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Exploring students' perception of AI tools for career guidance in Career Services: A case study of the University of Szeged

**A hallgatók mesterséges intelligencia alapú eszközökkel kapcsolatos
percepcióinak vizsgálata a karrier-tanácsadásban: Szegedi Egyetem
esettanulmánya**

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1.INTRODUCTION

1.1. Background and context of the research topic

Career services within higher education institutions play a critical role in supporting students as they transition from academic environments to professional careers. These services often include career counseling, skill-building workshops, internship placements, and job search assistance, which aim to increase student employability and readiness for the workforce (Bridgstock, 2019). Considering the rapid evolution of the current job market, particularly driven by rapid technological advancements, questions are being raised about whether universities effectively equip graduates with the skills required for success in today's workforce. The role of higher education extends beyond delivering academic knowledge, requiring institutions to also support students in developing career capital—the skills, knowledge, and networks that are essential for navigating complex, global career paths (Tomlinson, 2017). Career services in universities are thus increasingly expected to provide personalized and data-driven advice to meet the needs of a diverse student population, as highlighted in a longitudinal study by Vinson, Reardon, and Bertoch (2014) that analyzed the evolving role of career services over three decades.

In parallel with this transformation, AI technologies such as machine learning, natural language processing, and predictive analytics are revolutionizing various sectors, and education is no exception (LeCun, Bengio, & Hinton, 2015). While AI has shown promise in other sectors of education, such as personalized learning, its integration into university career services is still in its infancy (Holmes et al., 2019). AI tools, however, have the potential to streamline processes, personalize career advice, and enhance decision-making (Holmes, Bialik, & Fadel, 2019). Its integration into university career services remains limited, especially in Central and Eastern Europe (Vinson, Reardon, & Bertoch, 2014), in universities like the university of Szeged. This gap raises important questions about how students perceive AI's role in career services and whether such tools could enrich their career development experiences. Understanding how students perceive these AI tools and their willingness to adopt them in career services could provide insights, from the students' perspective, for universities seeking to innovate their support structures.

This thesis examines the current role of career services at the University of Szeged, as perceived by the students, investigating whether students utilize these services and their perceptions of its effectiveness. It further explores, from the students' perspective, whether integrating Artificial Intelligence (AI) could enhance these services, thus potentially enriching the students' educational and career planning experiences. By categorizing students into distinct groups based

on their engagement with career services and their personal use of AI tools, this research aims to offer a nuanced understanding of potential AI applications in career guidance.

1.2. Statement of the problem

The current state of career services at the University of Szeged remains largely unexplored, especially from the perspective of students. There is limited understanding of whether students use these services, how effective they perceive them to be, what they perceive the role of these services to be, and whether they believe the integration of AI tools in these services could enhance their experiences. This study aims to fill this gap by exploring students' perceptions of AI tools for career guidance within the University's career services framework.

1.3. Research objectives and questions

The primary objective of this research is to explore students' perceptions of career services at the University of Szeged and their attitudes toward the potential integration of AI tools to enhance these services. The following are the research questions:

1. Do students at the University of Szeged actively use career services, and what are the main reasons for their use or non-use?
2. How do students perceive the effectiveness of career services in supporting their career development, and what improvements do they suggest?
3. Are students aware of AI tools (e.g., job-matching algorithms, resume analyzers) that could be integrated into career services, and do they personally use any AI tools for career planning?
4. How do students feel about the integration of AI into career services, and would they prefer using AI tools alongside or instead of traditional, human-led services?
5. What specific AI functionalities, if any, do students believe would enhance the current career services?

By addressing these research questions, the study seeks to provide a holistic understanding of students' engagement with career services at the University of Szeged, as well as their perspectives on the future role of AI in enhancing these services. The findings will not only help clarify how students currently interact with and perceive these services but also highlight their openness to the integration of AI technologies. Ultimately, this research aims to provide practical recommendations for enhancing career services, ensuring they remain relevant and responsive to students' evolving needs in an increasingly technology-driven world. The study's conclusions

could have broader implications for universities seeking to incorporate AI into their student support systems, particularly in regions where such integration remains underexplored.

2. LITERATURE REVIEW

2.1. Artificial intelligence

2.1.1. Evolution and current trends in AI technologies

Artificial Intelligence (AI) has rapidly evolved over the past few decades, from rule-based systems to advanced machine learning algorithms and deep learning techniques. Early AI systems were limited by their reliance on manually crafted rules, but the advent of machine learning in the 1980s and 90s allowed AI systems to learn patterns from data without needing explicit programming (Goodfellow, Bengio, & Courville, 2016). More recently, deep learning has revolutionized fields such as computer vision and natural language processing (NLP), allowing AI systems to recognize images, understand text, and even generate human-like language (LeCun, Bengio, & Hinton, 2015).

Key trends in AI today include advancements in natural language models, such as OpenAI's GPT-3, and the rise of AI ethics, which focuses on ensuring that AI systems are fair, transparent, and accountable. AI is now widely used in areas such as healthcare, finance, and education, where it helps automate complex processes and provides personalized services at scale (Holmes, Bialik, & Fadel, 2019).

2.1.2. Application of AI in Education context

AI applications in education are diverse, ranging from administrative automation to personalized learning environments. AI applications in education have diversified, spanning across personalized learning environments, administrative automation, predictive analytics, and even curriculum development. These applications leverage AI's capability to analyze large datasets, provide tailored feedback, and optimize both student and institutional performance. Below are key areas where AI is being applied in educational contexts:

Intelligent Tutoring Systems (ITS)

One of the most transformative AI applications in education is Intelligent Tutoring Systems (ITS). ITS platforms leverage AI to offer personalized and adaptive learning experiences, which modify content and feedback based on individual student performance and learning styles. For instance, Carnegie Learning, a math tutoring system, uses machine learning algorithms to adapt

math exercises in real-time, providing students with personalized feedback and extra support where needed. Research by Pane et al. (2014) demonstrated that students using the Cognitive Tutor system showed significant improvements in their understanding of algebra compared to traditional teaching methods.

Another example is ALEKS, an AI-driven platform that continuously assesses student knowledge and recommends appropriate learning materials. The system adapts to the student's evolving skill level and offers tailored exercises, which results in more effective learning outcomes. This adaptive learning approach has been proven to improve retention rates and overall academic performance.

Predictive Analytics

Another significant AI application in education is predictive analytics, where AI analyzes student data to identify at-risk students and predict academic performance. This enables early interventions to support students who may be struggling. For example, Fahd et al. (2022) conducted a meta-analysis of AI applications in higher education and found that machine learning models are increasingly effective at predicting student attrition and academic success, allowing educators to design timely support programs for at-risk students. Predictive models are now used by universities to forecast course completion rates and improve student retention strategies.

Moreover, platforms like Coursera and edX use machine learning algorithms to recommend courses, resources, and pathways based on individual learners' histories, preferences, and progress. These platforms use AI to optimize the learning journey, making personalized suggestions that enhance engagement and increase course completion rates (Pardo et al., 2017).

AI in Administrative Automation

AI is also being employed to automate administrative tasks in education, such as admissions, resource scheduling, and student inquiries. Automation tools, including AI-powered chatbots, are used by universities to handle repetitive tasks such as answering frequently asked questions about course enrollment, deadlines, and campus services. This automation allows administrative staff to focus on more complex, student-centric tasks. For example, Holmes, Bialik & Fadel (2019) discuss how AI chatbots, such as those used by the Georgia Institute of Technology. Georgia Institute of Technology (Georgia Tech) uses an AI chatbot named Jill Watson (developed using IBM's Watson AI) to assist students in its online Master of Science in Computer Science program. Jill Watson answers routine questions about assignments, deadlines, and course material. The chatbot operates 24/7, providing students with instant responses and freeing up human teaching assistants for more complex inquiries. This has led to enhanced student support and satisfaction (Holmes, Bialik & Fadel, 2019).

Furthermore, AI tools are increasingly used to automate parts of the admissions process, such as guiding prospective students through application steps, answering questions, and providing personalized advice. AdmitHub (now known as Mainstay) is an AI-driven platform widely used by universities such as Georgia State University to guide prospective students through the admissions process. Its chatbot, Pounce, provides tailored advice and reminders to applicants, reducing confusion and preventing students from missing important deadlines. Georgia State University credits the chatbot with improving retention rates by helping students transition smoothly into the university environment.

AI in Curriculum Development and Instructional Design

AI is also transforming the way curricula are designed and how instructional strategies are developed. AI-driven analytics offer deep insights into teaching effectiveness and student engagement by analyzing data from online learning platforms and classroom interactions. For instance, Siemens & Long (2011) describe how learning analytics can be used to track student progress, assess the effectiveness of instructional methods, and suggest improvements to curricula based on real-time data.

2.2. Career services

2.2.1. Role and importance of career services

Career services in higher education institutions play a crucial role in helping students transition from academic environments to the workforce. These services provide a range of support, including career counseling, resume writing workshops, interview preparation, job placement assistance, and networking opportunities. The overarching aim of career services is to enhance students' employability by equipping them with the skills, knowledge, and confidence needed to navigate complex job markets.

According to Bridgstock (2019), career services are becoming increasingly important in the 21st-century job market as students face new challenges and opportunities arising from rapid technological advancements and globalization. Career services are integral not only for preparing students for their first job but also for fostering lifelong career management skills. Universities are expected to help students develop “career capital,” which includes technical skills, soft skills (e.g., communication, teamwork), and networks that will help them succeed in a constantly evolving job market (Tomlinson, 2017).

Furthermore, research highlights that universities that prioritize career services tend to see improved student outcomes, including higher levels of graduate employment and student satisfaction. Career services provide the infrastructure for students to connect their academic achievements with the professional skills required by employers, which can ultimately lead to better employment outcomes (Vinson, Reardon, & Bertoch, 2014). As a result, universities have

begun to integrate career services more centrally into their institutional mission, aligning them with both academic curricula and student support services.

2.2.2. Career services at Universities

Universities worldwide have developed career services as a key part of their support systems, offering a range of services tailored to the diverse needs of students from different disciplines. For example, career services typically provide personalized career counseling, host career fairs, and offer access to internship and job placement programs. Services also include help with creating professional resumes and cover letters, providing mock interviews, and guiding students through job searches and networking strategies.

According to Bridgstock (2019), career services have become an essential institutional resource as universities increasingly focus on employability as a key outcome of higher education. Career services serve not only to assist students in securing their first post-graduation job but also to equip them with the skills necessary for long-term career management. These services foster a range of competencies, such as adaptability, networking, and lifelong learning, that students will need to thrive in the modern workforce.

In many universities, career services also play a crucial role in promoting graduate employability, which has become a major focus in the higher education sector. Vinson, Reardon, and Bertoch (2014) emphasize that career services have shifted from being reactive to proactive, with universities embedding career-related activities directly into academic curricula. For example, institutions such as Stanford University and the University of California, Berkeley integrate career services into their academic programs, ensuring that students receive ongoing career development support throughout their university journey. This approach helps students to see career development as an ongoing process rather than something that begins only after graduation.

Types of Career Services at Universities

Career services at universities typically offer a wide range of programs designed to address the diverse needs of their student populations. The following are typical types of career services offered at universities:

Career Counseling

Career counseling services provide personalized guidance to students on career planning, job search strategies, and professional development. Career counselors help students explore their interests, strengths, and career aspirations, guiding them towards opportunities that align with

their goals. For example, at Harvard University, career counselors meet with students one-on-one to develop individualized career plans and connect them with resources such as networking events and job postings.

Workshops and Skill-Building Programs

Universities frequently organize workshops on essential career skills such as resume writing, interview preparation, and professional communication. These workshops are often tailored to different fields of study, ensuring that students receive relevant and specialized guidance. Massachusetts Institute of Technology (MIT) offers regular workshops on industry-specific job search strategies and technical resume-building for engineering and tech students.

Internship and Job Placement Programs

Internship and job placement services help students gain valuable work experience while still in school. Universities often partner with employers to offer internships, co-op programs, and job placements that provide students with hands-on experience in their chosen fields. Northeastern University in Boston is known for its robust co-op program, which integrates periods of academic study with full-time professional experience, allowing students to graduate with both a degree and substantial work experience.

Career Fairs and Networking Events

Career fairs and networking events are a staple of university career services. These events connect students with employers, industry professionals, and alumni, giving them the opportunity to explore job opportunities, learn about different industries, and develop professional networks. New York University (NYU) hosts an annual career fair that attracts hundreds of employers from various sectors, providing students with a platform to showcase their skills and learn about potential career paths.

Alumni Networks and Mentoring Programs

Many universities leverage their alumni networks to provide students with mentoring opportunities and access to industry contacts. Alumni often participate in career events, offering advice and mentorship to current students. For example, Princeton University maintains a robust alumni mentoring program that pairs students with alumni in their fields of interest for career advice, job shadowing, and networking opportunities.

The Importance of Career Services for Student Success

Research consistently shows that students who engage with career services during their university studies are more likely to secure employment after graduation - that career services significantly contribute to student success by helping them build the skills and networks

necessary for navigating the job market. Career services not only assist in finding immediate employment but also in developing the ability to manage long-term career trajectories in dynamic and evolving industries.

According to a report by Gallup and Purdue University (2014), students who engage with career services are more likely to report higher levels of satisfaction with their overall university experience. The report found that graduates who utilized career services during their studies were twice as likely to say they had a “good job waiting for them” upon graduation compared to those who did not use these services. Furthermore, the study highlighted that career services help bridge the gap between academic education and the real-world skills required by employers.

Challenges and Evolving Trends in Career Services

While the role of career services is crucial, universities face several challenges in ensuring that these services meet the evolving needs of students and employers. As the nature of work continues to change due to automation, AI, and the gig economy, career services must adapt to prepare students for an uncertain and rapidly shifting job market. Universities are increasingly integrating AI-driven career tools to enhance the effectiveness of career services. These tools provide personalized job recommendations, analyze skill gaps, and offer real-time feedback on resumes and applications, all of which help students navigate an increasingly competitive job market.

Furthermore, the demand for flexibility and accessibility in career services is growing. Many students now expect career services to be available 24/7, leading to the adoption of online platforms that offer virtual counseling, resume reviews, and job postings. Institutions like Arizona State University and Southern New Hampshire University have responded by developing comprehensive online career platforms that allow students to access services remotely, making them more accessible for students who may be working or studying part-time.

2.3. AI in Career services

2.3.1. Existing application of AI in career services

As mentioned above, there are some universities integrating AI into their career services to provide students with more tailored and efficient support. One notable example is Georgia Institute of Technology, where the AI-powered chatbot Jill Watson assists students by answering routine queries about assignments, job placement services, and internship opportunities, freeing up time for staff to focus on more complex tasks. Similarly, Deakin University in Australia uses Genie, an AI-powered personal assistant, to help students with a range of career-related queries, such as job search tips and resume reviews.

AI-based platforms such as Handshake, which is used by several universities worldwide, use machine learning algorithms to provide students with personalized job recommendations based on their interests, academic background, and career aspirations. This has resulted in more efficient job placement processes and higher levels of student engagement with career services.

In terms of administrative automation, AI is being used in admissions and job-matching processes, enhancing efficiency in areas such as interview scheduling, resource allocation, and applicant tracking. For instance, Coursera and edX leverage machine learning algorithms to recommend courses and career resources to students based on their learning histories, thus supporting students' career readiness through continuous skill development.

2.3.2. Theoretical frameworks relevant to perceptions and acceptance of AI

The theoretical frameworks used to study the adoption and perception of technology in various contexts provide critical insight into understanding how users—such as students—might engage with and accept AI tools within career services. In the context of AI in career guidance, two prominent models are highly relevant: the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). Both models offer a structured approach to understanding how individuals perceive the usefulness and ease of use of technology, and they have been widely applied in educational and organizational contexts to examine technology adoption.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was introduced by Davis (1989) to explain how users come to accept and use a new technology. TAM posits that two main factors influence technology acceptance:

1. Perceived Usefulness (PU): The degree to which a person believes that using a particular technology will enhance their job performance or learning outcome.
2. Perceived Ease of Use (PEOU): The degree to which a person believes that using the technology will be free of effort.

In the context of AI in career services, TAM can be adapted to measure how students perceive AI tools like resume analyzers or job-matching systems. For example, students' perceived usefulness could refer to how much they believe AI will improve their job search outcomes, while perceived ease of use could measure how easily they can interact with AI platforms for career guidance. TAM has been a foundational model in examining user adoption of technology across various fields, including education, but its focus is more narrowly on two primary factors. TAM has been applied in the context of educational technologies, such as e-learning platforms and digital learning tools. A study by Teo (2011) applied TAM to measure university students' acceptance of e-learning, finding that both perceived usefulness and perceived ease of use were

strong predictors of students' willingness to adopt new technologies. While TAM is useful for understanding the basic motivations behind technology adoption, its limited number of constructs (usefulness and ease of use) may not fully capture the broader range of influences that impact the adoption of AI in more complex contexts, such as career services.

Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh et al. (2003), expands on TAM by incorporating additional factors that influence technology acceptance. UTAUT includes four key constructs:

1. Performance Expectancy: Similar to perceived usefulness, this refers to the degree to which an individual believes that using a particular technology will help them achieve gains in performance.
2. Effort Expectancy: Similar to perceived ease of use, this refers to the degree of ease associated with using the technology.
3. Social Influence: The extent to which individuals perceive that important others (e.g., peers, teachers) believe they should use the technology.
4. Facilitating Conditions: The degree to which an individual believes that an organizational or technical infrastructure exists to support the use of the technology.

UTAUT is particularly relevant to this research as it extends beyond the limitations of TAM by incorporating the social and environmental factors that influence technology adoption. For example, students' potential desire to adopt the use of AI in career services might not only depend on their personal perceptions of AI's usefulness and ease of use but also on the influence of peers, mentors, or university resources that encourage or facilitate AI adoption. Social influence could be particularly important in your context, where students may adopt AI tools if they see others (e.g., friends, professors, or career counselors) using them. Facilitating conditions are also critical, as the availability of resources such as workshops or access to technology could impact students' willingness to adopt AI-driven career services. Joo, Lee, and Ham (2014) applied UTAUT to examine factors influencing university students' acceptance of e-learning tools. The study found that performance expectancy and facilitating conditions were the strongest predictors of technology acceptance, which suggests that having the necessary resources and support plays a significant role in student adoption of educational technologies.

The model choice for this research

Given the complexity of integrating AI into career services, UTAUT is a more comprehensive model for this research compared to TAM. The additional constructs in UTAUT—particularly social influence and facilitating conditions—are highly relevant for understanding how students at the University of Szeged perceive and potentially adopt AI in career services. For example, students' perception to accept the integration of AI might be influenced by their professors' or

peers' recommendations (social influence), and their ability to access necessary technology (facilitating conditions) might further impact their acceptance of AI tools.

In this study, the UTAUT model can help with the exploration of how students' attitudes towards AI tools (e.g., job-matching algorithms, resume analyzers) are shaped not just by their perceived usefulness or ease of use, but also by external factors such as institutional support and peer recommendations.

2.4. Research Gaps and Opportunities

Despite the growing interest in AI's role and application in various sectors and industries, there are significant gaps in the literature. Much of the research on AI in education has focused on academic learning and administrative support, with relatively few studies exploring how AI can enhance career guidance (Holmes et al., 2019) and further the students' perception on its integration.

This study is significant as it explores an under-researched area and addresses an emerging need within higher education—enhancing career services to meet the evolving demands of students and the job market through the integration of AI technologies. As traditional career services face limitations in scalability and personalization, AI tools such as resume analyzers, job-matching algorithms, and interview simulations offer the potential to transform how students engage with career guidance.

At the University of Szeged, where career services remain largely unexplored, especially from the perspective of students and where AI integration in these services remains minimal, this research fills a crucial gap by examining whether students currently use career services potentially reflecting on its relevance. It further explores whether they are aware of or currently use AI tools in their career journeys. It explores student attitudes toward AI, revealing if they perceive these tools as valuable alternatives or enhancements to traditional career counseling.

Furthermore, the study seeks to identify which specific AI functionalities students believe would be most beneficial for improving career guidance, offering actionable insights for the university to adopt cutting-edge solutions tailored to student preferences. With the rapid technological advancements and the increasing role of data-driven decision-making in the workforce, understanding student perceptions of AI in career services is not only timely but also critical for aligning educational support services with future job market needs.

The outcomes of this research can also guide policymakers and administrators at the university in optimizing the integration of AI technologies, ensuring that career services remain relevant, efficient, and accessible to all students. This could enhance student satisfaction, career readiness, and employability, contributing to the overall mission of higher education institutions to prepare students for the complexities of the modern workforce. Moreover, this research could contribute

to broader academic discussions on the integration of technology in higher education, particularly in a Central and Eastern European context, where research on this topic is still emerging.

By bridging the gap between current career services and AI innovations, this study has the potential to offer new perspectives on how higher education can evolve to better serve students' career development needs in a technology-driven world.

3. PRIMARY RESEARCH

3.1. Research design

This study employs a mixed-methods research design, combining both quantitative and qualitative approaches, with a focus on adapting the Unified Theory of Acceptance and Use of Technology (UTAUT) model to assess student perceptions of AI tools in career services at the University of Szeged.

The quantitative phase involves a survey based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This model evaluates factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions related to the use of AI tools in career services. The survey is designed to gather measurable data from a broad sample of students, enabling the identification of patterns and trends in the use of career services and perceptions of AI tools.

The qualitative phase involves semi-structured interviews with a smaller group of students. These interviews will provide deeper insights into students' personal attitudes, concerns, and expectations regarding AI integration into career services. By complementing the quantitative data, the qualitative findings will help explain the reasoning behind students' responses and offer more nuanced perspectives.

The mixed-methods approach is appropriate because it allows for the strengths of both quantitative and qualitative data collection to be leveraged, ensuring a robust exploration of student attitudes towards AI in career services.

3.2. Participant selection

Inclusion Criteria:

All currently enrolled undergraduate and graduate students at the University of Szeged.

Exclusion Criteria:

Alumni and non-enrolled individuals.

Survey Participants:

For the quantitative survey, a target sample size of at least 100 students was chosen. This number was based on guidelines in educational research, which suggest that sample sizes of around 100 participants are suitable for achieving a balance between statistical reliability and feasibility in resource-constrained studies (Cohen et al., 2018; Creswell & Creswell, 2017). In studies focusing on technology adoption and educational settings, samples between 80 and 150 participants are often deemed appropriate for exploring general trends (Dillman et al., 2014). Given that the University of Szeged has a diverse student body across various faculties, a sample size of 100 provides sufficient representation while remaining manageable within the time frame of the study.

A convenience sampling method was used to gather data for this research. The survey was distributed online, and participants were self-selected, responding voluntarily without any formal process of random selection. Convenience sampling is commonly used in educational research when access to the entire population is not feasible, as it allows for the collection of data from readily available participants. While this method does not guarantee a representative sample, it provides insights into the views of those who chose to participate. As a result, the findings may not be generalizable to the entire student population, but they still offer valuable perspectives on the use of career services and attitudes toward AI integration within the university.

Interview Participants:

For the qualitative interviews, a target sample size of between 10 and 15 participants was selected. This range aligns with qualitative research best practices, where the focus is on depth rather than breadth, and saturation (the point at which no new information is being uncovered) is typically reached within 10–15 interviews (Guest, Bunce, & Johnson, 2006).

The inclusion criteria for the interviews were simple: any survey respondent who indicated a willingness to participate in a follow-up interview was invited. There was no requirement that the participant had previously used career services or AI tools, ensuring a broad range of perspectives to be captured. This allowed the study to include both users and non-users of AI tools, enriching the diversity of experiences discussed in the interviews.

3.3. Data collection methods

Quantitative Survey:

The quantitative survey was developed using Google Forms and distributed online to ensure easy access for students. It was carefully designed to align with the objectives of the research and was primarily influenced by the UTAUT model. It was divided into four sections to address the study's objectives:

1. Career Services Use and Perception (Performance Expectancy): This section aimed to assess the frequency of career services use and students' perceptions of their effectiveness in supporting academic and professional development. Questions included rating the usefulness of services like career counseling and job placement assistance on a 5-point scale and providing reasons for using or not using these services.
2. Awareness and Use of AI Tools in Career Guidance (Effort Expectancy): This section explored students' awareness and usage of AI tools for career planning.
3. Attitudes Toward AI Integration in Career Services (Performance Expectancy and Facilitating Conditions): Students were asked to rate the potential of AI to enhance career services and identify functionalities they found most beneficial (e.g., interview simulations, AI-powered resume reviews). The aim was to understand how AI could improve the accessibility, accuracy, and personalization of career guidance.
4. Demographics: This section collected key demographic information such as academic level, year of study, and major to keep track of the representation across different student subgroups.

Qualitative Interviews:

All interviews were conducted online via Microsoft Teams, providing flexibility and convenience for participants. The use of an online platform also allowed for recording and easy transcription.

3.4. Ethical considerations

The study followed strict ethical guidelines to ensure that participants' rights and well-being were protected throughout the research process. Informed consent was obtained from all participants before the survey and interviews, with clear explanations about the purpose of the research, the voluntary nature of participation, and the option to withdraw at any time without consequence. Furthermore, Anonymity and confidentiality were guaranteed to all participants. Survey responses were collected anonymously, and no personal information was gathered during the interview process. All data, including interview transcripts and survey responses, were securely stored and will only be used for the purposes of this research. Participants' identities were protected by using pseudonyms in the reporting of findings.

4. RESULTS AND ANALYSIS

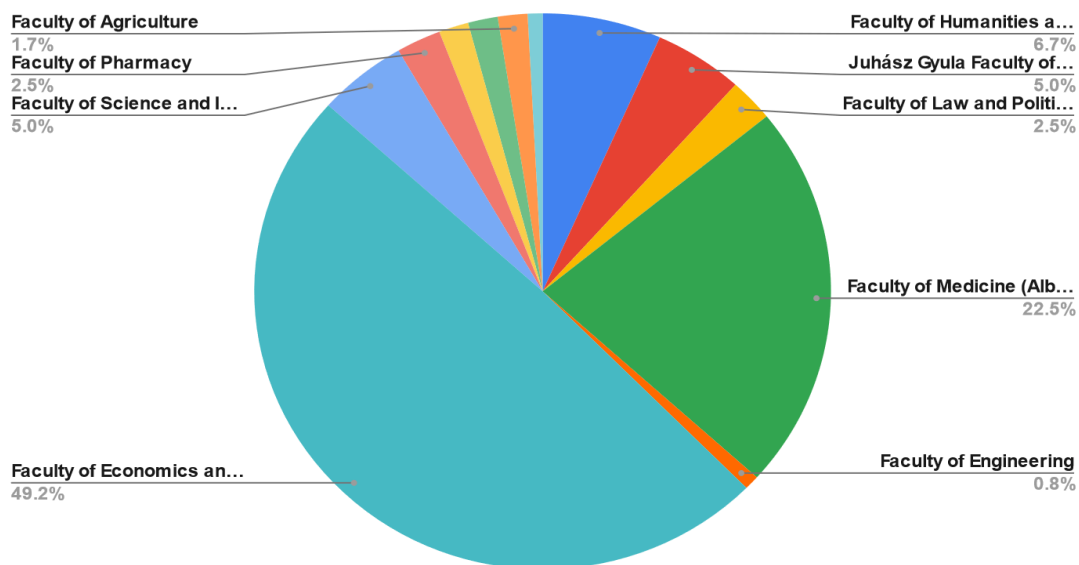
The following are the key findings and analysis from the primary research in relation to the research questions (RQs) of the study respectively.

4.1. RQ1: Do students at the University of Szeged actively use career services, and what are the main reasons for their use or non-use?

Demographic of respondents:

For the quantitative research, there were 120 Survey respondents of students from the University with almost 50% of them coming from the Faculty of Economics and Business, 22.5% represented the Faculty of Medicine and the remaining coming from other faculties.

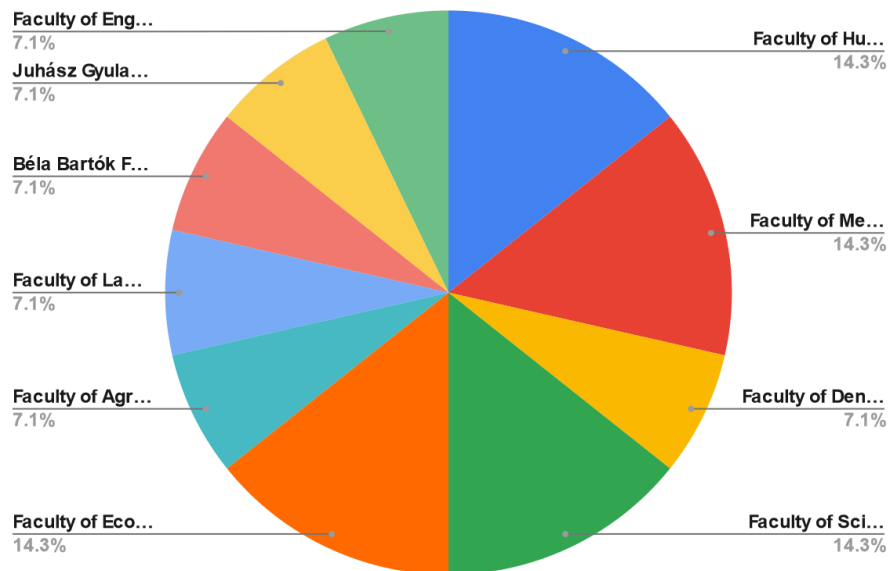
Figure 1 Survey Respondents Faculty distribution



Source: Own Construct Based On Quantitative Primary Research

The qualitative research consisted of 14 semi-structured interviews comprising of students from the following Faculties:

Figure 2 Semi-structured Interviews Faculty distribution

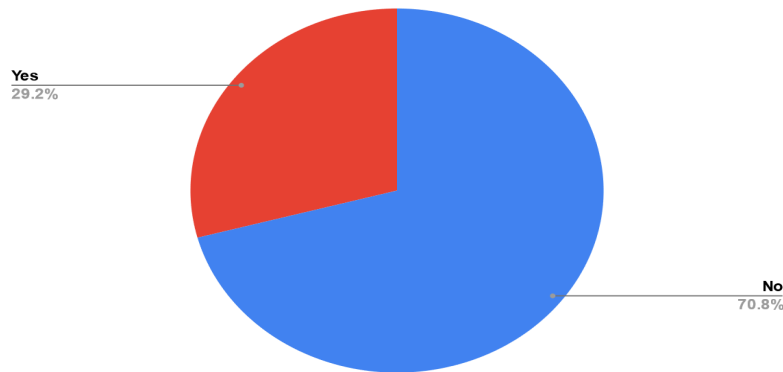


Source: Own Construct Based On Qualitative Primary Research

Career Services Usage:

Out of the 120 students who participated in the survey, 70% indicated they had never used the career services provided by the University of Szeged. This result demonstrates a significant underutilization of the services, which prompted deeper exploration into the reasons.

Figure 3 University of Szeged's Career Services' Students Usage

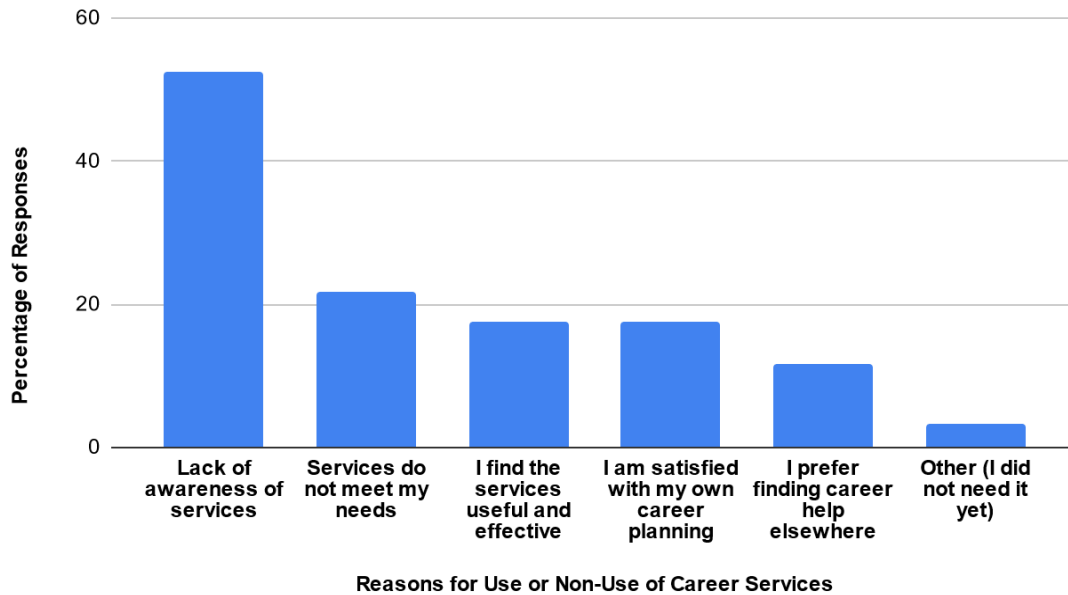


Source: Own Construct Based On Quantitative Primary Research

Reasons for Use or Non-Use:

To understand the motivations behind students' use or non-use of career services, the survey asked respondents to select from a list of possible reasons. The most common reason for non-use, cited by 52.5% of respondents, was a lack of awareness of the services. Other significant reasons included services not meeting students' needs (21.67%) and a preference for finding career help elsewhere (11.67%). A smaller proportion of respondents indicated they found the services useful and effective (17.5%) or were satisfied with their own career planning (17.5%). An additional 3.33% selected "other," most commonly stating that they did not yet need the services.

Figure 4 Reasons for Use or Non-use of Career Services



Source: Own Construct Based On Quantitative Primary Research

The interviews provided additional context for understanding why students are either unaware of or choose not to use career services. Several key themes emerged from the interviews that align with the survey findings.

1. Lack of Awareness (52.5% of survey respondents)

The most frequent reason for non-use in the survey was a lack of awareness of the services, a point echoed by multiple interviewees. One student mentioned:

“I’ve been studying here for two years, but I didn’t even know we had career services until it was brought up.”

This response illustrates a communication gap between the university and students, where many students are simply unaware that these resources exist, even though they may benefit from them.

2. Services Do Not Meet My Needs (21.67% of survey respondents)

Another significant portion of students indicated that the career services did not meet their specific needs. Several students in the interviews also expressed dissatisfaction with the relevance of the services to their academic fields. One student in a creative field explained:

“I checked the services offered, but they were mostly focused on traditional businesses and corporations, not on the kind of jobs that relate to my field, like art or event management.”

This highlights that while the university offers career services, they may not be tailored to the diverse range of student needs, particularly those in specialized fields like arts or design.

3. Preference for Finding Career Help Elsewhere (11.67% of survey respondents)

Some students prefer to seek career guidance outside the university's services. One interviewee commented:

"I prefer to look for jobs myself, usually online through platforms like LinkedIn. I feel like the university's services are slower, and I can get quicker results on my own."

This reflects a growing trend where students rely more on digital platforms for career planning, finding them faster and more personalized than university-provided services.

4. I Find the Services Useful and Effective (17.5% of survey respondents)

While most students did not use the services, 17.5% of respondents found them useful. In the interviews, one student shared a positive experience:

"We had open days and special events where we could meet with companies. These kinds of opportunities were really helpful to get an idea of the job market and what we can expect."

This suggests that when services are interactive and directly linked to industry, students find them more beneficial. It indicates that the services could be more effective if they focus on real-world experiences, such as company visits or networking events with employers.

5. I Am Satisfied with My Own Career Planning (17.5% of survey respondents)

Another 17.5% of students expressed that they were satisfied with their own career planning and did not feel the need to use the university's services. One student explained:

"I already had my career plans figured out and didn't feel the need for any additional guidance from the university."

This reflects the views of students who are self-reliant and confident in their ability to navigate the job market independently, possibly through personal networks or their own career research.

6. Other (I Did Not Need It Yet) (3.33% of survey respondents)

A small number of students stated that they had not needed the services yet, reflecting the idea that for some students, especially those in the early stages of their studies, career planning is not yet a priority. As one student mentioned:

“I didn’t really think about using the career services because I’m still early in my studies, and I don’t need them yet.”

This suggests that timing plays a role in whether students engage with career services, with those closer to graduation more likely to see their value.

Conclusion:

The combination of survey data and interview insights reveals that a majority of students at the University of Szeged do not actively use career services, primarily due to a lack of awareness and the perception that the services are not relevant to their specific needs. For those who do use the services, experiential opportunities such as industry events and hands-on experiences seem to be the most valued.

The results suggest that the university should focus on raising awareness about the career services and ensuring that these services are more tailored to the diverse academic backgrounds of the student body. Integrating field-specific guidance and digital career platforms could also improve student engagement and make the services more appealing to a wider range of students.

4.2. RQ 2: How do students perceive the effectiveness of career services in supporting their career development, and what improvements do they suggest?

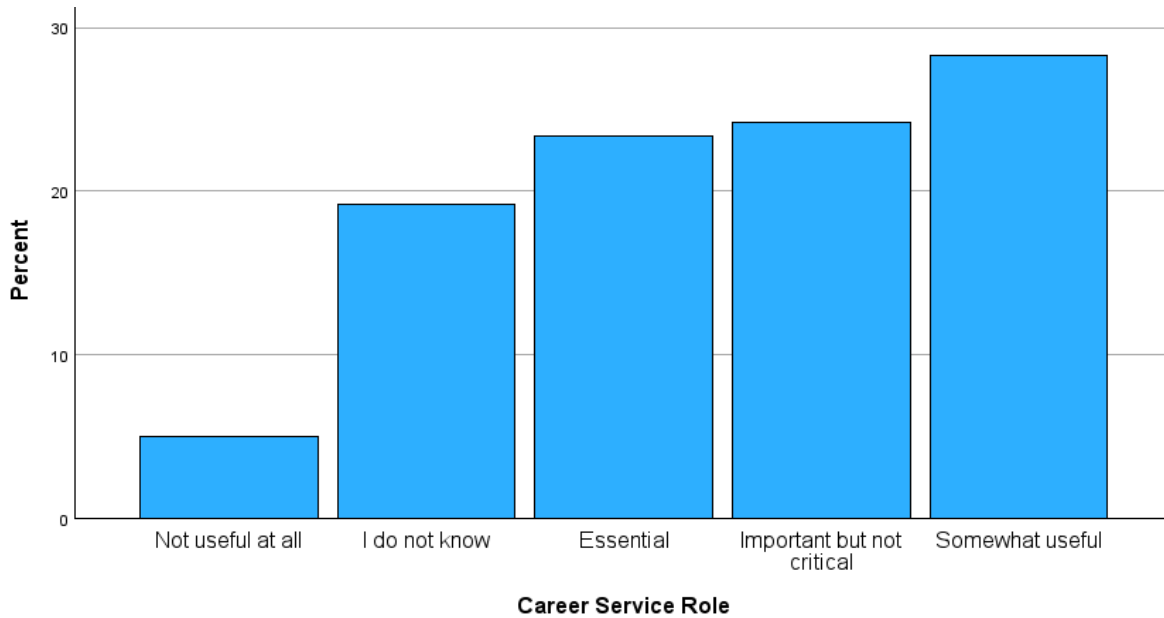
The second research question seeks to understand how students at the University of Szeged perceive the role and effectiveness of career services in their academic and professional development, as well as their suggestions for improvements.

Perception of the Role of Career Services

Based on the survey results, students had varied perceptions regarding the role of career services in their academic and professional development. Out of the 120 respondents:

- 23.3% (n=28) viewed the career services as essential for their development.
- 24.2% (n=29) found them important but not critical.
- The largest group, 28.3% (n=34), rated the services as only somewhat useful.
- 5% (n=6) stated that career services are not useful at all.
- A significant portion, 19.2% (n=23), responded with "I do not know", indicating either a lack of awareness or a lack of engagement with these services.

Figure 5 Career Services' Role as perceived by Students



Source: Own Construct Based On Quantitative Primary Research

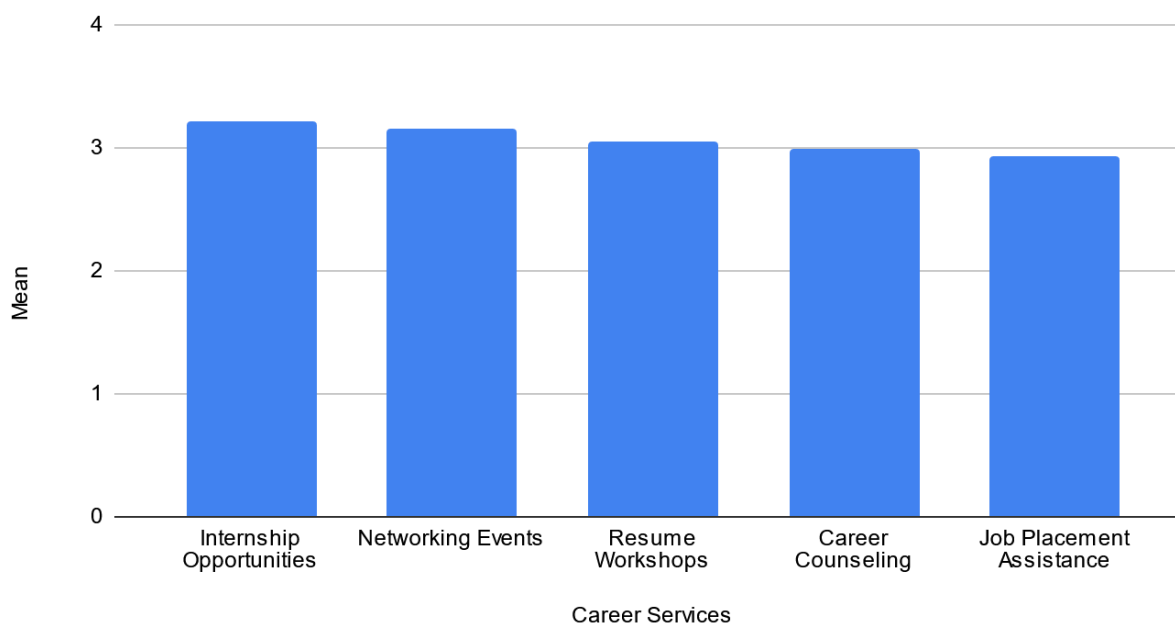
The data reveals that while a small portion of students (23.3%) perceive career services as essential, a larger proportion (28.3%) find them only somewhat useful. This suggests that many students may not see career services as critical to their development. Furthermore, the 19.2% of students who answered "I do not know" suggests a gap in awareness, with nearly a fifth of students unclear about the role that career services can play in their career development. This reflects a significant opportunity for improvement in promoting these services and educating students on their potential benefits.

Effectiveness of Specific Career Services

The ratings for the effectiveness of specific career services at the University of Szeged, as measured on a 5-point Likert scale, provide further insights. The mean scores for different services were:

- Internship Opportunities: Mean = 3.22, SD = 1.24
- Networking Events: Mean = 3.15, SD = 1.03
- Resume Workshops: Mean = 3.06, SD = 0.93
- Career Counseling: Mean = 3.00, SD = 0.99
- Job Placement Assistance: Mean = 2.93, SD = 1.09

Figure 6 Career Services Effectiveness As Perceived By Students



Source: Own Construct Based On Quantitative Primary Research

The services scored between 2.93 and 3.22 on average, indicating that none of the services received exceptionally high ratings. Internship opportunities received the highest average score of 3.22, while job placement assistance had the lowest average score of 2.93. This suggests that while students see some value in the services, there is substantial room for improvement across all areas. The moderate-to-low standard deviations suggest that opinions were relatively consistent, but these scores indicate that students are only moderately satisfied with the career services provided by the university.

Suggestions for Improvement

Both the quantitative survey and qualitative interviews provided insights into how students believe career services can be improved. A common theme among respondents was the need for greater awareness and promotion of the career services offered. From the survey responses, the top suggestions included:

1. Raising Awareness: Multiple students pointed out that they were either not aware of the existence of career services or did not know how to access them. As one student commented, *"I had no idea of the career office and how it could help me, it would be great to advertise more and raise awareness about their goals and services in future"*

university events." This sentiment was echoed by several others, with students suggesting more advertising via email, social media, or faculty websites.

2. **Tailoring Services to Diverse Fields:** Several respondents mentioned that career services seemed more focused on certain faculties, such as business and economics, and did not adequately cater to students from other disciplines. One student expressed, *"Career services aren't really extended towards the medical faculty or if they are, they aren't very popular. So promoting internship positions for doctors and offering more practice opportunities for students would make the Hungarian workplace seem much more attractive."*
3. **More Opportunities for International Students:** A frequent concern raised by both survey and interview respondents was the lack of services or opportunities tailored for international students. One respondent suggested, *"There is a lack of opportunity for international students, as most of the presentations are held only in Hungarian."*
4. **More Practical Support and Personalized Services:** A few students suggested offering more personalized counseling and practical support, particularly with resume building and interview preparation. As one interviewee mentioned, *"They should introduce seminars that guide from the basics to the advanced level of job hunting like CV/Resume preparation to interview question/answers guidance."*
5. **Increasing Collaboration with Employers:** Students also highlighted the need for career services to establish stronger connections with companies, particularly for facilitating internships and job placement. One student suggested, *"The university should provide internship opportunities throughout the whole year. Usually in other countries, universities are collaborating with big companies just to provide them interns... but unfortunately, our university doesn't really provide that opportunity."*

Qualitative Insights from Interviews

The interview data further validated the quantitative findings. Several students interviewed expressed a lack of awareness about career services. One student said, *"I didn't even know the university had a career office until recently,"* while another noted, *"I don't think my faculty ever mentioned the career office in any of our classes."*

A student also emphasized the need for services to be more practical and tailored: *"If they could offer personalized advice, especially for international students like myself, I think more people would use the services."* This quote complements the survey feedback regarding the need for more targeted support.

Conclusion

The findings suggest that while some students find career services essential or important, a substantial portion is either unaware of them or finds them only somewhat useful. Ratings for specific services such as internships and job placement assistance were moderate, highlighting

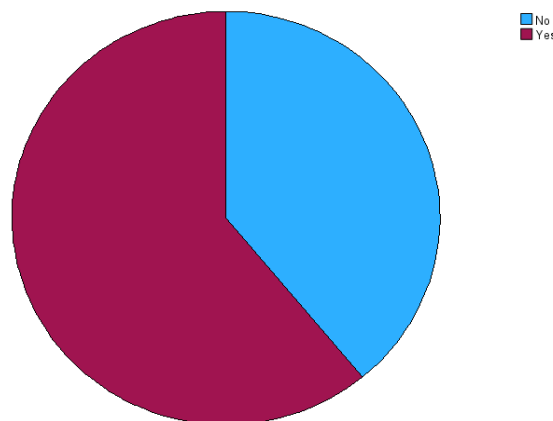
areas where the university could improve. Based on student feedback, raising awareness, expanding services to more faculties and international students, offering more practical and personalized support, and strengthening partnerships with employers are critical steps that the university could consider to enhance the effectiveness and reach of its career services.

4.3. RQ 3: Are students aware of AI tools that could be integrated into career services, and do they personally use any AI tools for career planning?

Awareness of AI Tools

The survey data reveals that the majority of respondents (61%) are aware of AI tools that can assist with career planning. Only 39% of students reported being unaware of such tools. This suggests that a significant proportion of students at the University of Szeged are familiar with the emerging technologies that can support career guidance. However, nearly 40% of students still lack awareness, which indicates a potential area for growth in promoting these tools within the student population.

Figure 7 Students' Awareness of AI tools



Source: Own Construct Based On Quantitative Primary Research

The qualitative data aligns with these findings, as one student noted in the interviews:

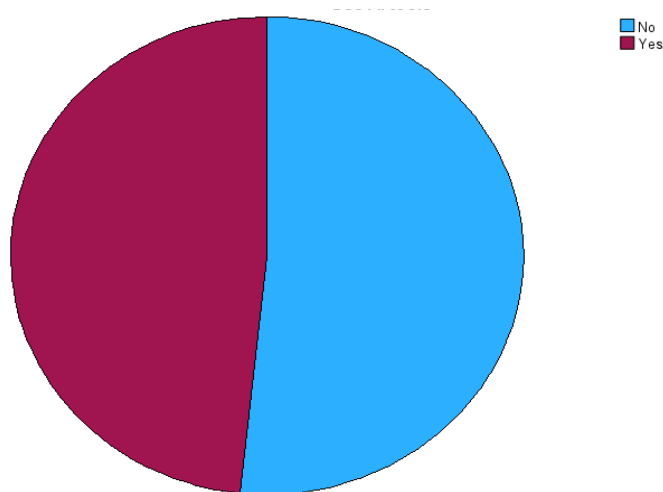
"I didn't know much about AI tools until my classmates started using them for CV building and job searching. Now I realize how helpful they can be, but it's something I just recently discovered."

This underscores that, while there is a good level of awareness, the knowledge of AI tools is not universal and many students may benefit from additional information and resources to better understand the potential applications of AI in career planning.

Use of AI Tools

Despite the relatively high awareness of AI tools, only 48.3% of respondents indicated that they personally use them for career planning. Slightly over half (51.7%) of the students reported not using AI tools. This suggests that while awareness exists, it does not necessarily translate into widespread usage. Barriers to adoption may include a lack of understanding of how to utilize these tools effectively, preference for traditional methods, or simply the students not yet seeing the need for such tools in their career development.

Figure 8 Students' Usage of AI Tools



Source: Own Construct Based On Quantitative Primary Research

One student in the interviews highlighted this gap between awareness and usage:

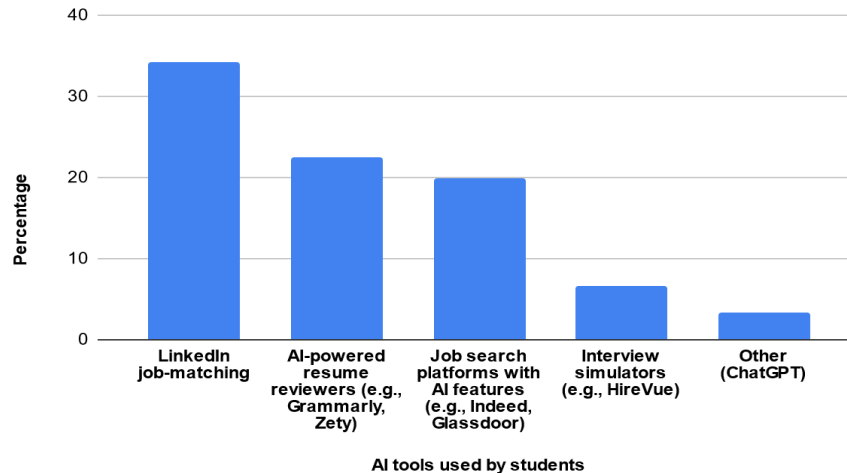
"I know about LinkedIn and some of the AI tools for job matching, but I haven't really used them myself. I still prefer looking for internships through personal networks or career fairs."

This indicates that personal habits, comfort with traditional methods, or rather a lack of immediate perceived need could be influencing the lower usage of AI tools.

Types of AI Tools Used

Among those who reported using AI tools, LinkedIn job-matching emerged as the most frequently used tool, with 34.17% of respondents selecting it. This is followed by AI-powered resume reviewers (e.g., Grammarly, Zety), used by 22.5% of respondents, while job search platforms with AI features such as Indeed and Glassdoor were used by 20%. Other tools like Interview simulators were less popular, with only 6.67% of respondents reporting usage, and a small percentage (3.33%) reported using other tools like ChatGPT.

Figure 9 AI Tools Used By Students



Source: Own Construct Based On Quantitative Primary Research

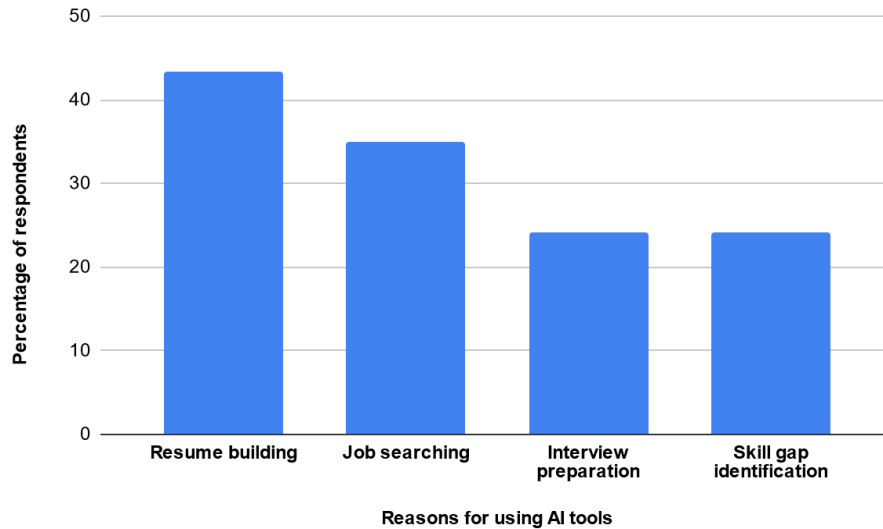
This distribution reflects the broader trend in AI adoption, where tools that integrate directly with professional networking platforms (e.g., LinkedIn) or offer concrete support for job-seeking tasks like resume reviewing have seen the highest levels of adoption. Tools that are less familiar, such as interview simulators, seem to lag behind.

Purpose of Using AI Tools

When asked about their reasons for using AI tools, the most common purpose cited by respondents was resume building (43.33%), followed by job searching (35%). Other reasons included interview preparation and skill gap identification, both at 24.17%.

These results indicate that students predominantly turn to AI tools for practical, task-oriented support in their job applications. The focus on resume building and job searching aligns with the capabilities of popular tools like LinkedIn and AI resume reviewers, which help users enhance their employability by refining their CVs and identifying job opportunities.

Figure 10 Students' Reasons For Using AI Tools



Source: Own Construct Based On Quantitative Primary Research

A student interviewed provided further context for this:

"I use tools like Grammarly for resume building because it's easy to get feedback and improve your application quickly...Job searching on platforms like LinkedIn is also helpful because it gives personalized recommendations based on your profile."

This quote highlights how AI tools streamline tasks that are often time-consuming, such as building a professional resume and finding suitable job opportunities.

Analysis of Findings

The findings from both the quantitative and qualitative data demonstrate that students at the University of Szeged are relatively aware of AI tools that can support career planning, but a significant portion of them do not yet use these tools. LinkedIn job-matching and AI-powered resume reviewers are the most popular tools, likely due to their integration with professional development tasks that are highly relevant to students' immediate career goals.

The primary purpose of using AI tools—resume building and job searching—reflects the students' focus on practical, results-driven applications of AI. However, interview preparation and skill gap identification are less utilized, suggesting that students may either be unaware of the benefits of AI in these areas or they may prioritize traditional methods (e.g., attending workshops or preparing manually) for these tasks.

The qualitative insights further underscore the mixed attitudes towards AI tools. Some students appreciate their convenience, while others are either unaware of them or prefer to rely on established, human-led processes. This highlights an opportunity for the University of Szeged's career services to bridge the gap between awareness and usage by promoting AI tools more effectively, if the university chooses to be in alignment with the advancement in technology, and thus demonstrating value in career planning through these tools.

Conclusion

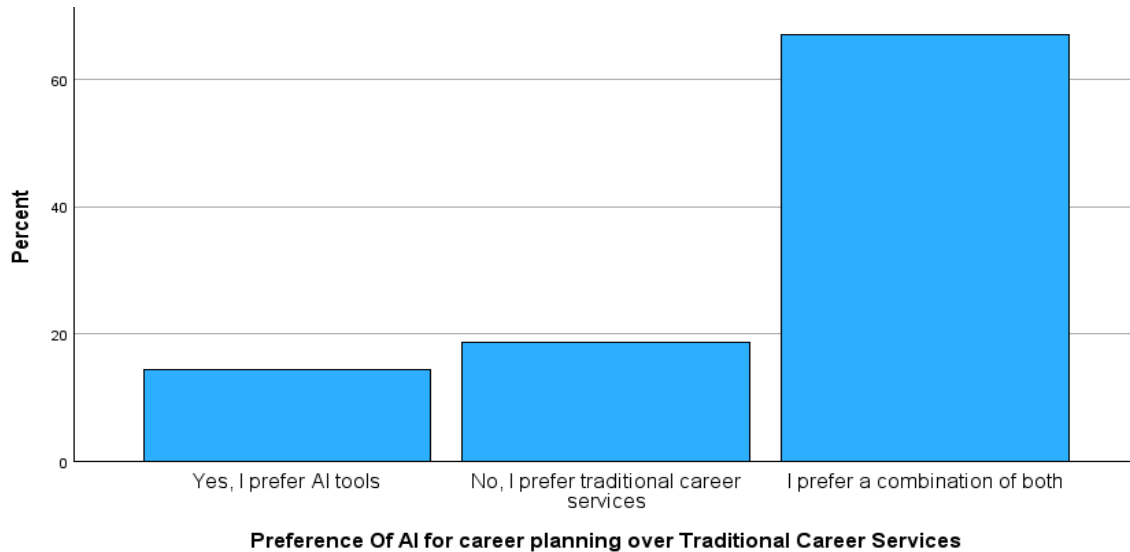
In conclusion, while awareness of AI tools for career planning is relatively high among students, actual usage lags behind. This suggests that efforts to promote and integrate AI tools into career services need to focus not just on raising awareness but also on educating students on the practical benefits and ease of use of these technologies. The university could improve its communication about how AI tools can complement existing career services and enhance students' career readiness.

4.4. RQ 4: How do students feel about the integration of AI into career services, and would they prefer using AI tools alongside or instead of traditional, human-led services?

Preference for AI Tools vs. Traditional Services

The survey results provide a clear indication of students' preferences when it comes to the integration of AI tools in career services. While a minority of students, 14.4%, expressed a preference for AI tools alone, and 18.6% preferred traditional career services, the overwhelming majority, 66.9%, favored a combination of both AI and traditional services. This suggests that students at the University of Szeged see value in both systems, highlighting a desire for a hybrid model that leverages the strengths of AI tools while retaining the human element.

Figure 11 Students' Preference Of AI For Career Planning Over Traditional Services



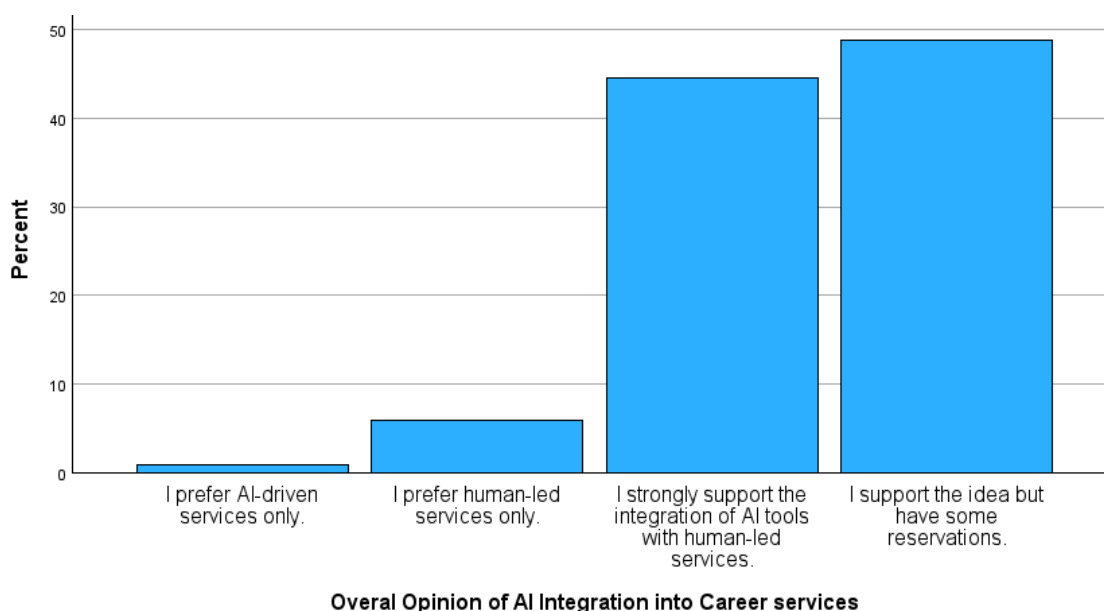
Source: Own Construct Based On Quantitative Primary Research

From the open-ended responses, it is evident that students view AI as an efficient and fast tool for specific tasks like job searches or resume reviews, but they also recognize the limitations of AI in providing the emotional support and personalized advice that human career counselors can offer. One student mentioned that "AI tools are faster and can go through many opportunities at once that we may not be aware of," emphasizing the efficiency of AI. However, this was tempered by the recognition that "a human experience and consciousness cannot be fully replaced by AI," highlighting the indispensable role of human counselors.

Support for AI Integration into Career Services

When asked about their overall opinion on combining AI tools with human-led career counseling services, nearly half of the respondents (44.4%) strongly supported the integration of AI with human services, while an additional 48.7% supported the idea but had some reservations. Only 6% of respondents preferred human-led services only, and less than 1% (0.9%) expressed a preference for AI-driven services exclusively.

Figure 12 Overall Opinion of AI Integration Into Career Services



Source: Own Construct Based On Quantitative Primary Research

This broad support for integrating AI tools into career services reflects a cautious optimism. Students appear to recognize the advantages of AI tools, such as the ability to streamline processes and provide real-time feedback, but they are also mindful of its limitations. One student stated, *"AI tools can be useful if used correctly as a tool, not as a replacement,"* a sentiment that aligns with the view that AI should complement rather than replace traditional career services.

Several students also emphasized the importance of balance. One respondent remarked, *"Both are unique in their own way. AI can't outsmart the help of humans."* Another commented, *"AI is still a new element in our lives... but it's not yet discovered widely here,"* reflecting an awareness of the potential of AI but also highlighting that trust in AI remains underdeveloped in certain contexts.

Reasons for Preference

The open-ended responses revealed several key themes regarding students' preferences for combining AI tools with traditional services. Many students highlighted efficiency and speed as the primary advantages of AI. One student explained, *"AI tools are faster and can help improve at our own pace,"* emphasizing the convenience and time-saving potential of AI, particularly for tasks like resume building and job searching.

However, many students underscored the importance of human interaction in career guidance. One student explained, *"I still prefer someone I can meet physically who I would be able to share*

my fears and desires with." This aligns with the recognition that human-led services are still seen as essential for more complex, emotionally-driven aspects of career planning, such as decision-making, interview preparation, and career counseling. Another respondent summed it up by stating, *"AI can give you suggestions or help organize your job search, but it doesn't know you the way a human counselor does."*

The idea of using both AI and human-led services together also resonated strongly with students. One respondent commented, *"Using both methods would optimize time and effort in my career building."* Another explained, *"AI can search faster and more effectively for jobs, but you need a human to provide more personal support and confidence."*

Interview Insights on AI and Traditional Career Services

The qualitative interviews provided deeper insights into these preferences. Most interviewees echoed the survey findings, expressing a preference for a hybrid model that combines the technical strengths of AI with the personal touch of human counselors. One student mentioned that *"AI tools are helpful for quick, technical fixes, but when it comes to important career decisions, I still prefer talking to someone who understands my situation and can provide advice tailored to me."*

Another student emphasized the importance of personal interaction, especially in contexts like interview preparation, where emotions and confidence play a significant role: *"AI might be able to simulate interviews, but it's not the same as having a real person guiding you and helping you overcome the nerves."*

Conclusion

The findings for Research Question 4 demonstrate that while students at the University of Szeged see significant value in integrating AI tools into career services, they are not willing to fully abandon traditional human-led services. A hybrid model—combining the efficiency of AI with the personalized support of human counselors—emerges as the preferred approach for the majority of students.

Students recognize the advantages of AI tools in tasks like resume building, job matching, and skill gap identification, where efficiency and data-driven insights are key. However, they still value the human element, particularly for tasks that require empathy, personal understanding, and emotional support. This balance between AI and human-led services provides the optimal solution for students, allowing them to take advantage of cutting-edge technology while still benefiting from the experience and guidance of career counselors.

The University of Szeged's career services should consider these preferences when developing future strategies, ensuring that AI tools are incorporated to enhance, rather than replace, the

essential human interaction that students clearly value. This dual approach will allow the university to provide a comprehensive career service that meets the needs of its diverse student body, maximizing the benefits of both AI technology and human expertise.

4.5. RQ 5: What specific AI functionalities, if any, do students believe would enhance the current career services?

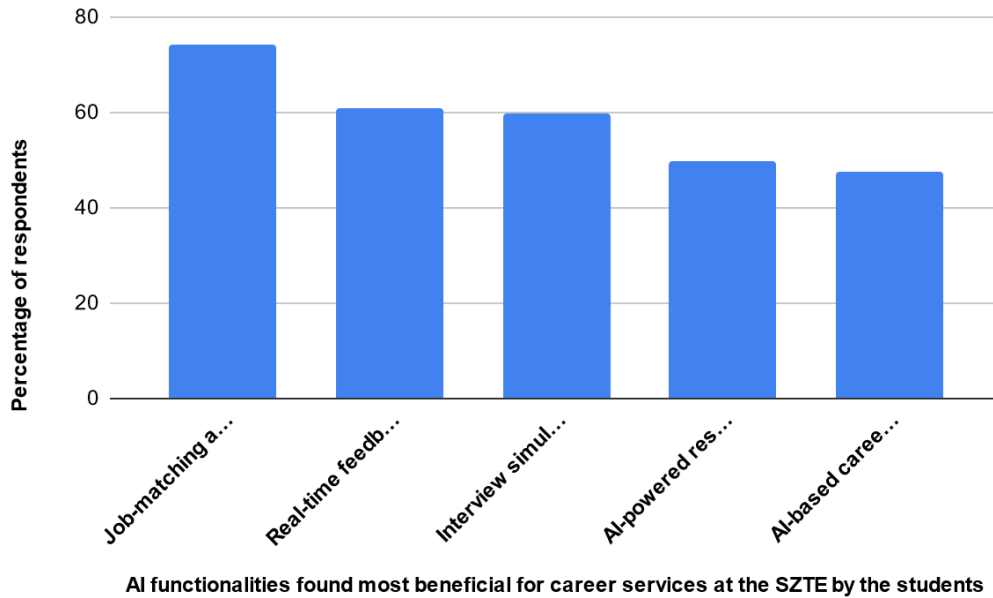
Findings

The survey results provide a comprehensive view of which AI functionalities students believe would be most beneficial to enhancing career services at the University of Szeged. The most preferred functionality, as expressed by 74.17% of respondents, was job-matching algorithms. Students see the potential of AI in efficiently matching them with job opportunities, helping them navigate the often overwhelming landscape of career choices. One student remarked in the interviews that AI could be particularly helpful in offering a "personalized analysis of the individual to help find the best option under seconds," which underscores the demand for more efficient job-matching processes.

In addition to job-matching, real-time feedback on job applications was highlighted as another crucial area of improvement, with 60.83% of students expressing support for this functionality. Students see value in receiving quick, actionable insights into their job application processes, which could help them improve their chances of success. This was echoed in the interviews, where one student noted that AI could “*provide real-time feedback, making the entire process much faster and more organized.*” This suggests that students are looking for AI to reduce waiting times and provide more transparent, consistent feedback.

A significant proportion of respondents (60%) also expressed interest in AI-powered interview simulations. Students believe that this technology could help them better prepare for job interviews by offering practice opportunities and personalized feedback based on AI-driven simulations. One student mentioned how AI could help simulate real-world interview scenarios, offering an advantage to students who might feel anxious or unsure about what to expect in professional settings. By practicing in a controlled, AI-driven environment, students could boost their confidence and preparedness for actual interviews.

Figure 13 AI Functionalities Found Most Beneficial For Career Services



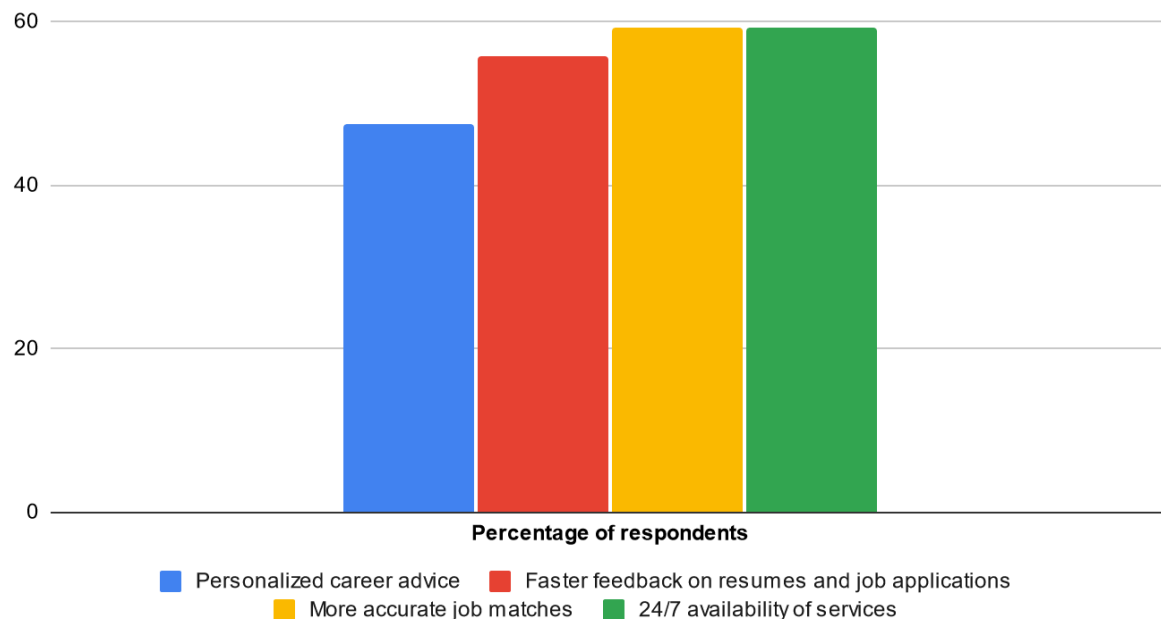
Source: Own Construct Based On Quantitative Primary Research

AI-powered resume reviews were seen as beneficial by 50% of respondents. In the qualitative responses, students suggested that AI could help "perfect resumes" by offering real-time, data-driven recommendations for improvement. One interviewee mentioned that AI could *"help fine-tune resumes with more accurate feedback based on metadata and job market trends,"* which would help students present themselves in the best possible light to potential employers.

Lastly, AI-based career counseling recommendations were valued by 47.5% of respondents, indicating that many students see potential in AI offering personalized advice tailored to their career paths. However, while students recognize the value of AI in offering technical and data-driven support, many still believe that human interaction is essential in providing deeper, more empathetic guidance. One student commented that while AI can "filter out the best-fitting job for each individual," human counselors are better equipped to understand emotional factors, such as career aspirations or personal challenges.

The survey also revealed the areas of career services that students believe could be most improved by AI. More accurate job matches (59.17%) and faster feedback on resumes and job applications (55.83%) were ranked highly by students. These preferences align closely with the AI functionalities that students found most beneficial, suggesting that they expect AI to make the job search and application process more efficient and accurate. One student explained that AI could help by "analyzing each individual with higher accuracy and deeper awareness of possible matching opportunities," indicating that students value AI's ability to process vast amounts of data and offer precise recommendations.

Figure 14 Areas of Career Services To Be Improved The Most Through AI



Source: Own Construct Based On Quantitative Primary Research

24/7 availability of services was also a popular improvement area, with 59.17% of respondents noting that AI's ability to provide support at any time is a significant advantage. Several students mentioned in the interviews that AI's continuous availability would allow them to access career support whenever they need it, without having to wait for traditional office hours. As one student put it, *"AI could offer personalized career advice without judgment, and it would be available 24/7, which is much more accessible."* This aligns with the growing demand for flexible, on-demand services among students.

The qualitative data further reinforced the importance of personalized career guidance. Many students mentioned that AI could provide tailored advice based on their individual needs, helping them navigate their career options more effectively. One student suggested that AI could be used to create a "personalized career pathway, offering advice based on interests, skills, and job market trends," which would help students make more informed decisions about their career choices.

Additionally, students pointed out the benefit of AI in reducing bias and creating a more equitable career services experience. One interviewee noted that AI *"could start everyone at the same level without prejudice,"* emphasizing the potential for AI to provide impartial and unbiased career advice, which could be especially valuable for students who may feel marginalized by traditional career services.

On the practical side, students offered suggestions for integrating AI into the university's career services. One common theme from the interviews was the idea of incorporating an AI-powered chatbot into the career services platform or the university's websites including the official website and or Coospace and Neptune. As one student explained, a chatbot could *"help answer common questions quickly and direct students to the right resources,"* allowing human counselors to focus on more complex, personalized support. This practical suggestion reflects students' desire to blend the efficiency of AI with the empathy and experience of human counselors.

Conclusion

The findings indicate that students at the University of Szeged see significant potential in using AI to enhance career services. They particularly value AI's ability to provide job-matching algorithms, real-time feedback, interview simulations, and personalized career advice. However, students also recognize the importance of maintaining human interaction in career counseling, particularly for more complex, emotionally-driven decisions. The integration of AI should, therefore, focus on complementing traditional services, offering efficiency and personalization while preserving the empathetic, nuanced guidance that only human counselors can provide.

5. DISCUSSION AND IMPLICATIONS

5.1. Interpretation of Findings

The findings of this study provide valuable insights into students' perceptions of career services at the University of Szeged and their attitudes toward the integration of AI into these services. The results reflect both the opportunities and challenges that exist within the current career services framework and suggest potential ways forward to enhance student engagement and outcomes.

Engagement with Career Services

One of the key findings of the study was that a significant proportion of students at the University of Szeged do not actively engage with career services. The survey revealed that 70% of students had never used these services, with the primary reason being a lack of awareness (52.5% of respondents). This suggests a critical gap in communication between the career services and the student population. The lack of awareness aligns with similar findings in the literature, where the importance of visibility and promotion of career services is often highlighted as a determinant of student engagement (Bridgstock, 2019). Universities that proactively communicate the value of their services through targeted campaigns or embedding

career services into the curriculum tend to achieve higher levels of student participation (Vinson, Reardon, & Bertoch, 2014).

Moreover, students who do use the career services report that they find them only moderately useful. Services such as internships, resume workshops, and job placement assistance scored average ratings in the survey, which indicates that while students recognize their value, there is significant room for improvement. The dissatisfaction with the relevance of career services for non-business students, such as those in creative fields, is consistent with Tomlinson's (2017) argument that career services need to be tailored to diverse academic disciplines and future career paths. The data suggests that career services at the University of Szeged could benefit from greater customization, ensuring that offerings are relevant to students across all faculties.

AI in Career Services: Awareness and Adoption

While there is substantial awareness of AI tools for career planning (61% of students), the actual usage of these tools remains relatively low, with only 48.3% of respondents indicating that they use AI-driven platforms such as LinkedIn, resume analyzers, or job-matching algorithms. This gap between awareness and usage could be explained by several factors, including a lack of understanding of how to leverage AI tools effectively or simply a preference for more traditional, human-led career services. This finding corresponds with the Unified Theory of Acceptance and Use of Technology (UTAUT), which highlights that both performance expectancy (how useful the technology is perceived to be) and effort expectancy (how easy it is to use) play a significant role in determining whether users adopt new technologies (Venkatesh et al., 2003).

The results of this study suggest that while students are open to using AI for practical, task-driven purposes—such as resume building and job searching—many still prefer the human element for more complex and emotionally nuanced aspects of career planning, such as counseling and interview preparation. This reflects previous studies that underscore the importance of maintaining a balance between AI and human-led services in education and career guidance (Holmes et al., 2019).

Preference for a Hybrid Model

One of the most significant findings is that the majority of students (66.9%) expressed a preference for a hybrid model of career services that integrates both AI tools and human-led support. This aligns with previous literature suggesting that while AI can enhance efficiency, personalization, and access to data-driven insights, it cannot fully replicate the human aspects of career counseling, such as empathy, emotional support, and personalized advice (Holmes, Bialik, & Fadel, 2019). The UTAUT model proved useful in explaining this hybrid preference, as social influence and facilitating conditions (such as the availability of AI tools and institutional support) also emerged as key factors in students' willingness to adopt AI in career services.

The Role of the UTAUT Model in Achieving Research Objectives

The Unified Theory of Acceptance and Use of Technology (UTAUT) model was instrumental in structuring this research and helping achieve its objectives. The model provided a clear framework for exploring how students at the University of Szeged perceive the usefulness and ease of use of AI tools in career services, as well as the social and institutional factors that influence their adoption of these technologies.

The four key constructs of UTAUT—performance expectancy, effort expectancy, social influence, and facilitating conditions—were central to shaping the research questions and survey design. These constructs allowed the study to assess not only how students view AI in terms of its practical benefits (performance expectancy) but also the ease with which they could integrate these tools into their career planning processes (effort expectancy). For instance, students reported favoring AI tools for task-specific purposes like resume reviews and job-matching algorithms, suggesting that AI is seen as both efficient and user-friendly for these tasks. This aligns with the UTAUT model's assumption that perceived usefulness and ease of use drive technology adoption.

Moreover, the social influence factor within UTAUT helped capture the role of peers, professors, and institutional support in shaping students' attitudes toward AI tools. Many students indicated that they were aware of AI tools through classmates or external platforms (e.g., LinkedIn), and this social exposure was a factor in their adoption of these tools. This illustrates the importance of social influence in the technology adoption process, as outlined by the UTAUT model.

Facilitating conditions, such as the availability of technology and institutional support for AI, also played a critical role in this research. The study revealed that while students were open to using AI, many were unsure how to access or fully utilize these tools within the university's existing career services framework. This gap between potential use and actual use demonstrates that institutional support, including access to workshops or informational resources about AI, is necessary to foster greater engagement.

By applying the UTAUT model, the research effectively met its objectives by identifying the key factors influencing students' perceptions and usage of AI in career services. The model provided a comprehensive lens to examine not only individual attitudes toward AI tools but also the broader social and organizational contexts that affect their adoption. This holistic approach was critical in understanding the nuanced reasons behind students' preferences for a hybrid model of AI and human-led career services, as well as identifying the areas where institutional improvements could be made.

5.2. Implications

Practical Implications for Career Services at the University of Szeged

The findings have several practical implications for the University of Szeged's career services. First and foremost, raising awareness about the existence and potential benefits of career services is essential. Targeted outreach, possibly integrated into academic programs or first-year orientations, could help bridge the awareness gap identified in the survey.

Second, there is a clear demand for more personalized and field-specific career support. Career services could consider expanding their offerings to better cater to students in non-business fields, such as the arts or sciences, where traditional job placement services may not be as relevant. Additionally, there is an opportunity to develop more international student-focused resources, addressing the needs of a diverse student body, as many international students felt underserved by current offerings.

Third, the integration of AI into career services presents a significant opportunity to enhance both efficiency and effectiveness. One of the most significant findings from this study is the preference among students for a hybrid model that integrates both AI tools and human-led career services. By introducing AI-powered tools like job-matching algorithms, resume analyzers, and interview simulations, the University can provide students with tailored, real-time feedback that complements traditional services. One practical recommendation is to implement AI-powered chatbots on the university's existing digital platforms, such as the official website of the Career Office, Neptune (the academic management system), and Coospace (the e-learning platform). Integrating chatbots into these platforms could offer continuous, real-time assistance to students, complementing the traditional services provided by the Career Office. Chatbots could be designed to handle a variety of tasks, such as answering frequently asked questions related to career guidance, providing job and internship recommendations tailored to students' academic backgrounds, and offering advice on career paths based on students' individual progress in their degree programs. By connecting the chatbot to systems like Neptune and Coospace, it could analyze student data—such as course credits, academic performance, and career goals—thereby enabling the chatbot to offer personalized career advice, including recommendations for internships or job openings relevant to a student's field of study.

In addition to personalized job-matching services, chatbots could also assist students with resume building and reviewing by using AI-powered tools to provide real-time feedback on their resumes. Students could receive suggestions on improving their CVs, optimizing keywords for job markets, and highlighting relevant skills and experiences. This would not only help students refine their applications but also speed up the process of job or internship searches, as they would receive feedback and guidance without having to wait for an appointment with a career counselor.

Moreover, implementing chatbots on these platforms would extend the availability of career services beyond the regular office hours of the Career Office. The 24/7 accessibility of AI-powered chatbots would cater to students who need support outside of business hours, making career guidance more flexible and responsive to the diverse schedules of students. This is particularly valuable for students balancing academic work with part-time jobs or other commitments, as well as international students who may face additional challenges in navigating the local job market or accessing career advice in their non-native language.

The potential for AI-powered chatbots to enhance university services is already demonstrated in institutions like the Georgia Institute of Technology, which uses the AI chatbot Jill Watson to answer students' routine queries, and Deakin University in Australia, where the AI assistant Genie helps students with a range of queries, including those related to career planning. As mentioned in the literature review, these chatbots have proven to be effective in providing personalized, automated support that complements human-led services (Holmes, Bialik, & Fadel, 2019). By adopting a similar approach, the University of Szeged could leverage AI technology to offer students enhanced, continuous access to career services.

This proposal would also allow students to handle basic career-related administrative tasks more efficiently. For example, students could use chatbots to register for career-related workshops, book appointments with career counselors, or access relevant resources directly through the platforms they already use for their academic activities, such as Neptune and Coospace. The integration of these systems would streamline the student experience by centralizing access to career services and reducing the need for multiple, fragmented systems.

It is important to emphasize that these AI-driven chatbots should not replace human counselors but instead work alongside them to provide a more comprehensive and effective service. While chatbots can offer efficient, task-oriented assistance and handle routine queries, they cannot replace the empathy, nuanced advice, and emotional support that human career counselors provide, especially for complex career decisions. Students who participated in this study expressed the importance of maintaining personal connections with career counselors, particularly when it comes to making significant decisions about their career paths, interview preparation, or navigating challenging situations in the job market. Thus, the implementation of chatbots should be seen as a complementary solution that enhances the accessibility of services, while leaving space for the human element in more personalized and emotionally-driven aspects of career counseling.

Furthermore, the use of AI-powered chatbots could help the Career Office manage its workload more efficiently, allowing counselors to focus on more complex, personalized support, while the chatbot handles routine tasks. This dual approach of AI and human interaction would create a more responsive and scalable system, ensuring that career services can meet the growing and diverse needs of the student population at the University of Szeged.

Broader Impacts

Beyond the University of Szeged, this study's findings could inform career services in other higher education institutions, particularly in Central and Eastern Europe, where the integration of AI remains limited. As universities worldwide grapple with the challenges of preparing students for a rapidly changing job market, the adoption of AI in career services could be a game-changer. By offering more personalized, data-driven career guidance, AI has the potential to enhance employability and job readiness for graduates. Universities that successfully integrate AI tools into their career services could see improved student outcomes, including higher rates of job placement and satisfaction with career services.

Additionally, the integration of AI tools, such as chatbots, into university platforms also aligns with global trends towards digital transformation in education. As universities increasingly digitize their operations, integrating AI into student support services could serve as a key differentiator in attracting tech-savvy students who expect high-quality, technology-enhanced educational experiences. Ultimately, this hybrid model of AI and human-led services could become a benchmark for how universities can modernize their support systems to remain competitive and relevant in an increasingly technology-driven world.

5.3. Limitations of the study and Future Research

While this study provides valuable insights into the perceptions of students at the University of Szeged, several limitations should be acknowledged.

Sample Size and Representation

Another limitation of the study lies in its sample size and demographic representation. While the study surveyed 120 students, which is appropriate for exploring general trends, it might not be fully representative of the diverse student population at the University of Szeged. The results may not capture the experiences of smaller student groups, such as international students or students from less-represented faculties, as thoroughly as needed.

Similarly, the study used a convenience sampling method, where participants self-selected to take part in the research. This method does not guarantee a representative sample, as the survey was distributed online, and participation was voluntary. As a result, certain faculties may have been overrepresented in the sample. For instance, the study showed an overrepresentation of students from the Faculty of Economics and Business, which could skew the findings toward the needs and perspectives of students from this faculty. Given this limitation, the findings may not fully reflect the diversity of the entire student population. Future research should consider using a more structured sampling method, such as stratified random sampling, to ensure that all faculties and disciplines are proportionately represented, thereby providing a more comprehensive understanding of students' perceptions across the university.

Generalizability

The findings of this study are context-specific to the University of Szeged, particularly within a Central and Eastern European context, which may limit the generalizability of the results to other institutions. Cultural, economic, and institutional differences between universities in different regions may affect how students perceive and engage with both career services and AI tools. For instance, universities in Western Europe or North America, where AI integration in higher education is more advanced, may exhibit different student attitudes toward AI tools.

Future research could expand this study to a broader range of institutions, both within Hungary and internationally, to compare how different cultural and institutional contexts shape student perceptions of AI in career services. Such comparative studies would provide more robust insights into how different factors—such as regional technological infrastructure, institutional support, and workforce demands—affect the adoption and perceived usefulness of AI tools in higher education.

Self-Reported Data

The reliance on self-reported data is another limitation that could influence the accuracy of the findings. Students were asked to reflect on their own use of career services and AI tools, as well as their perceptions of these services. Self-reported data is subject to biases such as social desirability bias, where students might provide answers they believe are expected of them, rather than what truly reflects their experiences. Similarly, recall bias could have affected the accuracy of their reported engagement with career services or AI tools.

To mitigate this limitation, future research could incorporate observational data or case studies to complement self-reported data. For example, tracking actual usage of career services and AI tools through university systems could provide more objective data on student engagement. Combining quantitative survey data with such observational methods could lead to a more nuanced understanding of how and why students use career services and AI tools.

Lack of Input from Career Counselors

The study did not explore the perspectives of career counselors themselves, who are key stakeholders in the adoption of AI in career services. Understanding their views on how AI might influence their work and the overall delivery of career guidance could add an important dimension to the discussion.

Future research could address this gap by conducting interviews or surveys with career counselors to understand their views on AI integration and its potential to enhance or challenge their roles. Counselors may have valuable insights into the feasibility of AI adoption, potential barriers, and how they could balance their work with AI-driven systems to provide a more

personalized, effective service to students. Including career counselors in the research could help inform more balanced recommendations and create a more collaborative approach to implementing AI in career services.

Focus on Student Perceptions

While this study provides valuable insights into student perceptions, another limitation is the exclusive focus on the student perspective. Career services are multi-faceted systems that involve multiple stakeholders, including university administrators, employers, and career counselors. Each of these groups has a unique perspective on how career services should be structured and how AI might impact the effectiveness of these services.

Future research could take a more multi-stakeholder approach, incorporating the views of employers who collaborate with university career services, as well as the career counselors themselves, as mentioned earlier. Employers could provide insights into whether AI-enhanced career services are aligned with the skills and attributes they seek in graduates, while administrators might offer a broader perspective on the institutional challenges of integrating AI into student services.

Technological Readiness

Finally, the study did not directly assess the technological readiness of the University of Szeged to integrate AI tools into its career services. While the research explored student perceptions of AI, it did not examine the current state of the university's digital infrastructure or its capacity to support such innovations. AI integration requires not only student acceptance but also sufficient technological resources, staff training, and institutional commitment to maintaining and updating AI systems. Without assessing these aspects, it remains unclear how feasible AI integration would be in the short term.

Future research could evaluate the institutional capacity for AI adoption, including the availability of financial resources, technological infrastructure, and the readiness of staff to support AI-enhanced services. This would provide a more comprehensive view of the challenges and opportunities associated with implementing AI in career services.

Lack of Longitudinal data

Finally, another limitation is the lack of longitudinal data. The study captures a snapshot of students' attitudes toward career services and AI tools at a single point in time. However, attitudes toward AI are rapidly evolving, and it would be beneficial to conduct follow-up studies to track changes over time as AI tools become more widespread and integrated into university services.

6. CONCLUSION

This thesis set out to explore the perceptions of students at the University of Szeged regarding the university's career services and their attitudes toward the potential integration of Artificial Intelligence (AI) tools to enhance these services. With the rapid advancements in AI and the increasing pressure on higher education institutions to equip students with the skills necessary to thrive in the 21st-century job market, using a mixed-methods approach, combining both quantitative surveys and qualitative interviews, the study sought to understand the extent to which students engage with existing career services, the effectiveness of these services from their perspective, and their openness to technological innovations such as AI.

The primary objective of the research was to investigate students' perceptions of career services at the University of Szeged and their attitudes toward incorporating AI tools to improve career guidance. To achieve this, the study focused on answering five key research questions:

1. Do students at the University of Szeged actively use career services, and what are the main reasons for their use or non-use?
2. How do students perceive the effectiveness of career services in supporting their career development, and what improvements do they suggest?
3. Are students aware of AI tools that could be integrated into career services, and do they personally use any AI tools for career planning?
4. How do students feel about the integration of AI into career services, and would they prefer using AI tools alongside or instead of traditional, human-led services?
5. What specific AI functionalities do students believe would enhance the current career services?

Summary of Key Findings

The study revealed several important insights regarding student engagement with career services at the University of Szeged. A significant proportion of students (70%) do not actively use the university's career services. The primary reasons for this low engagement include a lack of awareness about the available services (52.5%), a perception that the services do not meet their specific needs (21.67%), and a preference for seeking career support through other means (11.67%).

For those students who do use the career services, their perceptions of the effectiveness were generally moderate. Services such as internships, resume workshops, and job placement assistance were seen as somewhat useful, but there is room for improvement. In particular, students indicated a need for more field-specific guidance, especially for non-business faculties. They also suggested increasing awareness of the services, tailoring them more closely to different academic fields, and providing more opportunities for international students.

In terms of AI awareness and usage, while 61% of students are aware of AI tools that could assist with career planning, only 48.3% actively use them. The most commonly utilized AI tools include LinkedIn job-matching and AI-powered resume reviewers. This points to a gap between awareness and usage, with many students being aware of AI tools but not consistently relying on them for their career planning needs.

The majority of students (66.9%) expressed a preference for a hybrid approach that combines AI-driven tools with traditional, human-led career services. They appreciated the efficiency of AI for specific tasks, such as job-matching and resume feedback, but still valued the personalized support and emotional guidance offered by human counselors, particularly for complex career decisions.

Several key AI functionalities were identified by students as enhancements to current career services. These included job-matching algorithms (74.17%), real-time feedback on resumes (60.83%), and AI-powered interview simulations (60%). There was a strong demand for AI tools to provide personalized, data-driven career guidance while maintaining human interaction for more nuanced and emotionally supportive career counseling.

Implications of the Findings

The findings have several practical implications for the University of Szeged's career services. First, the university should prioritize raising awareness about its existing career services, particularly for students from non-business faculties and international students who feel that the current offerings do not meet their specific needs. More targeted outreach through academic programs, faculty involvement, and digital communication could help bridge the gap in awareness. Second, the integration of AI tools into career services presents a significant opportunity to enhance personalization, efficiency, and accessibility. AI-powered chatbots, as suggested in this study, could be implemented on platforms like the Career Office website, Neptune, and Coospace to provide 24/7 assistance to students, offering job recommendations, resume feedback, and real-time support. This would complement the work of human career counselors, ensuring that students receive both personalized, empathetic support and the efficiency of automated, data-driven tools.

Lastly, the findings suggest that students at the University of Szeged are generally open to innovation in career services, particularly if these innovations can improve the relevance and accessibility of career guidance. The university has the potential to serve as a model for other institutions by adopting a hybrid model that leverages both AI and human interaction in career counseling.

Limitations of the Study

Several limitations should be acknowledged in this study. First, the study focused solely on the perceptions of students, without incorporating the perspectives of career counselors or other key stakeholders, such as employers. Including these perspectives could have provided a more holistic understanding of the potential challenges and benefits of AI integration in career services. Second, the sampling method used was convenience sampling, as the survey was distributed online and participants self-selected to participate. This method does not ensure representativeness of the broader student population, which may limit the generalizability of the findings. Third, the sample size, while sufficient for identifying general trends, may not fully capture the diversity of experiences among the university's student population, particularly in smaller faculties. Future research could aim to include a more representative sample across all disciplines and student demographics. Additionally, the reliance on self-reported data introduces the possibility of biases, such as social desirability bias, which may affect the accuracy of the findings. Finally, the study did not assess the technological readiness of the university to implement AI tools, which could affect the feasibility of these recommendations in the short term.

Recommendations for Future Research

Future research could build on this study by incorporating the views of career counselors and employers to better understand how AI could complement traditional career services. Additionally, exploring the institutional and technological readiness of universities to integrate AI tools would provide deeper insights into the practical challenges of implementing these technologies. Comparative studies across different universities and regions could also shed light on how cultural, economic, and institutional factors influence the adoption of AI in career services. Finally, longitudinal studies could track how student attitudes and behaviors regarding AI in career services evolve over time, offering a deeper understanding of its long-term impact on career readiness and employability outcomes.

Final Thoughts

In conclusion, this study contributes to the growing body of literature on the effectiveness of career services from the students' perspective and the integration of AI in higher education by exploring its potential in enhancing these services. While students at the University of Szeged recognize the value of both AI tools and human-led services, there is a clear demand for more accessible, personalized, and technologically advanced solutions. By adopting a hybrid model that combines the strengths of AI and human interaction, the university can better meet the evolving needs of its students and ensure that its career services remain relevant in an increasingly technology-driven job market. The findings of this research have the potential to inform both institutional practices at the University of Szeged and broader discussions on the future of career services in higher education.

7. REFERENCES

- Bridgstock, R. (2019). University career services and employability: Learning from strategic and operational approaches. *Studies in Higher Education*, 44(6), 1030-1044.
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). London: Routledge.
https://books.google.hu/books/about/Research_Methods_in_Education.html?id=uMI5vgAACAAJ&redir_esc=y
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). London: Sage Publications.
https://www.ucg.ac.me/skladiste/blog_609332/objava_105202/fajlovi/Creswell.pdf
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). Hoboken: John Wiley & Sons.
https://www.researchgate.net/publication/378082896_Internet_Phone_Mail_and_Mixed-Mode_Surveys_The_Tailored_Design_Method
- Fahd, K., Venkatraman, S., Miah, S. J., et al. (2022). Application of machine learning in higher education to assess student academic performance, at-risk, and attrition: A meta-analysis of literature. *Educational Information Technology*, 27, 3743–3775.
<https://doi.org/10.1007/s10639-021-10741-7>
- Gallup & Purdue University. (2014). *Great jobs, great lives: The 2014 Gallup-Purdue Index report*. <https://www.luminafoundation.org/resource/great-jobs-great-lives/>
- Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep learning*. MIT Press.
<http://www.deeplearningbook.org/>
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 59–82.
<https://doi.org/10.1177/1525822X05279903>
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.

Joo, Y. J., Lee, S., & Ham, Y. (2014). The acceptance of e-learning services in higher education: A comparative study in the U.S. and Korea. *The Internet and Higher Education*, 17, 33-45.

Kolanovic, M., & Krishnamachari, S. (2017). *Big data and AI strategies: Machine learning and alternative data approach to investing*. J.P. Morgan Global Research. <https://faculty.sites.uci.edu/dist/2/51/files/2018/05/JPM-2017-MachineLearningInvestments.pdf>

LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature*, 521(7553), 436-444. <https://doi.org/10.1038/nature14539>

Long, P., & Siemens, G. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review*, 46(5), 31-40. <https://er.educause.edu/articles/2011/9/penetrating-the-fog-analytics-in-learning-and-education>

Pane, J. F., Griffin, B. A., McCaffrey, D. F., & Karam, R. (2014). Effectiveness of Cognitive Tutor Algebra I at scale. *Educational Evaluation and Policy Analysis*, 36(2), 127-144. <https://doi.org/10.3102/0162373713507480>

Pardo, A., Mirriahi, N., Dawson, S., & Gašević, D. (2017). Using learning analytics to scale the provision of personalised feedback. *British Journal of Educational Technology*, 48(6), 1468-1479. <https://doi.org/10.1111/bjet.12592>

Reardon, R. C., Vinson, B. M., & Bertoch, S. C. (2014). Career services at colleges and universities: A 30-year replication study. *Journal of College Student Development*, 55(2), 203-207. <https://doi.org/10.1353/csd.2014.0018>

Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers & Education*, 57(4), 2432-2440. <https://doi.org/10.1016/j.compedu.2011.06.008>

Tomlinson, M. (2017). Career capital in global kaleidoscope careers: The role of organizational support. *Journal of World Business*, 52(2), 270-280. <https://doi.org/10.1016/j.jwb.2016.12.001>

Trochim, W. M., & Donnelly, J. P. (2008). *Research methods knowledge base* (3rd ed.). Mason, OH: Atomic Dog Publishing. <https://archive.org/details/researchmethodsk0003troch>

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478. <https://doi.org/10.2307/30036540>

