JOURNAL OF E-LEARNING AND KNOWLEDGE SOCIETY
Vol. 19, No. 3 (2023), pp. 43-48

Artificial Intelligence: exploring the attitude of secondary students

Kalyani Pande[a,1], Sanjeev Sonawane[a], Vaibhav Jadhav[a], Mahesh Mali[a]

[a]*Savitribai Phule Pune University, Department of Education and Extension – Pune (India)*

(submitted: 6/7/2023; accepted: 18/7/2023; published: 31/10/2023)

Abstract

This paper aims to find the attitude of secondary students towards artificial intelligence. Intelligence is blessing received to mankind through which we have got the ability to learn new things, experience surrounding, and solve complex problems by making our life at a pace (Ewert, 2018). Likewise artificial intelligence (AI) is one of such abilities given to machines by humans for performing all possible tasks which humans can perform (Kengam, 2020). Rapidly growing technology has continuously changed the way of human existence by inclusion of robotics, automation leading to magical transformation. This technological transformation has not left the education field untouched. By the Google survey this paper analyzes the understanding of secondary students towards the artificial intelligence and its possible effect in the field of education. From the qualitative and quantitative data collected researcher found the high attitude in Pune city.

KEYWORDS: Artificial Intelligence, Attitude, 4th Industrial Revolution, Transformation, Evaluation, Microlearning.

DOI
https://doi.org/10.20368/1971-8829/1135865

CITE AS
Pande, K., Sonawane, S., Jadhav, V., & Mali, M. (2023). Artificial Intelligence: Exploring the Attitude of Secondary Students. *Journal of e-Learning and Knowledge Society*, *19*(3), 43-48. https://doi.org/10.20368/1971-8829/1135865

1. Introduction

Imparting knowledge is not limited to schools only. This process of knowledge building, including teaching and learning, has the addition of technological advancement. This advancement brought an effective instrument called artificial intelligence. And it is dominating the education sector also (Raja, 2018). Talking about innovation and revolution has brought magical, unexpected, surprising changes in numerous arenas (Khoza, 2020). In terms of transformation, from 1 Industrial Revolution, which started from 1790-1840, till the beginning of 4 Industrial Revolution, which came up with growing mechanical learning, automation, and technological advancement (Khoza, 2020) in every possible field made our life easy with artificial intelligence. Intelligence is the basis of human existence (Colom et al., 2010). Which is the guiding light for solving any problem, finding a solution, and inventing things to make human life better and more comfortable? Intelligence is present and shapes and helps humans gain new perspectives and adapt to emerging situations. With the blessing of human intelligence, humans gave birth to manufactured artificial intelligence (Colom et al., 2010). And John McCarthy is known as the father of Artificial Intelligence (AI). He coined this term in 1950. Artificial intelligence is part of every possible stream though it is part of the Science and Engineering arena. Artificial Intelligence reveals the characteristics we identify with human intelligence, like behavior, problem-solving, giving quick solutions, and creating innovative things to enhance productivity (Hemlatha et al., 2020). Robotic work is done immediately. It would be correct to call AI an interdisciplinary field (Dusan, 2020). It is entrenched in every field, even in the field of education. For example: Inclusion of mathematics through engineering, science through scientific discoveries in medicine, agriculture, psychology, neuroscience, economics, statistics for finding the inference, etc. (Tecuci, 2012). It continually keeps inculcating innovative concepts and techniques and upgrading with added inputs. AI solves most problems through knowledge (Hemlatha et al., 2020).

[1] corresponding author - email: john.smith@unixxxx.edu – address: Carnaby Street 43, 34522, London (UK)

1.1. Artificial Intelligence and Education

Comparing the education system with earlier learning, there has been a major observable shift in the use of AI due to the beginning of the 4 Industrial Revolution. Per Horizon report of 2018, specialists have anticipated the ongoing increase in the use of AI by 43% from 2018 to 2022 (Kengam, 2020). Also, as per the conference held in the 21st century on an international level based on Artificial Intelligence, AIED is an emerging arena in educational technology (Kengam, 2020). This could be observed in daily life without further confusion by monitoring the emergence of online learning-teaching platforms like; Digital Classroom, YouTube, MOOC courses, distance learning platforms, etc.

The presence and widespread of AI, kept us connected to education in the hard times of life and death. Schooling in earlier days was not flexible, but it became possible due to artificial intelligence (Pantelimon et al., 2021) Because of these significant functions of AI which are flexibility, diverse leaning, micro learning, multiple intelligence, knowledge boost etc. (Figure 1).

This significance of artificial intelligence makes it so, essential and making optimum use of it for effective & productive outcomes are crucial task (Hemlatha et al., 2020). However, qualities of AI are not limited to these. There are uncountable ways of making a fruitful outcome using it. Likewise, it also has a negative side. The use of AI and rapid automation can have unexpected outcomes if not used well. Targeting the field of education, AI can make learners and teachers dependable (Kumar, 2018), which can become a problem if balance is not maintained. Also, availability of too much information available at online platforms in terms of online classes leads to chaos rather than a focused outlook. That is why the way students perceive AI in an educational context becomes more important.

1.2. Attitude and Education

Attitude refers to people's judgment about events, ideas, and ways of perceiving things. It could be positive or negative. Attitudes are based on personal experience and belief systems (Das et al., 2010). Titchener of Structuralist schools believes that behind every action of a person, there are deep thoughts that could be temporary or permanent. The word 'attitude' has an Italian origin, 'attitudine' having traces in Latin' aptus' which means "fitness".

Cognitive	Affective	Psychomotor
Ability to understand developed through thinking, experiences and senses.	It involves our feelings, attitude and emotions.	It includes physical movement and coordination of motor skills.

Table 1 - Three Domains by Bloom.

According to Wood and Wood (1980) attitude has three components. Bloom gives the domains in Table 1, and attitude plays a crucial role in adaptation. Considering artificial intelligence has positive and negative effects (Peter, 2019). When we consider it for bringing effective changes by adding to lacking parts, attitude plays a significant role in any consideration. In terms of education, knowing the learner's attitude is necessary for making optimum use of artificial intelligence to reach the need of time. This study is for exploring the attitude through quantitative and qualitative analysis attempts to find the attitude of students at the school level. This would act as the guiding force to have an idea about the mindset of the students.

2. Methods and Materials

This study aims to explore School Students' attitudes toward Artificial Intelligence. An online digital survey collected the data. The researcher uses the descriptive

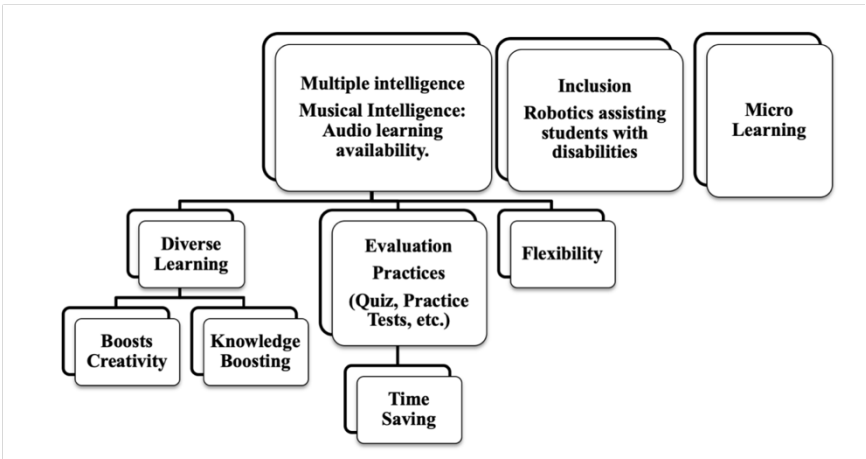

Figure 1 - Significant Functions of Artificial Intelligence.

survey method during this research by taking a sample of secondary school students from the Central Board of Secondary Education in Pune City. Moreover, the survey instrument used by the researcher is a scale for exploring the "attitude of school students towards artificial intelligence". The scale is formed based on a three-point Likert scale. The Likert scale was formed to calculate the attitude scientifically in 1932 (Ankur, Saket & Satish 2015). The questionnaire has, in total, twenty questions. From which eighteen are closed-ended, and two are open-ended. Closed-ended questions are for quantitative data, and open-ended questions are for qualitative data. The target population for the research was Secondary School students.

Moreover, from the instrument made to collect data, one hundred and twenty responses have been considered for the data analysis. The sample was selected using the random sampling method. The data collected from all respondents is divided based on the component for transparency and clarity. Furthermore, these components are divided into four categories based on the learners' experience towards artificial intelligence, micro learning, subjective performance of artificial intelligence, and evaluation.

Table 2 has data collected from the respondent by calculating mean and standard deviation and its interpretation.

2.1. Methodology and Data Analysis

For this research, the researcher used a descriptive digital survey using the random sampling method. After analyzing the data collected from the respondent, the data appeared slightly high. This clearly indicates the need for more awareness (Asmatahasin et al., 2020) people have in terms of learning through artificial intelligence, even though microlearning in terms of education has the significant significance of artificial intelligence because it makes learning available in micro chunks, which makes learning complex terms quickly.(Asmatahasin et al., 2020) Still, students' attitude is on the slightly high, which becomes questionable, and there is a need for practical learning related to AI usage. Regarding attitude towards the subject, the wise performance of artificial intelligence is noted as high. Artificial intelligence makes learning enjoyable and more interesting with ICT tools in the classroom regarding Science, Geography etc. (Reggien et al., 2021). Which is, sure, enjoyable for the students? For this component received, attitude is moderate. It makes the efficiency of artificial intelligence questionable. And this brings us to the reality that artificial intelligence's evaluation methods have limitations (Hasan, 2023), e.g., summative, formative, and other kinds of evaluation need critical analytical skills, which is the disadvantage of machine learning because it works on artificial intelligence. So in terms of evaluation, there is a need for improvement. After qualitative analysis, researchers have found that school students' attitude toward AI is high. However, the presence of teachers to make learning impactful (Felix, 2020) and technology is no alternative for teachers. Moreover, proper educational adoption of technology will create a better tomorrow.

Sr. No	Components of Attitude	Mean	Standard Deviation	Interpretation
01	Learners Experience Towards the AI	17.50	2.42	High
02	Micro Learning with AI	13.48	1.70	High
03	Subject Wise Performance of AI	10.17	1.57	High
04	Evaluation with AI	5.18	1.02	High
05	Overall Attitude towards AI	46.35	5.44	High

Table 2 - Component of attitude of school students towards the artificial intelligence.

3. Results

This study follows a mixed research methodology. The present study does qualitative and quantitative data analysis. The attitude towards artificial intelligence seemed high through the table and the above interpretation. However, necessary improvements are compulsory in terms of educational adaptation for learning with the help of artificial intelligence, microlearning, the subjective performance of artificial intelligence, and evaluation. From qualitative analysis, we can state that the options students have are available in case of learning through the online platform. It gives them intelligence-wise learning experience and the facility to learn anywhere, anytime, at their convenience.

Nevertheless, from the data collected, it is observed that even in the impactful times of technology, the teacher's role is sometimes questionable. Respondents have very clearly stated that the teacher is the most crucial part of the learning process by stating the disadvantage of online learning. Furthermore, the way teacher adds life to the class by adding emotional connecting elements to the teaching and learning process. Respondents realize artificial intelligence and its functioning, with clarity about it having a secondary role and the teacher

having the primary role. While stating the disadvantage of AI, respondents pointed out the lack of seriousness and effectiveness of learning virtually by giving importance to offline learning, where there should be the inclusion of ICT & AI, with the highly intellectual teacher who would facilitate the process of learning by the application of human intelligence.

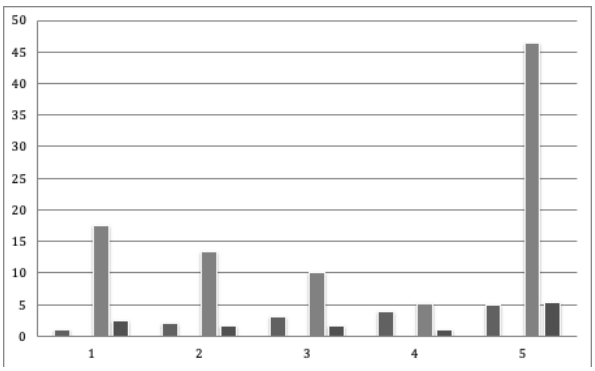

Figure 2 - Representation of Received data from Components of AI.

It would be right to state that a wrong attitude toward the educational adaptation of artificial intelligence will create distraction and confusion about what to use and where to receive knowledge for productive outcomes (Tang, Chang & Hwong 2020). However, we cannot stop the fast widespread of the 4 Industrial Revolution, but we can use AI by making optimum use of it. Furthermore, this study helps to gain insight into school students' perspectives and attitudes toward artificial intelligence.

4. Discussion

Artificial intelligence increasingly paves the way to the future, especially in improvising and revolutionizing the structure of the education system. A medical study assessed the attitude toward artificial intelligence (Asmatabasin *et al.*, 2020). A lack of awareness about the educational usage of artificial intelligence is found from the study amongst the respondents in terms of social media, newspapers, and magazines. Basic knowledge about artificial intelligence was found in the past study. It is similar in the present study when questions based on 'attitude of artificial intelligence in terms of micro learning'. The calculated mean of the component is measured at 13.48, which shows a borderline attitude. Another research related to the expectation and concerns of artificial intelligence has fundamental arguments from the received data while testing attitudes towards the knowledge of artificial intelligence shown agreeable 53%. Furthermore, non-agreeable of 47%, which is an indicator of lack of awareness and proper knowledge (Sheela, 2022)? Similar to these lines, the calculated mean from the present study, 17.50 is the mean where the range availability was till 21. Moreover, the gap between it shows that the attitude was borderline high. The study stating positive attitude towards artificial intelligence by (Reggien et al., 2021) found which brings advantages AI holds of fastening work related to healthcare; data collection is in alignment with the present study in terms of 'Subject wise performance of AI'. Where the attitude towards from respondents is noted as high and the calculated mean is 10.17 in terms of numbers. In addition to the above result, a study conducted based on an online survey of knowledge and attitude by (Soad et al., 2022) finds disagreement among the respondent regarding replacing AI doctors with robots. Likewise, in the present study, during qualitative analysis, the question on the AI replacing teachers and their role in the era of technology. Respondents clearly stated the need for teachers in the technological era. The other opinion expressed by (Yadrovs Kaia *et al.*, 2023) stated similarity with the present research for the component of 'overall attitude of learner towards AI' noted borderline high attitude with a calculated mean of 46.35 mean. This stated the scope for much-needed development for creating awareness amongst the school students.

5. Conclusion

The usage of artificial intelligence in the field of education makes assessing the attitude of students essential. Because students' perception of artificial intelligence helps further improve learning and understanding the educational topic. This study provides the attitudes of secondary school students through the gathered data concerning the given components. Moreover, the assessed attitude helps gain insight into the learner's way of perceiving artificial intelligence in education (Schepman, 2022). However, with some benefits, this study comes with limitations. First, the study is limited to school students. Second, the study is limited to the tested components which are calculated by collecting one-twenty samples at the school level. Third, the limitation of the study is the response given by the respondents, which are collected from India from Maharashtra state from Pune. After analyzing respondents' responses, it can be concluded that even with the dominance of artificial intelligence, students have numerous options for every difficulty. Still, respondents have clarity about the importance of teachers in the classroom and their impact on their life. Learning through a virtual platform is seen as an option rather than an alternative that could be chosen according to the student's condition. Additionally, respondents have a positive attitude towards using artificial intelligence (Selamat, 2021) because it makes learning lively and meets learners' different levels of intelligence. Nevertheless, there is need for improvement in evaluation and knowledge about

making the optimum outcome with the given components.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee.

Conflict Of Interest

The Authors declare that they have no conflict of interest.

Authors' Contributions

All authors have equally contributed to collecting the data, analyzing the data, reviewing the literature, writing and revising and approving the final draft of the paper.

Acknowledgment

We would like to thank all the respondents who have participated in the research and the respective school. And special thanks to Prof. Sanjeev Sonawane for encouraging and supporting during the research.

References

Al Saad, M. M., Shehadeh, A., Alanazi, S., Alenezi, M., Eid, H., Alfaouri, M. S. & Alenezi, R. (2022). Medical students' knowledge and attitude towards artificial intelligence: an online survey. *The Open Public Health Journal*, *15*(1).

Astrid S. & Paul R. (2022). The General Attitudes towards Artificial Intelligence Scale (GAAIS): Confirmatory Validation and Associations with Personality, Corporate Distrust, and General Trust, International Journal of Human–Computer Interaction, DOI: 10.1080/10447318.2022.2085400

Colom, R., Karama, S., Jung, R. E., & Haier, R. J. (2010). Human intelligence and brain networks. *Dialogues in clinical neuroscience*, *12*(4), 489–501. https://doi.org/10.31887/DCNS.2010.12.4/rcolom

Das, Samit & Halder, Ujjwal & Mishra, Bapi. (2014). Study on relationship between Attitude towards Education and Academic Achievement in Secondary Level Minority Students.

Ewert, Michael & Brodowicz, Dominika & Pospieszny, Przemek. (2018). Artificial Intelligence and machines : A curse or blessing for corporate real estate?. Corporate Real Estate Journal. 7. 337-351.

Felix, C.V.. (2020). The Role of the Teacher and AI in Education. 10.1108/S2055-364120200000033003.

Groumpos, P. (2019). Artificial Intelligence: Issues, Challenges, Opportunities and Threats. 10.1007/978-3-030-29743-5_2

Hasan, Md. M., Islam, M. U., Sadeq, M. J., Fung, W.-K., & Uddin, J. (2023). Review on the Evaluation and Development of Artificial Intelligence for COVID-19 Containment. *Sensors*, *23*(1), 527. https://doi.org/10.3390/s23010527

Hemalatha, A. and Kumari, P. Barani. (July 2020). A Conceptual Framework On Artificial Intelligence Technologies In Human Resource Management The International Journal of Analytical and Experimental Modal Analysis 2020, Available at SSRN: https://ssrn.com/abstract=3897499

Hoque, Md. (2017). Three Domains of Learning: Cognitive, Affective and Psychomotor. 2. 45-51.

Joshi, Ankur & Kale, Saket & Chandel, Satish & Pal, Dinesh. (2015). Likert Scale: Explored and Explained. British Journal of Applied Science & Technology. 7. 396-403. 10.9734/BJAST/2015/14975.

Kai-Yu T., Ching-Yi C. & Gwo-Jen H. (2021). Trends in artificial intelligence-supported e-learning: a systematic review and co-citation network analysis (1998–2019), Interactive Learning Environments, DOI: 10.1080/10494820.2021.1875001

Kengam, J. (2020). Artificial Intelligence In Education. 10.13140/RG.2.2.16375.65445.

Khoza, S. B. (2020). Academics' "why" of knowledge-building for the fourth industrial revolution and COVID-19 era. *International Journal of Higher Education, 9*(6), 247–258. https://doi.org/10.5430/ijhe.v9n6p247

Khoza, S.B. (2021). Can Teachers' Identities Come to the Rescue in the Fourth Industrial Revolution?. *Tech Know Learn* https://doi.org/10.1007/s10758-021-09560-z.

Kusters R, Misevic D, Berry H, Cully A, Le Cunff Y, Dandoy L, Díaz-Rodríguez N, Ficher M, Grizou J, Othmani A, Palpanas T, Komorowski M, Loiseau P, Moulin Frier C, Nanini S, Quercia D, Sebag M, Soulié Fogelman F, Taleb S, Tupikina L, Sahu V, Vie J-J and Wehbi F. (2020) Interdisciplinary

Research in Artificial Intelligence: Challenges and Opportunities. Front. Big Data 3:577974.

Mahind, Rupali & Amit. (2017). A Review Paper on General Concepts of "Artificial Intelligence and Machine Learning". IARJSET. 4. 79-82. 10.17148/IARJSET/NCIARCSE.2017.22.

Mousavi Baigi, S. F., Sarbaz, M., Ghaddaripouri, K., Ghaddaripouri, M., Mousavi, A. S., & Kimiafar, K. (2023). Attitudes, knowledge, and skills towards artificial intelligence among healthcare students: A systematic review. *Health science reports*, *6*(3), e1138. https://doi.org/10.1002/hsr2.1138

Pantelimon, F.-V., Bologa, R., Toma, A., & Posedaru, B.-S. (2021). The Evolution of AI-Driven Educational Systems during the COVID-19 Pandemic. *Sustainability*, *13*(23), 13501. https://doi.org/10.3390/su132313501

Peter N. Stuart R., "Artificial Intelligence: A Modern Approach"

Raja, R. & Nagasubramani, P. (2018). Impact of modern technology in education. Journal of Applied and Advanced Research. 3. 33. 10.21839/jaar.2018.v3iS1.165.

Selamat, E. M., Sobri, H. N. M., Hanan, M. F. M., Abas, M. I., Ishak, M. F. M., Azit, N. A., ... & Nor, S. F. S. (2021). Physicians'attitude Towards Artificial Intelligence In Medicine, Their Expectations And Concerns: An Online Mobile Survey. *Malaysian Journal of Public Health Medicine*, *21*(1), 181-189.

Seo, K., Tang, J., Roll, I. *et al.* (2021). The impact of artificial intelligence on learner–instructor interaction in online learning. *Int J Educ Technol High Educ* 18, 54 https://doi.org/10.1186/s41239-021-00292-9

Sheela J. (2022). Attitude of nursing students towards artificial intelligence. International Journal of Science & Healthcare Research.; 7(2): 344-347. DOI: https:// doi.org/10.52403/ijshr.20220447

Tecuci, G. (2012). Artificial intelligence. Wiley Interdisciplinary Reviews: Computational Statistics. 4. 10.1002/wics.200.

Vasiljeva, T., Ilmars, K., and Ilze, L. 2021. Artificial Intelligence: The Attitude of the Public and Representatives of Various Industries. Journal of Risk and Financial Management 14: 339. https://doi.org/10.3390/jrfm14080339

Yadrovskaia, M. & Porksheyan, M. & Petrova, A. & Dudukalova, D. & Bulygin, Y. (2023). About the attitude towards artificial intelligence technologies. E3S Web of Conferences. 376. 10.1051/e3sconf/202337605025.