

TOURISM STUDENTS' USE OF AI TOOLS: A PRELIMINARY STUDY

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Abstract

The use of artificial intelligence (AI) in education has grown exponentially, especially since the introduction of ChatGPT in 2022. Teachers and students have started to become aware of other tools that allow them to work and study more efficiently. In the case of students, besides the generalised use of chatbots, some examples are useful for content creation, research, image generation, proofreading, productivity and others. In this context, this study aims to identify the main AI tools that students use in their self-study routine. As this is an ongoing study, the preliminary results are presented and the aim is that the final results will make it possible to identify the tools that students use for two specific areas of study, namely Mathematics and English. Therefore, undergraduate tourism students from a Portuguese university are being surveyed about their use of these tools through a quantitative survey. The results are expected to shed light on the knowledge and use of AI Tools, as well as the main features to support studies, thus contributing to the optimisation of teaching practices and autonomous learning.

Keywords: *AI in education, mathematics, English, tourism, higher education.*

1. Introduction

The integration of AI tools in Education is somehow recent but has already shown how the traditional learning paradigms can change. It can bring both benefits and challenges, so it is important that institutions are aware of the new possibilities.

Denecke, Glauser, and Reichenpfader (2023) conducted a study which concluded that lecturers and students find the main strengths of these tools to be the personalization of the learning experience or increased efficiency by automating repetitive tasks, whereas the main downsides include data protection, bias and skills teaching. A more recent research study showed that higher education students use AI tools to “define or clarify concepts (69,2%), to generate ideas while writing (53,3%), for translation (50,7%) (Almassaad, Alajlan and Alebaikan, 2024). The main benefits perceived included ease of access and use, time-saving on tasks, instant feedback and increased confidence while learning, whereas the greatest challenges identified were associated with unreliable information, plagiarism and cheating, as well as inaccurate or false references.

2. AI tools use in higher education

AI tools are playing an important role in what it comes to students' self-study routines, particularly in the areas of Mathematics and English, as they provide real-time feedback, personalized instruction and tailored support (Mukkala et al., 2025), which have the potential to address some of the main traditional challenges of these two fields of study. By integrating AI into their study routine, students can foster their critical thinking and problem-solving skills as well as improve their communication skills and ultimately enhance their retention and understanding (Cai, Msafiri and Kangwa 2024; Delcker et al, 2024).

At the higher education level, students are expected to have reached a stage of autonomy (Henri, Morrell and Scott, 2018), in which they are responsible for their own learning and seek resources that allow them to develop their knowledge. AI tools can therefore offer support that can adapt to the learner's progress.

A recent study by Akhmadieva et al. (2024) comprised a bibliometric analysis on the use of AI in education showed that the use of AI in higher education has significantly grown in the past few years, particularly after 2019.

According to Crompton and Burke (2023), who worked on a systematic review of AI in higher education, undergraduate were the most studied students and the most dominant subject was Language Learning (17%), whereas Math accounted for only 4%. They concluded that AI was mostly used for assessment and evaluation (feedback and automatic assessment), predicting (forecasting trends in data) and Managing Student Learning (identifying learning patterns, for instance). The main tools were AI Assistant (which includes nomenclature such as virtual assistant or intelligent tutor) and Intelligent Tutoring System (which involves the use of AI techniques and educational methods).

Other studies show some current trends on the use of AI tools, such as generative AI models and image/content creation tools, which can contribute to enhance student creativity but also raise concerns about academic integrity (Nguyen, 2025). Besides, it can also bring benefits in respect to the processes of research, proofreading and productivity (Khalifa and Albadawy, 2024).

3. Methodology

To investigate how undergraduate Tourism students use AI tools for self-learning in English and Mathematics, a quantitative study using a survey was conducted. The questionnaire used in this study was adapted from von Garrel & Mayer (2023), previously tested and validated as a research instrument. The survey was divided into the following sections: demographic information, general use of AI tools and main characteristics, use and purpose of AI tools for English and Mathematics. The online questionnaire was designed using Microsoft Forms and distributed to students enrolled in Tourism undergraduate programs via email and learning platforms.

To determine the minimum sample size, we used the calculation formula with correction for finite populations (Triola, 2022):

$$n = \frac{Nz^2p(1-p)}{(N-1)E^2 + z^2p(1-p)}$$

where:

- N - size of the population or universe
- z - critical value of the standard normal distribution corresponding to the degree of confidence
- E - margin of error (in this case, 7.1%)
- p - estimated proportion

For a universe of 839 students, with a degree of confidence of 90 per cent ($z=1.645$) and a margin of error of 7.1 per cent, considering the worst-case scenario (maximum variability: $p=0.5$), we found that the minimum sample size should be 116 students. We received 120 responses to the questionnaire, slightly exceeding our target of 116 responses.

Due to time constraints, only preliminary results could be extracted, as the research is still ongoing.

4. Results and discussion

Regarding the demographic information of the participants, namely students of different courses and degrees in the field of tourism, the majority of the respondents are female (63%), aged between 18 and 20 years (75%), and undergraduate students (75.83%). The results are presented in Table 1.

Table 1. Demographic information ($n=120$).

	Attributes	Frequency	Percentages
Gender			
	Male	43	36.0%
	Female	75	63.0%
	Other	1	0.5%
	Rather not respond	1	0.5%
Age			
	18-20	90	75.0%
	21-23	24	20.0%
	≥ 24	6	5.0%

Academic Level			
	Professional Higher Technical Courses (TeSP)	29	24.17%
	1 st year	28	
	2 nd year	1	
	Undergraduate degrees	91	75.83%
	1 st year	68	
	2 nd year	19	
	3 rd year	4	

In terms of previous knowledge and use of AI tools, the results show that the vast majority of students know what AI tools are (98.33%), a very large number have already used AI tools to support their studies (90.68%), but only 10.28% of respondents say they use these tools very often. A similar percentage of students say they use these tools often (37.38%) or only sometimes (37.38%).

Table 2. Knowledge and use of AI Tools (n=120).

Do you know what AI tools are?			
	Yes	118	98.33%
	No	2	1.67%
Have you ever used AI tools to support your studies?			
	Yes	107 (out of 118)	90.68%
	No	11 (out of 118)	9.32%
Frequency of use of AI in support of your studies			
	Very rarely	2 (out of 107)	1.87%
	Rarely	14 (out of 107)	13.08%
	Sometimes	40 (out of 107)	37.38%
	Often	40 (out of 107)	37.38%
	Very often	11 (out of 107)	10.28%

Using a five-point Likert scale (where 1 = Not at all relevant and 5 = Very relevant), students were asked to indicate the relevance they attributed to a number of aspects of their experience as users of AI tools to support their studies. The results are presented in the heatmap of Table 3, which also includes the median, mean and standard deviation (s. d.) of the responses. We can see that, overall, the results are very positive and very few respondents consider any of the attributes to be unimportant. These results are in line with other studies (Almassaad et al., 2024; Chan and Hu, 2023).

Table 3. AI Tools features to support studies (n=107).

	1	2	3	4	5	median	mean	s. d.
Immediate Feedback	0	2	19	49	37	4	4,13	0,58
Acessibility	0	1	1	56	39	4	3,96	0,44
Clarity of answers	0	1	35	46	25	4	3,89	0,59
Answers without inaccuracies	0	7	51	31	18	3	3,56	0,71
Detailed answers	0	2	24	49	32	4	4,04	0,60
Indication of information sources	3	11	34	36	23	4	3,61	1,04
Development of digital skills	1	6	33	47	20	4	3,74	0,74
Personalised learning	0	6	29	50	22	4	3,82	0,67

5. Conclusions

According to Batista, Mesquita and Carnaz, (2024), the adoption of Gen-AI is irreversible and it is transforming the learning process by enhancing student support and teaching efficiency, but assessment strategies need to be reconsidered in order to “maintain academic integrity and ensure the quality of education” (p. 24).

With the definite results, we intend to clarify how students employ AI tools in both Mathematics and English.

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