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Review research paper

ESP/LSP COURSES IN THE ERA OF ARTIFICIAL INTELLIGENCE: POTENTIAL FOR FACILITATING THE INTERNATIONALISATION PROCESS

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Abstract. *In the increasingly interconnected global landscape, internationalising education has become a crucial focus for higher education institutions. Specifically, English for Specific Purposes (ESP) courses play a pivotal role in equipping students with specialized communication skills across various fields. Changes in the external environment have led to shifts in the internal landscape, particularly affecting the role of ESP teachers. Unfortunately, ESP/LSP courses, which enable university students not only to master the appropriate language register in simulated contexts but also to articulate and structure their ideas, collaborate effectively in team projects, engage in constructive discussions, and assess differences, are frequently overshadowed by other core disciplinary courses. These transformations in higher education also impact disciplinary teachers who are often compelled to deliver their subjects in English, sometimes without prior experience in doing so. Furthermore, the advent of artificial intelligence (AI) technologies presents a transformative potential to enhance the efficacy of ESP courses and accelerate the internationalization process. This paper explores the synergy between ESP courses and AI-driven educational tools in advancing internationalisation efforts.*
The paper employs a review of existing literature, complemented by insights from ESP/CLIL experts and their findings from a brief survey on AI awareness among students and teachers at STU MTF.

Key words: *English for Specific Purposes, internationalisation, artificial intelligence, higher education, language learning, cross-cultural communication*

1. INTRODUCTION

The rapid advancement of technology in the 21st century has not only reshaped the way we live and work but has also transformed the landscape of education. English for Specific Purposes (ESP) and Language for Specific Purposes (LSP) courses have long been at the forefront of pedagogical innovation, designed to meet the specialized linguistic needs of learners in various professional domains. However, with the advent of artificial intelligence (AI) and its integration into virtually all sectors of society, these courses face both unprecedented challenges and opportunities. The fusion of ESP/LSP education with AI

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technologies promises to revolutionize language learning and internationalization processes, potentially providing more inclusive, efficient, and effective educational experiences.

The phenomenon of internationalisation, characterised by the globalisation of economies, cross-border collaborations, and increased mobility of individuals, necessitates a proficient command of English and other languages specific to professional domains. This internationalization process has brought to the forefront the significance of ESP/LSP courses, which serve as a vital bridge between language acquisition and practical application in diverse, often highly specialized, contexts. As we enter an era characterized by digital transformation and AI's ever-expanding capabilities, we stand at a crossroads where the traditional paradigms of ESP/LSP education meet the boundless potential of machine learning, natural language processing, and big data analytics.

In this academic paper, we embark on a comprehensive exploration of how ESP/LSP courses, deeply rooted in linguistic precision and practicality, can leverage AI to not only adapt to the evolving educational landscape but also to enhance and streamline the internationalization process for students and professionals alike. We will delve into the multifaceted ways in which AI-driven technologies can be harnessed to cater to the individualized needs of learners, facilitate international communication, and bridge the gap between language proficiency and specialized knowledge.

Furthermore, we will examine the ethical considerations and potential challenges inherent in this integration, such as concerns related to privacy, the human touch in education, and the equitable access to AI-enhanced language learning tools. By addressing these issues and fostering an open discourse on the future of ESP/LSP courses in the AI era, this paper aims to contribute to the ongoing conversation surrounding the intersection of technology, language education, and global integration.

As the world navigates the ever-evolving landscape of AI, it is paramount that the realm of ESP/LSP education embraces innovation and capitalizes on the potential for synergy with artificial intelligence, ultimately redefining the internationalization process and ensuring that learners are well-equipped to thrive in a dynamic, interconnected world.

However, challenges such as privacy concerns, the need for teacher-student interaction, and the potential for algorithmic biases in AI tools must be addressed to fully harness the benefits of AI in ESP courses. The survey findings underscore the importance of pedagogical innovation that combines the strengths of AI with human expertise.

2. ESP/LSP IN SLOVAK CONTEXT

What does Language (or English) for Specific Purposes in Slovakia look like in recent years? Currently, according to portalvs.sk (the portal accumulating the necessary data on HEIs), there are 35 higher educational institutions (HEIs) comprising 117 faculties of which 101 provide non-philological education (not only in science, engineering, technology but also in medicine, law, economy, state administration, art, music, etc.). Not all of them have integrated also the foreign (or namely English) language competence into their graduate profile; this is not only the matter of priorities of the particular institution management but also the matter of finances. The number of faculties providing teaching of ESP/LSP varies from year to year, according to the authors´ recent survey about two thirds of HEIs provide ESP/LSP courses.

These educational institutions frequently offer diverse study programmes; which means that it is sometimes difficult to find a monothematic and ready-to-use material, textbook the ESP/LSP teachers can utilize. Therefore, ESP/LSP practitioners have to be prepared not to depend on fixed or printed materials, and have rather develop them on their own. Needless to mention that also these own materials have to be upgraded on a regular basis, especially if they relate to information technology or science, the disciplines where the progress is very fast.

This situation has also another interesting point all ESP teachers know – they have to be quite familiar with the major topics taught at their institutions, i.e. they need to be "experts" e.g. in IT, Materials Science or Integrated Safety, to mention at least some of the fields from our Faculty of Materials Science and Technology. This means that you cannot become a good ESP/LSP practitioner overnight, it takes at least two years to accommodate in an ESP/LSP course in a particular university or faculty, and it also means a lot of materials to develop and go through numerous consultations with disciplinary teachers. In our experience, it represents also a distracting factor for young prospective English teachers.

No one doubts the fact that having a competence in a foreign language is a prerequisite for success. Since English in particular has become the *lingua franca* of the academic and scientific world, ESP practitioners have been not only interested in but also involved in the process of the internationalisation of higher education, where the appropriate language competence is essential.

The language competence provided by ESP/LSP courses develops a variety of skills, however, the design of own ESP/LSP materials for any ESP/LSP course could be really demanding and time-consuming. What is more, in the recent years, the teachers were challenged by the pandemic shifting the courses to the virtual environment as well as they had to verify many teaching tips and tasks in terms of their utility and practicality. And here, the enormous possibilities of AI have been discovered and started to be appreciated. From that moment on, as far as the education is concerned, "we can say that AI is an integral part of education at universities being used in various fields of study. "Needless to mention, students are sometimes faster to adopt AI tools than their teachers" (Hurajová, Luprichová, Chmelíková, 2024).

3. ESP/LSP Teachers - Their Roles

As the English language is needed as *lingua franca* to enhance the attractiveness of engineering studies and improve the graduate employability, the authors have looked also at different roles the ESP/LSP teachers they have experienced at their workplace – STU Faculty of Materials Science and Technology in Trnava, Slovakia.

As already mentioned in our previous publications, a good ESP/LSP teacher´s competence is based on four pillars: 1) solid English language knowledge; 2) adequate knowledge of university subject areas; 3) awareness of specific needs of stakeholders (university, students, government, parents, etc.); 4) experience with cultural issues of the current international and multicultural environment (Mironovová, 2015, p. 167), as well as being aware of ethics and appropriate etiquette (Miština, 2006, p.7).

The ESP/LSP teachers – especially in a recent decade – have had to jump quite fast into the shoes of their new roles, and customize and incorporate their own experience into a more-faceted ESP teacher´s profile.

Not only they are foreign **language practitioners**; regarding their long-term cooperation with disciplinary teachers as well as per the current requirement of the European Funds to promote interdisciplinary or multidisciplinary projects; they are expected to be also the **facilitators of wider inter- or even multidisciplinary cooperation**. These two roles could be enough, nevertheless, there is one more, hence, to be the **supporters of the process of internationalisation** of Higher Educational Institutions (HEIs) as the university management are challenged to provide as many English study programmes as possible (Hurajová, Luprichová, Chmelíková, 2022).

3.1. ESP/LSP teachers and internationalisation

Internationalization is not an issue, nor even a new one; the question is how to incorporate it efficiently into tertiary education. And, this could be the playground for ESP/LSP teachers, who – as one of the first and crucial steps – should make the use of intercultural approach in their teaching and can help thus the cross-cultural understanding, develop positive and open attitudes to different cultures and help build the skills as introduced by Byram (2002):

- knowledge about the others´ culture and how they perceive your culture,
- attitudes, i.e. willingness to learn about the others´ cultures and beliefs,
- skills, i.e. the abilities and competences to interpret and explain form one culture to another one.

Similarly, we should not limit the work of ESP/LSP practitioners just to teaching as they can be also members of interdisciplinary research teams. Regarding the STU MTF experience, ESP teachers can mention three successful international projects:

- **bilateral project** with Serbia SK-SRB-2013-0034 titled *Student on-line conferences between STU MTF (Slovakia) and FEE, University of Niš (Serbia) for the purposes of specific English language and other skills development;*
- **ERASMUS+ Project** 2015-1-SK01-KA201-008937 titled as *Transnational exchange of good CLIL practice among European Educational Institution*s, with 5 EU countries;
- or international project in **Visegrad+** Scheme bringing together ESP and disciplinary teachers (DT) from Slovakia, Czech Republic, Hungary, Poland and Albania, and Serbia from the Western Balkan countries.

Needless to mention, that ESP/LSP practitioners also participate in international conferences or workshops developing their teaching strategies, e.g. on Design Thinking (Pondelíková, 2023) on a regular basis, similarly as their disciplinary counterparts do, as this is a natural part of their academic life, and they can prove it by numerous publications.

We can see that ESP/LSP teachers are really the right ones who can help facilitate the process of internationalisation at their Higher Educational Institution (HEI). Besides own enthusiastic teaching, one of the first steps could be the help to all disciplinary teachers who are willing (as based on the results of a successfully completed institutional project) to teach their subject in the English language.

3.2. Disciplinary teachers and internationalisation

Disciplinary teachers play an important role in the internationalisation of education, in higher educational institutions in particular. There are several ways how they could contribute to the process of internationalisation:

- *curriculum design* in which they could integrate international perspectives into their curriculum such as incorporate global case studies, international research, and

comparative analyses that highlight how different cultures and countries approach the same subject matter. By doing so, students gain a broader understanding of their discipline within a global context;

- *collaborative research*: teachers can get engaged in international projects which can enhance the quality and scope of their research outputs. These collaborations can bring diverse perspectives and methodologies to the research, making it more comprehensive and globally relevant. Students involved in such research projects also benefit from this international exposure;
- *teacher and student mo*bility: not only the disciplinary teachers should take part in a mobility within well-known schemes (ERASMUS, Ceepus, etc.) or Internships, they can also encourage and facilitate the students to do so in order to gain international experience and develop a global outlook;
- *international conferences, workshops*: an obvious way to exchange knowledge and research results as well as an opportunity to start networking. This allows teachers to stay updated with the latest global trends and advancements in their field, and it can be passed on to students, ensuring they are learning from the cutting edge of their discipline.

To sum up, our Faculty is currently within the accreditation process and the disciplinary teachers together with the management try to update the curriculum so that it reflects the global tasks. STU MTF disciplinary teachers are involved in numerous and successful international projects, e.g. *Slovak Centre of Excellence in Ion Beam and Plasma Technologies for Materials Engineering and Nanotechnology – SlovakION*, or *Directional Composites through Manufacturing Innovation*, or *Sustainable Transition to the Agile and Green Enterprise* to mention at least three of them. These projects are very beneficial not only in terms of finances but also in terms of knowledge and experience. Mobility and participation in international conferences or workshops are an obvious and inseparable part of academic life at our Faculty. All these ways of supporting or facilitating the process of internationalisation can be now multiplied by the reasonable approach to the possibilities that AI offers.

4. AI IN HIGHER EDUCATION

AI-driven tools utilized in higher education have the potential to significantly enhance the learning environment, improve teaching methodologies, support research development, and facilitate academic writing. Despite ongoing concerns from various perspectives, including ethical considerations, access, and proficiency in using AI tools, we are undeniably in the era of artificial intelligence. As a result, we are compelled to adapt to this environment or develop the necessary skills to effectively leverage AI for our purposes.

The authors of a recently highly cited review article emphasised the insufficient critical reflection on the challenges and risks associated with AI in education (AIEd), as well as the weak integration of theoretical pedagogical perspectives. They also highlighted the necessity for further exploration of ethical and educational approaches in the implementation of AIEd within higher education. (Zawacki-Richter, O. et., 2019)

Considering pedagogical theories such as constructivism, social constructivism, cognitive load theory, experiential learning, transformative learning, self-determination theory, cognitivism, connectivism, behaviorism, critical pedagogy, creative pedagogy,

universal design for learning (UDL), and humanism, it is essential that all of these frameworks influence higher education. Elements of each theory should be reflected when incorporating AI-driven tools into course design.

4.1. AI in FL education

AI-driven tools have profoundly transformed foreign language education by providing personalized learning experiences, real-time feedback, and improved access to educational resources. These benefits highlight some of the key advantages of AI integration in language learning. Students who prefer a self-paced learning approach can benefit from **AI-powered language learning platforms** such as Duolingo, Babbel, and others. These applications use AI algorithms to track user progress and adjust lessons in real time, offering personalized learning pathways tailored to individual proficiency levels and learning speeds. Among the most commonly cited advantages of these tools are personalisation, immediate feedback, gamification, and increased engagement (Vall & Araya, 2023; Liang, Hwang, Chen, & Darmawansah, 2021; Son, Ružić & Philpott, 2023; Shivakumar et al., 2019; Woo & Choi, 2021; Almelhes, 2023; Katsarou et al., 2023). **AI chatbots** designed for conversational practice act as "virtual partners," helping learners improve pronunciation, grammar, vocabulary, and communication skills in a low-pressure environment (Mageira et al., 2022). Speech recognition systems, AI-driven writing assistants, **AI-powered translation tools**, **virtual reality environments**, and **intelligent tutoring systems (ITS), ChatGPT** can all be effectively integrated into both individualised learning and traditional educational settings. These technologies provide versatile applications that support personalised instruction as well as collaborative learning within broader educational frameworks. On the other hand, a critical consideration is how ESP/LSP teachers are trained and equipped to effectively and safely utilise AI-driven tools to enhance students' language skills. Integrating AI tools into systematic education presents a complex challenge that requires careful attention. This process demands the collaboration of a multidisciplinary team of experts to ensure that the outcomes are reliable, sustainable, and appropriately tailored to the specific educational context and cultural environment.

4.1.1. AI in CLIL

Enhancing the internationalisation process within higher education institutions, where the majority of students are domestic speakers of Slovak or Hungarian, necessitates the gradual development of an "artificial" English Educational Environment (EEE). This can be effectively achieved through the implementation of the Content and Language Integrated Learning (CLIL) approach which fosters language acquisition while integrating subject-specific content. Step by step, this method builds a structured and immersive English-language learning setting, thereby promoting international competencies in a context that lacks a substantial presence of international students. AI-powered tools discussed in section 4.1 can be effectively applied in the CLIL (Content and Language Integrated Learning) environment not only for students but also for subject-specific (disciplinary) teachers who may lack sufficient foreign language proficiency. These tools, which include commonly known AI-driven applications and platforms, offer significant advantages in enhancing language and content delivery. For instance, they provide personalised support, adaptive learning, and real-time feedback, helping thus the teachers navigate language challenges more effectively. However, the full functionality of these platforms, including

advanced features, often requires premium subscriptions which can pose financial barriers to full access and utilisation.

4.1.2. CLIL in STU MTF

Accelerating the internationalisation process in our context cannot be achieved without the active involvement of disciplinary teachers, who may require either linguistic support, didactic/pedagogical assistance, or both to effectively navigate the CLIL (Content and Language Integrated Learning) environment. These teachers must be equipped with the necessary language skills and instructional methodologies to facilitate the creation of an English Educational Environment (EEE). Without this comprehensive support, teachers may struggle to deliver subject content in a foreign language, thus limiting the institution's ability to foster an internationalised learning environment. Therefore, targeted professional development and the integration of AI-driven tools are essential to empower educators to master CLIL processes and successfully contribute to internationalization goals.

Our ESP experts are developing a support training program for disciplinary teachers, drawing on findings from relevant projects conducted so far in the field of internationalisation in STU MTF and their own experience. However, we lack a clear understanding of the teachers' familiarity with AI technologies, particularly tools like ChatGPT, which can offer a combination of linguistic and content support.

5. STU MTF SURVEY

The survey was designed to assess awareness and usage of AI tools, particularly ChatGPT, in teaching and learning contexts. It targeted not only university teachers but also students across all levels of study. The survey was distributed via our network, reaching participants not just from our faculty but also from other universities across Slovakia. The goal was to collect data that would enable a comparison analysis, providing an institutional picture of how ChatGPT is utilized at the Slovak University of Technology's Faculty of Materials Science and Technology (STU MTF). This comparative data would help identify patterns in AI tool usage and inform future strategies for incorporating AI in both teaching and learning processes across the university.

The survey consisted of 12 questions: three defining questions, five open-ended questions, two combined Yes/No with open-ended explanation questions and two yes/no questions. The defining questions focused on key demographic or contextual factors, such as the participant's role (English or disciplinary teacher or student), level of education. The open-ended and combined Yes/No with open-ended explanation questions aimed at exploring the participants' perspectives and experience with AI in learning and teaching, such as how they had used tools like ChatGPT or what potential they saw in integrating AI for educational purposes. The yes/no questions served to quickly assess the participants' current use of AI tools, including whether they had used ChatGPT before and whether they had perceived it as beneficial in their educational context. See the Table 1 below.

Table 1 Survey Questions

Question type	Question
Defining Questions	*1.Select one of the options: Are you? university teacher, Bachelor's degree student, Master's degree student, PhD student.* *2. Are you a university teacher/student with a focus on technical, humanities, economics, natural sciences, or arts?* *3. Are you an English teacher at university?*
Open-ended Questions	*1.Explain the term artificial intelligence.* *2.Explain the terms NLP and ChatGPT* *3.List the activities in which you use artificial intelligence. If you do not use artificial intelligence, please state 'I do not use this technology' or 'I am not aware that I am using it'.* *4. What do you consider to be the strengths of ChatGPT technology in education?* *5. What are the negative aspects of using ChatGPT in education?*
Combined Yes/No with open-ended explanation questions	*1. Do you think it is necessary to educate teachers/students on the use of artificial intelligence in education? Please justify your answer.* *2. If you are a foreign language teacher, please answer this final question of the survey. Do you plan to use ChatGPT in your courses? If so, in what way?*
Yes/No Questions	*1. Do you use ChatGPT as part of your studies/teaching?* *2. Will artificial intelligence replace foreign language teachers?*

Out of over 100 recipients, we received a total of 35 responses. Of these, **18** were **university teachers**, with 10 from technically oriented universities, 3 from institutions focused on the humanities, 1 from an economically oriented university, and 3 from universities specializing in natural sciences. Notably, there were no responses from teachers at art universities. The remaining **17** responses were from **students**, comprising 1 Bachelor's student, 1 Master's student, and 15 PhD students. The PhD students, in particular, can be considered "pre-teachers" in our context, as they typically gain some teaching experience during their doctoral studies.

5.1. Survey Findings

We present only the findings from the survey that are directly relevant to the focus of this paper: how English for Specific Purposes (ESP) and Language for Specific Purposes (LSP) teachers can contribute to and accelerate the internationalisation process of higher education in the age of artificial intelligence (AI). These findings provide insights into the role of AI tools, particularly ChatGPT, in supporting both linguistic and content-related aspects of teaching. They also highlight the potential for ESP/LSP educators to facilitate the internationalisation by leveraging AI to enhance language acquisition, intercultural communication, and academic collaboration in a global context. As we have not yet reached a sufficient dataset for a quantitative analysis, we can only report findings from a qualitative perspective. A significant portion of teacher respondents, including pre-teachers (PhD students), were unable to explain the concept of Natural Language Processing (NLP). Moreover, only a few of them were aware of NLP or ChatGPT. These insights suggest

that there is a knowledge gap regarding AI-driven tools among educators, highlighting the need for targeted training to better integrate such technologies into teaching, especially within the context of enhancing the internationalisation of higher education.

After filtering the responses from 18 teachers and 15 PhD candidates, we narrowed our analysis to a small cohort of 23 respondents from technically oriented universities (10 teachers and 13 PhD candidates). Among these, only two of the teacher respondents were ESP teachers. Notably, just one teacher reported a regular usage of ChatGPT, while another expressed plans to use it in the future but indicated a need for further information before doing so. Among the disciplinary teachers (21 respondents), ChatGPT experience was similar, with four teachers regularly using it, nine teachers having tested its functionalities, and eight teachers not using it at all. The most commonly utilised AI-driven tools and ChatGPT features by these educators were text formulation, information search, grammar correction, academic writing, term definition/explanation, and AI-powered translation tools. Importantly, none of the respondents in this cohort reported using AI-driven tools for course development or co-creation. **This data suggests that while some teachers are beginning to integrate AI into their teaching practices, particularly for language-related tasks, there is still a lack of broader application, such as for the course development.** Additionally, the need for further training and information is evident, especially among those planning future use of AI tools like ChatGPT. These findings reflect a general openness to AI tools among educators but highlight a clear need for further training and awareness to maximise their potential in both linguistic and disciplinary contexts.

6. Discussion

The integration of ChatGPT into education has generated a wide spectrum of academic discourse, reflecting both its potential and challenges. Kovacevic (2023) identifies ChatGPT as both an effective and time-saving tool for English for Specific Purposes (ESP) courses, though its time-consuming nature presents a challenge. However, Tufan et al. (2023) highlight ethical concerns associated with ChatGPT usage, such as data privacy and potential misuse alongside the practical challenges in its implementation within educational settings. These ethical issues, along with concerns about plagiarism and misinformation, are echoed by Lo et al. (2023), Dempere et al. (2023), and Cotton et al. (2023), who emphasise the need for careful oversight when incorporating AI tools in education.

Romero-Rodriguez et al. (2023) have found that university students generally accept ChatGPT as a useful educational tool, though they emphasise the need for training to help students understand its limitations. Similarly, Pethigmage et al. (2023) support the application of ChatGPT in higher education but express concerns about the integrity of assessments and the potential for academic dishonesty.

On the other hand, Iqbal et al. (2022) report a negative attitude among university teachers toward ChatGPT, largely driven by concerns over cheating and the spread of inaccurate information. They suggest that more information and training are necessary to help teachers make informed decisions regarding the AI usage. In contrast, Kiryakova and Angelova (2023) describe positive attitudes among some professors, while attributing resistance among others to a fear of the unknown. Lo et al. (2023) further recommend training for both instructors and students to address ChatGPT's impact on the educational environment.

Several scholars, including Lin (2023) and Kohnke (2023), have explored ChatGPT's broader impact on teacher-student interactions and intergenerational differences, while also raising the questions about the digital competencies required for effective AI tool integration. Nguyen (2023) advocates for professional training and user education, particularly in writing classes, to ensure proper use of ChatGPT. Concerns regarding the potential hindrance of students' creativity and critical thinking skills are highlighted by Stepanechko & Kozub (2023), reflecting broader anxieties about AI's impact on essential cognitive processes.

The importance of developing a clear strategy for ChatGPT implementation is stressed by Halaweh (2023), while Rueda et al. (2023) and Kang et al. (2023) underscore the necessity of providing teachers with adequate training to use AI tools effectively. These studies collectively suggest that while ChatGPT has a significant potential in education, its successful integration requires careful consideration of ethical, pedagogical, and practical dimensions as well as comprehensive teacher training programmes.

7. Conclusion

In conclusion, the survey results and academic discourse collectively highlight both the potential and challenges of integrating AI tools like ChatGPT into higher education, particularly in the context of accelerating internationalisation through English for Specific Purposes (ESP) and Language for Specific Purposes (LSP) teaching. The qualitative survey findings reveal a knowledge gap among university teachers, particularly those in technically oriented fields, regarding AI tools, the term Natural Language Processing (NLP) and ChatGPT, underscoring thus the need for targeted training and increased awareness. While some teachers have already begun to integrate AI into their teaching practices, primarily for tasks like grammar correction, text formulation, and academic writing, broader applications, such as course development, remain underutilised.

This reflects broader academic concerns about the ethical, pedagogical, and practical dimensions of AI integration, as seen in studies by Kovacevic (2023), Tufan et al. (2023), and others. Ethical issues, including the risk of plagiarism, misinformation, and academic dishonesty, are recurrent themes, along with calls for professional development to ensure that educators are equipped to use AI responsibly and effectively. Moreover, student and teacher attitudes toward AI tools vary, with some expressing openness and others showing resistance due to concerns about cheating or lack of familiarity with AI technologies.

To fully harness the potential of AI in higher education and enhance the internationalisation efforts, it is clear that comprehensive teacher training and strategic planning are essential. These efforts will not only address ethical concerns but also help educators develop the digital competencies needed to use AI tools to their full potential.

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