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Perceived AI and Digital Literacy for Learning among University Students

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Abstract: As digital technologies and artificial intelligence (AI) become more embedded in higher education, there is still limited empirical evidence on how students perceive their own AI and digital literacy in learning contexts. This study explores university students' perceived AI and digital literacy using survey data collected from 118 undergraduates at a university in Seoul, Korea. The instrument focused on students' self-reported competence in using digital tools and AI-supported resources for academic purposes. The findings show that students generally reported moderate to relatively high levels of AI and digital literacy. They expressed greater confidence in tasks such as document creation and information gathering, while reporting comparatively lower confidence in areas such as advanced search strategies and the use of digital content creation tools. No statistically significant differences were identified by gender or academic year, although slight variations appeared in specific skills. Overall, the results suggest that students are comfortable with routine uses of digital technologies but may require further support in developing more advanced and critical digital skills. These findings point to the importance of providing structured learning opportunities to strengthen higher-order AI and digital literacy in higher education settings.

Keywords: Artificial Intelligence Literacy; Digital Literacy; Digital Competence; University Students; Higher Education

1. Introduction

Digital technologies and artificial intelligence (AI) are now deeply embedded in higher education settings. In particular, the growing use of generative AI tools and digital platforms has reshaped how students approach learning tasks. For instance, university students increasingly rely on these technologies when searching for information, reviewing course materials, communicating with peers, and completing assignments. Given this shift, the ability to use digital technologies effectively is no longer optional. It has become a key competency for students navigating contemporary academic environments.

Against this backdrop, the concept of digital literacy has gained increasing attention in educational research. Digital literacy is generally defined as the ability to use digital technologies to locate, evaluate, create, and communicate information. As digital technologies become deeply integrated into learning processes, the concept of digital literacy has expanded beyond basic technical skills to encompass higher-order competencies such as critical evaluation of information, digital problem-solving, and digital content creation. More recently, with the growing use of AI technologies in education, the concept of AI literacy has also emerged. AI literacy refers to learners' ability to understand and appropriately use AI-based technologies, as well as to critically interpret AI-generated information.

Previous research on digital literacy has steadily increased; however, a substantial portion of these studies has focused on instructors or on students' perceptions of instructors' digital literacy [1–4]. These studies have emphasized the importance of instructors' digital competencies in shaping the quality of education and learning environments in higher education. Nevertheless, students are the primary users of digital technologies and AI tools in learning contexts, and understanding their digital competencies represents an equally important research area.

Studies focusing on students have shown that university students actively use digital technologies across various learning activities. For example, activities such as online information searching, digital document production, and the use of collaborative platforms play an important role in students' everyday learning processes. At the same time, previous studies indicate that university students' digital competence often remains at an intermediate level. In particular, lower levels of proficiency have been observed in areas such as information literacy and digital content creation [5]. These patterns imply that digital literacy cannot be reduced to basic technical skills alone, but also involves broader cognitive and critical abilities.

Previous research has explored whether digital literacy differs across individual characteristics such as gender and academic year [6,7]. Some earlier studies reported that male students tend to show higher levels of digital technology use in certain areas [8]. More recent work, however, points to a gradual reduction in these differences as access to digital technologies becomes more widespread. For example, Lucas et al. found slightly higher digital competence among male students, while also emphasizing that such findings remain part of an ongoing discussion rather than a consistent pattern [8].

A similar lack of consensus can be seen in relation to academic year. While some studies suggest that digital competence increases as students progress through university, others indicate that such differences are not clearly observable, as digital skills may also develop through everyday use of technology. Comparable patterns have been reported in studies of instructors. Inamorato dos Santos et al., for instance, found that higher education instructors generally exhibited intermediate levels of digital competence, with no significant differences by age or gender [7]. Likewise, Silva-Quiroz and Morales-Morgado reported that students' digital competence tends to remain at an intermediate level and is influenced by contextual factors such as educational background and learning environment [5]. Taken together, these findings suggest that digital competence cannot be fully explained by demographic variables alone.

Despite increasing attention to digital literacy, relatively few studies have examined how university students perceive their own digital and AI-related competencies within specific learning contexts. Much of the existing research has focused on instructors or on students' perceptions of instructors' competencies, leaving students' own perspectives underexplored. This gap is important, as students' self-perceptions may shape their confidence, engagement, and willingness to adopt digital and AI-based tools in learning environments.

In response to this gap, the present study focuses on university students' perceived AI and digital literacy. Specifically, it examines overall levels of perceived competence and explores whether differences are associated with gender and academic year. The study addresses the following research questions:

What is the level of university students' perceived AI and digital literacy?

Are there differences in perceived AI and digital literacy according to gender?

Are there differences in perceived AI and digital literacy according to academic year?

The findings are expected to contribute to a better understanding of students' self-perceived digital competence and to provide practical implications for supporting the integration of AI and digital technologies in higher education.

2. Literature Review

The ongoing advancement of information and communication technologies (ICT) has brought substantial changes to how knowledge is created, accessed, and shared in contemporary society. Within higher education, these developments have reshaped learning environments, increasing the importance of students' ability to engage effectively with digital tools in both academic and professional contexts [7,9]. As digital technologies continue to be integrated into teaching and learning practices, the development of students' digital competence has become a central concern for universities.

Traditionally, literacy was understood in terms of basic skills such as reading, writing, and numeracy. With the rise of digital technologies, however, this concept has expanded considerably. Literacy now includes the ability

to interpret and use multimedia content, visual information, and various forms of digital communication [10,11]. In this sense, technological change has not only introduced new tools but has also reshaped how literacy itself is defined and practiced in modern society [12,13]. As a result, individuals are increasingly expected to develop a broader set of competencies to navigate complex digital environments.

Within this broader perspective, the terms digital literacy and digital competence are frequently used, often with overlapping meanings. While some researchers attempt to distinguish between the two, many use them interchangeably to refer to the ability to access, evaluate, and use digital information effectively [7,14,15]. Digital literacy is generally treated as a multidimensional construct that goes beyond technical skills to include cognitive, social, and critical dimensions of digital engagement. More recently, the widespread use of artificial intelligence (AI) in education has further expanded this concept. AI literacy, in particular, highlights learners' ability to understand, evaluate, and appropriately use AI-generated information, suggesting that contemporary digital competence increasingly involves both digital and AI-related capabilities.

In this context, digital literacy should not be reduced to the ability to operate devices or software. It also involves a range of higher-order skills, including searching for information, assessing its credibility, solving problems using digital tools, communicating through online platforms, and creating digital content [16]. These competencies are now widely recognized as essential components of learning in higher education, where digital technologies are embedded in everyday academic practices.

As interest in digital literacy has grown, a considerable number of studies have examined university students' digital competencies. Many of these studies rely on survey-based self-assessment instruments, which capture students' perceptions of their own abilities [6]. Such approaches are useful for understanding how learners view their digital skills and how confident they feel when using digital technologies in learning environments. In addition, self-report data have often been used to compare digital competence across different groups, including gender and academic level.

A range of factors has been identified as potentially influencing digital literacy. These include demographic characteristics such as age and gender, as well as contextual elements such as prior experience with technology, educational settings, and access to digital resources [16–18]. However, the role of gender remains unclear. While some studies report no meaningful differences [19], others suggest that certain background factors may contribute to variation in digital competence. The lack of consistent findings points to the need for further investigation in specific educational contexts.

Digital literacy is also shaped by the interaction between individual and environmental factors. On the one hand, personal experiences with technology and attitudes toward its use can influence the development of digital skills. On the other hand, institutional conditions—such as infrastructure, access to digital tools, and the availability of educational support—play an equally important role [20,21]. These perspectives highlight that digital literacy should be understood not only as an individual attribute but also as something that is embedded within a broader learning context [22–24]. In addition, although some studies have explored whether digital competence develops across academic years, the findings remain mixed, indicating that this issue requires further empirical examination.

Despite the growing body of literature, there is still a need for research that focuses specifically on how university students perceive their own digital and AI-related competencies within particular educational settings. Much of the existing work has either focused on instructors or examined students' perceptions of instructors' digital competence, leaving students' own perspectives relatively underexplored. Examining students' self-reported perceptions is important, as these perceptions may influence their confidence, engagement, and willingness to use digital and AI-based tools in learning contexts. Understanding these perceptions can therefore provide useful insights into how digital learning environments function in higher education and how they can be improved.

3. Method

This study adopted a quantitative survey design to investigate university students' perceived AI and digital literacy within a higher education context. The research focused on how students evaluate their own ability to use digital technologies and AI-related tools for learning purposes. Data were collected using a structured questionnaire administered to undergraduate students. In addition to examining overall levels of perceived AI and digital literacy, the study also explored potential differences across gender and academic year, as well as broader patterns in students' digital learning practices.

3.1. Participants

Participants were undergraduate students enrolled at a university in Seoul, Korea. A convenience sampling approach was used, primarily due to accessibility within the researcher's institutional context. The survey was conducted at the end of the 2025 fall semester, a period when students had accumulated sufficient experience with digital and AI-supported learning activities. Prior to participation, students were informed about the purpose of the study and provided informed consent. Participation was entirely voluntary, and students were assured that they could withdraw at any point without any disadvantage.

A total of 118 valid responses were included in the final analysis. The participants' mean age was 20.66 years (SD = 1.68), with an age range from 19 to 26 years. In terms of gender distribution, 71 participants (60.2%) were male and 47 (39.8%) were female. Students from multiple academic years were represented in the sample, allowing for comparison across different stages of university study rather than focusing on a single cohort.

3.2. Instrument

A structured questionnaire was employed to examine university students' perceived AI and digital literacy in learning contexts. The instrument was derived from the digital proficiency questionnaire developed by Lucas et al. [8], which was originally designed to assess students' digital competence based on the European Digital Competence Framework for Citizens (DigComp) [25]. Within this framework, digital competence is organized into five broad areas: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving. Together, these domains represent a comprehensive range of skills required for effective participation in contemporary digital environments. In this study, these domains were operationalized as a framework for organizing and adapting the questionnaire items to assess students' perceived AI and digital literacy in learning contexts.

Drawing on the original instrument, the questionnaire used in this study was adapted to better reflect the context of Korean higher education as well as the increasing role of AI tools in learning environments [8]. In particular, several items were revised to incorporate the use of AI-based technologies for information search and learning support. To enhance clarity and contextual relevance, the instrument was reduced and refined, resulting in a 12-item scale capturing key dimensions of perceived AI and digital literacy in university learning settings. For example, items related to information search were extended to include AI-based information gathering, while content-related items were refined to reflect students' engagement with digital content creation tools. This approach helps ensure that the instrument remains relevant to contemporary learning practices involving AI use. In addition, formal validation procedures (e.g., expert validation or factor analysis) were not conducted, and this limitation is acknowledged in the Discussion section.

The final set of items assessed students' perceived competence across a range of digital learning activities, including advanced search strategies, AI-assisted information gathering, critical evaluation of digital information, data analysis, digital problem solving, document production, and digital content creation. All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating higher levels of perceived AI and digital literacy. The conceptual relationship between the reference framework and the adapted measurement instrument is illustrated in **Figure 1**.

To assess the internal consistency of the instrument, a reliability analysis was conducted using Cronbach's alpha. The results showed that the 12-item scale demonstrated a high level of internal consistency (Cronbach's $\alpha = 0.953$), indicating that the items functioned cohesively in measuring perceived AI and digital literacy. This suggests that the instrument provides a stable and consistent measure of students' self-reported digital competence in learning contexts. At the same time, it is important to consider that a very high Cronbach's alpha may also indicate a certain degree of similarity among items. While this does not undermine the overall reliability of the scale, it suggests that some items may capture closely related aspects of the construct. Therefore, this characteristic should be taken into account when interpreting the results.

3.3. Data Analysis

The collected data were analyzed using SPSS (Version 29). Both descriptive and inferential statistical procedures were applied to address the research questions. Descriptive statistics, including means and standard devi-

ations, were first calculated to examine the overall level of students' perceived AI and digital literacy. To explore group differences, an independent-samples t-test was conducted to compare scores by gender, while a one-way analysis of variance (ANOVA) was used to examine potential differences across academic years. The level of statistical significance was set at $p < 0.05$ for all analyses. Before conducting these analyses, the distribution of the data was assessed by examining skewness and kurtosis values. No substantial deviation from normality was identified. Considering the sample size and distributional characteristics, parametric tests were deemed appropriate for the present study. Skewness values ranged from −0.66 to 0.15, and kurtosis values ranged from −1.40 to 1.36, indicating acceptable normality. Therefore, no substantial deviation from normality was identified. Considering the sample size and distributional characteristics, parametric tests were deemed appropriate for the present study. Although Likert-scale data are ordinal in nature, they were treated as continuous variables, as is common practice when aggregated scores approximate normal distribution, and this approach is widely accepted in similar educational research contexts.

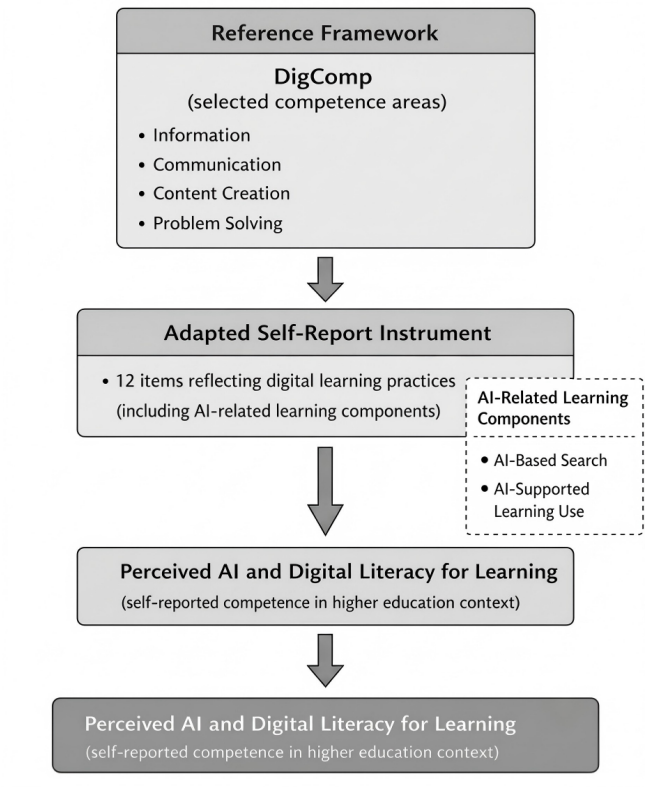

Figure 1. Conceptual Framework of Perceived AI and Digital Literacy for Learning.

In addition, the assumption of homogeneity of variance was evaluated using Levene's test prior to group comparisons. The results indicated that the assumption was satisfied for both gender ($F = 0.266$, $p = 0.607$) and academic year groups ($F = 0.907$, $p = 0.440$).

4. Results

4.1. Descriptive Statistics of University Students' Perceived AI and Digital Literacy

To examine university students' perceived levels of AI and digital competence, descriptive statistics were calculated for 12 items (**Table 1**). The results indicated an overall mean score of 3.66 (SD = 0.69), suggesting that, on a five-point scale, students generally demonstrate above-average use of AI and digital technologies in learning contexts. This finding indicates that students are relatively familiar with utilizing digital tools and AI functions for academic purposes. The 95% confidence interval for the overall mean was (3.54, 3.78).

Table 1. Descriptive Statistics of Perceived AI and Digital Literacy.

Skill	M	SD
Advanced Search Strategies	3.53	0.89
AI-Based Information Gathering	3.78	0.81
Cloud-Based Data Management	3.69	0.85
Information Evaluation	3.74	0.79
Data Analysis Skills	3.58	0.96
Ethical Use of Digital Information	3.69	0.87
Digital Problem Solving	3.68	0.92
Critical Evaluation of Online Information	3.58	1.00
Document Creation Skills	3.81	0.81
Understanding of Digital Copyright	3.69	0.88
Exploration of Digital Content Creation Tools	3.58	0.88
Interest in Content Creation Tools	3.63	0.92
Overall	3.66	0.69

A closer examination of individual items revealed that Document Creation Skills showed the highest mean (M = 3.81, SD = 0.81), suggesting that students are relatively comfortable with basic digital tools such as word processing software. This was followed by AI-Based Information Gathering (M = 3.78, SD = 0.81) and Information Evaluation (M = 3.74, SD = 0.79), indicating that students demonstrate a relatively high level of confidence in collecting and evaluating information in digital learning contexts. Overall, the results indicate that students demonstrate a solid level of competence in fundamental and practical digital tasks commonly required in learning contexts.

In contrast, relatively lower mean scores were observed for Advanced Search Strategies (M = 3.53, SD = 0.89), suggesting that students may be less confident in applying more sophisticated search techniques or optimizing information retrieval processes. A similar pattern was found for Exploration of Digital Content Creation Tools (M = 3.58, SD = 0.88) and Critical Evaluation of Online Information (M = 3.58, SD = 1.00), both of which represent more advanced or higher-order digital skills. Taken together, these patterns indicate that while students are generally comfortable performing routine digital tasks, they may experience greater difficulty or uncertainty when engaging in more complex, strategic, or creative uses of digital technologies.

4.2. Gender Differences in Perceived

AI and Digital Literacy

An independent samples t-test was performed to examine potential gender differences in perceived AI and digital literacy (**Table 2**). The mean score for male students was 3.69 (SD = 0.76), compared to 3.63 (SD = 0.57) for female students. Although male students showed a slightly higher mean, the difference was not statistically significant, $t(116) = 0.46$, $p = 0.646$. The effect size was very small (Cohen's d = 0.09), indicating a negligible difference between the two groups.

These results indicate that perceived levels of AI and digital literacy are largely similar across gender. That is, male and female students in this sample reported comparable levels of competence in using digital and AI-related tools for learning.

Table 2. Gender Differences in Perceived AI and Digital Literacy.

Gender	n	M	SD	*t*	df	*p*
Male	71	3.69	0.76	0.46	116	0.646
Female	47	3.63	0.57			

Note: Cohen's d = 0.09, indicating a negligible effect size.

To further explore gender differences across specific skill areas, independent samples t-tests were conducted for each individual item (**Table 3**). The results indicated that most items did not show statistically significant differences between male and female students. An exception was observed for Advanced Search Strategies, where male students (M = 3.72, SD = 0.90) scored higher than female students (M = 3.26, SD = 0.82), $t = 2.84$, $p = 0.005$. This result, however, should be interpreted with caution, as it did not remain significant after applying a Bonferroni correction for multiple comparisons (adjusted $\alpha = 0.05/12 = 0.0042$).

Table 3. Gender Differences in Perceived AI and Digital Literacy Skills.

Skill	Male M (SD)	Female M (SD)	*t*	*p*
Advanced Search Strategies	3.72 (0.90)	3.26 (0.82)	2.84	0.005**
AI-Based Information Gathering	3.83 (0.81)	3.70 (0.81)	0.85	0.398
Cloud-Based Data Management	3.66 (0.94)	3.66 (0.76)	0.01	0.988
Information Evaluation	3.76 (0.80)	3.70 (0.78)	0.39	0.696
Data Analysis Skills	3.68 (0.92)	3.45 (0.72)	1.44	0.153
Ethical Use of Digital Information	3.66 (0.91)	3.74 (0.74)	−0.52	0.604
Digital Problem Solving	3.70 (0.87)	3.74 (0.79)	−0.26	0.798
Critical Evaluation of Online Information	3.58 (0.92)	3.60 (0.83)	−0.11	0.913
Document Creation Skills	3.75 (0.86)	3.89 (0.73)	−0.97	0.335
Understanding of Digital Copyright	3.68 (0.95)	3.53 (0.80)	0.85	0.394
Exploration of Digital Content Creation Tools	3.61 (0.95)	3.53 (0.78)	0.44	0.658
Interest in Content Creation Tools	3.63 (0.90)	3.72 (0.80)	−0.55	0.581

Note: ** indicates statistical significance at the 0.01 level ($p < 0.01$).

For all other areas—including AI-based information gathering, cloud-based data management, information evaluation, data analysis skills, ethical use of digital information, digital problem solving, critical evaluation of online information, document creation skills, understanding of digital copyright, and the use of content creation tools—no statistically significant gender differences were found ($p > 0.05$). Although female students showed a slightly higher mean in document creation skills, this difference was not statistically significant.

Overall, perceived AI and digital literacy levels appear broadly similar across gender. At the same time, the results suggest that any observed differences in specific technical areas, such as advanced search strategies, should be interpreted cautiously.

4.3. Differences by Academic Year

A one-way analysis of variance (ANOVA) was conducted to examine whether perceived AI and digital literacy differed across academic years (**Table 4**). The mean scores were 3.61 (SD = 0.64) for first-year students, 3.66 (SD = 0.80) for second-year students, 3.73 (SD = 0.70) for third-year students, and 3.62 (SD = 0.60) for fourth-year students. Although third-year students recorded the highest mean and first-year students the lowest, the differences among groups were small and did not display a consistent or linear pattern. The ANOVA results indicated that these variations were not statistically significant, $F(3, 114) = 0.16$, $p = 0.920$. The effect size was also negligible ($\eta^2 = 0.004$), suggesting that academic year had minimal influence on students' perceived AI and digital literacy. The effect size was also negligible ($\eta^2 = 0.004$), indicating negligible practical significance and suggesting that academic year explains only a minimal proportion of variance in students' perceived AI and digital literacy.

Table 4. Differences in AI and Digital Literacy by Academic Year.

Academic Year	n		M		SD
1st year	26		3.61		0.64
2nd year	33		3.66		0.80
3rd year	31		3.73		0.70
4th year	28		3.62		0.60
Source	**SS**	**df**	**MS**	**F**	***p***
Between groups	0.23	3	0.08	0.16	0.920
Within groups	56.79	114	0.50		
Total	57.02	117			

Note: $\eta^2 = 0.004$, indicating a negligible effect size.

The results indicate that perceived AI and digital literacy levels did not show systematic variation across academic years. In other words, a longer duration of study at the university level was not necessarily associated with higher levels of AI and digital competence. One possible explanation is that students' digital and AI-related skills are shaped not only through formal academic experiences but also through frequent use of digital technologies in everyday contexts. However, this interpretation remains speculative, as the study did not directly measure the sources of digital skill development.

Given that digital tools are already widely integrated into students' daily lives before entering university, differences across academic years may not appear as clearly as expected. This pattern also suggests that exposure to

university-level instruction alone may not be sufficient to create meaningful differences in students' perceived AI and digital literacy. In this regard, the findings point to the importance of providing more structured and targeted support for the development of digital literacy within the curriculum.

5. Discussion

The purpose of this study was to examine the level of university students' perceived AI and digital literacy and to explore whether differences existed according to gender and academic year. The results show that students generally reported a moderate to relatively high level of perceived AI and digital literacy. In addition, no statistically significant differences were identified in overall literacy levels across gender or academic year, although a limited gender difference appeared in one specific area related to advanced search strategies.

The descriptive statistics indicated that the overall mean score of perceived AI and digital literacy was above the midpoint of the scale. This pattern suggests that university students tend to view themselves as capable of using digital technologies and AI-related tools for learning purposes. Higher scores were particularly observed in tasks associated with document creation and information gathering using digital tools and AI technologies. These patterns reflect the extent to which digital technologies are embedded in students' academic activities. In many higher education contexts, the use of digital tools for searching information, organizing knowledge, and completing coursework has become routine. In this regard, it is reasonable that students report a certain level of confidence in using such technologies. This result is consistent with previous research indicating that university students' digital competence generally falls within an intermediate range. For example, Silva-Quiroz and Morales-Morgado reported that students' overall digital competence tends to remain at an intermediate level, suggesting familiarity with digital tools but not necessarily advanced proficiency across all domains [5].

At the same time, the findings point to several limitations in students' perceived digital competencies. Lower scores were observed in areas related to advanced search strategies and the exploration of digital content creation tools. This pattern indicates that, while students are accustomed to everyday digital activities, they may have less experience with more specialized or higher-order skills. Previous studies have reported similar tendencies, showing that students often demonstrate adequate competence in basic digital tasks but comparatively weaker performance in more complex areas, such as critically evaluating online information, applying advanced search strategies, and producing digital content. These patterns highlight that digital literacy extends beyond the ability to operate devices and should be understood as a multidimensional construct that includes cognitive, technical, and critical components. This interpretation is also in line with DigComp-based research, which shows that competence levels often differ across domains, with relatively lower levels observed in areas such as information literacy and digital content creation [5].

The results of the independent-samples t-test showed no statistically significant gender differences in overall perceived AI and digital literacy. This suggests that male and female students in the present study reported broadly similar levels of digital competence. Although male students showed slightly higher scores in advanced search strategies, the overall pattern indicates that gender alone may not play a decisive role in shaping students' perceived digital literacy. This result is consistent with recent research suggesting that gender gaps in digital technology use are gradually narrowing as access to digital technologies becomes more widespread. For instance, Lucas et al. reported slightly higher scores among male students in certain areas but also noted that such differences should be understood within an ongoing discussion rather than as a fixed or universal pattern [8]. Accordingly, the difference observed in this study may reflect variation in specific domains rather than a general gender-based disparity.

The ANOVA results likewise indicated no statistically significant differences in perceived AI and digital literacy across academic years. Although third-year students showed slightly higher mean scores, the overall differences across groups were minimal. This pattern suggests that perceived digital competence does not necessarily increase in a linear manner as students progress through university. One possible explanation is that digital skills may be influenced by a variety of experiences beyond formal university coursework, including everyday interactions with digital technologies and online platforms. In other words, students' digital competencies may be shaped by informal learning experiences in their daily digital environments, rather than solely by structured academic instruction. This observation is consistent with prior research suggesting that digital competence is shaped not only by demographic variables but also by contextual and experiential factors related to technology use and learning environments [7].

From an educational perspective, these findings highlight the importance of integrating digital literacy and

AI literacy more systematically into university curricula. While students appear comfortable using digital tools for routine academic tasks, additional support may be needed to develop more advanced competencies, including effective information search strategies, critical evaluation of online information, and digital content creation. In this regard, higher education institutions may consider providing structured learning opportunities that encourage students to engage with AI and digital technologies in more critical and creative ways.

Despite these contributions, several limitations should be acknowledged. First, the data were collected from students at a single university, which may limit the generalizability of the findings; therefore, the findings should be interpreted within the specific institutional and contextual setting of this study without generalization beyond similar contexts. Second, the study relied on self-reported survey data, which may reflect students' perceptions rather than their actual digital competencies; therefore, the findings should not be interpreted as indicators of actual competence but rather as perceived abilities. Future research could incorporate performance-based assessments or task-based measures to provide a more objective evaluation of students' digital skills. In addition, further studies are needed to examine how AI-integrated learning environments influence the development of digital literacy over time.

In conclusion, this study provides empirical insights into university students' perceived AI and digital literacy in a higher education context. The results show that, while students generally demonstrate moderate levels of digital competence, certain areas—particularly those requiring more advanced or strategic skills—remain in need of further development. As AI technologies continue to shape learning environments, strengthening students' digital literacy will become an increasingly important priority for higher education institutions.

6. Conclusions

This study examined university students' perceived AI and digital literacy and explored whether differences existed according to gender and academic year. The results indicate that students generally reported moderate levels of AI and digital literacy, suggesting that they possess a reasonable degree of confidence in using digital technologies and AI-related tools for learning purposes.

At the same time, the findings point to relatively lower levels of competence in more advanced areas, such as advanced information search strategies and digital content creation. This pattern suggests that, although students are familiar with everyday uses of digital technologies, their higher-order digital literacy skills may not be equally well developed.

From an educational perspective, these results underscore the need to more systematically incorporate AI and digital literacy into higher education curricula. In particular, universities may consider designing learning environments that support not only the use of basic digital tools but also the development of more advanced competencies, including critical evaluation of online information, effective information-search strategies, and creative digital content production.

As AI technologies continue to shape contemporary learning environments, fostering students' digital literacy in a more structured and intentional manner is likely to become an increasingly important priority for higher education institutions.

Author Contributions

Conceptualization, S.P. and M.-g.K.; methodology, S.P.; software, S.P.; validation, S.P. and M.-g.K.; formal analysis, S.P.; investigation, S.P.; resources, M.-g.K.; data curation, S.P.; writing—original draft preparation, S.P.; writing—review and editing, M.-g.K.; visualization, S.P.; supervision, M.-g.K.; project administration, M.-g.K.; funding acquisition, M.-g.K. Both authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

Ethical review and approval were waived for this study because it involved a voluntary survey with minimal risk.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy considerations.

Conflicts of Interest

The authors declare no conflict of interest.

AI Use Statement

During the preparation of this work, the authors used ChatGPT for language editing. The authors subsequently reviewed the content and takes full responsibility for the final manuscript.

References

1. Cook, H.; Apps, T.; Beckman, K.; et al. Digital competence for emergency remote teaching in higher education: Understanding the present and anticipating the future. *Educ. Technol. Res. Dev.* **2023**, *71*, 7–32.
2. de Obesso, M.D.L.M.; Núñez-Canal, M.; Pérez-Rivero, C.A. How do students perceive educators' digital competence in higher education? *Technol. Forecast. Soc. Change* **2023**, *188*, 122284.
3. Muammar, S.; Hashim, K.F.B.; Panthakkan, A. Evaluation of digital competence level among educators in UAE higher education institutions using DigComEdu framework. *Educ. Inf. Technol.* **2023**, *28*, 2485–2508.
4. Tondeur, J.; Howard, S.; Van Zanten, M.; et al. The HeDiCom framework: Higher education teachers' digital competencies for the future. *Educ. Technol. Res. Dev.* **2023**, *71*, 33–53.
5. Silva-Quiroz, J.; Morales-Morgado, E.M. Assessing digital competence and its relationship with the socioeconomic level of Chilean university students. *Int. J. Educ. Technol. High. Educ.* **2022**, *19*, 46.
6. Miljković, M.; Vuković, D.; Kerum, F. Critical digital literacy as a key skill in higher education: Attitudes of students and professors. *J. Syst. Cybern. Inform.* **2025**, *23*, 48–55.
7. Inamorato dos Santos, A.; Chinkes, E.; Carvalho, M.A.G.; et al. The digital competence of academics in higher education: Is the glass half empty or half full? *Int. J. Educ. Technol. High. Educ.* **2023**, *20*, 9.
8. Lucas, M.; Bem-Haja, P.; Santos, S.; et al. Digital proficiency: Sorting real gaps from myths among higher education students. *Br. J. Educ. Technol.* **2022**, *53*, 1885–1914.
9. Guillén-Gámez, F.D.; Mayorga-Fernández, M.J. Prediction of Factors That Affect the Knowledge and Use Higher Education Professors from Spain Make of ICT Resources to Teach, Evaluate and Research: A Study with Research Methods in Educational Technology. *Educ. Sci.* **2020**, *10*, 276.
10. Leino, K. *The Relationship between ICT Use and Reading Literacy: Focus on 15-Year-Old Finnish Students in PISA Studies*; University of Jyväskylä, Finnish Institute for Educational Research: Jyväskylä, Finland, 2014.
11. Säljö, R. Literacy, digital literacy and epistemic practices: The co-evolution of hybrid minds and external memory systems. *Nord. J. Digit. Lit.* **2012**, *7*, 5–19.
12. Chan, G.H. Enhancing digital literacy in education: Educational directions. *Educ. Train.* **2024**, *66*, 127–142.
13. Siregar, K.E. Increasing digital literacy in education: Analysis of challenges and opportunities through literature study. *Int. J. Multiling. Educ. Appl. Linguist.* **2024**, *1*, 10–25.
14. Calvani, A.; Fini, A.; Ranieri, M.; et al. Are young generations in secondary school digitally competent? A study on Italian teenagers. *Comput. Educ.* **2012**, *58*, 797–807.
15. Comba, V. Net generation and digital literacy: A short bibliographical review and some remarks. *J. e-Learn. Knowl. Soc.* **2011**, *7*, 59–66.
16. Cabero-Almenara, J.; Gutiérrez-Castillo, J.J.; Guillén-Gámez, F.D.; et al. Digital competence of higher education students as a predictor of academic success. *Technol. Knowl. Learn.* **2023**, *28*, 683–702.
17. Dias-Trindade, S.; Moreira, J.A.; Ferreira, A.G. Assessment of university teachers on their digital competences. *Qwerty* **2020**, *15*, 50–69.
18. Guillén-Gámez, F.D.; Mayorga-Fernández, M.J.; Contreras-Rosado, J.A. Incidence of Gender in the Digital Competence of Higher Education Teachers in Research Work: Analysis with Descriptive and Comparative Methods. *Educ. Sci.* **2021**, *11*, 98.

19. Hicham, K. Distance teaching: Challenges to intercultural competence implementation in Moroccan higher education institutions. In Proceedings of the E-Learning and Smart Engineering Systems (ELSES 2024), Tetouan, Morocco, 23–25 May 2024; pp. 870–890.
20. Fox, K.; Bryant, G.; Srinivasan, N.; et al. *Time for Class—COVID-19 Edition Part 2: Planning for a Fall Like No Other*; Tyton Partners: Boston, MA, USA, 2020.
21. Tartavulea, C.V.; Albu, C.N.; Albu, N.; et al. Online teaching practices and the effectiveness of the educational process in the wake of the COVID-19 pandemic. *Amfiteatru Econ.* **2020**, *22*, 920–936.
22. Marín, V.I.; Castaneda, L. Developing digital literacy for teaching and learning. In *Handbook of Open, Distance and Digital Education*; Springer Nature: Singapore, 2023; pp. 1089–1108.
23. Junaedi, A.T.; Renaldo, N.; Yovita, I.; et al. Digital culture as a moderating factor in increasing digital literacy. *Reflection Educ. Pedagog. Insights* **2023**, *1*, 116–127.
24. Holm, P. Impact of digital literacy on academic achievement: Evidence from an online anatomy and physiology course. *E-Learn. Digit. Media* **2025**, *22*, 139–155.
25. Carretero, S.; Vuorikari, R.; Punie, Y. *DigComp 2.1: The Digital Competence Framework for Citizens with Eight Proficiency Levels and Examples of Use*; Publications Office of the European Union: Luxembourg, Luxembourg, 2017.