The use of AI and student population: The change is inevitable.

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***Abstract* – Generative AI systems have become a permanent fixture, with various authors highlighting their pros and cons. In education, a persistent technological gap often puts teachers at a disadvantage, trailing behind students who are more adept at embracing new technologies. The SETCOM project successfully introduced AI to both students and teachers, particularly focusing on educational study program students destined to become teachers themselves. Despite generational disparities between teachers and students, with younger generations showing more inclination towards ICT and AI, utilization remains sporadic. While students readily embrace AI, subscription-based advanced AI systems see surprising uptake, with around a fifth of students utilizing them. Primarily, students use AI to comprehend unfamiliar concepts, acknowledging its capacity to generate responses but exercising caution by verifying and correcting errors in over half of cases. For teachers, embracing AI becomes crucial to remain relevant in their field, despite potential financial implications. Failure to adapt risks being perceived as outdated by their students across all educational levels. In summary, generative AI systems are entrenched in education, offering both opportunities and challenges. Bridging the technological gap is imperative for teachers, as students increasingly rely on AI for learning support. Embracing AI becomes essential for educators to maintain relevance and effectiveness in teaching, ensuring they do not become obsolete in the eyes of their tech-savvy pupils.**

Keywords: education, AI, student perspective, influence

I. INTRODUCTION

Since November 2022, when ChatGPT became available to a broad audience, we have observed a generational gap between students and teachers. Most teachers were unaware of these AI services and did not adapt their educational strategies to this new reality. Over the last two years, we have affirmed what Nosović once stated: "Who will teach the teachers?" [1] is paramount in this transition period. The impact of AI is overwhelming in today's world, including in education [2]. Although most educational conflicts are perceived in textual assignments related to the social science disciplines, they are also present in engineering [3]. Artificial intelligence is not detrimental to education; rather, it presents unique opportunities as AI personalizes education, streamlines processes, and enhances accessibility through diverse applications, including intelligent tutoring systems, adaptive learning platforms, and automated grading tools [4] [5]. Artificial intelligence is subject to author rights and GDPR, and there has been an increase in lawsuits from publishers claiming their articles were not meant for public use. A generative AI model is capable of producing 'human-like' text. These events raise questions for the future of AI in education (AIEd) and the underlying function of assessment, emphasizing the importance of active student participation in integrating AI into education [6].

We were fortunate to apply for a project on AI and Social-Emotional Learning (SEL) just before the widespread adoption of AI, allowing us to prepare for its integration into education [7] [8] [9]. At the beginning of the project, we learned how to use AI systems and educated students and teachers alike. We conducted two tests on course participants, one before the course (550 participants) and another after (245 participants). The data showed that in most cases, progress was evident. However, we observed three unexpected shifts where participants changed their opinions more than average: [10]

1. Organizations use artificial intelligence unethically (15 % increase).
2. I think AI systems make a lot of mistakes (20% increase).
3. People like me will suffer if artificial intelligence is used increasingly (15 % increase).

II. PREVIOUS RESEARCH FINDINGS

But we did not reach the same portion of the teachers as we reached the students at our faculties.

Therefore, we did research on lower levels of education (primary and secondary education) with the observations that correspond with the previous findings.

Key observations include: [11]

- Generation Z (born 1995-2009) is comfortable with AI and digital content, more so than Generations X (born 1965-1980) and Y (born 1981-1994).
- Generation Z is digitally literate.
- The Alpha generation (born 2010-2024) views AI systems as a natural, integral part of life.
- These trends raise questions about the education system's adaptation to technology, especially regarding generation X and Y teachers' attitudes and understanding of AI. The difference in digital literacy across generations impacts both teaching and learning.

In 2023 we gather information from teachers from primary and secondary schools using 23 questions anonymous survey. The questionnaire was specifically designed for this research and categorized into four domains: demographic classification, feedback on ICT equipment usage, opinions on ICT integration in education, and perspectives on AI in educational contexts. Even though the response levels are very low today the 75 respondents are quite an achievement (49 primary schools and 29 secondary schools). The statistical analysis shows almost no significant differences between primary and secondary school teachers in using AI in education [10]. The descriptive statistics show

something interesting: Teachers are not able to distinguish between text assignments written by students or AI systems (30.6 %) or they misinterpreted the authors work in around half of the cases (38 %) [10]. On the other hand, only 13 % of teachers have looked at AI systems and they think it is beneficial, where Chat GPT is leading service (81 %) followed by Office 365 (66 %) [10]. The later, the use of Office 365, proves to be a statistically significant difference between primary and secondary school teachers ($\chi^2 = 4.18$; $p = 0.041$)

When the teachers were asked how their students use AI systems, we gathered interesting results (see Table I).

TABLE I: How students use AI systems in the eyes of their teachers

	Responses
For writing (homework) assignments.	74 %
As a point of interest.	43 %
To find ideas.	58 %
To find additional resources.	34 %
To explain learning content.	43 %
To translate between languages.	66 %
For fun.	61 %

On the other hand, teachers are going to use AI systems in the following manner (see Table II).

TABLE II: How teachers are going to user AI systems

	Responses
I will introduce students to the use of AI systems.	73 %
I will give the students a task to use an AI system.	70 %
We will evaluate the products (texts, images) prepared by the AI system.	25 %
We will use the products of AI systems as building blocks in our work.	55 %

This implication is obviously not favourable for teachers because the use of AI in education could undermine learning activities. Teachers need additional training and a transfer of good practice as other studies also proved. [12] In view of this, teachers need to learn not only how to use technology but also how to successfully integrate it into their curricula [13]

From the data we could extract (from the years of service) the generation of the teachers where 35 were from generation X and 27 from generation Y [14]. We were able to see the differences between generation how they use computers ($\chi 2 = 10.91$; $p = 0.004$). The later inquiries into these findings with the interviews of selected teachers from both generations shows that difference may be attributed to the fact that older generations of teachers are accustomed to using desktop computers with full keyboards and large screens, whereas small keyboards on laptops are too constraining for them. However, younger generations of teachers do not face this issue [14]. Additionally, we have found that difference between teachers of different generations can be found in three additional topics: communication by typing ($\chi 2 = 11.72$; $p = 0.020$), online banking ($\chi 2 = 1.52$; $p = 0.033$), and content creation ($\chi 2 = 11.09$; $p = 0.026$).

Teachers from the Generation X have a greater problem to assess the author of textual assignments (students or AI systems) than Generation X teachers but there is no significant difference between generations [14] The statistically significant difference between generations of teachers is observed in the topic of explaining learning content ($p= 0.017$) and translation between languages ($p = 0.022$). Older generation (X) of teachers uses much more these two services than younger generation (Y). For the end we have expected difference between generations of teachers in their inclination toward AI systems where younger generation are going to use it more in their educational activities than older generation ($p = 0.008$) [14] Translation between languages is very important because students at the lower levels of education do not have sufficient knowledge of the language to be able to study from literature in the foreign language. Using AI translation in such cases is highly recommended [15]

III. AIMS OF THE RESEARCH

The main aim of the research was to gain an insight into how students of the Faculty of Education and the Faculty of Arts deal with the challenges of AI systems and use these systems in their current and future work. It also aimed to find out which AI systems they use, what purpose they serve and how they manage the information they collect. The investigation focused on the following research questions:

- Which AI systems do they use?
- The purposes of use of AI systems?
- Are they aware of the critical use of the information collected?
- What is the students' opinion on the impact of the expansion of AI systems on the educational process?

IV. METHODOLOGY AND DATA COLLECTION

The present study utilized an online survey consisting of nine questions to gather data regarding students' awareness of AI systems, their utilization purposes, attitudes towards acquired information, and perceptions concerning the future educational landscape under AI system influence. Categorization was performed using three questions, with the remaining serving as research data. Survey participants comprised students enrolled in the academic year 2023/24 at the Faculty of Education and the Faculty of Arts in Maribor, Slovenia. The sample consisted of 84 students, evenly distributed with 42 students from each institution. Only valid responses were included in the analysis, excluding incomplete or omitted answers. Data analysis was conducted using SPSS statistical software, employing descriptive statistics, the chi-square test, and selected non-parametric tests to examine rating scales.

V. RESULTS

The question was which AI system the students know. Using multiple-choice question, we provide a list of current systems based on our experience. Among the AI systems, GhatGPT predominate (Ver 3.5/31.5 % and Ver 4/24.7 %), totalling 56.2 %. The reason for the higher share of ChatGPT 3.5 is, in our opinion, its free availability, while ChatGPT 4 is not. Microsoft Copilot and Google Gemini are currently at around 5% each, as they are only available for a short time. Students are aware of the image and video generation systems, with image generation being known by around 21.3 % of students and video generation by 10.6 % of students. For 2.1 %, other systems such as Grammarly, Sound Synthesizer or Perplexity were listed in the *other* category.

After getting an insight into the AI systems the students know, we prepare a multiple-choice question to find out which AI system they use and how often.

TABLE III: Which AI systems students use

	Frequency	Percent
ChatGPT 3.5	64	47.8
ChatGPT 4	26	19.4
Copilot	2	1.5
Gemini	5	3.7
Image generating	22	16.4
Video generating	9	6.7
Other	6	4.5
Total	134	100,0

The AI system most frequently used by the students is ChatGPT 3.5 with a share of 47.8 %, followed by ChatGPT 4 with 19.4 % (see Table III). The difference is not surprising, as the first system is free, while the second is paid. Around 16.4 % of students also use an image generation system, while video generation systems are used less frequently. This is most likely due to the complexity of such systems. We rate the result of AI systems usage as positive since the students, future teachers, know how to use AI systems. But our research cannot find out how effectively they do it.

VI. THE PURPOSE OF USING AI SYSTEMS

More than the use of AI systems, which we welcome, we believe it is important to find out for what purpose or purposes students use them and how often. Based on our experience and research on the internet, we have created a list of the most common purposes people use AI systems. However, as we were aware that there are other uses, we created the option to select "Other", where students could indicate the purposes for which they use AI systems that differ from the list. In the table, the purposes are listed and sorted in descending order. The table also shows how often AI systems are used for each purpose. The five-point scale from Never to Regularly (1 to 5) was used to assess the frequency of a particular purpose. The categories "rarely" and "a few times a month" were combined, as it is not possible to make a precise distinction.

TABLE IV: The purposes students use AI systems.

Purpose	$\overline{R}$	Frequency of use
To explain something, I don't yet know or don't understand	4.93	Often 20.8 %, rarely + a few times a month 59.8 %, Never 10.4 %
To find extended information	4.52	Often 19.5 %, rarely + a few times a month 61.1 %, Never 16.9 %
To translate between languages	4.47	Often 29.9 %, rarely + a few times a month 45.5%, Never 14.3 %
To find basic information	4.35	Often 23.4 %, rarely + a few times a month 55.9%, Never 11.7 %
For the creation of written outcomes	4.32	Often 22.1 %, rarely + a few times a month 61.1 %, Never 20.8 %
Other purpose(s)	2.73	For fun, creating lyrics; creating posts on social networks; for feedback on whether I have written the text well; e-mail message creation; writing grammatically better work instructions
For proofreading the text	2.68	Often 5.2 %, rarely + a few times a month 37.7 %, Never 54.5 %

The table (Table IV) presents the results of the non-parametric Friedman test, which indicates that students use AI systems to gain a better understanding of a particular topic or topics or to obtain deeper explanations. The mean ranks ($\overline{R}$) indicate the frequency of the selected scale level used to describe the frequency of use of each purpose. The higher the mean rank, the closer the selection is to the higher scale level 5, which stands for regular use. The students can assist themselves with the functionality of AI systems themselves and that they want a better understanding of the different types of content. This result is confirmed by the second most cited reason for using AI systems, which shows that in addition to understanding, AI systems are also useful for obtaining even more comprehensive information about the content in question. In today's world, communicating in a foreign language is practically part of basic education. Nevertheless, there is a gap between poorer and better foreign language skills, which is normal, but there is a desire for written communication to be as correct as possible. It is therefore not surprising that the use of AI systems for translation into the chosen foreign language is a high priority. The reason for using AI systems as a tool for preparing written work is ranked lower than expected. The general opinion is that young people greatly simplify such tasks with AI, but often the use for these purposes has negative connotations. Especially from the perspective of the actual authorship of the product. Of course, it is not possible within the scope of our research to determine the actual intention behind the use of AI systems for the creation of written work, so we will limit ourselves to the reasons for using the AI systems themselves. The order of reasons for using AI systems by frequency shows the purposes and approximate frequency with which students use them. Regardless of the order, the descriptive statistics show that the average of all responses is between M=2.3 and M=2.5, i.e., a few times a month. From this we conclude that the functionalities of AI systems are only used when needed and not for everyday tasks. We cannot emphasize any particular reason and conclude that the reasons for using AI systems vary. The option least used by students is proofreading, which ranks behind the other reasons and is rarely used (M=1.4). We believe that the reason for this is that students at this stage of study period are not yet writing professional papers where proofreading is crucial. We believe that doctoral students would rate this option higher.

In the "other" category, interesting purposes for AI are mentioned, such as writing song lyrics and even writing messages on social networks, which is surprising. This is mainly because it is assumed that communication on social networks takes place on a relatively simple level.

VII. THE EVALUATION OF AI RESPONSES

AI systems are constantly evolving and use databases that are constantly updated with new data. The algorithms and inference patterns are also getting better and more reliable. The relevance or correctness of the information usually depends on the facts given, but also very much on the way users ask the question or what search keys they use. All this is the reason that the information or answers received are not necessarily true or correct and need to be evaluated rationally before being used. We wanted to know if students are aware of this and how they act when they receive information from an AI system. We created a list of the most common behaviours from which students chose their default behaviour.

TABLE V: The behaviour after receiving information.

	Frequency	Percent
I use it immediately	1	1.3
I only check	5	6.5

I check and correct errors	19	24.7
I check other sources	44	57.1
I also search for them online	8	10.4
Total	77	100.0

Based on the results, we can see that the students, as future teachers, handle the information they receive responsibly (see Table V). Most students (57.1 %) verify the information, and almost a quarter check and correct possible errors. Overall, almost 82 % do not blindly trust the information, but verify it in one way or another. Around 10 % double-check the information and also search the internet for additional information. Critical evaluation of information is of crucial importance, which is why we consider the present results to be very positive. Especially from the perspective of future teachers, who will soon be responsible for passing on information and knowledge to pupils. Overall, slightly less than 8% of students are extremely trusting, which we view with some reservation regarding the overall result. The additional analysis between students of both faculties shows that they act similarly or even the same when receiving information from an AI system, as there is no statistical difference between both groups ($p > 0.05$).

VIII. INFLUENCE OF AI TO THE EDUCATIONAL PROCESSES

From the students, the future teachers, we wanted to explore their understanding and perspective on the future of the educational process under the influence of the expansion of AI systems. This includes aspects of teaching, learning, knowledge assessment and quality assurance. Opinions were collected through open-ended questions.

The students agree that the inclusion of AI in the education system brings both benefits and challenges. They emphasize the need to review the credibility of information and the considerate integration of AI resources in schools, while advocating the use of technology as a tool and resource. They emphasize that the amount of independent work will decrease with the increased use of AI and anticipate a shift in the nature and importance of homework from memorization to the application of information, which they see as a positive change. Students believe that AI can have a positive impact on education by assisting teachers with administrative tasks and lesson preparation, but they also express concerns regarding impersonal relationships, reduced critical thinking and the potential for addiction. They predict changes in the educational process due to the increased use of interactive learning materials and the development of automated assessment tools, both of which demand adequate and continuous teacher training. They also point to the need to learn how to evaluate information critically and the increasing risk of cheating through AI. Individuals emphasize the need for appropriate AI management and ensuring quality education despite digitalization. To summarize, future teachers have a high awareness of the role and importance of AI in the educational process and have a picture of the future of education. However, it is not possible to predict with certainty how the process will actually develop, as the changes are extremely rapid and reliable predictions are not possible.

IX. DISCUSSION

The two research articles from teachers' perspective present insightful perspectives on the influence of artificial intelligence (AI) on teachers' practices and the broader educational landscape in 2023. [10] [14]

From the first research, it is evident that teachers recognize both the potential and challenges of integrating AI into educational processes [10]. The survey reveals that a significant number of teachers are using AI tools like Chat GPT, although many still struggle with distinguishing AI-generated content from student work. This distinction is crucial as it affects the authenticity and integrity of student submissions. The article underscores the necessity of addressing ethical considerations and competencies regarding AI use in education to ensure its beneficial implementation.

In contrast, the second research focuses more on the educators' adoption and perceptions of AI [14]. The findings indicate that while teachers are becoming more familiar with AI, there remains a notable gap in confidence and competence in using AI effectively in educational settings. The research suggests a need for ongoing professional development and training in AI for educators to bridge this gap.

Both researches [10] [14] highlight the importance of ethical education about AI and suggest that while AI is a powerful tool for enhancing educational processes, its integration must be managed carefully to ensure it supports fair and effective learning outcomes.

These insights suggest that as AI becomes more embedded in educational settings, there will be an increasing need for comprehensive training programs that not only enhance teachers' technical skills but also address the ethical dimensions of AI use [11] [16]. The findings from both researches contribute to a growing understanding of how AI is reshaping educational practices and highlight the critical role of educators in shaping its impact on learning environments.

X. CONCLUSION

In the examination of AI's influence within educational processes, our findings suggest a complex interplay between technological adoption and educational efficacy. AI systems, as we've seen, not only automate tasks but also enhance the learning experience by personalizing education and facilitating access to information. However, the effectiveness of AI systems hinges on their responsible use and the critical evaluation of their outputs. From our results, it's evident that while students are quick to adopt AI for various educational purposes, ranging from generating content to seeking clarifications, teachers are slower in adapting, highlighting a generational gap in digital literacy. This disparity necessitates targeted training programs to equip educators with the necessary skills to integrate AI tools effectively into their teaching methodologies.

Furthermore, the evaluation of AI-generated responses shows a commendable level of critical engagement from students, who predominantly cross-verify information, thus mitigating potential inaccuracies. This behaviour is crucial as it underpins the reliability of AI in educational settings. The broader impact of AI on educational processes includes potential shifts in pedagogical strategies, where traditional memorization tasks are replaced by applications that require higher-order thinking skills. This shift could redefine educational norms, making learning more interactive and less about rote learning.

Overall, the future trajectory of AI in education appears promising, with significant benefits that could revolutionize how educational content is delivered and absorbed. However, this potential can only be fully realized through comprehensive training and adaptation strategies for educators, alongside continuous evaluation of AI's role and effectiveness in education. These steps will ensure that AI acts as an enhancer rather than a disruptor of educational integrity.

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