (AI) and learning motivation.

4.5 Heteroscedasticity Test

Testing in heteroscedasticity uses method 1, Spearman's Rho method, by correlating variable X with residuals. The basis for making heteroscedasticity test decisions is the Sig value. (2-tailed) > 0.005, then there is no heteroscedasticity. Conversely, if the Sig. (2- tailed) < 0.05, then heteroscedasticity occurs. Based on the table above, the sig. value is 0.337>

0.005. Thus, it can be concluded that there is no heteroscedasticity in the regression model.

4.6 Simple Linear Regression Test

Simple linear regression analysis was conducted to test the effect of variable X (Artificial Intelligence (AI)) on variable Y (learning motivation). The regression equation model is declared significant if the significance value is <0.05. Based on the table above, it can be seen that the F-count is 125.807, with a significance of 0.001 <0.05. So, it can be concluded that the regression model is significant and can be used to predict whether or not the influence of variable X on variable Y exists.

The regression test results show that hypothesis H1, namely Artificial Intelligence (AI) affects respondents' learning motivation, can be accepted. Meanwhile, the H0 hypothesis, namely that Artificial Intelligence (AI) knowledge does not affect respondents' learning motivation, is not accepted.

4.7 Analysis and Interpretation

Table 1: Data Analysis Results

No.	Indicator	Results
1	AI-based learning knowledge (X1.1)	3.31 (SA)
2	Learning Outcomes (X1.2)	3.04 (A)
3	Affective Elements (X1.3)	2.80 (A)
4	There is passion and desire to succeed (Y1.1)	2.87 (A)
5	There is encouragement and a need for learning (Y1.2)	2.79 (A)
6	There are hopes and aspirations for the future (Y1.3)	2.80 (A)
7	There is an appreciation for learning (Y1.4)	2.31 (D)
8	There are interesting activities in learning (Y1.5)	2.63 (A)
9	There is a conducive learning environment (Y1.6)	3.11 (A)

Based on data analysis from the grand mean, it can be seen that students have good knowledge of AI-based learning. This is evidenced by the average score of 3.31. The highest score regarding knowledge of AI-based learning is in adaptation and interaction with digital-based learning, which is 3.45. The lowest score is on the ability to do problem-solving regarding AI-

based learning, with a score of 3.17. This is reasonable because AI is a new media in the digital world.

Students' understanding of AI-based learning (X1.1) affects their desire to succeed (Y1.1). This is demonstrated by a relatively good average value of 3.04, as demonstrated by the indicator item of students being able to complete the task completely with the assistance of ChatGPT, which is 2.87.

Students' understanding of AI-based learning (X1.1) also affects the existence of encouragement and needs in learning (Y1.2). This is evidenced by a fairly high average value of 2.77. The highest score for students excited about doing assignments with the help of ChatGPT is 2.84. While the lowest value is on the item, students can achieve their learning goals through ChatGPT, which is 2.75. So, it can be interpreted that with the help of ChatGPT, students are more enthusiastic about doing assignments than just achieving their learning goals.

Students' understanding of AI-based learning (X1.1) also affects the existence of future hopes and ideals (Y1.3). This is evidenced by a fairly good average value of 2.80. The highest score for students who believe ChatGPT can add new knowledge is 3.03. The lowest value is in the item Students believe they will get better grades than before with the help of ChatGPT, which is 2.58. So, it can be concluded that the presence of ChatGPT for students is more helpful in adding new knowledge than just getting better grades.

Students' understanding of AI-based learning (X1.1) does not affect their appreciation for learning (Y1.4). This is demonstrated by the relatively low average value of 2.31. The first low indicator value, 2.59, is on the item students are satisfied with ChatGPT's answers. The lowest indicator value is in the item. Students feel worthy of achievement by capitalizing on learning using ChatGPT, 2.04. So, it can be concluded that ChatGPT does not show appreciation in learning, namely regarding the satisfaction of answers and the feasibility of getting achievements capitalizing on ChatGPT.

Students' understanding of AI-based learning (X1.1) affects the existence of interesting activities in learning (Y1.5). This is demonstrated by the relatively low average score of 2.63. The item students feel helped by ChatGPT has the highest value in terms of interesting activities in learning, with a value of 3.27. The lowest value is in the behavioral similarity item, namely the rampant use of ChatGPT by other students, which is 2.90. So, it can be concluded that with ChatGPT, students feel more helped than just following the trend of the rampant use of ChatGPT by other students.

Students' understanding of AI-based learning (X1.1) affects a conducive learning environment (Y1.6). This is evidenced by a fairly good average score of 3.11. The highest value of a conducive learning environment is found in the item students are easy to operate the features in ChatGPT, which is 3.22. While the lowest value is in the item, students do not have difficulty accessing ChatGPT, which is 3.00. So, it can be concluded that students find it easier to operate the features in ChatGPT than just accessing ChatGPT.

Based on the grand mean analysis, it is known that the respondents' learning outcomes (X2) are quite good. This is evidenced by the average value obtained, which is 3.04. The highest value in the ChatGPT item, helping students learn more about the subject studied, is 3.15. Meanwhile, the lowest indicator is found in the ChatGPT item helping students master the subject being

studied, which is 2.92. So, it can be concluded that ChatGPT can help students learn the subject but cannot help students master the subject being studied.

Respondents' learning outcomes affect the desire and desire to succeed (Y1.1). This is evidenced by the average value of 2.87. So, it can be concluded that the desire to succeed arises when they know the learning outcomes obtained with the help of ChatGPT. Respondents' learning outcomes also affect the existence of encouragement and learning needs. However, the encouragement and need for students to learn is not as great as the desire and desire for students to succeed. This statement is evidenced by the average indicator value Y2 being lower than the Y1 indicator. In addition, respondents' learning outcomes also affect the existence of future hopes and aspirations, namely 2.80, the existence of interesting activities in learning, namely 2.63, and the existence of a conducive learning environment, namely 3.11. However, respondents' learning outcomes do not affect the existence of rewards in learning. This is evidenced by a fairly low value of 2.31.

According to the grand mean analysis, the affective elements of respondents are quite good. The average value of 2.80 demonstrates this. The highest value in this indicator is ChatGPT, which makes learning more fun, which is 3.04. Meanwhile, the lowest value found in the ChatGPT item, which helps increase student confidence, is 2.65. So, it can be concluded that ChatGPT makes learning more fun, but ChatGPT has not been able to increase student confidence.

The affective element of respondents affects the desire and desire to succeed (Y1.1) and the existence of encouragement and needs in learning (Y1.2). This is demonstrated by the average value, which has a significant difference, namely Y1 2.87 and Y2 2.79. Affective elements also affect the existence of future hopes and aspirations, namely 2.80, the existence of interesting activities in learning, namely 2.63, and the existence of a conducive learning environment, namely 3.11. However, respondents' affective elements do not affect rewards in learning, as evidenced by the relatively low value of 2.63. So, it can be concluded that a conducive learning environment has the greatest effect on the affective elements of respondents.

Based on the data analysis above, it can be seen in general that the appearance of the GPT-based chatbot affects student learning motivation. The findings of a simple linear regression analysis support this assertion, where the t-count is 11.216> t-table 1.986, which shows the influence of Artificial Intelligence (variable X) on Learning Motivation (variable Y).

5   Conclusion

This research aims to determine the effect of a GPT-based chatbot on the learning motivation of FIA Brawijaya University students. This research used two variables to achieve this goal: Artificial Intelligence as the independent variable (X), which influenced Learning Motivation as the dependent variable (Y). Based on the results of simple linear regression analysis, it can be seen that there is a significant relationship between Artificial Intelligence and learning motivation, as evidenced by t-count 11.308 > t-table 1.986. Thus, the emergence of GPT-based chatbots influences student learning motivation.

According to an analysis of the impact of GPT-based chatbots on the learning motivation of 2022 Faculty of Administrative Sciences students, respondents felt that GPT chatbots generally influenced students' learning motivation, as evidenced by the grand mean score of 2.85 (agree).

However, not all indicators of learning motivation are met and approved; this is proven by the low score of one of the indicators regarding rewards in learning, namely 3.21 (disagree). Respondents believed that the existence of the GPT Chatbot, on the other hand, caused their low appreciation for learning, as evidenced by their dissatisfaction with the answers produced by ChatGPT and their ability to achieve goals using ChatGPT.

The following suggestions are given based on the findings and discussion. First, students are expected to be able to wisely utilize GPT-based AI Chatbot media, especially to increase learning motivation. Apart from that, students are expected to gain additional knowledge and understanding of the subject being studied with the help of ChatGPT. So later, ChatGPT can help students increase learning motivation and become an effective medium for increasing learning understanding. Second, since this research only focuses on students of the 2022 Class of FIA UB, future researchers are expected to be able to develop research on research subjects with a broader scope. In addition, as technology continues to develop, it is hoped that future researchers will be able to develop this research focusing on ChatGPT chatbot-based learning.

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