Chapter 3
Using ChatGPT in Higher Education: Opportunities, Challenges, and Adaptation of LLMs in the Individual Learning of HEI Students

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Abstract Since the launch of chatbots such as ChatGPT or Google Gemini, large language models (LLMs) have been rapidly growing in popularity. Among others, intensive discussions are happening around the use of LLMs in education, in particular, with reference to the issues of plagiarism and dishonest use. To address the problem, the authors have engaged students of higher education institutions in the research of possibilities of LLMs application in the learning process. 91 respondents took part in the survey, answering questions about the possibilities of LLM usage. The findings of the research contain 66 codes that indicate the issues related to the engagement of LLM in learning process support. Among others, these issues are writing assistants, repetitive tasks, task individualization, anti-plagiarism introduction, data protection increase, AI usage rules, law protection, information verification, free access, conscious education, etc. The respondents emphasized the risk of receiving false answers and the necessity of critically assessing the results provided by LLMs. The authors came up with the conclusion that overall, the students understand the risk connected with using large language models in their learning process.

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Introduction

Large language models (LLMs) have gained popularity since the launch of conversational agent solutions (Tudor Car et al., 2020), commonly referred to as chatbots, such as ChatGPT or Google Gemini (Adel et al., 2024; Dowling & Lucey, 2023). Although artificial intelligence (AI) tools, including natural language processing (NLP), have been used in everyday life for years, the free provision of chatbots by OpenAI and Google to a wide range of users has sparked heated debate about their use, particularly in education and science (Cooper, 2023). The operation of LLM agents involves generating responses to queries or continuing a started statement based on the prompt or seed text provided by the user (Burger et al., 2023). LLMs can be very useful in modifying texts, for instance, by changing their tone of voice or providing brief input information with a formal, scientific, or sales character. They are also perfectly suited for summarizing scientific articles, translating text, summarizing email conversations, and transcribing and summarizing audio or video files. Moreover, they are used as support in creating, verifying, and processing code by programmers. Thanks to AI solutions, it is also possible to create interactive educational materials that can be a great support for teachers and students, including digital video (Orak & Turan, 2024), or learning content for personalized learning experiences (Tonbuloğlu, 2023).

However, discussions regarding the use of large language models in education have focused primarily on the issue of plagiarism. Numerous debates are ongoing on how to eliminate the dishonest use of LLMs by students (Cotton et al., 2024; Farrokhnia et al., 2023). It is proposed that there is a need to change teaching methods, moving away from writing essays that could be fully generated by free and widely accessible language models (Durak & Cankaya, 2024). Since chatbots utilizing LLMs are capable of generating academic-level text (Lim et al., 2023), there is a risk that students may copy generated responses instead of independently developing their work (Alsadhan et al., 2023; Choi et al., 2023a; Cotton et al., 2024; Dahlan et al., 2024; Farrokhnia et al., 2023; Karakose, 2023). This may limit their critical thinking and impair their ability to solve problems independently (Alsadhan et al., 2023; Mohammad et al., 2023). In 2023, the knowledge bases of the GPT model were already so extensive that the chatbot could pass a medical exam (Kung et al., 2023) or a law exam (Choi et al., 2023b), prompting a reconsideration of exam formats and the development of ones for which it would not be possible to ask models to provide answers (Dahlan et al., 2024; Gardner & Giordano, 2023; Karakose, 2023; Mohammad et al., 2023; Tlili et al., 2023).

The impressive capabilities of LLMs prompt considerations of how these tools should be used in education, without the assumption that their use should be prohibited (Karadağ, 2023; Strzelecki et al., 2024). It is essential to educate teachers so that they can integrate the effective use of LLMs into the learning process, maximizing the potential benefits of such utilization (Ramabu & Malebane, 2024; Xu et al., 2023). Furthermore, when LLMs are used in education, it is necessary to establish clear guidelines and agree with students on the principles of ethical use of these

tools (Halachev, 2024; Joshi et al., 2024; Kinik & Çetin, 2023; Stampfl et al., 2024; Tsai, 2023; Yesmin, 2023).

An increasing number of educational tools provide their users with built-in solutions based on LLMs. On the one hand, they assist in using AI in education (Bekes & Galzina, 2023; Maruszewska et al., 2024; Strzelecki, 2024; Ziemba et al., 2024); on the other hand, they help teachers address the problems of plagiarism and cheating that can be carried out via LLMs. To prevent the copying of chatbot-generated texts, solutions have been developed that can verify whether a text was written by a model or a human (Cotton et al., 2024; Eggmann et al., 2023; Kirchner et al., 2023). Texts generated by LLMs are characterized by specific grammatical syntax, which often makes it possible to determine whether a text was written by a human or a machine. However, individuals who frequently use these tools may eventually begin to write texts in a manner similar to that of the model. Despite the risks associated with academic integrity and independent work, as well as concerns that the use of chatbots may, over time, lead to the erosion of students' ability to engage in independent, higher-order creative thinking and solve complex problems (Arif et al., 2023), these tools undeniably offer numerous advantages. The objective of this paper is to analyze students' opinions on the possibility of using large language models in their learning process. To achieve this objective, the authors have set one research question (RQ):

RQ1: What are the possibilities of using large language models by students in their learning process?

The chapter's structure is as follows: the Literature review section explores previous research on LLM usage in higher education; the Methods section describes the applied methodology, which was qualitative content analysis; and the Findings section presents the results of the survey conducted among students. Finally, in the Discussion section, we summarize the results of the conducted research and draw conclusions.

Literature Review

The use of large language models can significantly assist students, help them save time, and serve as an aid in their independent education. Models can help translate educational materials and specialized texts from foreign languages, create summaries (Emenike & Emenike, 2023; Khan et al., 2023), quickly search for information, or compile materials on a specific thematic scope (Farrokhnia et al., 2023). As empirical research shows, they can also suggest appropriate research methods (Burger et al., 2023), including statistical tests for a given dataset (Macdonald et al., 2023). LLMs can provide suggestions for project descriptions or select a group of participants for a student's research, as well as support result analysis by organizing data, generating tables or charts, explaining obtained results, identifying patterns, and checking consistency in the reported findings (Cheng et al., 2023). They can also be used to create an initial draft for further work (Arif et al., 2023; De Angelis

et al., 2023; Lund et al., 2023), generate ideas, overcome writer's block [Cotton2023], write abstracts (Cheng et al., 2023; Lund et al., 2023), edit text, and verify its clarity (Cheng et al., 2023; Macdonald et al., 2023). LLMs can present examples of well-written texts (Cheng et al., 2023) and help develop language skills (Adel et al., 2024; Domenech, 2023; Stampfl et al., 2024) by suggesting alternative expressions (Lund et al., 2023) or translations (De Angelis et al., 2023; Eggmann et al., 2023; Lund et al., 2023). They can also support the automation of repetitive tasks and eliminate bias in the interpretation of research results (Burger et al., 2023), as well as help students learn programming and improve the learning experience (Firat, 2023).

Research results indicate that LLMs can enhance students' individual learning and comfort by interacting with them in real-time. Owing to their natural language processing capabilities, models can be used by students to review their written work, offering personalized feedback on the presented text and suggesting areas that need improvement (Adel et al., 2024; Kazi, 2024; Rawas, 2024; Xu et al., 2023). By combining popular LLMs with specialized tools such as research assistants, students can supplement their work by extracting information directly from scientific research (Gusenbauer, 2023) and benefit from explanations of calculations performed in studies or clarifications of concepts without needing access to external services (Gusenbauer, 2023; Zhang et al., 2023). This can help students understand the subject better and improve their academic performance (Kazi, 2024; Rawas, 2024; Xu et al., 2023). Models can also propose specific, individually tailored tasks that help students gain a deeper understanding of the topic, practice problem-solving using acquired knowledge, and allow them to learn at their own pace (Hasanein & Sobaih, 2023; Kazi, 2024). Setting problems for independent resolution in the form of exercises as part of individual tutoring (ElSayary, 2024) and providing responses that consider diverse perspectives can help students develop critical thinking skills (Adel et al., 2024; Dahlan et al., 2024; Gozali et al., 2024). However, it is important to consider data privacy issues, especially when submitting one's work for evaluation or providing sensitive data to the model (Arista et al., 2023; Mohammad et al., 2023), as well as the potential bias that the model may exhibit when suggesting what needs improvement (Achour et al., 2024; Dahlan et al., 2024; Ramabu & Malebane, 2024).

The bias of models arises from the fact that they are trained primarily on datasets from Western countries, including the United States, where the headquarters of the companies responsible for developing the most popular solutions are located. Additionally, they may use websites containing false information as data sources (Duncan & McCulloh, 2023). Students must be aware that they cannot fully trust the responses generated by the models, and LLM tools should serve an auxiliary, supplementary function and not be the primary source of knowledge (Kinik & Çetin, 2023). To use LLMs effectively, it is necessary to have the knowledge at a level that allows for verifying the accuracy of the content generated by AI tools (Wittmann, 2023). LLMs can generate false or unverified content [Alanezi2024], especially in the case of specialized texts (Ariyaratne et al., 2023), although they are phrased in a way that makes them appear credible. This phenomenon is referred to

in the literature as "hallucination" (Cascella et al., 2023). The impression of credibility can be further amplified when chatbots provide bibliographic sources; however, research shows that these sources most often do not exist (Day, 2023; De Angelis et al., 2023; Macdonald et al., 2023). To construct false references, the model uses real scientists' names, credible-sounding titles, and even the actual names of journals, which makes detecting inaccuracies more challenging (De Angelis et al., 2023). When LLM tools are used, one must keep in mind that they lack human reasoning capabilities (Alanezi, 2024; Mohammad et al., 2023). The tools may especially struggle with understanding the context of statements, grasping the deep meaning of words (Farrokhnia et al., 2023), and answering more abstract questions. The model can also introduce simplifications or limitations in data analysis, potentially resulting in inaccurate or incomplete outcomes (Alanezi, 2024; Burger et al., 2023; Dahlan et al., 2024; Mohammad et al., 2023; Vargas-Murillo et al., 2023), and the generated code intended for data analysis may contain errors (Macdonald et al., 2023).

Language models are incapable of deduction, have limited capabilities in solving mathematical problems (Frieder et al., 2023), and, as has been shown, are inadequate for evaluating data credibility (Farrokhnia et al., 2023). Excessive reliance on texts generated by chatbots can be misleading (Macdonald et al., 2023) and intensify the phenomenon of infodemics (De Angelis et al., 2023). Among the methods used to mitigate bias, the use of carefully crafted prompts (so-called prompt engineering) is worth mentioning. Carefully created input instructions can minimize the risk of bias (Bevara et al., 2023; Xie & Lukasiewicz, 2023), as can fine-tune the model during its use, for example, by systematically increasing the amount of data or changing model parameters (Bevara et al., 2024; Zhou et al., 2023). Numerous scientific studies that focus on mitigating bias are currently being conducted. Among the techniques tested are counterfactual data augmentation (Bevara et al., 2024; Zhou et al., 2023), self-debias, and contrastive self-debiasing (Bevara et al., 2024; Li et al., 2024), which supplement the model with synthetic data for underrepresented groups to balance the datasets used to train the model (Guo et al., 2022). These methods are being tested by researchers and will likely be implemented in popular LLM tools over time, but they also carry limitations, including the potential reduction in model efficiency (Li et al., 2024). Students using LLM tools should be sensitized to the phenomenon of bias, be aware of its existence and implications, and be trained in the effective use of AI-based tools (Chaudhuri & Terrones, 2024; González-Rico & Lluch Sintes, 2024; Naamati-Schneider & Alt, 2024).

When transferring data to the model, especially those involving private and sensitive information, it is essential to comply with legal regulations, including obtaining consent for data processing and storage (Huang et al., 2024; Naghiyev, 2024; Nayak et al., 2024). It is also suggested that data be anonymized before being sent to the model to prevent accidental data leaks (Zaman, 2023), which should be part of a broader procedure for responding to data security incidents (Huang et al., 2024). When using LLMs, secure communication protocols should protect data during transmission and prevent interception during transfer (Sharma et al., 2024). If the model can learn via user input data (e.g. when students create their

GPTs—custom versions of ChatGPT—or use custom versions created by a teacher for educational purposes (OpenAI, n.d.)), special care must be taken with the data, including encryption (Huang et al., 2024; Sharma et al., 2024), pseudonymization (Zaman, 2023), and access control (Ahamed & Krishnamoorthy, 2022; Huang et al., 2024). Therefore, security and privacy aspects must be also discussed by teachers with students who use LLMs for learning (Naamati-Schneider & Alt, 2024).

Tools based on large language models can be used to evaluate assignments and projects. On the one hand, this can help teachers with an assessment of tasks (Geckin et al., 2023) and minimize the bias associated with the teacher's assessment; on the other hand, the teacher provides human oversight of the correctness of the model's evaluation (Jukiewicz, 2024; Saravia-Rojas et al., 2024). Human supervision minimizes the risk of errors related to potential model hallucinations (Cascella et al., 2023) and issues with understanding context (Farrokhnia et al., 2023); however, the use of the model significantly speeds up the provision of feedback to students (Jukiewicz, 2024; Saravia-Rojas et al., 2024). Suggestions for feedback may also lack the necessary level of depth, which should be addressed through human supervision (Saravia-Rojas et al., 2024). This example perfectly illustrates how collaboration between teachers and AI tools can improve the quality of education (González-Rico & Lluch Sintes, 2024; Krügel et al., 2023; Synekop et al., 2024). These tools can also be used to create engaging, interactive teaching sessions (González-Rico & Lluch Sintes, 2024; Ramabu & Malebane, 2024; Synekop et al., 2024; Xu et al., 2023).

To effectively use LLMs for student learning, it is necessary to ensure equal access to these tools so that all students have the opportunity to use AI-based technology. Undoubtedly, this requires regulations at the national and international levels (Simshaw, 2023; Tong et al., 2023). For these tools to be considered at the level of relevant ministries, the education system, from its bottom and up, must demonstrate the readiness to use them lawfully and ethically (Elmaoğlu et al., 2024; Joshi et al., 2024; Kinik & Çetin, 2023; Nadarzynski et al., 2024). The development of educational programs, including personalized programs (Bulathwela et al., 2024; Gibbons, 2021) that allow students to use LLMs as educational support tools, can highlight the need to fund access to these tools and create legal frameworks that address AI-specific issues (Alanezi, 2024; Arista et al., 2023; Simshaw, 2023; Tong et al., 2023). The involvement of various groups in the co-creation of AI-enhanced education (Chan et al., 2021; Elmaoğlu et al., 2024) will also allow for the collection of feedback, which will help build tools that adhere to inclusivity principles (Elmaoğlu et al., 2024; Karim, 2023; Murphy, 2023; Sarı et al., 2024), addressing issues such as linguistic accessibility and cultural bias (Habicht et al., 2024; Nadarzynski et al., 2024).

Method

For this paper, we have chosen qualitative content analysis (QCA) as an adequate research approach for describing and interpreting textual data via systematic coding (Assarroudi et al., 2018). To conduct the QCA, we gathered the data via a survey prepared in Google Forms and distributed it among students at the University of Economics in Katowice. The survey took place in two study programs: informatics and econometrics and international business. Data collection took place in May and June 2023. The survey was distributed after the lecture about generative artificial intelligence. Participation was voluntary and anonymous. Ninety-one students took part in the study, but because the survey form allowed not to answer a given question, fewer than 91 answers were collected for each question. The survey included seven open questions. There were no limitations regarding the length of the provided answers. Because the survey was conducted in Polish and English classes, approximately 30% of all the gathered answers were in Polish, and 70% were in English.

By the patterns reported in the literature, the collection and analysis of the gathered data were conducted in four main phases (Andreotta et al., 2019). However, since we assigned the codes to the answers to every question, we did not group or categorize the codes, thus limiting the procedure to three stages.

The first phase focused on gathering written answers to the questions sent to the students. The survey was anonymous, yet since a specific group of respondents participated, one can conclude that purposive sampling. The respondents were also demographically similar (related to factors such as age, place of residence, education level, and university degree). All the gathered answers were transferred into a Microsoft Excel sheet and marked with a number. All the answers were qualified as meaning units (Erlingsson & Brysiewicz, 2017). At that point, the corpus was established with no further interference. The second phase of the research included an analysis of the answers meeting the Beaugrande and Dressler criteria for defining the text (White & Marsh, 2006). Since the survey was conducted via Google Forms, the respondent needed to answer every question to move to another question. Some answers did not meet the previously mentioned criteria since those were, for instance, only punctuation marks (e.g., "."). These answers were excluded from further analysis. In the third phase of the research, the codes were assigned to each condensed meaning unit. The total number of condensed meaning units at that point was 533 and reflected the answers to six of the seven questions provided in the survey. We formed codes to reflect the core meaning of each given answer (Erlingsson & Brysiewicz, 2017). The last question was an opportunity for the participants to share their opinions. This one received the lowest number of answers compared to the previous questions. The responses were not coded but served as an element illustrating the respondents' attitudes towards ChatGPT.

Altogether, we formed 66 codes: 11 for the first question, 10 for the second question, 8 for the third question, 7 for the fourth question, 10 for the fifth question, and

6 for the sixth question. The last survey question, question seven, was not coded due to its imprecise nature, allowing for free expression.

Findings

In the first question of the survey, the students were asked how ChatGPT can help with personalized learning and how to adapt AI and ChatGPT in education. There were 91 responses to this question, all of which were included in the results and coded. Based on the responses to the first question, 11 codes were identified that reflected each of the responses and indicated the extent to which the use of ChatGPT could support the personalized learning process. These codes are as follows:

- Information search—including searching for information on a specific topic,
- Writing assistants—referring to the use of ChatGPT as a linguistic tool for proofreading or translating texts;
- Repetitive tasks—indicating the use of ChatGPT to perform monotonous and repetitive tasks that can be performed faster with its help;
- Code assistant—talking about using ChatGPT as a tool for generating or correcting codes in a given programming language,
- Problem-solving tool—indicating the use of ChatGPT as a tool to help identify a specific problem;
- Education process support—indicating ChatGPT as an auxiliary tool not only for students but also for teachers, used, e.g., to create feedback or build plans;
- Task instructions—indicating ChatGPT as a tool for creating guides and step-by-step instructions to perform specific tasks;
- Providing explanations—indicating the use of ChatGPT to explain difficult-to-understand issues,
- Materials design—indicating the use of the Chat GPT as a tool for creating materials used in the teaching process, e.g., quizzes or presentations, by teachers;
- Information summary—indicating ChatGPT as a tool used to build summaries, e.g., of articles,
- Organizing information—indicating ChatGPT as a tool for cataloging information from various sources, as well as building summaries,
- No idea—lack of propositions.

Table 3.1 lists all the codes assigned during the study, with a sample of randomly selected responses from the respondents.

The vast majority of students consider ChatGPT to be a tool for searching for information, treating it as a substitute for an internet search engine. The general answers also appeared relatively often, indicating the use of the ChatGPT as a tool supporting the educational process. Interestingly, however, the students not only paid attention to the use of ChatGPT by themselves but also emphasized this possibility in the teachers' work. Finally, the use of ChatGPT was rather often indicated as a tool providing explanations of issues that students consider to be complicated

or that they do not understand based on traditional materials, e.g., articles. The percentage of responses for all codes is presented in Fig. 3.1.

The second question of the survey focused on changes in the methods of evaluating assignments and projects prepared during studies with the help of ChatGPT. There were 88 responses to this question, and some respondents did not answer it.

Table 3.1 Codes and sample answers for question 1

Q1: *How can ChatGPT help with personalized learning? How to adapt AI and ChatGPT in education?*	
Codes	Sample answers
Information search	"ChatGPT provides all the information we need to study, and helps us find information on a given topic."
Code assistant	"Chat is useful for checking typos in code that we often overlook."
Education process support	"AI may customize learning by adapting courses to the requirements of each learner, delivering immediate feedback, and providing advice."
Materials design	"One of my favourite features that ChatGPT offers in terms of learning is creating tests. ChatGPT can create single-choice, multiple-choice, and open-ended questions based on your studying material."
Writing assistant	"In learning languages, you can ask for personalized texts accessible to your level, order specific word or grammar sets."
Problem-solving tool	"Helps solve the problem and provides solutions that you might not normally come up with."
Task instructions	"Chat GPT can help in many ways. For example, it can help with providing specific steps to follow when doing a research study or other education-related thing."
Organizing information	"When prompted, the chat provides structured information, making it easier for students to learn the topics of interest."
Repetitive tasks	"Chat helps in carrying out repetitive and time-consuming tasks."
Providing explanations	"We can ask questions if the answer is unclear to get a better understanding of the problem."

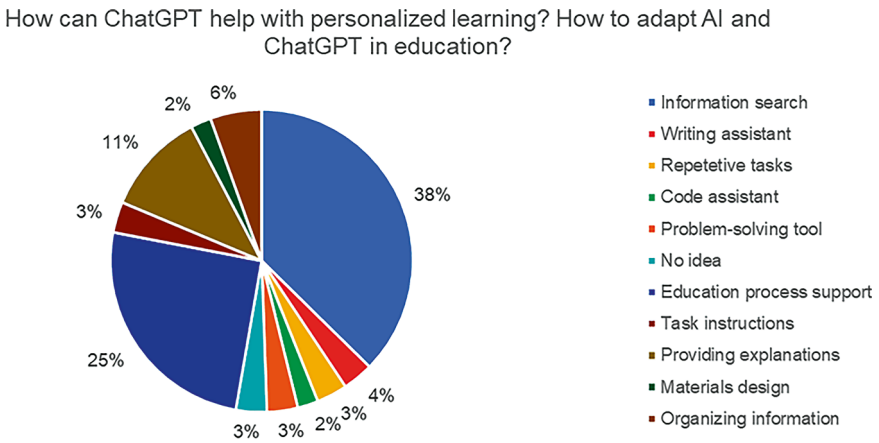

Fig. 3.1 Percentage of answers to question 1

Based on the responses provided, ten codes were identified as follows:

- No changes—indicating that there is no need to introduce any changes to the existing grading system.
- AI as a reference, indicating the need to mark content generated by ChatGPT in the references list;
- Task individualization—indicating the need to individualize tasks assigned to students to limit the generation of their solutions via ChatGPT;
- Limited AI access—indicating the need to limit or prohibit the use of ChatGPT when performing tasks by students
- AI as a checking tool—indicating the need to verify the independence of students' tasks from other AI-based software;
- AI usage rules—indicating the need to build rules for using ChatGPT by students,
- Introduce anti-plagiarism, indicating the need for teachers to use anti-plagiarism software to verify students' assignments;
- Solutions creativity—indicating the need to assess the level of creativity proposed in the solution provided by students;
- Students' presentation—indicating the need to introduce the obligation to present (e.g., orally) the completed task to verify its independence by the teacher,
- No idea—lack of propositions.

Table 3.2 lists the codes (without the 'no idea' code) assigned to those answers with a sample of randomly selected responses from the respondents.

Table 3.2 Codes and sample answers for question 2

Q2: What to change in the methods of evaluating assignments and projects done in studies with the help of ChatGPT?	
Codes	Sample answers
No changes	"In my opinion, nothing should be changed. ChatGPT is a study help the same as books or the internet."
AI as references	"The student should include in his/her work that he or she used Chat"
Tasks individualization	"Trying changing the exercises to be more interesting so the students would be eager to do them or maybe trying to formulate the exercises in a way that would be hard for chat to answer."
Limited AI access	"It can be banned from public use."
AI as a checking tool	"ChatGPT could evaluate an exam or an essay instantly better than a lot of professors."
AI usage rules	"I think projects done in the GPT tool, should be counted as valid, although they should be graded more strictly."
Introduce anti-plagiarism	"There should be a special app that will check if the assignments and projects were written in ChatGPT."
Solutions creativity	"When evaluating assignments and projects with ChatGPT, consider changes such as focusing on the learning process, assessing creativity and originality, evaluating collaboration skills, including reflection and self-assessment, and considering ethical awareness."
Students' presentation	"Make students present their work just to check their knowledge about the topic and their work."

Regarding the current system for assessing students' works, most respondents indicated the need to implement plagiarism detection solutions. This indicates that the respondents are aware of students using LLM, including ChatGPT, to generate ready-made answers and use them in the teaching process.

The second most frequent quantitative response was the statement that no changes were needed in the assessment of students' work, regardless of whether LLMs were used in their creation. The respondents justified their position by treating ChatGPT as a form of teaching aid or by the fact that students who use LLMs to complete tasks do not openly admit that they use them, which corresponds to the most frequently proposed change in the grading system.

Finally, the solution in the middle of the two methods proposed earlier is the individualization of tasks or the development of a set of rules, according to which students could use LLMs at work, as 13% of the respondents indicated. On the one hand, this shows the awareness of the extent to which students use solutions such as ChatGPT. On the other hand, there is a bottom-up demand for the regulation of this issue to be implemented by HEIs.

Figure 3.2 presents the percentage distribution of all answers given to this question.

Question 3 focused on protecting private information when ChatGPT was used. A total of 89 responses were received. The codes assigned to the individual answers are as follows:

- General internet rules—meaning the application of general principles of security and privacy on the internet to ChatGPT;
- Risk of privacy breach—meaning the impossibility of fully protecting private information when using ChatGPT,
- No private data, meaning that no private information is used when ChatGPT is used;

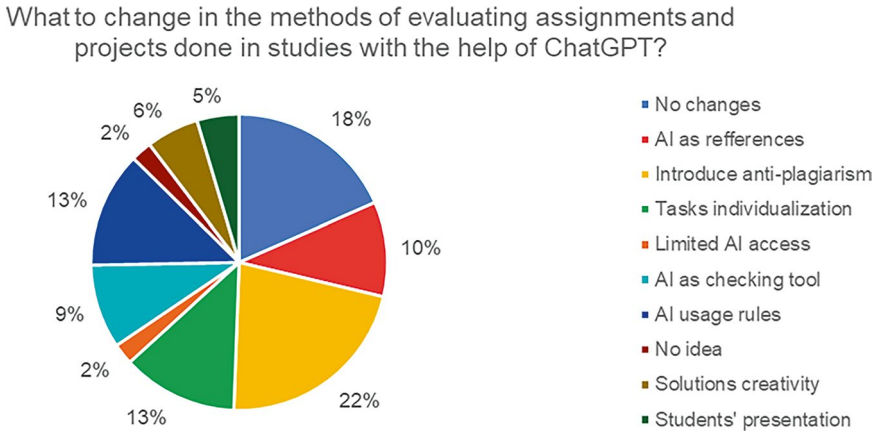

Fig. 3.2 Percentage of answers to question 2

- Data protection increase—this means increasing the level of security of private information, which is the responsibility of AI developers.
- User account protection—indicating the need to protect private information from the ChatGPT user account level;
- Law protection—meaning the need to implement legal solutions for the protection of private information when using ChatGPT,
- No idea—lack of proposition.

Table 3.3 presents the codes for this question along with sample answers.

Question 3, regarding the protection of private information when using ChatGPT, was the only one in which one dominant answer was visible among respondents. The vast majority (66%) of respondents chose not to provide private information when ChatGPT was used effectively to protect it. Many comments also included suggestions on how to omit private information when needed. Notably, they were replaced with false information, which was designed to meet the needs of the inquiry. The second most frequently mentioned way to protect private information when ChatGPT was used was to protect the user account. Unlike the most popular answer, this action is, on the one hand, the action of the user using LLM, and on the other hand, it is a strategic system solution that should be implemented by software developers, which was also pointed out in the responses.

Two indications received the same number of responses (5%): increased data protection and the still-existing risk of violating privacy and security principles. In both cases, the respondents indicated that ChatGPT, like other digital solutions, has some access to user data. According to the respondents, this poses a risk of potential data leakage. Therefore, it was suggested that those using ChatGPT should either

Table 3.3 Codes and sample answers for question 3

Q3: How to take care of private information protection and data security when using ChatGPT?	
Codes	Sample answers
General internet rules	"Just like when using the internet, literally the same rules will apply here as well."
Risk of privacy breach	"I don't think that we truly can because ChatGPT doesn't protect our data because it uses it as training data."
No private data	"Don't share private information online when it's not necessary."
Data protection increase	"The only thing that can increase the level of protection of private data is a slight suspension of development work on artificial intelligence."
User account protection	"If you care that much about it, I recommend you use a private browser with a proxy to not track your location. Review the privacy policies before creating a new fake email and a password that you have never used to sign up to ChatGPT."
Law protection	"Laws should be adapted to new circumstances, and users should be instructed and informed about their rights and how their personal data can be used and acquired."

use security applications or, in extreme cases, stop working on AI. Figure 3.3 presents the percentage distribution of all answers given to this question.

The next question in the survey focused on the ethical use of ChatGPT and handling its bias. A total of 88 answers were given to this question. The 7 assigned codes for those answers stand as follows:

- Critical thinking—indicating the need to consciously use the tool, including the need to be aware of potential biases of the obtained results;
- Specific prompts—referring to the need to use appropriate queries to avoid the risk of bias in answers;
- One cannot—indicating that regardless of what actions the user takes in contact with ChatGPT, the responses received will be biased.
- Information verification—indicating the user's need to verify all the responses obtained from ChatGPT in terms of both truthfulness and potential bias;
- Ensuring context data—indicating the need to use extensive queries that explain their context,
- AI improvement—indicating the need for further work on the part of developers to improve AI to eliminate bias in the answers generated by LLMs;
- No idea—lack of proposition.

Table 3.4 presents the codes for this question along with sample answers.

The most common answer to the question about addressing bias in responses generated by ChatGPT was the need to verify the information received by the user (36% of respondents). In their answers, the respondents emphasized the need to check key information in additional sources and the possibility of re-generating answers to a previously asked question to compare them. It was also advised that users should not deliberately mislead ChatGPT by praising it for an incorrect answer because the assessment of the usefulness of the answers also affects their quality in

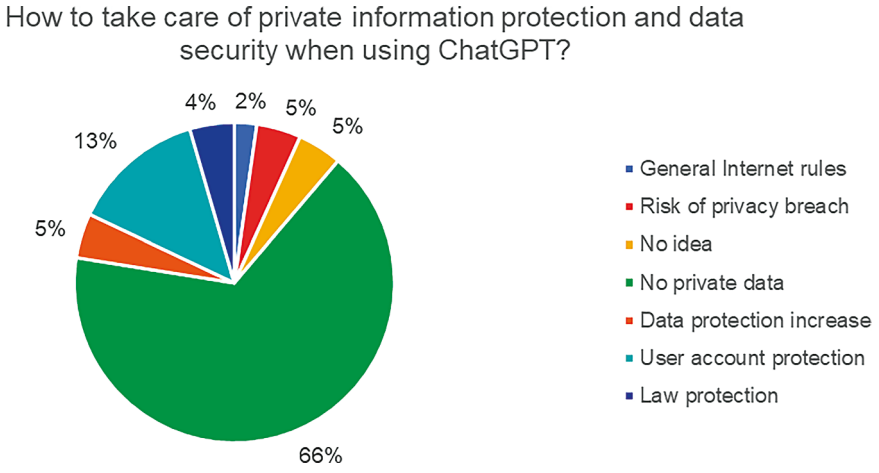

Fig. 3.3 Percentage of answers to question 3

Table 3.4 Codes and sample answers for question 4

Q4: How to deal with ChatGPT bias and use it fairly and equally?	
Codes	Sample answers
Critical thinking	"When using ChatGPT, you should remember that the information provided is biased, based on the majority of people who answered the question in a certain way."
Specific prompts	"Human moderation is essential for ensuring fairness and equity in ChatGPT prompt selection. By carefully monitoring the prompts and conversations generated by ChatGPT, human moderators can ensure that the conversations are appropriate, engaging, and free from bias."
One cannot	"At the moment it is pretty much impossible, as was showcased by the DAN(Do Anything Now) incident when an internet user issued a command to ChatGPT to bypass all the safety protocols that were implemented."
Information verification	"Everyone who uses ChatGPT to answer some questions should check once again the fairness of the information by themselves."
Ensuring context data	"You have to give it context of your question and ask it a few times the same thing."
AI improvement	"Chat has to be upgraded constantly to remove the bias factor."

the respondents' opinion. For 26% of the respondents, critical thinking was the key to dealing with ChatGPT bias. In their responses, they suggested using the information provided by ChatGPT as a form of inspiration, not relying on it completely, or only using ChatGPT when you need it. It was also noted that it is necessary to assume that each answer generated by LLM is biased and should not be thoughtlessly used by the user or copied.

The third most common response to this question was a suggestion about using specific queries (prompts). The possibility of expanding queries with additional, contextual information and asking further questions that complement the main questions addressed to ChatGPT was noted, as was ensuring that users do not formulate questions that are marked by bias and prejudices. Figure 3.4 presents the percentage distribution of all answers given to this question.

The fifth question concerned the possibility of expanding access to ChatGPT to reduce social inequalities. There were a total of 90 responses to this question. The answers were assigned ten codes, which stand as follows:

- Internet access—indicating the need to provide general access to the Internet, not only to a specific tool;
- Organizational access—indicating the need to involve organizations, e.g., HEIs, in the process of promoting access to ChatGPT,
- Free access—indicating the need for software developers to resign from its paid version;
- Promotion—indicating the need to take action to disseminate ChatGPT and promote its use at work, in education, and in everyday life;
- Language versions—indicating the need to provide the solution in many language versions;

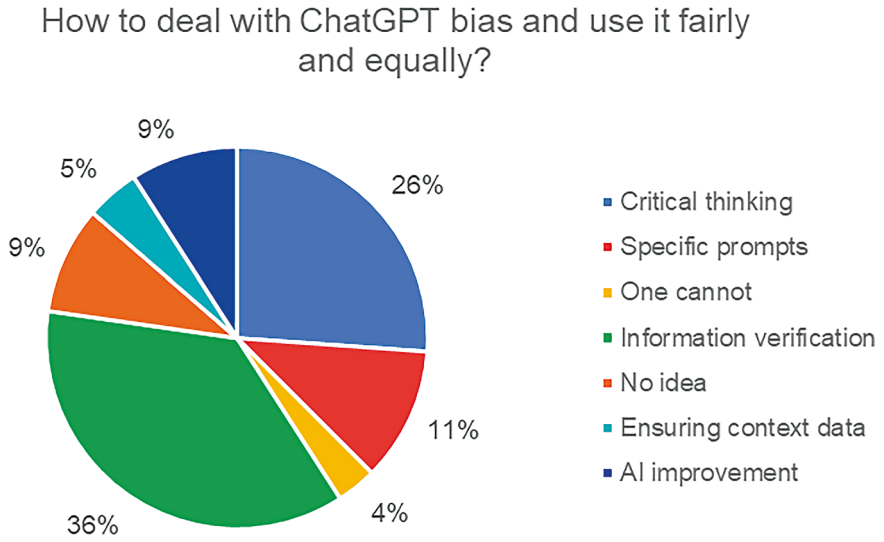

Fig. 3.4 Percentage of answers to question 4

- Broad enough access—indicating that, the current access to ChatGPT is sufficient;
- Non-restricted global access—indicating the political aspect of ChatGPT availability, which is unavailable to users in some countries;
- Education on usage—indicating limitations in the use of ChatGPT due to the lack of skills in using this tool and thus the need to educate users,
- Mobile app implementation—suggesting the implementation of ChatGPT in the form of a mobile application, which, according to respondents, will increase its availability;
- No idea—lack of proposition.

Table 3.5 presents the codes for this question along with sample answers.

The distribution of answers to this question was quite surprising. The most frequently indicated solution for popularizing and making ChatGPT available to as many people as possible was the suggestion of free access, which 22% of the respondents noted. These answers indicate that having access to the internet is equal to having access to ChatGPT, at least in the free version. The second most common answer was "I have no idea", which was not common for the previous questions. The access currently provided to ChatGPT is considered sufficient by 16% of respondents. The responses emphasized either the lack of need to make the tool more accessible or omitted the fact that the full version requires a subscription and, therefore, payment. Fifteen percent of the respondents indicated the need to promote the ChatGPT tool for its popularization and general availability. The responses indicated taking actions such as advertising on social media or promotion through social campaigns. It was also suggested that the tool be popularized among pupils

Table 3.5 Codes and sample answers for question 5

Q5: How to expand access to ChatGPT and reduce inequality in opportunities to use it?	
Codes	Sample answers
Internet access	"I think there are much more important cases of inequality in the world, than the opportunity to use AI, however, the simplest solution would be helping people around the world gain access to the internet (Right after they are given access to clean water, food, housing, healthcare, etc.)"
Organizational access	"Make it accessible in public spaces. For example, on monitors provided by shopping malls like Galeria Katowicka- why not offer an area where this service is provided for people to use."
Free access	"To reduce inequality in using ChatGPT, they should create a completely free version, which will help everyone access it a lot."
Promotion	"Promote ChatGPT as something good for use and helpful."
Language versions	"To expand access to ChatGPT, you can work on translation and accessibility in different languages."
Broad enough access	"I believe its usage is available on the level that it should be."
Non-restricted global access	"ChatGPT should be used equally in every country to make it easier for people to find information. If ChatGPT cannot be entered in some countries, there at least should be some substitute platform to use it there."
Education on usage	"The classes on how to use the tool should be included in every school's agenda. Additionally, NGOs or associations could introduce classes (and free computers) for disadvantaged groups such as the elderly or people without stable housing."
Mobile app implementation	"Perhaps they could make it more accessible through an app that is adapted to other devices and make it available as a platform where you can also record a voice message."

and students through classes. Figure 3.5 presents the percentage distribution of all answers given to this question.

The sixth question in the study concerned actions that can be taken to increase digital literacy among students using the ChatGPT. There were a total of 88 answers to this question. These answers were given six codes, which stand as follows:

- Conscious education—meaning undertaking not only educational activities but, above all, self-improvement activities, critical reflection on AI and its use, and building awareness of the advantages and disadvantages of this solution;
- Training in education—meaning the need to familiarize students with ChatGPT and other LLMs through dedicated classes included in the education programs of schools at various levels,
- No education is needed, meaning that there is no need for any education, workshops, or training in the use of ChatGPT, but emphasizing the independence of acquiring skills in this area by those interested,
- Online education—meaning the need to popularize training courses available publicly online;
- Restricted access to AI—meaning the need to limit, mainly by introducing an age limit, the possibility of using AI,
- No idea—lack of proposition.

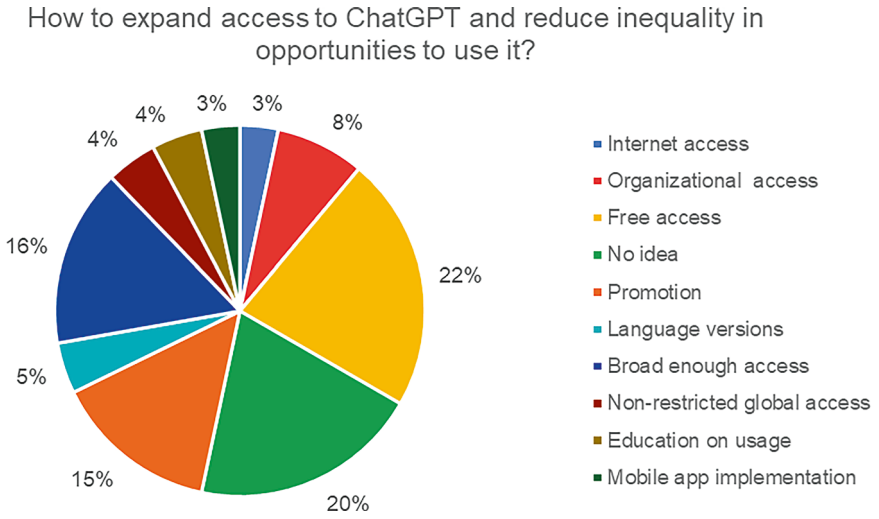

Fig. 3.5 Percentage of answers to question 5

Table 3.6 Codes and sample answers for question 6

Q6: How to prepare for the future and enhance students' digital literacy by using ChatGPT (and similar)?	
Codes	Sample answers
Conscious education	"Educate students on the good and bad sides of working with this system. Propose a situation in which it can help us but also make people aware that using this type of application is not a good solution."
Training in education	"In my opinion, the educational system has been failing every time a new technology has been introduced, with very few exceptions, so it is probably not feasible shortly, however, a good idea would be conducting some sort of classes with instructions on how to use AI chatbots, the ethics and dangers of it."
No education required	"Students will learn how to use it themselves or will find information on the internet. However, it is probably hard to create a guide for using ChatGPT."
Online education	"Make some courses that prepare the students and other people."
Restricted access to AI	"There should be an age limit, in my opinion, and people who can use it properly and not abuse ChatGPT should be allowed to use it normally."

Table 3.6 presents the codes for this question along with sample answers.

The structure of the answers to this question indicates the respondents' orientation towards forms of education in the field of ChatGPT, regardless of the form in which this education is to be provided and by what institutions. The majority of respondents—43%, indicated the need for conscious education in the use of the ChatGPT. The responses highlighted aspects such as: demonstrating proper usage of AI and Chat GPT, teaching fact-checking and critical thinking, educating

students on the good and bad sides of working with this system, and increasing awareness of this topic by showing the opportunities and threats of this software. In their answers, 39% of the respondents emphasized the need to acquire practical skills related to using ChatGPT, calling for implementing AI-related issues in teaching curricula. The respondents emphasized primarily the need to teach correctly formulated questions, create workshops with the practical use of ChatGPT, and the fact that using available solutions in the course of education can be beneficial for both students and teachers.

Five percent of the respondents indicated the risk of widespread access to ChatGPT, understanding it mainly as a form of abuse and a potential cause of job loss. The comments emphasized the need to introduce restrictions on use related to users' age as a form of protection against inappropriate use of ChatGPT. Figure 3.6 presents the percentage distribution of all answers given to this question.

The last question in the survey focused on other issues and challenges regarding the ChatGPT and its use in studies that are worth mentioning. Since it was an opportunity for free expression and the diversity of voices in the discussion, the authors did not decide to code the answers. Still, they only cited some of the areas mentioned by the respondents. For this question, after excluding empty lines with no answers or statements "I do not know" or "no comment," 64 answers were obtained.

The statements often repeated positions that appeared in answers to other questions. The respondents emphasized the risk of a lack of creativity and independence in performing tasks that will be delegated to AI and therefore indicated the need to verify the independence of performing tasks, including creating texts, with anti-plagiarism systems.

Referring to the results provided by ChatGPT, the risk of receiving false answers was emphasized, as were the uncritical acceptance of these answers and their

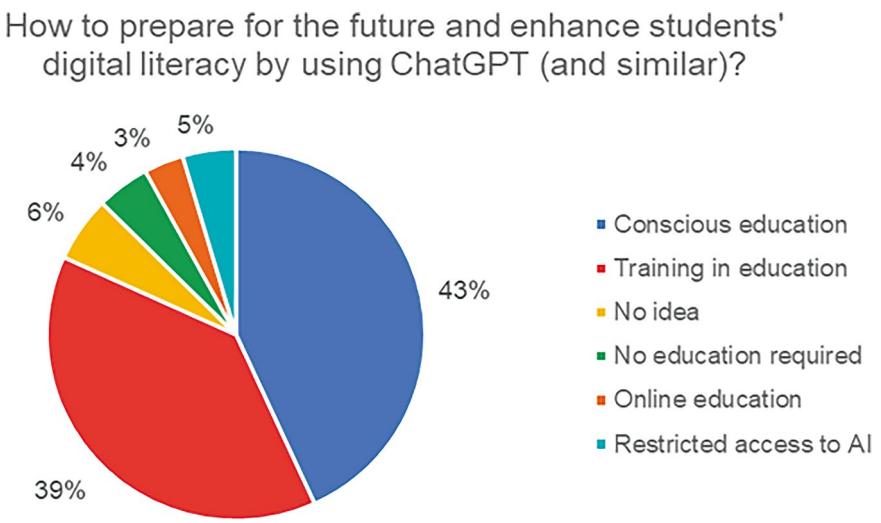

Fig. 3.6 Percentage of answers to question 6

further use without verification with other sources. Concerning tools, the answers provided by ChatGPT lack a broader context, which may make them incomplete or even biased. With respect to the use of ChatGPT by users, the main negative consequences of using this tool were indicated. Notably, these statements did not apply only to students but to everyone using this tool. Due to overusing ChatGPT, the respondents cited a lack of independence in searching for information, a lack of critical thinking, and even laziness. The respondents also mentioned attitudes that may develop due to long-term use of ChatGPT or similar tools, which, in their opinion, directly affects digital literacy. The loss of creative thinking, lack of motivation to work independently, and deepening stereotypes were noted.

The discussion also included statements focusing on the infrastructure aspect of the internet environment and its relationship with the use of AI and LLMs, including ChatGPT. The respondents indicated the risk of low server capacity, excessive use of resources, or low network bandwidth caused by overuse of AI. The discussion also highlighted the advantages of using a tool such as ChatGPT, primarily in a business context. The possibility of faster implementation of repetitive tasks, introducing automation of some processes, and saving time employees spend on tasks that can be entrusted to AI were noted.

In summary, the study shows that the surveyed students know the advantages and disadvantages of using ChatGPT. They point to the risk of overusing ChatGPT and the far-reaching consequences related to the quality of the teaching process, changes in the attitudes of its users, and social effects regarding the formation of specific attitudes. The respondents also understand the risk regarding the quality of information obtained via ChatGPT.

Discussion

In the students' opinion on assignments and projects completed with the assistance of ChatGPT, teachers should adjust their assessment methods to prioritize critical thinking and originality, ensuring that students deeply engage with the material rather than relying solely on AI-generated content (Mohamed et al., 2025). Incorporating mixed evaluation methods that combine human grading with AI tools can provide a balanced assessment, addressing accuracy and reliability issues. Implementing strict guidelines and using plagiarism detection tools are essential to maintain academic integrity, given the high similarity indices found in AI-generated work. Providing students with training on using ChatGPT as a supplementary tool and clear ethical guidelines can help mitigate over-reliance and promote responsible usage.

To protect private information and ensure data security when ChatGPT is used, compliance with data protection regulations such as the GDPR is crucial, involving strict data retention policies, obtaining user consent, and respecting data subject rights. Promoting user awareness by providing transparent data collection policies and obtaining informed consent further safeguards privacy.

To address bias in ChatGPT and ensure its fair and equal use, it is crucial to be aware of potential biases in AI models and use neutral language when interacting with them. Encouraging multiple perspectives by requesting different viewpoints, providing feedback on biased outputs, and promoting transparency about the model's limitations can help mitigate bias. Educating users on responsible interaction and establishing ethical use policies further minimize bias and encourage equitable use of ChatGPT.

Further findings on reducing inequality focus on offering free or low-cost versions and optimizing the platform for mobile and offline use to reach users in low-income or internet-restricted regions. Incorporating accessibility features for people with disabilities, providing educational programs to teach effective use, and forming partnerships with organizations such as schools and libraries can further broaden access. Additionally, supporting open-source initiatives, advocating for inclusive policies, and customizing ChatGPT to respect different cultural contexts help ensure that more people can benefit from AI technology, thereby reducing inequalities.

To prepare students for the future and enhance their digital literacy via ChatGPT and similar AI tools, teachers can integrate these technologies into their teaching methods to familiarize students with advanced digital interfaces. This includes teaching students how to effectively interact with AI by formulating precise queries and critically evaluating the responses they receive. By incorporating AI tools into assignments and projects, students can develop skills in digital communication, problem-solving, and critical thinking. Additionally, discussing the ethical considerations of AI, such as data privacy and algorithmic bias, can deepen students' understanding of the impact of technology on society.

To answer the research question set in the paper, the authors revealed a broad range of ways in which students can use LLMs in AI-powered tools in their study process. Among them are searching for answers, help with writing, problem-solving, and prompt engineering.

Conclusions

This chapter presents the results of qualitative research with over 90 students who shared their views on various aspects of using the Chat GPT in the learning process. They highlighted many advantages of how this tool can assist them but also emphasized that they know that the tool is imperfect and can lead to erroneous results. AI-supported tools have become increasingly popular and indispensable in using new technologies. Students very often utilize them; therefore, it is important for teachers to adopt and integrate these tools into their teaching programs so that students' ability to use them is optimal and balanced. The limitation of this study is lack of longitudinal data on long-term educational outcomes which might be direction for future research.

Disclaimer The manuscript was developed entirely by the author(s) without the assistance of any artificial intelligence tools.

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