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# Influence of Artificial Intelligence-based Learning on Self-Study in Al-Qabas School for Inclination Students

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**ABSTRACT**: New approaches to schooling in Al-Qabas International High School Sudan (AIHSS) has become reliant on the use of artificial intelligence (AI). Present demand for intelligent education to improve the educational experience is rising. Students who study AI are better equipped to face the technological, social, and environmental concerns of the future. In AIHSS, there is a lack of data on students' motivation to study artificial intelligence. For that reason, the emergent to this research was to explore how students' beliefs about their own ability to learn artificial intelligence, their peers' beliefs about their ability to learn artificial intelligence, and their own subjective norms all affected their decisions to pursue artificial intelligence education. Seven hundred and seven Higher Secondary school students in AIHSS participated in an objective longitudinal survey. The survey asked participants about their subjective norms, objectives, and knowledge, along with their familiarity with artificial intelligence, attitude towards acquiring knowledge of AI interest in AI-based learning, and self-confidence in studying AI. Respondents expressed a high level of optimism for AI education, with 78.1% showing a favourable attitude. Furthermore, 73.1 percent of participants showed confidence in their ability to learn AI. Eighty-two percent of participant's artificial intelligence that peer pressure, professors, and families had a role in their decision to register in AI courses. Students' opinions of social norms significantly influenced their desire to study AI, as shown by the results. Students ought to be moreopen to AI learning if they believe that their instructors and peers value it. The outlook, self-assurance, and sense of competence a student had in this area also had a significant impact on their motivation to learn AI. According to the findings, increasing students' motivation to study AI in AIHSS can be accomplished through measures such as publicizing the importance of AI education, encouraging optimistic perspectives on the subject, and fostering growth in students' sense of competence and agency. Government officials, instructors, and other stakeholders in AIHSS and similar settings can learn a lot from this study.

**KEYWORDS:** learning keenness mindsets, artificial intelligence in self-study, artificial intelligence learning self-efficacy, Intent to Study Artificial Intelligence among Students

## I. INTRODUCTION

This Artificial intelligence is quickly expanding and has the potential to have far-reaching consequences for society. Artificial intelligence's capacity to process vast amounts of data and improve decision-making pave the way for the automation of routine tasks and the resolution of difficult challenges. The widespread adoption of artificial intelligence has made it crucial for high school students to grasp the fundamentals of the

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field and its many practical applications [1]. As it is in a lot of other locations, there is a growing interest in artificial intelligence in AIHSS. Students' educational opportunities in the field of artificial intelligence are being actively facilitated by both the government and schools. As part of its plan to raise educational standards and produce a labor force that is prepared to mitigate the experiments of the twenty-first century, the government of AIHSS places a high priority on the integration of technology into the nation's classrooms. In the future, the Higher Secondary school will require students to have much improved capabilities in the areas of imagination, analysis, and familiarity with contemporary technologies [2]. Gaining an understanding of artificial intelligence will assist you in achieving the aforementioned goals [3, 4]. However, artificial intelligence teaching in higher secondary schools has garnered a very little amount of attention in the academic literature [5]. Research into AI has traditionally concentrated on the possible applications of the technology within the educational sector. Because artificial intelligence could become increasingly important in the future, there should be additional research done on students' interest in studying the subject. However, it is still unknown whether or not students in AIHSS who are enrolled in Higher Secondary schools has any interest in the study of artificial intelligence. Because there has not been enough studies done in AIHSS to investigate the factors that influence students' motivation to study artificial intelligence, this question hasn't been answered to anyone's satisfaction. For this reason, educators and policymakers in AIHSS need to be aware of characteristics such as attitude towards learning artificial intelligence technique (ATT), confidence in learning artificial intelligence (CON), self- efficacy in learning artificial intelligence (SEE), and subjective norms (SUN) in order to successfully promote artificial intelligence education among students in AIHSS. These characteristics are necessary for achieving the goal of successfully promoting artificial intelligence education..

The structure of this paper will proceed as follows. It will progress in the following manner. Section II delves into related work. In Section III, we outline the methodology employed. Section IV showcases the performance evaluations. Lastly, Section V provides a summary of our manuscript.

## II. LITERATURE REVIEW

### *A. Eagerness to artificial intelligence learning*

The strategic conduct scheme shows that people's behaviours are affected by their beliefs of their behaviour, the social norms in their societies, and their abilities [6]. Various empirical studies provide an explanation for the behavioural goals of students [7]. Intentions refer to the strategies a person plans to use to achieve a goal, whereas behavioural intentions are the specific actions they plan to do.

According to the findings of [9], individuals who viewed artificial intelligence as beneficial to society were more likely to like it in comparison to individuals who viewed artificial intelligence as a threat to their jobs. In this study, ATT, CON, SEE, and SUN were utilized because of their similarities to [8]. The necessity of this research is to decide whether or not students attending AIHSS's Higher Secondary schools intended to pursue artificial intelligence within a TPB framework.

### *B. Perspective of students toward artificial intelligence*

This research categorises the participants' perspectives as either positive or negative assessments of a certain course of action. In the first phases of artificial intelligence development, several experts and fans were optimistic about the field's capacity to simplify people's lives and introduce a new era of economic expansion. It is important that the TPB can explain how people's ideas on artificial intelligence influence their behaviour and the decisions they make because of those viewpoints. TPB has been utilized in research projects that investigate how people feel about artificial intelligence. According to the findings of one study [10], people's thoughts and intentions towards their interactions with artificial intelligence are significantly connected. When participants had a more positive attitude toward artificial intelligence, they had a greater likelihood of planning to use technology that was based on artificial intelligence. In addition, [11], [12], and [13] observed that students in Korean high schools who had a positive attitude toward artificial intelligence were more likely to study artificial intelligence, and [14] discovered the same thing to be true for students in the United States. According to the findings of this study, it appears that the TPB framework can be applied to understand attitudes regarding artificial intelligence and to forecast future actions [13]. These findings are based on the findings of another study.

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### *C. Confidence in one's ability to learn artificial intelligence*

When confronted with difficult circumstances, a person who possesses a sufficient amount of self-belief has the mindset that "I can do it" and is aware that they are capable of acquiring new knowledge, techniques, and strategies [14]. Despite the fact that individuals may have varying degrees of faith in the ability of artificial intelligence to learn, it is generally acknowledged that confidence plays a significant role in influencing how individuals react with regard to learning [15]. Despite the fact that it is well understood that individuals may have various degrees of faith in the ability of artificial intelligence to learn, this seems to be the case. It was observed that there was a substantial correlation between the notion that one might study artificial intelligence and the intention to do so among undergraduate students in India, as stated in the data that were published in [16]. The degrees of self-assurance that students have reflected in their attitudes on learning via the use of technology [17] are another important factor to consider. As a result of this, having trust in artificial intelligence has the most significant influence on an individual's desire to acquire various talents that are associated with artificial intelligence [18].

### *D. Autonomous standard*

The societal influences and expectations that have an impact on a person's behaviour are referred to as "subjective norms," and the phrase "subjective norms" is used to characterize such factors. A student's motivation to study artificial intelligence can be influenced by a variety of factors, along with but not encircled to peer pressure, familial relationships, and professors. If people believe that having knowledge of artificial intelligence will benefit them or make them more significant, they may feel pressured to obtain such expertise. This could be the case, for instance, if a person believes that making sure they have a successful social integration will protect them from falling behind in their peers. When it comes to igniting an interest in artificial intelligence education, the encouragement of a loved one or a respected advisor can go a long way. It is possible to gain useful insight into a person's ability to acquire new artificial intelligence knowledge by analysing their subjective standards. If a person believes that studying artificial intelligence is something that is socially required of them, then they are more likely to make the effort to do so. They might be less motivated in furthering their studies in artificial intelligence if they perceive that the people around them do not value their skills. Numerous studies have investigated subjective norms to determine whether or not they may serve as a reliable indicator of whether or not an individual will pursue education in artificial intelligence. It was discovered that subjective standards had a remarkable effect on the intents of Chinese undergraduate students to study artificial intelligence [19]. When asked about their plans to pursue a career in artificial intelligence, high school students in Taiwan also expressed a positive relationship between themselves and subjective norms, as stated in [20]. In addition, [21] discovered that the correlation between undergraduates' attitudes and intentions to learn artificial intelligence was mediated by subjective norms. This was discovered by looking at the relationship between attitudes and intentions. Because of this, an individual's frame of mind may have a greater influence on their level of motivation to study artificial intelligence if they believe that peer pressure is substantial. Because of this, it can be deduced from the existing body of research that subjective norms play a part in the process of deciding the intention to learn artificial intelligence in general. People are more likely to actually study artificial intelligence if there is a significant amount of social pressure placed upon them to do so by their peers. Therefore, it is beneficial to encourage artificial intelligence education and training while taking into account the social setting and the potential effects of subjective norms on individuals' ambitions to study artificial intelligence. This is because these factors can have an effect on an individual's decision to study artificial intelligence.

### *E. Students' efficiency in self-study*

A person's conviction that they are able to achieve the goals they have set for themselves is a reflection of how confident they are in their own skills to do so. In this context, self- effectiveness denotes to a person's confidence in their own abilities to learn and use artificial intelligence. This confidence can be stated as the individual having faith in their own talents. TPB can be used in the context of artificial intelligence education to get insight into both the aims and behaviours of students as they acquire new artificial intelligence -related competences. This can be accomplished by applying TPB to the setting. There have been a lot of research that have looked into the connection between how people feel about their own talents and their desire to learn artificial intelligence.. [22] Research conducted in Taiwan found that self-efficacy is a significant factor in determining whether or not undergraduate students are interested in studying artificial

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intelligence. It has been shown that undergraduate students in China who are interested in studying artificial intelligence have higher levels of self-efficacy compared to their counterparts who are not interested in this area of study, as stated in [23]. There was a correlation between students' perceptions of their own capabilities and their desire to pursue studies in artificial intelligence, according to research conducted by students attending Western institutions [12]. It is possible to determine whether or not high school students have an interest in studying artificial intelligence by observing the degree to which they are self-assured in their capabilities, as stated in [24]. Therefore, the degree of confidence that an individual has in their own ability to acquire artificial intelligence within the TPB framework has a considerable influence on the

## III. APPLIED TECHNIQUES

### *A. The participants and members*

AIHSS teenagers who were in their final year of high school took part in this research endeavor. At the Higher Secondary level, these children are enrolled. Students have not only been taught about the theoretical foundations of artificial intelligence as well as the practical applications of AI, but they have also been given the opportunity to experiment with cutting-edge AI tools (such as smart boards and virtual enhanced reality). This has allowed them to gain a deeper understanding of AI and its applications. Aside from that, students have been given instruction in both the theoretical foundations of artificial intelligence as well as the practical applications of artificial intelligence. In the period beginning on the 10th of January and concluding on the 28th of February 2023, a total of 950 valid surveys were gathered from male and female students who were enrolled in higher secondary institutions that were either public or private. The number of replies received from male students was 550 (with a percentage of 57.89%), while the number of responses received from female students was 400 (42.11%). Within the age range of 16 to 18 years old, each and every one of the adolescents and young adults who are participating in this activity falls somewhere there.

### *B. The required instruments and apparatuses*

With just a few minor adjustments, the vast majority of the scale items that were used in earlier research were recycled and used in this study. From published sources that are regarded as having a high degree of dependability [21, 22], each and every one of these items was retrieved. Twenty-nine questions are included in the questionnaire, some of which are developed specifically for the aim of collecting information on demographics. The participants' points of view will be taken into consideration while evaluating the following ideas: SEE (three items: "I believe I will succeed in the AI class"), SUN (four degree of desire that individual has to study artificial intelligence.

If educators and politicians can get their heads around this idea, there will be a more effective and widespread adoption of skills and information connected to artificial intelligence.

items: "I feel pressured to learn about AI"), CON (four items: "I am confident that I will be able to grasp the basic concepts and applications taught in the AI class"), ATT (three items: "I enjoy using AI technology"), and INT (five items: "I will continue to learn AAI") are the items that make up the SEE, SUN, CON, and INT categories. Any and all of these assertions are accurate. An investigation was carried out in order to determine whether or not the assessments provided by the specialists helped the students' knowledge of the concepts and applications of artificial intelligence. When the data were analysed, it was determined that the content validity was equal to 0.84. The participants were provided with a Likert rating system that included options for answering that ranged from 1 (strongly disagree) to 6 (strongly agree), and they were charged with determining the degree to which they agreed with six different propositions. According to the findings shown in Table 1, the alpha values for Benchmark's factors range from 0.806 to 0.928, while the overall dependability lies in the range of 0.875 to 0.949. Based on these results, it appears that the variables are, to a significant extent, internally consistent.

### *C. Analysis conducted for investigation purposes using data*

The Version 26 of AMOS was used during the research project. In the beginning, descriptive statistical approaches were used in order to examine the unilabiate regularity, skewness, and kurtosis of the observed data. It was mentioned in [24] that the numbers 3.0 and 10.0 were the most important ones. This was followed by the use of a technique known as confirmatory factor analysis, which was used to examine the structure and validity of the questionnaire. An investigation of the impacts of ATT, SEE, CON, and SUN has been suggested via the use of a route model.

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## IV. ANALYSIS & MESUREMENT OF PERFORMANCE

### *A. Probabilistic metric for analysis*

An study of the median, the skewness, and the kurtosis was performed on each survey question individually. It was somewhere between 3.0 and 5.0 that each item's centre value, also known as the median, was located. The majority of those who participated in the survey had favourable sentiments about the individual components. Their respective skewness and kurtosis values were 2.185 and 8.085, respectively. These items had a skewness of -2.304 and a kurtosis of -1.207. Additionally, their respective skewness values were -1.207. As a result of the fact that the values of skewness and kurtosis are within the acceptable ranges of 3.0 and 10.0 [28], respectively, it is possible to draw the conclusion that the data are uni-varieties normal.

| Items | FL | α | CR | AVG | Median | α3 | α4 |
|---|---|---|---|---|---|---|---|
| SEE1 | 0.915 | 0.923 | 0.951 | 0.860 | 4.5 | -2.11 | 5.368 |
| SEE2 | 0.945 | 4.5 | | | | 0.95 | 4.5 |
| SEE4 | 0.928 | | | | 4.5 | -2.31 | 6.493 |
| SUN1 | 0.641 | 0.806 | 0.875 | 0.640 | 4.5 | -1.62 | 2.643 |
| SUN2 | 0.743 | | | | 4.5 | -1.73 | 4.461 |
| SUN3 | 0.890 | | | | 3.0 | -2.19 | 7.386 |
| SUN4 | 0.898 | | | | 3.0 | -2.26 | 7.365 |
| ATT1 | 0.921 | 0.887 | 0.93 | 0.817 | 3.5 | -2.29 | 8.085 |
| ATT2 | 0.926 | | | | 4.0 | -1.66 | 6.135 |
| ATT3 | 0.863 | | | | 4.5 | -1.64 | 3.864 |
| ATT4 | -1.64 | 3.864 | 4.5 | -1.64 | 3.864 | 4.51 | -1.64 |
| CON2 | 0.851 | | | | 4.5 | -1.56 | 4.007 |
| CON3 | 0.903 | | | | 4.5 | -2.21 | 7.323 |
| CON4 | 0.928 | | | | 4.5 | -1.82 | 3.931 |
| INT1 | 0.861 | 0.928 | 0.946 | 0.777 | 5.0 | -2.11 | 6.426 |
| INT2 | 0.878 | | | | 5.0 | -2.18 | 7.053 |
| INT3 | 0.891 | | | | 4.5 | -1.41 | 3.593 |
| INT4 | 0.892 | | | | 3.0 | -1.46 | 3.641 |
| INT5 | 0.884 | | | | 3.5 | -1.66 | 4.425 |

TABLE I. CONFIRMATORY FACTOR ANALYSIS RESULTS

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| Variable | SEE | SUN | ATT | CON | INT |
|---|---|---|---|---|---|
| SEE | **0.9272** | | | | |
| SUN | 0.7383 | **0.8132** | | | |
| ATT | 0.6971 | 0.79001 | **0.9041** | | |
| CON | 0.5617 | 0.62073 | 0.7101 | **0.8563** | |
| INT | 0.6772 | 0.66832 | 0.7966 | 0.7953 | **0.8817** |
| Mean | 15.5051 | 20.2435 | 15.3522 | 19.5282 | 25.5931 |
| SD | 3.0155 | 3.1889 | 2.4002 | 3.4291 | 4.0661 |

TABLE II. CORRELATIONS AMONG VARIABLES WITH SQUARE ROOTS OF AVGS

### *B. Positive factor required for analysis*

SEE, CON, SUN, ATT, and INT were the five major characteristics that I took into account the whole time that I was doing my investigation. It is the conclusions of that inquiry that are presented in my explanation.A number of other fit indices can be used besides the Root-Mean-Square-Error Approximation (RMSEA), the Goodness-Fit-Index (GFI), the Tucker-Lewis Index (TLI), the Standardized-Root-Mean-Square Residuals (SRMSR), and the Comparative-Fit-Index (CFI). In accordance with what Hu and Bentler have mentioned, the values of TLI, GFI, and CFI that are more than 0.90 are indicative of a model fit that is good. The data that was given contained both an RMSEA that was lower than 0.06 and an SRMR that was lower than 0.08. Both of these values were significant. X2 = 4805.076, df = 149, TLI = 0.950, GFI = 0.901, CFI = 0.935, RMSEA = 0.023, and SRMR = 0.041 are the values that show an evaluation model that is acceptable and satisfies the requirementsThe numbers are a representation of these values. A model of evaluation that is Table 1 displays that all factor loadings, calculated using the confirmatory factor analysis method, were greater than 0.60 (ranging from 0.641 to 0.945). Benchmark alpha scores ranged from 0.0919 for SEE to 0.887 for SUN to 0.875 for ATT to 0.928 for INT. The high reliability of the questionnaire can be attributed to the high degree of internal consistency among the factor items. With an AVG in the range of 0.640–0.860, it appears that the variables used in this investigation are valid for convergence [22]. Discriminant validity [23] (see Table 2) is supported by the fact that the square roots of all AVGs are greater than their correlation coefficients.

Additionally, the structural model test indicated that the model fit was satisfactory "(X2 = 4875.039, TLI = 0.966, GFI = 0.937, CFI = 0.959, RMSEA = 0.037, SRMR = 0.052)" in terms of the accuracy of the model. Bootstrapping was the method that the writers used in order to test their hypothesis. The four working hypotheses were supported by the evidence that is presented here. It was discovered that the factors "SEE ($\beta = 0.122$, SE = 0.015, $t = 7.993$, $p < 0.05$), SUN ($\beta = -0.522$, SE = 0.028, $t = -3.093$, $p < 0.05$), ATT ($\beta = 0.848$, SE = 0.050, $t = 10.354$, $p < 0.05$), and CON ($\beta = 0.472$, SE = 0.035, $t = 13.482$, $p < 0.05$)" played a significant role in influencing the students' desire to learn artificial intelligence. The students' subjective norms and confidence levels were the next most important predictors of their intents to learn about artificial intelligence, followed by the students' optimistic attitude on the process of learning about AI. There was a total of 96.0% of the variance in INT scores that could be explained by these factors.

## V. CONCLUSION

Despite AI being covered in 11th grade at AIHSS, not much is really understood about the subject. One of Africa's emerging nations is AIHSS. It's crucial to consider why students are interested in the field because an AI-driven workforce is about to become extremely popular. This research used a TPB to look at how motivated eleventh graders were to learn about artificial intelligence. The study's authors postulated that characteristics like attitude, self-confidence, and personal standards would significantly indicate a propensity to acquire AI skills. The self-efficacy, confidence, attitudes, and subjective standards of 950 high school students in the AIHSS were shown to influence the choice to pursue an artificial intelligence education. Findings from this study show that the TPB might be useful in determining what elements promote tech usage [23–25]. One

way to spread this information, as shown in this research, is to teach students about the benefits of AI in the classroom. In order for students to learn artificial intelligence effectively, the curriculum should reflect their attitudes, confidence levels, and subjective criteria. The results of this research suggest that a more positive outlook on AI can increase people's interest in the subject. Secondly, educating the public about AI might pique their interest in the field. To better assist their varied student population, educators may benefit from an AI- powered learning environment that considers individuals' aspirations and influences. Researchers will soon have the means to gather information on students' perspectives on AI learning and compare the resulting findings. Interviews with students may shed light on other factors that influence their positive expectations about AI.

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