



Assessing Students' Understanding of Ethical Use of Artificial Intelligence (AI): A Focus Group Study

Salima Barkat Ali

Department of Allied Health sciences, Iqra University
salima.thepsychologist@gmail.com

Maha Haider,

Department of Allied Health sciences, Iqra University

Darakshan Samiullah

Department of Allied Health sciences, Iqra University

Shamsha Shamsy

University of Central Asia

Abstract

Artificial intelligence is at the center of technological advancement in the modern world. With the rapidly progressing use and multitude of uses, AI allows for more convenient methods, saving time and effort, both. The current study consisted of 3 focus groups with 8 in 1 group and 11 members in each of the other 2 groups, who were asked questions probing their understanding of the ethical use of AI. The responses to each question were manually recorded. The results displayed accountability as the best understood ethical concern in the context of responsible AI. Students were found to be most aware of accountability with different levels of knowledge of other ethical concerns covered in the framework. There was a moderately significant lack of awareness found among the students.

Keywords: Artificial intelligence, artificial intelligence in education, ethical considerations, intelligent tutor systems, learning management systems



Introduction

Artificial intelligence is the study of ideas that create machines that perform or ideally think like humans (Sweeney, 2003). Chatterjee and Bhattacharjee (2020) defined AI as computing systems that can perform human-like functions like adapting, learning, synthesizing, correcting, and employing different types of data needed to execute complicated tasks. Another way AI can be defined is simulating human intelligence through coded heuristics (Frankfield, 2023). Johnson et al. (2009), summarized AI in a similar manner, as artificially intelligent tutors that generate responses instantaneously dependent on its comprehension of the subject at hand to understand the problem and evaluate studies on students.

Alan Turing first articulated the vision of “thinking machines” in 1950. He published a paper, “Computing Machinery and Intelligence” (Turning, 1950). The term artificial intelligence was introduced for machines that can even do jobs more complex than typical tasks. With the increasing computing power, the term was applied to machines having the ability to learn. There is the common idea that machines based on AI, or ‘cognitive computing’, can potentially imitate or exceed cognitive capacities of humans, including sensing, language, reasoning, analysis, problem solving, and creativity (UNESCO, 2019).

In the 1970s, Artificial Intelligence in Education (AIED) emerged as a special field covering the latest technology for classrooms and learning, mainly for higher education. Along with core automation tasks, AIED offers the students versatile, individualized and engaging learning alternatives (Kengam, 2020; Chen et al., 2020; Leoste 2021). Current popular trends in AIED include flexible education, instructional agents, savvy technology for classrooms, and automated tutor systems (Schiff, 2021; Ng et al, 2023).

Cognitive automation involves giving computers the ability to complete tasks previously performed by humans, such as language processing, identifying speech patterns, authorship credit, classification, recognition of facial features, and transcribing text from audio data for a researcher to search using keywords or pre-defined classes. One prominent trend in AI over the past few years, for instance, has been the creation of growing language models, such as the Chat GPT-3 (OpenAI, 2021). A sophisticated impersonation of reading, comprehension,



summarization, and common sense reasoning is now possible with modern language models, which are supported by neural networks (Heaven, 2021; OpenAI, 2019; Rae et al., 2021). Businesses are largely adopting AI, according to the Harvard Business Review, 2017, to identify and prevent security intrusions (44%), fix users' technology problems (41%). Work on production management should be reduced (34%). AI is also used to check internal compliance (34%) with employing authorized vendors (Ramaswamy, 2018).

Ethics is defined as the difference between what is morally right and wrong. It comprises basic concerns of the standards that judge a human action right or wrong. (Singer, 2023). Ethical considerations in the context of responsible AI usage are based on maintaining ethical development and use of the developed AI system. Based on the foundational framework of AI ethics for this study, the principles include the fundamental values upholding the rights and responsibilities of the user.

UNESCO formulated an ethical framework for AI based on 6 ethical principles, which forms the foundation for the present study. The principles include, transparency, fairness, privacy, accountability, explain ability and safety. The current research aims to gather popular ethical domains of awareness in students regarding acceptable use of AI. As a result, collect what the students are mostly aware of. This will describe their perceptions and ideas regarding ethical usage of AI in detail.

Literature Review

AIEd or artificial intelligence in education is the integration of three vital disciplines, namely, statistics, education, and computer science. AIEd is a multidisciplinary field that extends to other domains like cognitive psychology and neuroscience (Chen et al., 2020). Additionally, AI ethics is a set of assumptions, concepts, and methods that apply generally recognized moral standards to direct moral behavior in the creation and application of AI technologies (Leslie, 2019).

Cope et al. (2020), claims the differentiation amongst human and artificial intelligence is remarkable in itself. These scholars consider it a mistake to define artificial intelligence as something linked to human intelligence since forever which is the reason they consider this concept as anthropocentric. They use a non-anthropocentric approach on the contrary and regard AI as the ability to meet complex goals. Therefore, inorganic forms of general intelligence are not implied to comply with the parameters of human intelligence (Korteling et al., 2021). The



fundamental differences between both types of intelligence are related to the biological versus digital structures, speed and connectivity. Additionally, they include upgradability, potential for development, and efficiency. They conclude that the AI machines will remain unconscious machines for the near future, regardless of how intelligent they are made.

AI tools are convenient forms of technology that can produce or transform different types of content including pictures, writeups, algorithms & codes or presentations. Approved and acknowledged use of AI tools is generally acceptable. However, in an educational context, unauthorized usage of AI services and products for the sake of academic progress might be considered a form of academic misconduct. Misconduct refers to any action completed or attempted that undermines integrity (Tauginienė et al., 2018, p. 9).

Beer (2019) suggests AI machines are fast and smart. Previously institutions relied on designated staff but AI presently offers the potential for new user insight along with lesser understanding or expertise in data analysis. AI-driven systems use larger data sets, allowing space for previously overlooked perspectives. The analytics can help with forecasting what might happen in the future.

Tools like proofreaders and spell check tools that alter the form only are mostly acceptable. An AI tool cannot stake a claim on ownership of the findings. Therefore, it cannot be listed as a co-author in a publication. The user is always responsible for the content, regardless of who or what generated that content (Levene, 2023).

A Focus Group Study of Medical Students

Researchers carried out a mixed methods study of focus groups and surveys in 2022. The participants included 128 medical students, to assess the knowledge of artificial intelligence in medical education globally. The support for incorporating artificial intelligence in education was similar across the world. However, few students had any training about it. The majority of students, 92%, stressed that the core medical curricula needs to integrate with AI-related teaching. A staggering 86% of the students showed interest in exploring interdisciplinary learning. The disciplines include computer science and biomedical engineering. The study found predominant interest in learning the clinical applications, development and assessment of AI-based tools. However, the current medical syllabi did not support it. Participants acknowledged



the importance of acquiring the skills necessary to operate in the field of AI in medicine. They pressed for multidisciplinary teaching on the topic, arguing on its importance (Ejaz et al., 2022).

AI in Modern Education

Artificial intelligence has revolutionized education. Starting from grading simple tests and providing feedback it has developed massively over time. Now, AI is not just some product or tool but has become an important part of the learning system, designing personalized syllabus and overall curricula (Chen et al., 2020). It can predict how a student will perform and interact with them using natural language. The Office of Educational Technology of the US department of Education published a report based on the future of AI based teaching and learning. This report summed up the risks and benefits for AI in teaching, learning, research and assessment based on the opinion of the public. The research identifies artificial intelligence (AI) as a rapidly growing technology that can facilitate newer methods of interaction and cooperation between teachers and students, assist teachers in addressing learning variability, strengthen feedback loops, and provide support (Durey, 2023).

AI is currently used in several forms in education. A Learning Management Systems (LMS) makes use of AI to monitor student development, provide resource recommendations based on unique learning preferences. This system can also help with collaborative discussions, video classes and meetings in addition to professional training and even forecast results. The program basically provides an online classroom to teachers and students (Bradley, 2021). Intelligent Tutoring Systems that provide individualized instructions. Students receive individualized training and feedback from Intelligent Tutoring Systems (ITS), which adjust to their learning style and pace. AI teaching assistants can respond to student questions, grade assignments, and even participate in conversations like those employed (Akyuz, 2020; Paladines, 2020). ITS can be tailored to function specifically. They leverage artificial intelligence to create models of subject matter and the teaching methods to be utilized.

Baker and Smith (2019) address academic tools functioning through AI from three distinct aspects. They include learner focused, teacher focused, and the system based AIED. The learner-focused products and services are the programs that students use to study a subject, for example, the customizable learning management systems or intelligent tutoring systems. Teacher-focused AIED systems assist the teacher and alleviate the workload by executing tasks such as management, inspection, comments and detecting copyright infringements. AIED platforms



provide the teachers an overview of the learning progress of their students so that they can actively give advice and support when required or needed. System-focused programs and products are the tools that facilitate higher authorities and administrators on an organizational level. For instance, it can track retention trends across departments or institutions.

The release of the generative model ChatGPT in 2022 signaled a breakthrough for artificial intelligence. Open AI created a highly functioning chatbot that could write articles based on specific prompts, legal documents, codes and even debug codes. The functions of ChatGPT extend to much more than the ones mentioned (Aydin & Enis, 2023; IBM).

Students with impairments or other learning requirements may have better access to and involvement in the classroom thanks to AI-powered educational resources. AI-based systems run the possibility of not being available to all pupils and potentially escalating already-existing disparities. AI systems can gather and exploit personal information about students, so the use of AI can raise concerns about privacy and security. Schools, universities, and other institutions must implement well-defined policies and procedures in order to protect student privacy and stop unauthorized access to their data (Fourtané, 2022).

AI in Different Educational Levels

Elementary Education. In elementary education, AI is usually used to support individualized instruction and the acquisition of foundational skills. For instance, AI-driven educational platforms may adjust to each student's unique learning rate, offering specialized exercises and feedback to aid in the development of fundamental abilities like reading, writing, and mathematics. These platforms might also use AI to pinpoint a student's weak areas and offer extra assistance or resources to help them advance.

The education sector has observed growth in use of artificial intelligence, moving beyond the customary conception of AI as a high-powered supercomputer to encompass integrated computer systems. For instance, built into robots, AI or computers and other supporting gear facilitates the production of robotic machines that improve the educational experience for the learner. This begins from the most fundamental level of education, early elementary education (Fang et al., 2019; Snyder, 2019).

Secondary Education. In secondary education, AI is often used for subject-specific tutoring and college preparation. AI-powered tutoring systems can provide personalized instruction in various



subjects, helping students to prepare for college entrance exams (Schmohl, 2022; Durey, 2023). The systems can adapt to a student's learning style and give targeted feedback to help them improve in specific areas. Additionally, AI can be used to predict a student's future performance and provide recommendations for courses or colleges that might be a good fit for them.

Higher Education. AI is being used in higher education for research assistance and advanced learning. For example, AI-powered research tools can help students and faculty to find relevant resources, analyze data, and generate insights (Kohnke et al., 2023). AI can also be used to create advanced learning environments, such as virtual labs or simulations, that encourage students to explore complex concepts or scenarios in a secure and controlled environment.

Adult Education. AI is frequently utilized in adult education to encourage lifelong learning and professional growth. Personalized learning pathways can be offered by AI-powered learning platforms to assist adults in gaining new skills or knowledge in their chosen fields. These platforms allow adults to learn at their own pace and on their own terms while accommodating their hectic schedules. AI can also be used to forecast future employment trends and suggest training programs or skills that might help people develop their careers (Durey, 2023).

Impact on Curriculum Design. The design of curricula is also significantly impacted by AI. For instance, AI can help with the building of question banks and lesson introductions, offering a solid foundation and igniting ideas for course development. A consistent scope and order for unit teaching as well as the setting of course objectives can both benefit from AI. Additionally, AI is being included into the curriculum itself, with students learning about its foundational ideas and diverse application areas. This not only gives kids useful skills for the future, but it also enables them to comprehend the technology that is becoming an increasingly important element of their educational process (Pedro et al., 2019; Alam, 2021).

Teaching and Syllabus AI. Predictive analytics, for instance, can promote early intervention by identifying students at risk of falling behind or experiencing difficulties in specific subjects (Corrin et al., 2019). Intelligent tutoring systems, which use AI to provide personalized guidance and feedback, are also becoming more sophisticated, offering the potential for even more individualized and effective learning experiences. However, as AI becomes more integrated into education, it's crucial for educators to receive training in using AI effectively and understanding its limitations and potential risks. Professional development on AI should help teachers



understand AI, how to use it and teach about it in their classrooms. This includes learning pedagogical content knowledge specific to AI, such as understanding machine learning, datasets, neural networks, AI's impact on the economy, and ethical considerations. Teachers also need dedicated time to use the technology both as teachers and as learners, try different approaches with students, and collaborate with colleagues to discuss what works and what does not (Durey, 2023; Vincent Lancrin and Van der Vlies, 2020).

The Beijing Consensus

The Beijing Consensus (2019) states that the use of AI techniques within education must aim to strengthen human skills and safeguard human rights for the sake of successful human & machine collaboration in life, learning, and work along with long-term growth. As per the Consensus strategic AI implementation in education has the potential to take on several of the most significant difficulties in education today, redefine teaching and learning approaches. This will eventually speed up progress toward SDG 4, which supports quality education (UNESCO, 2019).

While AI has the potential to undermine academic integrity, it can also provide possibilities. AI improves the abilities of users in both positive and negative ways. Therefore, students and educators must be guided on the positives and limitations of AI tools in order to study and use AI ethically and maintain academic integrity, (Foltynek et al., 2023). Integrity and ethics are critical to usage of AI.

The UN agency for education, UNESCO, recently issued guidelines warning governments that public authorities were ill-prepared to deal with the moral dilemmas posed by implementing "generative" AI programs in schools. The education organization in Paris issued a warning, stating that substituting these programs for actual teachers could harm a child's emotional health and make them more susceptible to manipulation. In addition to potential harm and bias, Audrey Azoulay of UNESCO described generative AI as a huge chance for human growth. She made mention of the need for government protections and restrictions, as well as how it would be impossible to integrate AI into education without public participation. In the latter half of last year, media attention was drawn to the remarkable capacity of ChatGPT, a generative AI system, to produce essays, poetry, and dialogues from the smallest inputs. Despite worries raised about



plagiarism and cheating in schools and colleges, investors flocked to the revolutionary sector, and advocates focused on education as a potentially lucrative market (UNESCO, 2023).

Ethical use of AI

Ethical implications are increasingly getting important as AI is rapidly added in educational settings. We cannot solely rely on the manufacturers of AI to ensure that it is used properly. These businesses are significant because they develop AI tools, but they frequently prioritize innovation and financial gain at the expense of what may be best for kids and instructors. The entities in charge of education in various nations are advised to play a more active role, according to UNESCO, an agency that concentrates on education and culture (Durey, 2023). Students can get basic knowledge using these AI systems, but they are not ideal for learning advanced concepts in any field. Students still need a professor in order to learn such challenging material. However, it's plausible that AI may be able to assist students in the future with more difficult issues that call for critical analysis and reasoning.

The ethical issues are significant, just as they are whenever artificial intelligence is used in any situation. AI is devoid of a purported "moral compass." Therefore, AI programming from one perspective, is as ethical as its developer, claims TowardsDataScience in an article about AI ethics that offers 2 crucial suggestions for the future (University Of San Diego, 2022).

The Belmont Report (1979) worked to simplify the fundamental ethical values and standards that the Commission identified during the course of its deliberations. It was the result of a thorough (four-day) discussion at the Smithsonian Institution's Belmont Conference Center that took place in the month of February, year 1976, in addition to the Commission's monthly meetings that took place over a period of almost four years. The report is a statement of fundamental ethical principles and rules that should help in finding solutions to the moral issues brought on by the use of human beings in research. The three main principles from the report that serve as the foundation for algorithm design and experiment include respectful attitude for individuals, beneficence and justice. The principle of respect acknowledges the autonomy of individuals and upholds an expectation for researchers to safeguard individuals with diminished autonomy. This can be due to a variety of circumstances such as illness, a mental disability, age restrictions. This principle primarily reflects the idea of consent. Individuals must be aware of the potential risks and benefits of any experiment that they are a part of. They should be able to choose to participate or withdraw at any time before and during the experiment. The principle of



beneficence is based on the ethical values of healthcare, where doctors swear to do no harm. The concept can be extended to AI where systems possibly worsen biased attitudes around race, gender, political opinion, etc, even if the intentions are good and for improvement . The principle of justice deals with problems such as justice and equity. The report offers five ways to divide troubles and benefits, which are a proportionate share, individual needs, individual efforts, societal contributions and merit (Guszcza et al., 2020; O'Donnellan, 2022).

We must integrate ethics into the reasoning behind the creation of every new piece of AI-enabled technology. In order to thoroughly check that particular item's behavior and ensure that our human moral compass is not compromised, we must keep track of and guard the results it produces.

Moreover, the growth of big data has increased the attention of businesses on implementing automation and decision-making that is data-driven throughout their operations. Some firms and their AI applications are having unintended repercussions while improving business outcomes is typically, if not always, the goal (Mansurova, 2023; Wani et al., 2018). This is particularly true because of an inadequate initial study design and biased datasets. To address concerns about the ethics of AI as examples of unfair outcomes have come to light, new rules have arisen, mostly from the research and data science sectors. Prominent AI businesses have a stake in establishing these regulatory standards since they have already begun to feel some of the repercussions of failing to follow ethical standards in their products (IBM).

Institutions must establish guidelines for students, teachers, researchers, and other stakeholders in the field of education in accordance with the ethical norms for employing AI tools. Clarity in communicating institutional policies to all those involved at various levels is the most crucial step. In addition to that, the consumers should be guided correctly on proper acknowledgement of the use of AI tools in different types of publications. The ENAI (European Network for Academic Integrity) recommended this for institutions. All the individuals, tools, and sources that affect content generation should be effectively acknowledged. An AI tool must be acknowledged whenever used. The acknowledgement can be done according to the context, the institution's rulebook or other criteria. The AI tool should be given specific instructions, wherever possible (Foltynek et al., 2023).



Primary Concerns for AI

Accountability: There is no ‘one fits all’ regulation of AI or a universal regulatory body but several states are working on developing strategies specifically for AI. Ethicists and researchers have collaborated to formulate ethical frameworks to govern AI models (IBM).

Privacy is mostly understood as protection, security and preventing data leaks. For instance, GDPR law developed in 2016 to provide people more rights over their data while keeping the personal information of those living in the European Union and European Economic Area, confidential and safe (Diaz, 2016; Goodman and Flaxman, 2017; Hoofnagle et al., 2019). According to laws like the California Consumer Privacy Act (CCPA), different states in the United States are drafting standards that will apply to all enterprises (Palmieri III, 2020). The law mandates that companies notify customers when their data is collected. Recently passed law has compelled businesses to rethink how they handle and keep Personally Identifiable Information (PII). Organizations have prioritized security spending more and more in order to restrict any gaps and opportunities for hacking, cyberattacks, and monitoring.

Governance: Governance asks to develop procedures for creating, managing, handling, and sharing information about AI and AI risks. It includes specification of the roles and responsibilities of those utilizing AI and educating everyone about how to build AI in a responsible manner. The methods utilize technologies to raise the performance and reliability of AI across the AI lifecycle (Google AI).

Bias Reports of biased and discriminatory behavior across multiple intelligent systems have raised several questions regarding ethical practices and usage of AI. The process of scrapping any such ideas gets tricky when the bias is inbuilt. In addition to human resources, discrimination is found in softwares and algorithms (IBM).

Foundation Models Foundation models are mostly highly scalable generative models with self-supervised training on unorganized data and several specifications. This makes foundation models highly adaptable. The models can carry out a variety of activities by swiftly applying their learned information. There are other potential problems and moral concerns, however, with foundation models that are widely acknowledged in the AI sector (Han et al., 2021; Ganesan, 2023). They include bias, misleading information, a lack of justification, abuse, and the impact



of society. Several of these challenges are associated with AI in general and now have greater relevance because of the offered potential and usability of foundation models (IBM, 2022; Murphy, 2023; Moor et al., 2023).

Impact on Teachers Artificial intelligence is a valuable resource for strengthening and enhancing educational standards. However, it should not be utilized in place of actual teachers. For the development of critical thinking and creativity, the human factor is essential (Chan and Tsi, 2023; Seo et al., 2021). It is important that students have access to both traditional instructional tools and those supported by AI. The benefits of using AI systems for educational institutions, teaching, and learning must be considered seriously. Recognizing the drawbacks of using AI in education and taking the necessary steps to mitigate any negative impacts are equally crucial. For artificial intelligence systems to function correctly, humans, not machines, must be ethical. After all, humans are responsible for designing and implementing AI systems (Fortané, 2022).

Platforms like Google Classroom make it easier to teach and learn. For instance, as they finish tasks, students get immediate feedback on whether or not they are on track. Visual explanations and films can be used to provide direction for students who are having difficulty understanding a concept. Since time restraints prevent personalized teaching in real time, these are activities that teachers would ordinarily be unable to complete. But it is possible to respond to this kind of issue thanks to the automation offered by AI (Spadafora, 2022).

Table 1

THEMES	13 March 2023 AMEE guides	April 2021 Wayne Holmes et al.	13 Oct 2022 Andy Nguyen et al.	1 May 2023 Tomas Foltynnek et al.	25 July 2023 David mhlanga	2021 Ke Zhang & Ayse begum Aslan	28 Oct 2019	1 Feb 2020 Thilo Hagedorff	March 2020 Keng siau et al.	IBM
➤ Transparency	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
➤ Fairness	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
➤ Privacy	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓
➤ Accountability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
➤ Explain ability	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓
➤ Safety	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Research Objectives

1. Evaluate a student's understanding and awareness of ethical concerns related to AI.
2. Identify common misconceptions.
3. Study the attitudes and perceptions of students regarding the ethical use of AI.
4. Examine the impact of educational methods and courses on strengthening students' understanding of moral AI use.

Research Methodology

Research Approach

The present research mandates a qualitative research approach. A focus group study design was selected as it provides the opportunity for quicker responses and in-depth information in addition to interactive questioning and follow up questions.

Population

The population of this research consists of students of 30 selective universities operating in Sindh province of Pakistan. A diverse sample from the population based on students was selected to represent multiple backgrounds and levels of exposure to artificial intelligence. A sample of 30 students were taken which were further included in three different focus groups. The first focus group was consisted of 8 students, second group was consisted of 11 students and 11 students were included in third focus group.

Participants

The shortlisted sample of participants includes university students from various disciplines. All samples in the study were selected based on the criteria set in this research for the focus groups participants. The criteria to take part in focus groups was consisted of, postgraduate students, different disciplines and having expertise and knowledge about AI usage.

Data Collection

The three focus groups had between 8 to 11 participants who were explained the purpose of the study, after which they gave informed consent. The focus group interview sessions were initiated by a moderator. An observer simultaneously recorded the responses of the participants. The audio and video recordings of the sessions were completed with consent from each participant.

Interview Process

Icebreaking. The first session began with an icebreaking activity to create a comfortable environment. The moderator asked the participants to guess each other's favorite color.



Subject of study. The goals of the interview were communicated to the participants, who started with the purpose of the study and explained the questioning alongside.

Questions. To encourage the students to engage in conversation and talk about their insight and exposure to AI, unassuming questions were presented. Specifically, the questions were kept free of any prejudice and discrimination to cater to an inclusive study purpose. The moderator further presented follow-up questions, picking emerging conceptions from the participants. This allowed for a more detailed conversation and significant information that provided supporting background for the understanding of the students.

Observation. The observer recorded the responses, noting individual ideas and experience in addition with the different perspectives.

Closing Statements. All participants were given an overview and summary of the session. The moderator motivated them to share their thoughts.

Data Analysis

Transcription: The audio and video recordings were deciphered using the NVivo software. Records integrated participants' clarifications, non-verbal prompts, and interchanges.

Coding: The coding process included comparing recurring themes, thoughts and examples used by the participants. The final codes produced were based on the themes connected with the ethical use of artificial intelligence.

Thematic Analysis: The codes were categorized as the ethical themes and their subdomains found in the conversations. This grouped similar concepts together. Finally, when all the responses were accordingly categorized, a table was drawn to know the themes most students were well-aware of. Data analysis employed the thematic analysis technique.

Ethical Considerations

Fair selection ensured an equal opportunity for everyone to volunteer for the study. During the entire research, ethical standards were followed. Participants provided informed consent before proceeding with the sessions. To protect their privacy, all data was kept confidential, only accessible by the researcher for interpretation. The observer did not interfere with the discussions and the participants were made aware of their rights as voluntary participants.



Results

Based on ethical considerations, a total of 25 responses were categorized in the domain and subdomains of accountability, 7 in safety, 5 in explainability and 4 in transparency. However, other themes were also supported by the responses where the knowledge aligned with their definitions. The tables given below highlight the response categories.

Table 2
 Focus Group 1

Focus Group 1

THEMES	PARTICIPANTS											TOTAL RESPONSES	
	1	2	3	4	5	6	7	8	9	10	11		
1. Transparency													
Function to AI	✓	✓											2
2. Fairness													
Industry specific	✓	✓											2
Equal Access	✓	✓											2
3. Privacy													
Access to AI	✓	✓											2
4. Accountability													
Moral justification	✓												1
Self-therapy	✓	✓	✓	✓									4
Academic dishonesty	✓	✓	✓	✓	✓								5
Cross-check	✓	✓											2
Individual responsibility	✓	✓	✓	✓	✓	✓	✓	✓					8
5. Explainability													
Creativity	✓												1
6. Safety													
Misuse of content	✓	✓	✓										3
Restricted Data and Use	✓	✓											2

Table 3
 Focus Group 2

Focus Group 2

THEMES	PARTICIPANTS											TOTAL RESPONSES	
	1	2	3	4	5	6	7	8	9	10	11		
1. Transparency													
Function of AI	✓	✓	✓										3
2. Fairness													
Industry specific	✓	✓											2
3. Privacy													
4. Accountability													
Moral justification	✓												1
Self-therapy	✓	✓	✓										3
Academic dishonesty	✓												1
Cross-check	✓	✓	✓	✓	✓								5
Individual responsibility	✓	✓											2
5. Explainability													
Creativity	✓	✓											2
Limited Data	✓												1
6. Safety													
Misuse of content	✓	✓	✓										3
Restricted Data	✓												1



Table 4

Focus Group 3

Focus Group 3

THEMES	PARTICIPANTS											TOTAL RESPONSES
	1	2	3	4	5	6	7	8	9	10	11	
1. Transparency												
Misconception	✓	✓	✓	✓	✓							5
2. Fairness												
3. Privacy												
4. Accountability												
Self-therapy	✓	✓	✓									3
Academic dishonesty	✓	✓										2
Cross-check	✓	✓	✓	✓	✓							5
Individual responsibility	✓	✓										2
5. Explainability												
Creativity	✓	✓	✓	✓	✓	✓	✓					6
6. Safety												

Theme 1

Transparency

Out of total 3 focus groups, many participants discussed the transparency of AI. Out of total 26 participants of 3 focus groups 14 participants emphasized on the transparency of AI. They cited personal use as the basis for their understanding of ethical principles. The respondents discussed that artificially intelligent systems must be clear with their functions, misconception and implications. The developers of the AI-related services have to put forward thorough guides for the interpretation of the working and output in the contexts they are used. Following are few quotations from

“The respondents discussed that artificially intelligent systems must be clear with their functions and implications” (FG017)

“The respondents discussed that artificially intelligent systems must be clear with their functions and implications” (FG028)

Theme 2

Fairness

The perceptions of students surround giving due credit to the original content producers. They argued on the importance of discouraging plagiarism by simply copying information without crediting the author or owner. Additionally, this idea was reiterated by other participants.



“The respondents discussed that artificially intelligent systems must be clear with their functions and implications” (FG037)

“The respondents discussed that artificially intelligent systems must be clear with their functions and implications” (FG028)

Theme 3 Privacy

Students highlighted privacy concerns and mentioned data leaks including sensitive information. The responses did not directly align with the theme of privacy but the domain and subdomain of safety and misuse of data.

Theme 4 Accountability

The findings clearly indicate accountability and related sub themes as the typically understood subject where ethical considerations are concerned. The arguments and answers mainly highlighted individual responsibility whenever AI was used. Artificial intelligence is a useful creation but the consumer is responsible for the output use and misuse on their part. Additionally, the development of intelligent systems meant the developers were liable for the behavior of a product or service. The performance of an AI system, according to the participants, depends on the information programmed and algorithm design. Other sub-themes of moral justification, self-therapy, academic dishonesty and cross-checking were also covered. A total of 8 students argued against self medication and believe that several people use AI services for self-therapy. Referring to Group 1, Group 2 and Group 3 tables above, students admitted to utilizing artificial intelligence tools for academic assignments and projects. Alongside that, they responded that cross-checking information was crucial because whoever posted that specific output was responsible for the consequences or impact.

Theme 5 Explainability

The questions corresponding to the theme of explainability saw a similar concept development in the participants. They stated that AI services must clearly explain the functionality and usage of the models for appropriate and correct use.

Theme 6 Safety

Part of the questions probed the idea of safe use. Citing morphed photos and compromised data, 7 respondents believed that AI is at times used with malicious intent and can put an individual



within range of harm. The responses touched the concept of safety as an ethical concern pertaining to artificial intelligence.

Understanding and Perceptions

Students were aware at some basic level and their perceptions developed overtime in the context of educational assignments and projects. Their primary concepts formed surrounding the idea of crediting the rightful resources and original author. However, the level of understanding is lacking with respect to different ethical dilemmas. Contrary to that, the participants admitted to using AI for assignments, albeit with minor changes.

Discussion and Conclusion

Discussion

Accountability and the subdomain of individual responsibility was continually highlighted in the responses by the participants. A majority of the students claimed that AI is now a staple in multiple domains of life, not just education. It depends on the context, background and requirement, how the ethical boundaries will be defined in a situation. For education, individual responsibility meant owning up to the content used. Whatever query that may be entered or asked, AI gave us a response based on the data fed to it. In a way, the tool works how the users want it to according to the reasons students mostly provided. As much as the AI service or product was responsible for entertaining a specific type of query, responsibility lied on the user too for how they utilized that output. Individual responsibility integrates with misuse, safety and accountability. For example, the recent trend of deep fake technology is considered along the lines of criminal acts. Anyone and everyone who morphs photos or videos to produce content, maligning a person, institution or anything at all is accountable for it. The responsibility lies on the consumer because they misused content, compromised safety and are accountable for how they acted. Considering the widespread use amongst the local population, a critical but ignored theme was fairness. Marcinkowski et al. (2020) indicated two aspects of fairness. One is factual fairness which applies to empirically measurable features, while the other is perceived fairness, a concept that is related to individual perspectives. The group discussions have shown an integration of both types of fairness. With the proceeding questions, the participants answered more comfortably and shared their use of AI too which gave an insight into their reasoning for the development of ethical concepts. One factor the researchers observed closely was conformity and peer pressure adding to it. However, around 2 to 3 responses came when the participant



talking wanted to show themselves as highly skilled or knowledgeable. A significant majority gave examples of the deep fake technology, talking about accountability and safety. The group discussions found links in prior learning of the students and education.

Conclusion

The research demonstrates the lack of awareness among youth. Participants discussed their ideas of ethical use based around multiple themes. The students mostly emphasized accountability as a primary concern. In other words, holding AI responsible for wrongful functioning or intentions of the developer was not enough because the user is equally accountable for the content use. Additionally, in line with misuse of content, any services, tools or product misused are a user's responsibility to correct. All themes drawn in the categorization require equal attention. Therefore, ethical concerns and responsible use of AI go hand in hand. Similarly, it is most important to impart knowledge of the correct usage of AI that is aligned with the ethical considerations. Educational institutions must implement and design policies to promote and enforce appropriate use of artificial intelligence. The strategies might be different for different educational levels.

Limitations

One of the limitations arising was the range of participants. The data we collected was from only a single stakeholder of education, the students. We did not collect the data of the faculty, education, consultants or other individuals involved with curricula design. The sample size was also small. Another critical limitation was the mishandling of the names of the participants. The responses were not recorded by a name, which prolonged the coding process.

Educational Interventions and Recommendations

Books and Syllabus. Comprehensive knowledge based courses and chapters must be introduced on each level in the education system. It is viable when considering the rapid integration and usage advancement of AI and AI based tools in the field of education.

Awareness sessions and campaigns. Institutions can organize awareness sessions based on the importance of ethical considerations and the defined boundaries of unethical practice. One of the key steps is basic awareness sessions that include interactive communication methods so as to make people know why ethical practice is needed.



Practical Tasks. Motivate the students to employ their knowledge in a practical setting. They can learn to identify unethical practices like plagiarism and wrongful credit. Practical application will develop better identification of ethical and responsible use of AI.

References

- Alam, A. (2021, December). Should robots replace teachers? Mobilisation of AI and learning analytics in education. In *2021 International Conference on Advances in Computing, Communication, and Control (ICAC3)* (pp. 1-12). IEEE.
- Anapey, G. M. (2024). Achieving Education for Sustainable Education Learning Outcomes: An Integrated Model for Higher Education in the Global South. *International Journal of Educational Reform*, 10567879241270503
- Chan, C. K. Y., & Tsi, L. H. (2023). The AI revolution in education: Will AI replace or assist teachers in higher education?. *arXiv preprint arXiv:2305.01185*
- Corrin, L., Kennedy, G., French, S., Buckingham Shum, S., Kitto, K., Pardo, A., ... & Colvin, C. (2019). The ethics of learning analytics in Australian higher education. *Accessed online, 26*
- Díaz Díaz, E. (2016). The new European Union General Regulation on Data Protection and the legal consequences for institutions. *Church, Communication and Culture*, 1(1), 206-239
- Durey, J. (2023). The role of AI in Education: A new landscape. www.linkedin.com.
<https://www.linkedin.com/pulse/role-ai-education-new-landscape-joshua-durey-he-him->
- Fang, Y., Chen, P., Cai, G., Lau, F. C., Liew, S. C., & Han, G. (2019). Outage-limit-approaching channel coding for future wireless communications: Root-protograph low-density parity-check codes. *IEEE Vehicular Technology Magazine*, 14(2), 85-93
- Foltynek, T., Bjelobaba, S., Glendinning, I., Khan, Z. R., Santos, R., Pavletic, P., & Kravjar, J. (2023). ENAI Recommendations on the ethical use of Artificial Intelligence in Education. *International Journal for Educational Integrity*, 19(1), 1-4
- Fourtane, S. (2022, December 16). *Artificial intelligence in Higher Education: Benefits and ethics*. Fierce Education. <https://www.fierceeducation.com/technology/artificial-intelligence-higher-education-benefits-and-ethics>
- Frankenfield, J. (2023). Artificial intelligence: What it is and how it is used. Investopedia. <https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp>
- Ganesan, K. (n.d.-b). Generative AI on Foundation Models: AI Paradigm Shift. www.linkedin.com. <https://www.linkedin.com/pulse/generative-ai-foundation-models-paradigm-shift-kathirvelan-ganesan/>
- Guszcza, J. G., Lee, M. L., Ammanath, B. A., & Kuder, D. K. (2020, January 28). Human values in the loop. Retrieved October 22, 2023, from



<https://www2.deloitte.com/us/en/insights/focus/cognitive-technologies/design-principles-ethical-artificial-intelligence.html>

- Goodman, B., & Flaxman, S. (2017). European Union regulations on algorithmic decision-making and a “right to explanation”. *AI magazine*, 38(3), 50-57.
- Google AI. (n.d.). *Google Responsible AI Practices – Google AI*.
<https://ai.google/responsibility/responsible-ai-practices/>
- Han, X., Zhang, Z., Ding, N., Gu, Y., Liu, X., Huo, Y., ... & Zhu, J. (2021). Pre-trained models: Past, present and future. *AI Open*, 2, 225-250.
- Heaven, W. D. (2021). DeepMind says its new language model can beat others 25 times its size
- Hoofnagle, C. J., Van Der Sloot, B., & Borgesius, F. Z. (2019). The European Union general data protection regulation: what it is and what it means. *Information & Communications Technology Law*, 28(1), 65-98
- Johnson, B. G., Phillips, F., & Chase, L. G. (2009). An intelligent tutoring system for the accounting cycle: Enhancing textbook homework with artificial intelligence. *Journal of Accounting Education*, 27(1), 30-39.
- Kengam, J. (2020). Artificial intelligence in education. *Research Gate*, 18, 1-4.
- Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). Exploring generative artificial intelligence preparedness among university language instructors: A case study. *Computers and Education: Artificial Intelligence*, 5, 100156.
- Leslie, D. (2019). Understanding artificial intelligence ethics and safety. *arXiv preprint arXiv:1906.05684*
- Levene, A (2023) Artificial intelligence and authorship. *COPE*. 23 February 2023. Available Online. URL - <https://publicationethics.org/news/artificial-intelligence-and-authorship>
- Mansurova, M. Y. (2023). Some issues of Big Data application in modeling business processes of e-business systems
- Marcinkowski, F., Kieslich, K., Starke, C., & Lünich, M. (2020, January). Implications of AI (un-) fairness in higher education admissions: the effects of perceived AI (un-) fairness on exit, voice and organizational reputation. In *Proceedings of the 2020 conference on fairness, accountability, and transparency* (pp. 122-130)
- Moor, M., Banerjee, O., Abad, Z. S. H., Krumholz, H. M., Leskovec, J., Topol, E. J., & Rajpurkar, P. (2023). Foundation models for generalist medical artificial intelligence. *Nature*, 616(7956), 259-265.
- Ng, D. T. K., Leung, J. K. L., Su, J., Ng, R. C. W., & Chu, S. K. W. (2023). Teachers’ AI digital competencies and twenty-first century skills in the post-pandemic world. *Educational technology research and development*, 71(1), 137-161.
- O’Donnellan, R. (2022, October 28). AI Ethics: *What are its Key Principles? - Intuition*. *Intuition*. <https://www.intuition.com/ai-ethics-what-are-its-key-principles/>



- Paladines, J., & Ramirez, J. (2020). A systematic literature review of intelligent tutoring systems with dialogue in natural language. *IEEE Access*, 8, 164246-164267
- Palmieri III, N. F. (2020). Who should regulate data: An analysis of the california consumer privacy act and its effects on nationwide data protection laws. *Hastings Sci. & Tech. LJ*, 11, 37
- Palmieri III, N. F. (2020). Who should regulate data: An analysis of the california consumer privacy act and its effects on nationwide data protection laws. *Hastings Sci. & Tech. LJ*, 11, 37
- Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development
- Rae, J., Irving, G., & Weidinger, L. (2021). Language modelling at scale: Gopher, ethical considerations, and retrieval. *DeepMind Blog*
- Ramaswamy, S. (2018, July 24). How companies are already using AI. Harvard Business Review. <https://hbr.org/2017/04/how-companies-are-already-using-ai>
- Schmohl, T., Schelling, K., Go, S., Thaler, K. J., & Watanabe, A. (2022). Development, implementation and acceptance of an AI-based tutoring system. A research-led methodology. In *Proceedings of the 14th international conference on computer supported education (CSEDU 2022). Volume 2* (pp. 179-186)
- Schiff, D. (2021). Out of the laboratory and into the classroom: the future of artificial intelligence in education. *AI & society*, 36(1), 331-348.
- Seo, K., Tang, J., Roll, I., Fels, S., & Yoon, D. (2021). The impact of artificial intelligence on learner–instructor interaction in online learning. *International journal of educational technology in higher education*, 18(1), 1-23.
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of business research*, 104, 333-339.
- Spadafora, A. (2022, March 16). *Google Classroom is using AI to help children learn in a whole new way*. TechRadar. <https://www.techradar.com/news/google-classroom-is-using-ai-to-help-children-learn-in-a-whole-new-way>
- Sweeney, L. (2003). School of Computer Science Carnegie Mellon University Pittsburgh, PA 15213-3890.
- Turing, A. M. (2009). *Computing machinery and intelligence* (pp. 23-65). Springer Netherlands.
- Tauginienė, L., Gaižauskaitė, I., Glendinning, I., Kravjar, J., Ojsteršek, M., Ribeiro, L., ... & Pongrac, M. (2022). *Glossary for academic integrity*.
- Ungerer, L., & Slade, S. (2022). Ethical considerations of artificial intelligence in learning analytics in distance education contexts. In *Learning analytics in open and distributed learning: Potential and challenges* (pp. 105-120). Singapore: Springer Nature Singapore



- Vincent-Lancrin, S., & Van der Vlies, R. (2020). Trustworthy artificial intelligence (AI) in education: Promises and challenges
- Wani, M. A., & Jabin, S. (2018). Big data: issues, challenges, and techniques in business intelligence. In *Big Data Analytics: Proceedings of CSI 2015* (pp. 613-628). Springer Singapore