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AI-Powered Population Health Education: Enhancing Student Awareness in Higher Education

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ABSTRACT

Artificial intelligence (AI) is increasingly shaping teaching and learning in higher education, yet its role in population health education remains underexplored. This study examined how AI supports population health education and enhances student awareness in higher education. A qualitative research design was employed to gain an in-depth understanding of students' perceptions, experiences, and interpretations of using AI tools in learning population health-related topics. Data were collected through semi-structured interviews with university students who had prior experience using AI-based tools for academic purposes. The data were analyzed using thematic analysis. The findings revealed that students used AI to simplify complex concepts, summarize academic materials, and access health-related information more quickly. Participants also reported that AI helped broaden their understanding of population health by increasing awareness of prevention, hygiene, sanitation, and community well-being. At the same time, important concerns emerged, including the risk of inaccurate information, overreliance on AI, and reduced critical thinking. These findings suggest that AI has strong potential to support population health education when integrated carefully and supported by critical guidance. The study contributes to current discussions on AI in higher education by showing that AI can enhance student awareness of population health issues, but its educational value depends on responsible and ethical use.

Keywords: Artificial Intelligence, Population Health Education, Student Awareness, Higher Education, Qualitative Research

INTRODUCTION

The role of artificial intelligence, especially generative AI, in transforming higher education is growing mainly due to changes in the information retrieval patterns, conceptual understanding, and interaction with learning activities by students. These advancements have gained new importance in the context of health-related education, as students are increasingly using AI tools to assist with academic assignments, explain complex ideas, and find quick answers to technical concepts. At the same time, the education of the population and health requires students not only to acquire sufficient facts but also to develop not only prevention skills and health literacy but also moral judgments and a sense of community health. This is why it is of utmost importance to question the idea that AI is able to support the students in building meaningful knowledge in this field or a superficial learning process (Acosta, 2025; Arif et al. 2025a; Schmidt et al., 2025; Shishehgar et al., 2025).

This urgency is supported by the increasing evidence that the formal AI literacy is still underrepresented in the public health and health education programmes, even though the role

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of AI in education and professional practice is becoming more and more relevant. According to Acosta (2025), it is important to mention that AI literacy is yet to be systematically introduced into the majority of public health programs, despite the fact that AI is increasingly becoming significant in fields like epidemiology, health communication, and policy analysis. Simultaneously, recent surveys indicate that health-related majors tend to think that AI is helpful, especially in enhancing access to information and aiding learning, but also raise the issue of ethical application, reliability, misinformation, and over-reliance. Of particular concern are these issues in population health education where the students are required to critically assess health information and gain a wider perspective of prevention, sanitation, risk communication and health outcomes at the community level. In this respect, the educational use of AI is not merely related to the availability of the technology, but also to the digital and health literacy of the students. Recent studies indicate that university students require better digital health literacy and a better understanding of how they can use AI in a responsible and ethical manner in their search and interpretation of health information. Students usually like AI due to its access, personalization, and learning support; however, the benefits are scarce when the learners do not have the ability to analyze AI-generated content critically. This implies that AI can be an invaluable aid to the learning process, but only in case the use of AI is predetermined by the systematic educational practices and supported by the skills of critical evaluation (Acosta, 2025; Alam et al., 2025; Knobloch et al., 2024; Salih, 2024; Schmidt et al., 2025).

Although the available literature has offered a rich insight, there are still a number of gaps. To begin with, recent studies tend to be broad in their focus on AI in higher education or on medical and nursing education, having not many studies that narrow down to focus on population-health education as an independent area of learning. Second, there is a large body of research that focuses on adoption, attitudes, or institutional integration, but little research provides insights into how students experience AI when learning about prevention, community health, and population-level health problems. Third, recent reports suggest that the methodological rigor of studies on AI-in-health-education is still insufficient and further qualitative and quantitative research is needed, especially on the experience of students and educators of AI in the context of a real educational environment (Shishehgar et al., 2025, Salih, 2024).

This paper attempts to address these gaps by examining how students experience and perceive the role of AI in population health education within higher education. It is innovative in that it integrates three traditionally separate strands, which include AI-assisted learning, student awareness, and population-health education. Instead of seeing AI as a technical tool or focusing only on academic performance, the current question is how learners learn about population health, use AI in education, think about how AI affects their awareness of issues related to health, and share their concerns in the context of accuracy, ethics, and critical thinking. As a result, the present research adds a student-focused angle to an impending research field, and it answers the growing demand to introduce AI into health and public-health education, which should be more organized, critical, and ethically informed (Acosta, 2025; Schmidt et al., 2025; Shishehgar et al., 2025).

Accordingly, this study has three main objectives: to examine students' understanding of population health in higher education, to explore how they use AI tools when learning

population health-related topics, and to identify the perceived benefits and challenges of AI in enhancing awareness of population health issues. In doing so, the study contributes to current debates on AI in education and offers insight into the potential of digital tools to support population health literacy and responsible learning in higher education (Acosta, 2025; Alam et al., 2025; Arif et al., 2025b). The study is guided by the following research question: How do students in higher education perceive and experience the role of AI in population health education?

Literature Review

Artificial intelligence, particularly generative AI, has become increasingly prominent in higher education because of its capacity to reshape how students retrieve information, understand concepts, and complete academic tasks. Recent studies indicate that students and faculty view AI as a useful tool for explanation, efficiency, and academic support, while also expressing concerns about overreliance, ethics, academic integrity, and the need for clearer institutional guidance. Schmidt et al. (2025), for example, argue that the integration of AI in higher education reflects both opportunity and challenge, particularly in relation to curriculum design, responsible use, and institutional preparedness. Similarly, Çerkini et al. (2025) found that students generally perceive AI as beneficial for learning, although they also remain concerned about misuse and dependency. These issues become even more significant in health and public health education, where learning involves not only the acquisition of information but also the development of judgment, literacy, and awareness related to prevention, health communication, and community well-being. Shishehgar et al. (2025) performed a recent systematic review and discovered that health students and academics tend to appreciate the importance of AI, yet formal AI education is still insufficient, and ethical issues are still prevalent. The review also highlighted that an important environment where future health professionals can be trained to utilize AI in a responsible manner is the university. Similarly, Acosta (2025) insists that AI literacy is not developed in most public health programs, yet the use of AI is becoming increasingly relevant to epidemiology, health communication, and policy analysis. Collectively, these studies indicate that AI in post-secondary education, especially in health domains, needs to be perceived as a technological phenomenon as well as a pedagogical and ethical challenge demanding greater educational leadership.

The other significant stream of literature is the digital health literacy of students and their perceptual power to critique information in the online space. The relevance of this area is specifically relevant due to the possibility of AI to increase the availability of health information, and it might not necessarily imply that learners will evaluate such information correctly. Alam et al. (2025) found out that the eHealth literacy and attitude towards AI among university students are deeply interconnected, which means that the educational value of AI, at least partially, depends on whether the students can interpret and critically assess digital health information. It has a particularly important implication on population-health education, where learning is not limited to the level of factual understanding, but can also encompass the ability to process prevention messages, analyze public-health information, and have an understanding of the wider determinants of health.

A number of educational advantages of AI-assisted learning are presented in the literature as well. In the literature on the topic, students state that AI enables them to obtain

information fast, receive simplified explanations, and engage in more individualized and self-directed learning. According to Knobloch et al. (2024), students of pharmacy used AI in numerous academic assignments without much formal training, and many of them stated that AI could be an effective aid to studying when performed as an addition to critical thinking and not a replacement. Similarly, Campillo-Ferrer et al. (2025) found that students found the generative AI to be beneficial in terms of support, efficiency, and learning flexibility, though with perceived limitations. Taken altogether, these studies imply that AI could be particularly helpful in advanced fields like health and population-health education, where the students might need to be helped to understand the complex terminology, abstract concepts, and quick access to explanations.

At the same time, recent works also underline that the benefits of AI in education are always accompanied by serious risks such as wrong results, informational hallucinations, plagiarism issues, bias, lack of critical thinking, and overdependence on AI mechanisms. The ethical issues and the lack of AI literacy were identified as the key barriers in health education (Shishehgar et al., 2025). Schmidt et al. (2025) equally emphasized that the institutions should adopt specific intentional measures to tackle the issue of AI instead of assuming that their adoption will improve the education outcomes. These concerns are particularly applicable to population-health education because the blindness in trusting what AI offers may confuse students in their perception of the prevention, risk communication, and community health issues.

Although the scholarship in this field is growing at a high pace, there are still some gaping issues. To start with, most of the current literature studies AI in higher education in general or the subject of professional education, including medicine, nursing, and pharmacy, but there is a relative scarcity of literature on population health education. Second, many studies emphasize adoption patterns, attitudes, or institutional policy, but fewer explore students' lived experiences of using AI to learn about prevention, public health awareness, and community health issues. Third, although emerging evidence suggests that AI use and digital health literacy are closely related, this relationship remains underexplored in studies of students' educational experiences. In light of these gaps, a qualitative approach is particularly appropriate because it allows for an in-depth exploration of how students interpret, use, and evaluate AI in the context of population health education. By focusing on students' perceptions and experiences, the present study seeks to generate a richer understanding of how AI may support awareness-building while also revealing the limitations, tensions, and critical concerns associated with its educational use in higher education.

RESEARCH METHOD

In this study, a qualitative research paradigm was adopted to examine how artificial intelligence (AI) can be used to enhance population health education and increase student awareness in tertiary education. A qualitative approach was considered the most appropriate because the aim of the study was to explore students' perceptions, lived experiences, and interpretive understandings in depth, rather than to measure relationships between variables. Unlike experimental, correlational, or purely descriptive designs, qualitative inquiry is better suited to clarifying meanings, attitudes, and context-based experiences within a specific educational setting. On this basis, the present study focused on how students use AI-related

tools when learning population health concepts, how they evaluate the pedagogical value of these tools, and what benefits and concerns they associate with them. Therefore, a qualitative design was selected as the most suitable approach, as it enabled the researcher to generate rich, descriptive, and context-specific data related to AI-mediated learning interactions (Creswell & Poth, 2018; Lim, 2025).

The study included 24 undergraduate and postgraduate students from the University of Balochistan who had prior experience using AI-based tools, such as ChatGPT, for academic purposes and for learning health-related content. Participants were recruited from nursing and pharmacy programs, making them especially relevant to the study because both disciplines involve direct engagement with health education and population health-related issues. There were 12 males and 12 females in the sample, representing varying affiliations to different departments in order to have a wider range of opinions within the academic field and gender. The research involved the use of purposive sampling, which is a traditional qualitative method of recruiting participants since it will help identify persons with a personal experience with the phenomenon being studied (Patton, 2015). This method was deemed appropriate, as not every student can be extensively exposed to AI-based learning and the research needed interviewees who could give valuable and pertinent accounts of their experiences. Paying more attention to higher-education students was especially timely because this group is getting more involved in AI in the academic setting, in seeking digital information relevant to population and public health. The data collected by including the participants who had a tangible experience with AI tools allowed basing them on the real-world practice of education and real-life learning experiences rather than on the hypothetical viewpoints.

The inclusion criteria were that the participants must be currently enrolled students of the University of Balochistan who are either undergraduate or postgraduate students but who have previously used AI tools to assist their learning in population health education. These were essential features since they were directly linked to the research objectives of the study. In the environment of tertiary education institutions, learners are already exposed to high academic standards and their dependence on digital learning technologies is increasing, thus making them a relevant group to research the pedagogical potential of AI. The stories of the participants presented first-hand information about the use of AI in the learning process, how it helped to raise awareness of health-related concerns, and what difficulties were faced during the learning process.

The main data-collection tool was semi-structured interviews. The methodology adopted due to its dual ability to provide a coherent framework of interviews as well as allow flexibility. It helps the administration of a standardized set of probes in line with the research objectives but leaves the participants with a leeway to expound using their own words and allows the investigator to follow up on the emergent lines of inquiry. Semi-structured designs are particularly well suitable to a qualitative study since they aid in-depth research on beliefs, perceptions, and experiences without losing the possibility of comparison of results among the participants (Creswell & Poth, 2018). In the present study, the interviews were conducted face-to-face, and each interview lasted approximately 30–45 minutes.The interview queries that enabled the issue in the given case were those that prompted them to talk about their perceptions of population health, how they had used AI-tools, how AI had affected their

thinking towards issues in the field of population health, and their perceptions as to whether they had concerns about the use of AI in education.

The interview agenda was carefully drawn to represent the aims of the study. It included open-ended questions that covered major areas: the conceptual understanding of population-health issues in students; awareness of AI tools and their use patterns; perceived educational benefits of AI; and issues related to dependability, ethics, reliance, and accessibility. Open questions were used to allow free responses, thorough description of the perspectives, and the availability of examples as to the academic experience of the participants. Such an approach enabled obtaining detailed, rich responses, as it is required in qualitative research (Creswell & Poth, 2018; Lim, 2025). After transcription, the interview records were returned to participants for member checking in order to confirm the accuracy of their responses and enhance the credibility of the data.

The ethics were followed in data-collection procedures. Before the actual interview, the participants were informed about the study purpose and the role of the interview. Being involved was voluntary and informed consent was taken prior to participation. The participants were guaranteed confidentiality and their information could only be used in academic ways. On the one hand, to maintain anonymity, the real identities were not reported; pseudonyms or coded names (e.g., Participant 1, Participant 2, etc.) were used. Interviews were arranged at a convenient time to the participants and with their consent, all discussions were audio-recorded to ensure that there was proper transcription and that it could be used in other analysis. These were taken to ensure that the study had integrity in its ethical aspects and give strength to the validity of its results. In addition, reflexivity was maintained throughout the data-collection process by ensuring that the interviewer used the same semi-structured guide for all participants, avoided leading questions, and remained aware of personal assumptions about AI in education so that participants' views could be represented as accurately as possible.

The obtained data set was analysed with the help of thematic analysis, an analytical approach that is often used in a qualitative study to determine, structure, and understand repeated meanings or patterns within an array of texts (Braun & Clarke, 2006; Nowell et al., 2017). The thematic analysis was considered appropriate as the information involved interview transcripts that had to be interpreted to reveal overall themes connected to the awareness of students, their narrative experiences, and their perception. The analytical process occurred in several phases: recording of recordings, repetitive reading of transcripts to develop familiarity, coding salient linguistic utterances, merging similar codes into larger categories, and subdivision of these categories into salient themes on which the Results and Discussion aspects are based. Reflexive attention was applied in order to minimize the bias of the researcher when interpreting the results of the research considering the impact of predetermined assumptions and expectations on the coding process and interpretation. The researcher thus reread the transcripts several times, was keenly connected to what the participants actually said and contrasted emergent themes with the raw data to make sure that the analysis was based on the accounts of the participants and not his preconceptions.

This methodological procedure helped to transfer personal statements to general interpretive knowledge. Thematic analysis helped the research to emerge with major themes in the understanding of population health by students, the use of AI in learning, perceived pedagogical advantages of AI-based learning, and the associated challenges and issues related

to AI-assisted learning. Such themes were inductively developed by intensive work on the interview content, and it is the main benefit of a thematic analysis in qualitative research (Braun & Clarke, 2006).

As a tool to increase the validity and reliability of the study, the strategies based on the construct of trustworthiness were introduced. Credibility, dependability, confirmability and transferability are some of the areas of trustworthiness in qualitative research (Lincoln & Guba, 1985). Confirmability was further strengthened through reflexive awareness during both interviewing and analysis, with careful efforts to distinguish participants' views from the researcher's interpretations. Data review and careful adherence to the alignment of statements of a participant and the interpretation of a researcher were performed as the means of establishing credibility. Reliability was ensured with a well described systematic presentation of the research process including the selection of participants, data collection methods, and analytic methods. The data anchoring of confirmation was supplemented with the introduction of direct quotes to illustrate derivations of interpretation. To counter the problem of transferability, adequate background information was provided, in terms of the research context and participant characteristics, so that the reader can determine applicability to similar contexts. All this contributed to the openness of the study, its predictability, and its general validity.

In general, the research questions were in line with the adopted methodology that was a qualitative design, purposive sampling, semi-structured interviews, and thematic analysis. It provided a detailed, systematically structured description of the experience of students on AI-enhanced population-health education in tertiary education. The methodological framework allowed analyzing the perceived educational value of AI as well as the challenges and concerns that accompany the implementation process. As a result, the current research provides a solid methodological basis to enhance the knowledge about the use of AI in improving student awareness concerning population-health problems (Creswell & Poth, 2018; Braun & Clarke, 2006).

RESULTS AND DISCUSSION

Overview of Thematic Findings

The thematic analysis generated five major themes: (1) participants' understandings of population health, (2) the use of AI tools in learning, (3) AI as a tool for enhancing population health awareness, (4) perceived educational benefits of AI in higher education, and (5) challenges and concerns related to AI use. These themes emerged across the interviews with 24 undergraduate and postgraduate students from the University of Balochistan and reflected both the opportunities and limitations associated with AI-supported learning in tertiary education. Although each theme is presented separately for analytical clarity, the findings also reveal strong connections between them. Meanwhile, the results indicate that all participants did not experience the role of AI in the creation of awareness to the same extent. To a select number of the students, AI seemed to promote a more inclusive concept of prevention, sanitation, and communal health, whereas to others it primarily served as a convenient source of simplified entry-level data. This distinction shows that AI has the potential to aid in understanding of the health concerns of the population, but the level of this understanding will

be determined by the extent to which the students are interested in reflecting on, questioning, and relating the information to the broader ideas of health.

Participants' Understanding of Population Health

A major finding of the study was that participants demonstrated varying levels of understanding of the concept of population health. Some students initially described it in narrow clinical or disease-focused terms, while others offered broader interpretations that included prevention, hygiene, nutrition, health education, and the general well-being of communities. This suggests that students did not share a uniform conceptual understanding of population health, and that their levels of health literacy differed in depth and scope.

> *"At first, I thought population health mainly meant diseases affecting a large number of people. Later, I started to understand that it also includes prevention, hygiene, nutrition, and the general well-being of communities. It made me realize that health is not only about treatment, but also about keeping people healthy before problems become serious" (Participant 11).*

This response reflects a shift from a disease-centered understanding of health to a broader preventive and community-oriented perspective. The participant's recognition of hygiene, nutrition, and prevention indicates a more developed understanding of population health as a multidimensional concept.

> *"In my view, population health is connected to how people live, what kind of health information they can access, and what kind of support they get from family and society. It is not only about hospitals or medicine. It also depends on social conditions, awareness, and whether people have the resources to stay healthy" (Participant 21).*

This quotation demonstrates awareness of the social determinants of health. Rather than viewing health only in biomedical terms, the participant linked health outcomes to information access, living conditions, and social support, revealing a more complex and socially grounded understanding.

All these observations indicate that the understanding of population health can lie at the simplest biomedical explanations, as well as the most comprehensive one that takes into account measures of prevention, the social environment, and the well-being of the population in general. This variance is important in the sense that it shows that not all the university students start with a common or global conception of population health but instead their conceptual frameworks build unevenly based on their background exposure to the subject, the kind of education they were exposed to, and access to learning materials.

These results suggest that higher education is essential in increasing the student awareness on health beyond personal illness to preventive health, systems thinking, and social determinants. At the same time, the findings show that this development was uneven across participants. Some students demonstrated only a basic shift from a disease-centered view to a broader preventive understanding, whereas others articulated a more complex awareness of community well-being and social determinants of health. This contrast suggests that students entered the learning process with different levels of prior exposure to population health concepts, which shaped the depth of their understanding.In this respect, the findings help to argue that the level of population health literacy should be actively developed during tertiary education, and not assumed as already possessed knowledge. The recent research in artificial intelligence and health education indicates the same trend, with an emphasis on the necessity

of organized, health-related literacy and critical educational support to help students have a deeper understanding of complex health matters.

The Use of AI Tools in Learning

A second major theme concerned the ways students used AI tools in their learning processes. Most participants reported using applications such as ChatGPT and similar systems to clarify difficult concepts, summarize long readings, simplify technical language, and obtain an initial understanding of assignments or academic topics. Their responses indicate that AI was integrated into learning in flexible and practical ways, depending on the student's needs, confidence, and academic challenges.

> *"When I get an assignment, I often use AI first to get a general understanding of the topic. It helps me see the bigger picture before I start reading on my own. After that, I usually check books, articles, or lecture notes so that I can build a better and more reliable understanding" (Participant 9).*

This quote is especially important because it shows that AI was not always used as a replacement for independent study. Instead, it served as a starting point that helped organize later reading and deeper academic engagement.

> *"I use AI tools to shorten long readings and help me understand difficult health-related terms. Many academic texts are hard to follow, especially when the vocabulary is unfamiliar. AI helps me break that difficulty and gives me a simpler explanation before I deal with the full reading" (Participant 6).*

This response suggests that AI helped reduce the linguistic and conceptual barriers associated with specialized academic material. In this sense, AI appeared to function as a bridge between students' existing level of understanding and the demands of academic reading in population health-related content.

In general, the patterns of use reported demonstrate that students utilized AI in various, yet meaningful, ways. Instead of using it to perform one activity, they included it in various activities in their learning process, such as clarifying the concepts, preparing, vocabulary assistance, and orientation of the task. These results are aligned with the literature that indicates that higher education learners tend to utilize AI to facilitate understanding, time management, and organize preliminary research of academic assignments. The current research contributes to that body of literature by demonstrating that population health learning and awareness-building is also subjected to such usage.

However, the findings also revealed important differences in students' patterns of AI use. Some participants used AI critically as an initial support tool and then verified or expanded their understanding through lecture notes, books, and academic articles. Another group seemed to be using AI as a quicker way to get clarification and simplified explanations. This difference has a considerable implication, as it shows that AI worked differently among learners: some of them considered AI as a scaffold to further elaboration, whereas others believed it would be a convenience-based shortcut. Consequently, the educational quality of AI was not only the quality of the tool, but rather the level of critical thinking students applied to using the tool.

AI as a Tool for Enhancing Population Health Awareness

The third theme that appeared during the interviews was the use of artificial intelligence to improve the awareness of the students on the issue of population health. Several interviewees said that AI-based learning helped them to look beyond the personal view of health and become more serious about other aspects of health, prevention, sanitation, disease management, health promotion, and community health. In this regard, AI was not seen simply as a device to conduct study sooner but also to enhance awareness of the general issues of the health of the population.

> *"The experience of using AI opened my eyes to the fact that population health does not belong to the type of one sick or one healthy person. It also entails the way communities stay healthy by preventing, creating awareness, and getting information. Prior to implementing AI, I had not given much consideration to the broader community aspect of health" (Participant 17).*

This quote suggests a conceptual departure of an individualist approach to health to a community-based approach to health. The description provided by the participant illustrates that the AI-based learning can be helpful in enabling students to connect their personal health-related issues to the social and preventive implications.

> *"Before using AI, I was not very concerned with issues such as sanitation, disease prevention, and health education. AI helped me understand the importance of these issues not only for individuals, but also for society. It made me realize more clearly how public health operates in everyday life" (Participant 8).*

This reaction means that AI helped forecasting the public health issues that had not been given attention before or were not known. Not only did the participant gain knowledge, but it also improved his/her understanding of the social relevance of population health.

All these results point to the idea that artificial intelligence can be significantly implemented in the context of creating awareness, by allowing students to read and understand the concepts of public health in simpler, more understandable language. The implication in question is especially relevant to the context of the higher education where students will have little prior knowledge about population health as a specific field of study. Thus, the current findings represent the continuation of recent research on AI in health education to the effect that AI should be able to facilitate not just the efficiency of the learning process but also a more generalized sense of preventive and community-based health issues. Meanwhile, the results indicate that all participants did not experience the role of AI in the creation of awareness to the same extent. To a select number of the students, AI seemed to promote a more inclusive concept of prevention, sanitation, and communal health, whereas to others it primarily served as a convenient source of simplified entry-level data. This distinction shows that AI has the potential to aid in understanding of the health concerns of the population, but the level of this understanding will be determined by the extent to which the students are interested in reflecting on, questioning, and relating the information to the broader ideas of health.

Perceived AI Educational Benefits in Higher Education

Participants also described a range of educational benefits associated with their use of AI in higher education. These benefits were practical, cognitive, and affective in nature. Students highlighted fast access to information, personalized explanations, improved

preparation before class, better understanding of difficult content, and greater confidence in academic participation. These responses indicate that students perceived AI as more than a convenience tool; they saw it as a flexible learning support system that responded to their individual needs.

> *"AI provides fast answers, so I can learn more quickly and focus on the parts I do not understand. It is especially useful when I need a quick explanation before class or while revising. I feel that it helps me manage my time better and study in a more targeted way" (Participant 4).*

This response emphasizes efficiency and targeted learning. The participant valued AI not only because it saved time, but because it allowed them to concentrate on specific gaps in understanding.

> *"When I use AI before lectures, I feel more prepared because I already know something about the topic. That makes me more confident in the classroom and less confused when the teacher starts explaining. In that sense, AI helps me participate with a better base of understanding" (Participant 11).*

This quote shows that the benefits of AI extended beyond information access to affective dimensions of learning, particularly confidence and readiness to participate in class.

Overall, the findings suggest that students viewed artificial intelligence as a flexible and responsive educational tool that supported efficiency, personalized explanation, repeated clarification, and self-paced learning. These results are widely aligned with earlier studies that indicate that students tend to appreciate generative AI due to its accessibility, study aids, and better task organization. However, the present findings should not be interpreted as uniformly positive. Other past researchers have indicated that AI can also generate a greater cognitive load, encourage shallow thinking or induce false confidence when learners are given simplified explanations without in-depth thought. The current research concurs with the current literature in this regard: AI seems useful in cases where it assists students in structuring and explaining learning but its effects can be counterproductive when the pace and comfort take the place of long-lasting academic work and critical interpretation.

Challenges and Concerns Related to AI Use

Despite the great number of positive statements that were made by the participants about AI, it is also possible to mention several important concerns connected with its position in the academic learning. The most mentioned issues were the delivery of false information, overdependence on AI tools, and the fact that the frequent application of AI could degrade critical thinking and independent learning. The same worries indicate that the participants did not take AI uncritically, rather they became aware of its benefits and its potential threats. Notably, these were not the only issues raised by people who were not optimistic about AI. Although some students mentioned AI as useful and efficient, there remains a threat of inaccuracy, overdependence, and diminished critical thinking, which is accepted even by students who identified AI as useful and efficient. It could indicate that the views of students did not exactly fall into the categories of positive and negative; instead, a large number of participants simultaneously had both attitudes and found AI to have a practical value but were concerned about its implications on education.

> *"I believe that students may become overly reliant on AI in case they use it in all situations. When it occurs, they might cease to think deeply and attempt to resolve issues independently. That would*

> *undermine critical thinking and independent learning skills, in the long run, could weaken them" (Participant 4).*

There is another deeper educational issue being pointed out in this quotation. The subject was particularly concerned not only with the accuracy of the facts, but also with the consequences of dependence on AI in the long term in relation to intellectual growth and analytical skills.

> *I too much without checking the source of the information. Since the response has a confident tone, they can think that the answer is correct. Nonetheless, when the source is not checked, it may lead to issues in the academic work and comprehension" (Participant 15).*

The transparency of sources and blind following are highlighted in this quote. It is not merely the fact that AI can be incorrect, but students can confuse authoritative language with knowledge that can be trusted.

These concerns complicate any overly optimistic view of AI in higher education. Although participants valued the convenience and usefulness of AI, they also recognized that its benefits are conditional and depend on critical engagement. This observation is consistent with previous research showing that reliability, false confidence, and reduced independent thinking are major concerns when students use AI without sufficient guidance. The findings therefore point to the need for practical institutional responses. Universities should provide explicit AI literacy training that helps students verify AI-generated information, compare AI outputs with credible academic sources, recognize bias and misinformation, and use AI as a support tool rather than a substitute for independent thinking. In health-related fields, this need is especially important because uncritically accepted AI-generated information may distort students' understanding of prevention, risk communication, sanitation, and community health. Accordingly, the effective educational use of AI requires not only access to digital tools, but also structured pedagogical support and clear ethical guidance.

Overall Discussion

The findings of this study suggest that the educational value of artificial intelligence in population health education is neither automatic nor uniform. Rather, AI appears to support learning when students use it as a scaffold for understanding complex ideas, preparing for independent study, and expanding their awareness of prevention, sanitation, and community health. In this sense, AI was not experienced merely as a tool for convenience, but as a pedagogical resource whose value depended on how critically students engaged with it. At the same time, participants' concerns about inaccurate information, overreliance, and reduced critical thinking indicate that the benefits of AI remain conditional rather than guaranteed. This tension between usefulness and risk shows that students did not passively accept AI, but instead evaluated it in relation to both its advantages and its possible educational consequences.

One of the main contributions of this study is that it extends current discussions of AI in higher education beyond efficiency, productivity, and task completion. Much of the existing literature focuses on how AI supports academic performance or simplifies learning activities, whereas the present findings suggest that AI may also influence how students understand broader issues such as prevention, hygiene, sanitation, and community well-being. In this respect, the pedagogical significance of AI goes beyond academic assistance and enters the

domain of awareness-building. However, this awareness did not appear to develop equally across all participants. For some students, AI encouraged a broader and more reflective understanding of population health, while for others it functioned mainly as a source of simplified introductory information.

This finding is in line with previous studies that reveal that AI in higher education has both learning opportunities and significant threats. For example, Schmidt et al. (2025) emphasize that the integration of AI requires responsible use and institutional preparedness, while Shishehgar et al. (2025) highlight the continuing importance of ethical concerns and formal AI education in health-related contexts. The current research builds on this literature by revealing that in population health education, AI can contribute not only to academic efficiency but also to a higher level of the awareness of prevention and community health, but this potential relies on the extent to which students are critical of AI-generated information.

From a constructivist perspective, the findings suggest that AI may function as a form of scaffolding that helps students build initial understanding, organize ideas, and approach unfamiliar topics with greater confidence. Simultaneously, the results are in line with digital health literacy views, in which having access to information is not enough unless individuals are able to assess its accuracy, credibility and relevance. In that sense, blind faith in AI can contribute to shallow learning and unfounded belief, but thoughtful and mindful usage can help to learn more and be more responsible in their learning habits. Overall, the study indicates that AI can support students' knowledge and awareness of population health issues, but its educational potential is strongest when it is positioned as a supportive and instructive tool rather than a replacement for independent thinking

Implications of the Study

This paper has a number of significant implications on education, learning in public health and the role of artificial intelligence in higher education. To begin with, the results indicate that AI can become a useful educational resource in population health education because it allows accessing information quickly, simplifying complex feedback, and expanding knowledge of prevention, hygiene, and community health and public health concerns. Universities can then take into account integrating AI-supported learning practices into health-related studies through the manner that enhances student engagement and health literacy.

Second, the paper points out that AI use in education must not be viewed as a substitute of teacher, critical reading and independent thinking. Students, however, as helpful as AI became, also brought up the problems of inaccuracy, excessive reliance, and less critical thinking. This implies that the institutions of higher learning should provide explicit advocacy in terms of responsible and ethical use of AI in academic learning by not only imparting on students on how to use AI tools, but also how to analyse, question and evaluate AI-generated information.

Third, the research has implications to the curriculum design. The findings reveal that the pedagogical methods of integrating traditional teaching with facilitated digital tools can be useful in population health education. Teachers might be required to revise sections of the curriculum to include AI literacy, digital health literacy and critical information evaluation as a learning outcome. This way, students will be able to acquire not only substantive knowledge

of the subject material but also the skills to use the emerging technologies in a responsible manner.

Fourth, the research is consequential to health education among the population since it shows that AI is capable of aiding the population-wide awareness of health issues. By allowing students to acquire knowledge regarding prevention, sanitation, disease control, and community well-being, AI can have a positive impact on population health by enhancing its knowledge outside the classroom. Thus, AI-assisted learning could have a positive effect on education and socialization into knowledgeable and health-conscious citizens.

Finally, the paper highlights the need to conduct additional empirical research on AI in the domain of population health education, especially in diverse student groups, institutional settings, and cultural backgrounds. Further research needs to cover the long-term effects of learning, cross-disciplinary comparisons and how educational institutions and policymakers can enable AI integration in higher-education institutions to be successful and ethically sound.

CONCLUSION

This study explored how students in higher education perceive the role of artificial intelligence in population health education. The findings suggest that AI can assist learning by clarifying complex concepts, summarizing academic content, and expanding awareness of prevention, sanitation, and community health. Meanwhile, participants noted worries regarding false information, excessive use, and poor critical thinking, meaning that the educational quality of AI depends on the responsible use, critical consideration, and pedagogical advice. The paper adds to the existing discussions about AI in higher education by showing that AI can be used in population health education as a tool not only to facilitate academic understanding but also to raise awareness. These results suggest that AI literacy and digital health literacy must be incorporated into the health-related programs of universities to foster responsible usage, information verification and critical thinking in terms of information generated by AI. Nevertheless, the research has certain limitations due to the qualitative design, rather small sample, university-specific setting, no faculty opinions, and no triangulation, which can restrict the generalizability of the results. Subsequent studies are thus advised to investigate more heterogeneous institutional contexts and adopt larger, mixed-method or longitudinal research designs to better comprehend the educational implications of AI in the long term in the context of population health education.

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