Practices, Challenges, and Training Needs of Faculty in Terms of Generative AI

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Abstract: This paper investigates the role of Generative AI (GenAI) tools in higher education at TTK University of Applied Sciences (TTK UAS), Estonia, the largest applied sciences university in Estonia providing higher education in engineering. Through a survey of 81 faculty members, it examines the use of GenAI in teaching, research, and administrative tasks, highlighting patterns of usage, perceived benefits, challenges, and training needs. The findings reveal that while GenAI is seen as a valuable asset in personalized learning and efficient task management, concerns about reliability, ethical implications, and workload dynamics persist. The study emphasizes the importance of targeted training to address these challenges and support the effective integration of GenAI tools in higher education.

1 INTRODUCTION

Generative AI (GenAI) is a type of artificial intelligence (AI) technology capable of generating new and unique outputs, such as images, text, audio, videos, 3D models (Holmes & Miao, 2023). Due to its ability to produce sophisticated and realistic content that reflects human creativity, GenAI has become a valuable tool in various industries, including education, entertainment, and product design (Castelli & Manzoni, 2022).

Since the launch of ChatGPT (Chat Generative Pre-trained Transformer - the fastest-growing app in history to date, based on large language models) at the end of 2022, extensive discussions and widespread research have emerged, raising both concerns and innovative ideas for enhancing higher education (Holmes & Miao, 2023). Based on studies and general trends published over the past two years, it can be stated that AI technologies have the potential to significantly transform teaching and learning in higher education (Holmes & Miao, 2023; Ward et al, 2024).

However, several challenges remain, including addressing ethical and quality concerns within higher education, navigating implementation issues, and utilizing appropriate pedagogical frameworks. To best support faculty members at TTK UAS in navigating these challenges, it was necessary to first map out the existing knowledge, attitudes, and practices related to AI. This foundation would allow for targeted training to address the identified gaps. More specifically, the aim of the study is to determine the current use of GenAI tools in both the planning and delivery of teaching, as well as in other activities associated with faculty work (such as projects, research, and administrative tasks) at TTK UAS, to identify challenges and support their resolution through targeted training initiatives. Accordingly, the following research questions were formulated:

- What is the level of awareness and familiarity with GenAI tools among faculty at TTK UAS?
- In which work fields are these tools most used?
- What are the perceived potentials and concerns regarding GenAI across different fields at TTK UAS?
- What AI-related training and guidance do faculty members need to ensure that the use of AI tools is both effective and aligned with academic ethical principles?

On one hand, by mapping the opportunities and risks associated with the use of AI-based applications in the local higher education landscape and

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comparing these findings with previous research, the survey results will facilitate more focused and precise planning of faculty training needs on site. On the other hand, by contributing to the collection of data on AI trends in education, this approach will enable cross-border insights and support the design of a common value space, providing support and training on the topics that present the greatest challenges at this time, where technological changes are rapid, but adaptation to these changes takes time and requires a systematic approach.

Therefore, before conducting the survey, the authors analysed previously published literature, with the results appearing in a separate article titled "Integrating Artificial Intelligence in Higher Education: A Literature Review of Current Trends, Challenges, and Future Directions" (Safiulina et al., 2024). The key findings from this article have been integrated with the results of the current literature review, focusing on more recent studies.

2 LITERATURE REVIEW

Growing research (Kung et al, 2023; Lund, 2023; Lee et al., 2024; Lepik, 2024; Peres et al, 2023; Rahman & Watanobe, 2023; Safiulina et al., 2024; Strzelecki, 2023; Ward et al, 2024) has explored faculty perceptions of generative AI tools in higher education, highlighting the expanding role of AI in various academic tasks beyond teaching, such as research activities, project-based work, and administrative duties like drafting emails and providing feedback. These tools support personalized learning, enhance teaching materials, provide research input, and assist with drafting responses to student inquiries.

In addition to these benefits, recent literature (Safiulina et al., 2024) identifies the role of AI in personalized and adaptive learning as one of the most transformative applications in higher education. AI enables tailored educational experiences by adjusting content to individual student needs and learning styles, improving engagement and learning outcomes. This finding aligns with the growing recognition of AI's ability to offer personalized feedback and improve the efficiency of educational delivery (Ward et al., 2024; Lee et al., 2024).

Moreover, AI's impact on assessment processes has been increasingly noted. Automated grading systems and AI-enabled exams offer consistent and timely evaluations, streamlining assessment tasks. However, alongside these efficiencies, challenges such as ethical concerns around fairness and bias in AI-driven assessments remain significant (Neumann, Rauschenberger & Schön, 2023). Safiulina et al. (2024) also highlight this concern, emphasizing the need for clear governance frameworks to ensure equitable use of AI in assessment and teaching.

However, significant challenges have also been identified regarding using AI-based text generators like ChatGPT and other generative AI tools in education. These include concerns about reliability, the use of biased data (Obaid & Yaseen, 2023), the generation of inaccurate or fabricated content, including fictitious citations (Rahman & Watanobe, 2023), and the potential for over-reliance on AI, which may negatively affect students' critical thinking and problem-solving skills (Neumann, Rauschenberger, & Schön, 2023). These concerns align with broader discussions on AI ethics, emphasizing the importance of transparency and fairness in using AI systems for educational purposes (Holmes & Miao, 2023; Yusuf, Pervin, & Román-González, 2024).

The ethical concerns surrounding AI use are not limited to bias. Privacy, data security, and the responsible use of AI are prominent in the literature (Safiulina et al., 2024). For instance, AI systems that collect and analyse student data raise privacy and security concerns, particularly regarding unauthorized access to sensitive information. Higher education institutions must address these concerns to ensure the responsible adoption of AI tools (Safiulina et al., 2024; Lepik, 2024).

The response from higher education institutions (HEIs) has varied, ranging from those enforcing strict limitations on the use of ChatGPT (Rahman & Watanobe, 2023) to those developing guidelines on the ethical and responsible use of AI tools (Neumann, Rauschenberger, & Schön, 2023). Based on the literature review for the current study, it can be broadly stated that there is a relatively high level of awareness and familiarity with generative AI tools among faculty members across a wide geographical range and multicultural backgrounds. However, common to these studies is the finding that faculty require support and training to address concerns related to academic integrity (Lee et al., 2024; Ward et al., 2024; Yusuf, Pervin, & Román-González, 2024). As Safiulina et al. (2024) suggest, there is an urgent need for AI literacy among both educators and students, as well as comprehensive institutional strategies that integrate AI into professional development programs to enhance AI competency.

As Chiu (2024) suggests, rather than issuing strict recommendations, institutions should develop guidelines and policies that emphasize the

competencies needed for the future workforce, supported by in-class and hands-on activities. To fully comprehend the impact of generative AI on assessment, AI and generative AI should be integrated into teacher professional development programs within universities. D. Ward and his research group emphasize that, given the complexities of generative AI, faculty require time and resources to effectively learn and adapt their classes to help students engage with AI ethically and critically; therefore, universities should creatively develop AI-powered learning assistants, adaptive learning systems, and faculty support tools while focusing on inclusiveness, transparency, privacy, and safety, all with a steadfast commitment to enhancing human interaction and improving the quality of teaching and learning (Ward et al., 2024). The most comprehensive treatment of this topic has been provided in the Guidance for generative AI in education and research (Holmes & Miao, 2023). Additionally, Lepik (2024) indicates that instructors prefer regular, specific, and field-relevant training formats to address ongoing challenges, further underscoring the need for structured institutional support.

3 METHODOLOGIES

3.1 Sample

This study, conducted in June 2024, utilized a quantitative approach to assess the perceptions of academic staff regarding the use of GenAI in educational settings. The survey was partly based on a similar staff survey conducted in February 2024 at the University of Tartu, Estonia's largest university (ranked #358 in the QS World University Rankings), which focused solely on the use of text-generating bots in teaching.

The data for the current study were collected through an online survey administered via Google Forms, ensuring ease of access and participation for all employees. The survey was designed to be self-administered, allowing respondents to fill out the questionnaire independently. This approach facilitated anonymity and encouraged honest responses, which is critical for obtaining accurate and reliable data.

In the 2023/24 academic year, the total number of TTK UAS academic staff was 237. The study group consisted of 81 lecturers who responded to the survey. The response rate in the population was approximately 34.18%. Participants were ranked as follows by discipline: engineering (71.60%) and social sciences and humanities (28.40%); by teaching experience: up to 3 years (20.99%), 4–6 years (9.88%), 7–9 years (11.11%), and 10+ years (58.02%); and by AI training experience: has previously participated in AI training (51.85%) and has not previously participated in AI training (48.15%).

3.2 Data Collection

The survey comprises five distinct subscales, each focusing on different aspects of generative AI usage among lecturers. These include the Purpose of Using Generative AI, Capabilities of Using Generative AI Tools in Teaching, Risks Associated with Using Generative AI Tools in Teaching, Training Needs in AI, and Workload Dynamics of Academic Staff. The responses for each of the items are summed to give a total score.

The ‘Purpose of Using Generative AI’ subscale (Cronbach’s alpha 0.77) is an 8-item scale used to measure the extent to which lecturers use AI in the preparation and conduct of teaching, research, writing documentation, answering emails, etc. The total score ranges from 2 to 27, with a higher score indicating more frequent use of generative AI.

The ‘Capabilities of Using Generative AI tools in Teaching’ subscale (Cronbach’s alpha 0.84) is an 8-item scale used to measure how useful generative AI can be in teaching from a lecturer's perspective. The total score ranges from 13 to 38, with a higher score indicating that the lecturers see more opportunities for using generative AI tools in teaching.

The ‘Risks Associated with Using Generative AI Tools in Teaching’ subscale (Cronbach’s alpha 0.88) is a 9-item scale used to measure how risky generative AI can be in teaching from a lecturer's perspective. The total score ranges from 14 to 45, with a higher score indicating that the lecturers see more risks associated with using AI tools in teaching.

The ‘Training Needs in AI’ subscale (Cronbach’s alpha 0.82) is an 11-item scale used to assess which topics should be covered in future AI training for academic staff. The total score ranges from 31 to 55, with a higher score indicating that lecturers need more diverse training on how to effectively apply generative AI tools in teaching.

The ‘Workload Dynamic of Academic Staff’ subscale is a 6-item scale (Cronbach’s alpha 0.89) used to assess how the use of generative AI has affected lecturers' workload. The total score ranges from 0 to 18, with a higher score indicating that lecturers perceive an increase in workload due to the use of generative AI.

3.3 Analysis

Firstly, the descriptive statistics for the relevant scale variables were calculated. Then, the relationships between these scale variables were investigated. Finally, it was examined whether these variables differed significantly according to independent variables such as institution, teaching discipline (engineering or social sciences/humanities), teaching experience, and whether the individuals were AI trained or not.

Data were analysed using MS Excel and the statistical software R. Correlations between variables were examined using Spearman's rho coefficient. Differences between groups were assessed using the Wilcoxon rank-sum test and the Kruskal-Wallis rank-sum test. Significance was set at a minimum level of 0.05, with other significance levels (0.01 and 0.001) also reported.

4 RESULTS

The analysis of faculty awareness and usage of GenAI tools at TTK UAS revealed varied levels of familiarity, tool preference, and impact on academic workload. The findings indicated that most faculty members are acquainted with generative AI tools, particularly text bots, with 82.72% of respondents reporting usage in their work. This preference is followed by image generators (29.63%), audio generators (8.64%), and video generators (7.41%). Notably, 16.05% of respondents do not utilize any GenAI tools in their professional activities.

The previous question was expanded on how the use of these tools has affected faculty's workload? The 'Workload Dynamic of Academic Staff' scale consists of six items measured on the following scale: 0 – 'Not relevant to me,' 1 – 'Decreased,' 2 – 'Remained the same,' and 3 – 'Increased.' Descriptive statistics for the relevant scale variables were calculated and the in-depth examination revealed that, in most cases, AI adoption led to faculty workloads either remaining consistent or showing a slight shift, either increasing or decreasing. It is essential to specify that the responses reflect perceived values when addressing how the use of these tools has affected faculty's workload. Faculty did not perceive a change in workload in Student Support and Feedback (M=2.00, SD=0.58) and in Research (M=1.82, SD=0.56). The workload remained the same or slightly decreased in Preparation of Teaching Materials (M=1.75, SD=0.61), in Project Work (M=1.65, SD=0.57) and in Administrative Duties - such as email management and routine communication (M=1.71, SD=0.54). The workload tended to remain stable too or showing slight increase in Assessment of Student Work (M=2.23, SD=0.56). Note that the workload score tends to be higher when the lecturer's field of activity is broader, rather than reflecting a genuine increase in workload.

The 'Purpose of Using Generative AI' scale consisted of eight items measured on the following scale: 0 – 'Not Relevant to Me', 1 – 'No, I Don't Plan to Start', 2 – 'No, But I Plan to Start', 3 – 'Yes, Occasionally', and 4 – 'Yes, Regularly'. Descriptive statistics for the relevant scale variables were calculated and the most frequent usage of generative AI tools lies in preparing teaching materials (M=2.68, SD=0.84). Generative AI tools for conducting teaching activities in exercises and practical sessions (M=2.32, SD=0.98), for research-related tasks (M=2.31, SD=0.94), and for writing project documentation (M=2.29, SD=0.95) were viewed as promising but not yet fully adopted. The application of AI in student-related tasks, particularly for non-graded assignments (M=1.99, SD=0.87) and graded evaluations (M=1.89, SD=0.90), remained relatively low, as well the same applies also for AI assistance in managing email correspondence (M=1.89 (SD=1.03). Generative AI tools were the least commonly used for guiding students and providing feedback (M=1.64, SD=0.84).

In this survey, there were two additional questions about how lecturers regulate the use of AI in practical work with students and the reasons for refraining from using AI in teaching. For these questions, multiple-choice answers were permitted. 45.7% of respondents allow students to use text bots freely without altering teaching methods. 35.8% incorporate text bots while educating students on associated risks and opportunities. 17.3% have adjusted their teaching methods to integrate AI tools. A small portion (4.9%) prohibit AI use and enforce this restriction.

Common reasons for avoiding AI tools in teaching centred on concerns about reliability, guidance, and educational impact: 40.7% expressed doubts about the reliability of AI-generated information. 35.8% cited a lack of guidance on responsible and ethical AI usage. 33.3% were concerned about AI's impact on student knowledge. Other notable reasons included AI errors (25.9%), incompatibility with subjects taught (23.5%), and difficulty in effective AI use (23.5%).

Table 1: Means (M) and standard deviations (SD) for the 'Capabilities of Using Generative AI Tools in Teaching' items (n=81).

Capabilities of Using Generative AI Tools in Teaching	M	SD	Conclusion
Enables the quick creation of personalized learning materials	3.30	0.93	Neutral, dissension
Makes teaching more practical and closer to real life by supporting the use of active learning methods	3.12	1.08	Neutral, dissension
Enables automated grading and feedback	3.26	0.95	Neutral, dissension
Encourages experimentation with new pedagogical approaches and promotes creativity	3.69	1.03	Rather Agree
Supports the development of more systematic and analytical thinking	2.85	1.12	Neutral, dissension
Develops skills in students that will be required in the future labour market (including expanding current career opportunities and enhancing their ability to succeed in the labor market)	3.64	1.02	Rather Agree
Does not provide extra opportunities to enrich the study (the reverse scale is used)	3.80	0.97	Rather Disagree
Complements traditional teaching methods	3.88	0.97	Rather Agree

Table 2: Means (M) and standard deviations (SD) for the 'Risks Associated with Using Generative AI Tools in Teaching' items (n=81).

Risks Associated with Using Generative AI Tools in Teaching	M	SD	Conclusion
Raises the risk of academic fraud because AI-generated content is difficult to detect	4,20	0,90	Rather Agree
Produces unreliable content, which in turn threatens academic integrity and distorts the worldview	4,01	0,93	Rather Agree
Does not support the development of students' critical thinking and makes the learning process "copy-paste" based	3,86	1,16	Rather Agree
Causes security risks related to the safety of users of systems that manage AI tools and to the unfair use of personal data	3,63	0,98	Rather Agree
Blurs the boundaries and principles of ethical and unethical academic behaviour	3,81	1,00	Rather Agree
It has a negative impact on the development of students' mental and emotional health	3,00	0,92	Neutral, dissension
Reduces the component of creativity and originality in students' work	3,43	1,22	Neutral, dissension
Makes it difficult to treat students equally	3,63	1,17	Rather Agree
There are no significant risks associated with using AI-based tools in education (the reverse scale is used)	3,79	1,10	Rather Disagree

The 'Capabilities of Using Generative AI Tools in Teaching' and 'Risks Associated with Using Generative AI Tools in Teaching' scales each consisted of items measured on a 5-point Likert scale: 1 – 'Strongly Disagree', 2 – 'Disagree', 3 – 'Neutral', 4 – 'Agree', and 5 – 'Strongly Agree.' Descriptive statistics for the relevant scale variables were calculated and are presented in Tables 1 and 2. Among the open responses, it was highlighted that integrating AI provides the opportunity to break exercises down into smaller parts or combine them into a whole, which supports learning. It also helps to offer different examples from practical life for the solutions to a single task. AI-based technology has provided new possibilities for doing things differently and for experiencing both learning and teaching in new ways. In the open responses, a direct threat to the future of engineering was even emphasized, suggesting that allowing AI-based solutions could create a springboard for charlatans in the field, posing a danger to society.

To evaluate the overall impact of generative AI on higher education, a 5-point Likert scale was used: 1 – 'Very Negative,' 2 – 'Rather Negative,' 3 – 'Neutral,' 4 – 'Rather Positive,' and 5 – 'Very Positive. 61.73% of participants rated it as rather or very positive, 20.99% as neutral, and 17.28% as rather or very negative. In assessing the overall impact, speed-related aspects (more information, faster) were the most frequently mentioned in the comments. As a counterpoint to the ability to process information more quickly, open responses also highlighted that

the issue is not just about the best technical solution but about what it should enable in one's ongoing work—something that isn't always clear, with significant time potentially spent on adjusting workflows (meta-work). Overall, it was noted that achieving a positive impact requires proper guidance and the parallel development of supportive skills such as critical thinking and creativity; otherwise, the role of independent thinking may diminish. Descriptive statistics and correlations of the relevant scale variables and AI overall impact rate were calculated for the total sample (Table 3 and 4). The results indicate, similarly to the previous findings, that the participants rated the overall impact of generative AI tools on higher education as rather positive on a 5-point Likert scale (M=3.49, SD=0.88).

There was also a moderate positive correlation between the 'Capabilities of Using Generative AI' and 'Training Needs in AI' (ρ=0.30, p=0.0058), as well as the 'Overall Impact Rate of AI' (ρ=0.61, p<0.001). A Spearman's rho correlation analysis found a moderate negative correlation between 'Risks Associated with Generative AI' and 'Purpose of Using Generative AI' (ρ=-0.32, p=0.0042), 'Capabilities of Using Generative AI' (ρ=-0.495, p<0.001), and 'Overall Impact Rate of AI' (ρ=-0.52, p<0.001).

There was no significant correlation between 'Risks Associated with Generative AI' and 'Training Needs in AI.' Similarly, a weak positive correlation was found between 'Training Needs in AI' and 'Overall Impact Rate of AI' (ρ=0.26, p=0.0175). However, no significant correlation was found between the 'Workload Dynamics of Academic Staff' and other relevant variables.

The Wilcoxon rank-sum test and the Kruskal-Wallis rank-sum test were used to assess statistically significant differences between groups based on institution, teaching discipline (engineering or social sciences/humanities), teaching experience, and whether the individuals were AI trained or not. It was found that there were no statistically significant differences between the groups based on institution and teaching experience with respect to all relevant variables. Additionally, the Wilcoxon rank sum test revealed that the total scores for 'Risks Associated with Generative AI' differ significantly according to the lecturers' teaching discipline (W=891, p=0.01905). Specifically, the test results indicate that the total scores for 'Risks Associated with Generative AI' were higher for lecturers who teach engineering disciplines than for those who teach social sciences or humanities.

Table 3: Descriptive Statistics of the relevant scale variables and the overall impact rate of AI (n=81).

Variable	M	SD	MIN	25%	50%	75%	MAX	Skewness	Kurtosis
Purpose of Using AI	13.53	5.86	0	10	13	17	27	-0.17	0.24
Capabilities of Using AI	27.54	5.51	13	24	28	32	38	-0.36	0.15
Risks Associated with AI	33.37	6.80	14	30	34	38	45	-0.69	0.47
Training Needs in AI	47.54	5.67	31	44	48	52	55	-0.82	0.42
Workload Dynamic of Acad. Staff	6.57	4.88	0	2	7	11	18	0.03	-1.26
Overall Impact Rate of AI	3.49	0.88	1	3	4	4	5	-0.71	-0.15

Table 4: Spearman's rho coefficients for the relevant scale variables and the overall impact rate of AI (n=81).

	Purpose of Using AI	Capabilities of Using AI	Risks Associated with AI	Training Needs in AI	Workload Dynamic of Academic Staff	Overall Impact Rate of AI
Purpose of Using AI	1					
Capabilities of Using AI	0.45***	1				
Risks Associated with AI	-0.32**	-0.495***	1			
Training Needs in AI	0.29**	0.30**	0.07	1		
Workload Dynamic of Academic Staff	0.19	0.08	0.001	-0.04	1	
Overall Impact Rate of AI	0.49***	0.61***	-0.52***	0.26*	0.03	1

***p<0.001 **p<0.01 *p<0.05

Table 5: Means (M) and standard deviations (SD) for the 'Training Needs in AI' items (n=81).

Training for academic staff should focus on the following topics	M	SD	Conclusion
Practical recommendations for using text bots in planning and organizing teaching, including evaluation and feedback	4,49	0,63	Rather Agree
Text bots (including those that generate images, videos, and audio) and academic fraud	4,46	0,78	Rather Agree
Learning methods in the age of AI	4,38	0,66	Rather Agree
The future of the labor market and the skills required by graduates	4,21	0,89	Rather Agree
Enhancing the effectiveness of teaching staff using AI tools	4,48	0,63	Rather Agree
Legal and ethical aspects of data protection and the use of text, image, video, and audio generators	4,43	0,79	Rather Agree
Equal treatment of students in using generative AI tools	4,15	1,00	Rather Agree
The risks associated with the use of generative AI tools for humanity (including negative environmental impacts)	3,98	1,12	Rather Agree
The use of text bots in scientific research	4,26	0,92	Rather Agree
The use of text bots in project work	4,27	0,84	Rather Agree
There is no need for additional training (the reverse scale is used)	4,43	1,01	Rather Disagree

The Wilcoxon rank sum test also found that the total scores for 'Risks Associated with Generative AI' (W=1139.5, p=0.00245) and 'Capabilities of Using Generative AI' (W=606, p=0.04393) differ significantly between lecturers who had previously attended AI training and those who had not. Specifically, lecturers trained in AI perceive fewer risks and more opportunities in using generative AI in teaching compared to those who are untrained.

Finally, we collected information on which topics faculty believe should receive the most attention in training. The 'Training Needs in AI' scale consists of items measured on a 5-point Likert scale: 1 – 'Strongly Disagree,' 2 – 'Disagree,' 3 – 'Neutral,' 4 – 'Agree,' and 5 – 'Strongly Agree.' Descriptive statistics for the relevant scale variables were calculated and are presented in Table 5.

5 DISCUSSIONS

The findings of this study provide detailed insights into the use and perceptions of GenAI among faculty members at TTK UAS, which align closely with trends observed in the broader academic literature. The existing literature emphasizes the potential for AI tools to transform higher education, particularly in areas such as personalized learning and automated assessments (Ward et al., 2024; Safiulina et al., 2024). Similarly, the findings of this study indicate that faculty members at TTK UAS recognize the potential of GenAI tools in preparing teaching materials (M=2.00, SD=0.58) and conducting research (M=1.82, SD=0.56).

The literature emphasizes the importance of addressing ethical concerns and ensuring the transparency of AI systems (Holmes & Miao, 2023; Neumann, Rauschenberger, & Schön, 2023). The current study reinforces these findings by identifying reliability (40.7%) and ethical concerns (35.8%) as significant barriers to the adoption of GenAI tools. The survey results also highlight practical challenges, such as a lack of training and guidance, which align with previous studies (Chiu et al., 2023; Lepik, 2024; Safiulina et al., 2024; Ward et al., 2024) advocating for structured institutional support and professional development programs.

While the literature (Chiu et al., 2023; Lee et al., 2024; Neumann et al., 2023; Ward et al., 2024) underscores the efficiency gains associated with AI in educational settings, the workload dynamics observed in this study present a more complex picture. Although AI tools are seen as beneficial in streamlining certain tasks, their impact on workload appears to vary across different academic activities. The observed slight increase in workload related to the Assessment of Student Work, as reported in this study, may reflect the additional effort required to evaluate AI-generated student submissions. In this context, addressing workload concerns underscores the importance of employing appropriate pedagogical frameworks and implementing more nuanced strategies for integrating AI tools, ensuring that faculty workloads are optimized without introducing additional burdens.

One of the key contributions of this study is the identification of discipline-specific differences in perceptions of GenAI risks and opportunities.

Engineering faculty members, for instance, reported higher levels of concern regarding AI risks compared to their counterparts in social sciences and humanities. This aligns with previous research suggesting that the perceived applicability and risks of AI tools can vary widely depending on the disciplinary context (Rahman & Watanobe, 2023).

The findings also reveal significant correlations between faculty perceptions of GenAI capabilities, risks, and training needs. Faculty members with prior AI training were more likely to perceive opportunities and fewer risks associated with GenAI. This underscores the critical role of training in shaping positive attitudes and facilitating the effective integration of AI tools in teaching and research.

Overall, this study extends the existing literature by providing localized insights into the challenges and opportunities associated with GenAI in higher education. Challenges, particularly in guiding students and providing personalized learning experiences, can be addressed through well-designed training programs that support faculty, as the literature suggests that GenAI tools can play a critical role in assisting vulnerable student groups, including those with learning disabilities (Lee et al., 2024). While 45.7% of TTK UAS faculty allow students to use AI without adapting teaching practices—aligning with findings from the University of Tartu study, where 22.03% reported similar permissiveness—this may reflect a lack of awareness or readiness to address associated risks and their underlying causes. In this context, practical, goal-oriented training on integrating GenAI tools into teaching, in alignment with academic and ethical values, is essential, as outright prohibition is neither practical nor sustainable.

The study also reveals that generative AI tools are moderately utilized in research-related tasks and project documentation, yet faculty express a desire for additional training in these areas, indicating untapped potential for streamlining such activities. Faculty at TTK UAS have expressed strong interest in actionable, discipline-specific guidance, emphasizing the need for institutional efforts to prioritize these areas to fully harness AI's potential while mitigating risks and promoting equitable educational practices.

These findings underscore the importance of developing tailored educational programs and institutional policies that address both the ethical and practical dimensions of AI integration.

6 CONCLUSIONS

This study contributes to the growing body of research on the integration of generative AI in higher education by providing empirical evidence on faculty perceptions, usage patterns, and training needs at TTK UAS. The findings highlight that while GenAI tools have significant potential to enhance teaching, research, and administrative tasks, their effective implementation requires addressing key challenges related to ethical concerns and AI literacy.

The study underscores the need for targeted training programs to equip faculty with the skills and knowledge needed to effectively use AI tools while adhering to ethical guidelines. By emphasizing discipline-specific needs, institutions can ensure that AI tools are integrated in ways that enhance educational quality without compromising academic integrity.

The identification of correlations between training, perceptions of risks, and opportunities suggests that increasing access to AI training could play a pivotal role in overcoming barriers to adoption. Additionally, the underutilization of AI in student-focused tasks indicates a need for further exploration of how these tools can enhance student engagement and learning outcomes.

Future research should examine the longitudinal impact of AI integration on both faculty workload and student learning outcomes. Additionally, there is a need for comparative studies across institutions to identify best practices and develop standardized frameworks for the ethical and effective use of AI in higher education. Such efforts help higher education institutions manage the challenges of adopting AI, leading to a more inclusive and innovative learning environment.

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