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Empowering Soft Skills through Artificial Intelligence and Personalised Mentoring

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Abstract: At present, the integration of technology into education has generated a significant change in the way students access knowledge and develop skills. The availability of digital tools and online platforms has democratised access to information, allowing students to learn from anywhere and at any time. This article focuses on how the combination of artificial intelligence digital tools, such as ChatGPT, with one-to-one tutoring affects the development of soft skills in higher education students. A total of 182 university students participated in the study, divided into two groups. One group was required to construct an academic topic autonomously using only ChatGPT. The other group used the ChatGPT tool in conjunction with personal tutoring, with the teacher present to expand knowledge and enrich learning. The findings suggest that a combination of technology and meaningful human interactions is necessary to optimise the educational experience. While digital tools can be beneficial in accessing knowledge and developing skills, it is essential to acknowledge the value of individual connections with teachers in fostering authentic and deep learning. Furthermore, the study considers the potential necessity to modify and refocus both teaching participation and the student assessment system. This would entail a shift away from an emphasis on the memorisation of theoretical knowledge and towards the training and development of soft skills, competences, values and social implications.

Keywords: educational technology; personalised tutoring; soft skills; artificial intelligence; higher education

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1. Introduction

The advent of the digital age has expanded educational possibilities, allowing students to access instant information and inexhaustible resources. However, academic training is not merely the acquisition of knowledge; it seeks the development of soft skills, which are essential for professional and personal success [1–3] The continuous process of evolution in education highlights the importance of focusing on the cultivation of interpersonal and social competences as a fundamental element for the holistic education of students [4,5]. This study examines the nexus between soft skills, employability and innovation in teaching, explaining the interconnectivity between these dimensions.

1.1. Impact of Technology on Education

The impact of technology on education has been profound and transformative in recent decades, particularly with the emergence of artificial intelligence-based tools and online learning platforms. The integration of technology in education has revolutionised the way knowledge is accessed and shared, providing new opportunities for teaching and learning [6–8].

Firstly, technology has greatly expanded access to knowledge by breaking down geographical and temporal barriers. Online learning platforms enable students to access courses and educational resources from anywhere in the world and at any time convenient

to them [9,10]. This has democratised education by making it more accessible to people of all ages and socio-economic backgrounds.

Artificial intelligence in particular has played a significant role in enhancing the educational experience [11]. Tools such as ChatGPT allow students to receive instant and personalised answers to their questions and queries. This contributes to self-directed learning and problem solving, two soft skills that are in high demand in the professional market. These are directly related to employability. Furthermore, technology has facilitated collaboration and teamwork in educational environments. Remote collaboration platforms, shared document-editing tools and virtual meeting spaces allow students to work together on projects, share ideas and collaborate in real time, regardless of their physical location.

Finally, several studies have evaluated the positive impact of technology on learning and skill development. The use of technology in the classroom has been demonstrated to enhance academic performance, increase the retention of knowledge and foster the development of cognitive skills, including critical thinking, problem solving and creativity. In addition, technology can assist in the development of the digital skills and competencies that are relevant to the contemporary labour market [12–15].

1.2. Active and Participatory Teaching

In the contemporary educational landscape, there is a discernible shift towards more dynamic and participatory pedagogical approaches that aim to redefine the traditional role of the student as a passive recipient of knowledge as one that is more active and engaged in their own learning process [16]. In this context, various pedagogical strategies that seek to involve students in a more intense and relevant way stand out. One such trend is project-based learning, which focuses on the resolution of practical problems and the completion of concrete tasks that require the application of acquired knowledge [17–19]. This approach encourages teamwork, creativity and critical thinking, as students must collaborate with each other to achieve common goals and face real challenges.

In essence, technology has revolutionised the field of education by providing new learning opportunities, enhancing the educational experience and equipping students with the skills required to thrive in the digitised world of today. The effective use of technological tools in the classroom can lead to more interactive, personalised and meaningful learning for all students. It is evident that the concept of 21st-century teaching is undergoing a redefinition, with a shift towards a holistic approach to education. This encompasses the imparting of academic knowledge, as well as the cultivation of social, emotional and practical skills. This holistic approach to education is designed to prepare students with the necessary skills to navigate the challenges they will face in the contemporary world [20–22].

1.3. Justification of the Study

This study is based on the need to examine how the incorporation of artificial intelligence technology tools, such as ChatGPT, can enhance students' soft skills [23,24]. By contrasting two groups, one that relies solely on artificial intelligence and one that enriches this experience through one- on-one tutoring with a teacher, the aim is to discern the importance of human interaction in the educational process and to understand its influence on the holistic development of students.

By incorporating the students' perspective, this research provides valuable insights into their preferences and perceptions. This information is crucial for adjusting pedagogical and technological strategies more precisely, thus enabling educators to respond to the individual needs and expectations of learners. The ultimate goal of education is to bring value to the learner, and this should not be lost sight of. The study analyses the importance and relevance of tutoring in comparison to the acquisition of knowledge through purely automatic sources. It highlights the notion that tutoring can provide additional benefits, especially in terms of personal reflection, practical application and connection to everyday life.

1.3.1. Objectives

The main objective of the study is to analyse how the integration of digital tools, specifically those based on artificial intelligence, with the personalised interaction provided by an academic tutor affects the development of soft skills in university students. Furthermore, the study aims to explore whether teaching innovation can be adapted more effectively to the needs of students, thus leading to a redefinition of conventional teaching methods, generating engagement with learners that also fosters increased motivation and interest in learning and training.

1.3.2. Expectations

Regarding the theory that technology, represented in this study by the ChatGPT tool, can effectively meet the theoretical needs of this topic, focused on the construction of a didactic unit (in this case, eco-innovation), it is proposed that combining it with personalised tutorials will present better results in terms of the personal development of the students, leading them towards a deeper understanding of the subject matter and its applications in practical situations. This will not merely involve memorising content but developing the ability to project the implications of that content onto life outside the classroom. In consideration of the aforementioned aspects, the following expectations are presented for further examination from a descriptive point of view:

- Expectation 1: The combination of ChatGPT and personal tutoring with a teacher will improve students' perception of how a topic can enhance their skills, competences and values in comparison to the use of the ChatGPT tool only.
- Expectation 2: The combination of ChatGPT and personal tutoring with a teacher will result in a greater perception of the social implications of the subject studied than would be the case with exclusive use of the ChatGPT tool.
- Expectation 3: The perceived mastery of the proposed subject matter will be higher for students who combine ChatGPT with personal tutoring than for those who only use ChatGPT.
- Expectation 4: The perceived efficiency of teacher participation in content explanation will be higher in the group combining ChatGPT and personal tutoring than in the group using only ChatGPT.
- Expectation 5: Students who combine ChatGPT with personal tutoring will have the perception that this will better prepare them to pass the final examination of a subject compared to those who only use the ChatGPT tool.

Previous research has demonstrated the significance of human interaction in the comprehension of abstract concepts and their implementation in real-world settings [25]. Active teacher involvement can help students in connecting theoretical content with practical situations, as well as providing additional clarification and individualised guidance to enhance their perceived mastery of the subject.

The synergy between technology and tutoring for well-rounded learning becomes the centrepiece of this analysis, which aims not only to assess the effectiveness of tutoring in the educational environment but also to shed light on how education can be adapted to strengthen soft skills, improve employability and foster deeper reflection in students, preparing them to face the challenges of the 21st century.

2. Materials and Methods

The research was carried out with a descriptive scope approach with the aims of exploring in depth the use of artificial intelligence tools in the classroom, the perception of such use and students' perceptions on the sufficiency or otherwise of this tool to promote their learning. For this purpose, both objective measurement tools, such as questionnaires, and subjective measurement tools, such as in-depth personal interviews, are employed. The rationale behind this approach is that the use of both objective and subjective measurement tools in conjunction can yield relevant insights that can be transformed into enhanced pedagogical and training practices for students.

3. Sample

The sample for the present study consisted of 182 first-year students on a bachelor's degree course in Business Intelligence at a private university in Spain. Stratified random sampling was employed to select the participants, who were divided into two groups with different scopes throughout the research (90 and 92 members, respectively, after 2 participants were excluded due to their refusal to complete the final questionnaire). The participants in the study were aged between 18 and 19 years old (61.5% men, 38.5% women). This constituted a significant sample from the first year of the Business Intelligence degree at the university under analysis.

4. Procedure

The procedure was structured according to three phases. In Phase 1, all the participants were in the same room, not yet divided into groups, where they were informed of the objectives of the project and the activity was described. After a brief introduction to the ChatGPT 3.5 tool, in which they were permitted to interact with the tool freely for approximately 15 min, they were instructed to construct the academic content of a topic that was to be provided to them using only the tool. They were allowed to formulate as many requests and questions as they considered appropriate. The specific topic was "Eco-Innovation: necessity or marketing?" The initial phase was allotted a duration of 2.5 h. During this period, the teacher's role was limited to addressing any technical issues related to the tool.

In this sense, eco-innovation emerges as an ideal context for the application of these educational methodologies, as it provides real problems and challenges related to environmental sustainability and technological development. By tackling eco-innovation projects, students not only acquire theoretical knowledge but also develop practical skills and become aware of the importance of finding innovative solutions to global environmental problems. In this manner, active and participatory teaching becomes a powerful tool to prepare students with the requisite skills to confront the challenges of the 21st century and to contribute significantly to the sustainable development of society.

Upon completion of the initial phase, the sample was divided into two groups. In the first group, comprising 90 participants and designated as "Chat only", the activity was temporarily halted, in accordance with the stipulation that they would not be included in Phase 2, which involved only one group of participants, with a total of 92 individuals. This group was designated "Chat + Tutoring".

Phase 2 sought to reinforce and expand upon the information provided by the technological tool used by means of individual tutoring lasting approximately 30 min with each member of the second group. These tutorials were conducted in person in the teacher's office or in a classroom. The tutorials were semi-structured, in which both types of content constructed in Phase 1 were dealt with, as well as an invitation to delve deeper into the impacts that this topic could have on the students in terms of values, competences, skills and projection into the professional market, as well as any questions that the student decided to discuss freely with the teacher.

In Phase 3, both groups were involved, i.e., all the participants, by voluntarily and anonymously completing an opinion and satisfaction questionnaire constructed ad hoc for this project, with a Likert-type response scale of 1–5, designed and distributed using the Google Forms tool, which was previously tested in a control group of 15 students to check their understanding of the items. The items in the questionnaire asked for opinions on issues such as the degree of satisfaction with the use of this tool to construct the theoretical content of a subject and the feasibility of using this tool to obtain university knowledge and training, as well as the implications that this particular subject could have for the student's personal life. Key information regarding the participation and involvement of each group throughout the study can be found in Table 1.

Table 1. Project phases.

Phase	Number of Participants	Group Name	Tasks Performed	Outcome
1	182	"Chat only" and "Chat + tutoring"	To construct the academic content	Development of the topic through a digital tool
2	92	"Chat + tutoring"	Individual tutoring	Relevance of values and employability
3	182	"Chat only" and "Chat + tutoring"	To complete questionnaire	Opinion and perception responses

Source: own elaboration.

5. Analysis of Data and Results

5.1. Expectation 1

In general, the distributed questionnaire yielded interesting results, with the most significant findings being those where the greatest differences between the two study groups can be observed. Firstly, only 37.7% of the students who exclusively used ChatGPT managed to perceive that the subject matter presented could improve their skills, competences and values, both professionally and personally, and that this activity and subject matter could have implications beyond the purely theoretical content (see Figure 1). In contrast, among the students who complemented ChatGPT with personal tutoring with the teacher, this figure rises to 65%. This information confirms the proposal put forward in Expectation 1, which postulated that those students who were in the group that combined the use of ChatGPT with personal tutoring with the teacher would have a greater perception of learning and improvement of their skills, competences and values than the working group that exclusively used ChatGPT.

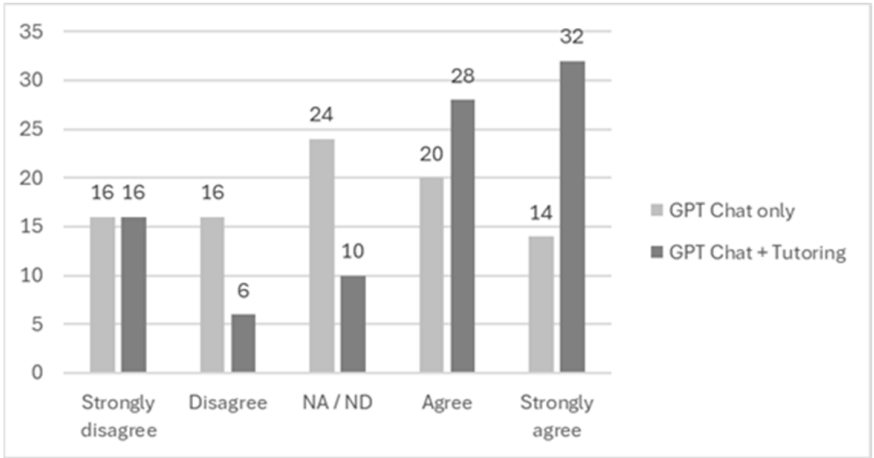

Figure 1. Perceived improvement in values, skills and competences. Source: own elaboration based on questionnaire data.

This result is of significant importance, as it demonstrates a clear trend of the growing importance not only of the active participation of the teacher but also of the focus of this participation. According to the Agency for the Quality of the University System of Cataluña [26], factors of great relevance to the employability of recent graduates are currently influenced by a number of factors, including their values, skills and competences. The combination of the use of new technologies with the involvement of educators yields superior outcomes compared to the exclusive use of technological tools [27]. Therefore, the trend leans towards the combined use of technology with teacher participation, with the update that the focus of teacher participation should be more oriented towards training on

soft skills that could enhance the employability of students than towards purely theoretical content since the latter can be achieved with the available technological tools.

5.2. Expectation 2

With regard to discussion of the social implications that the subject matter could have, only 33% of the students who used ChatGPT exclusively managed to perceive them, while 72% of the students who combined it with personal tutoring with the teacher stated that they clearly perceived how this theoretical content could be applied in real life outside the classroom (see Figure 2). The data thus obtained serve to confirm Expectation 2, which postulated that those students who received personalised tutoring from the teacher would perceive a broader vision of the situation in terms of the social impact outside the classroom of the subject studied in comparison to the students who had only used the artificial intelligence tool.

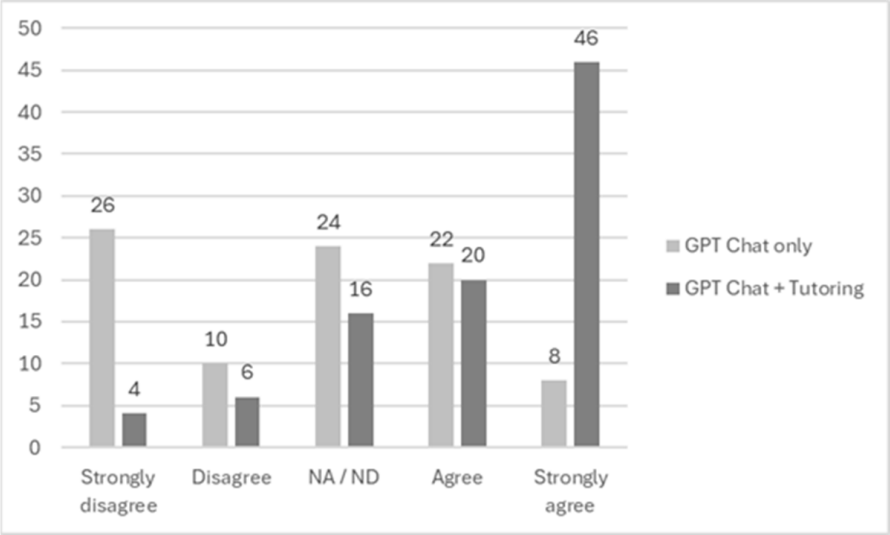

Figure 2. Perception of social implications. Source: own elaboration based on questionnaire data.

These results prompt a profound reflection on the teacher's involvement, as it seems that the students in the sample analysed, without the teacher's collaboration and support, limited themselves exclusively to the theoretical content that would allow them to pass a subject. Conversely, it can be posited that more proactive participation on the part of the teacher may contribute to an openness in the students' global vision. Teachers should not limit themselves to transmitting theoretical content as if they are robots since these already exist. Rather, teachers should be aware that their main contribution of value lies in providing students with the ability to think critically and project the future.

5.3. Expectation 3

On the other hand, of the students who solely utilised ChatGPT in the activity, 64% stated that they considered that they had obtained enough content to master the proposed subject matter, while the figure for those who complemented the use of ChatGPT with personal tutoring was 87% (see Figure 3). In other words, the percentage of perceived understanding and mastery of the subject improved with the participation of a teacher. These results allow us to validate the proposal put forward in Expectation 3, which postulated that those students who participated in the project with the combined use of ChatGPT and personal tutoring with the teacher would have a better perception of their control and mastery of the proposed subject matter than those who used only ChatGPT.

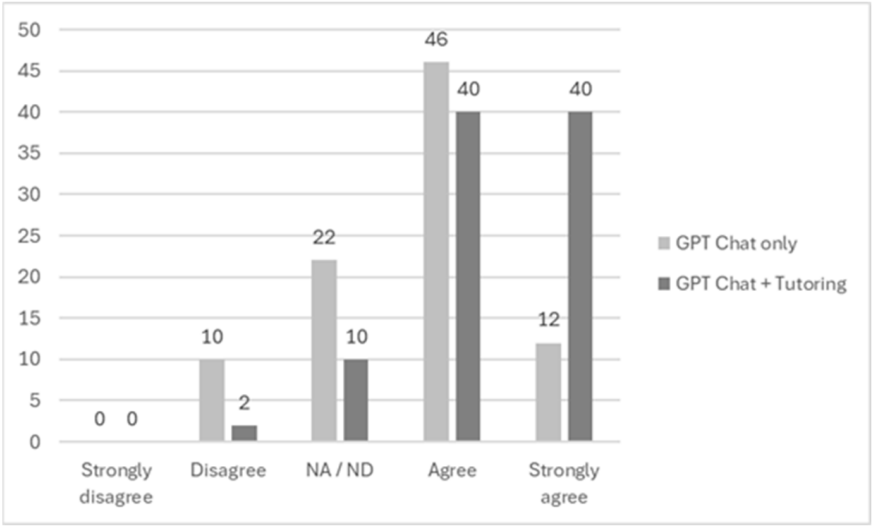

Figure 3. Perception of subject matter mastery. Source: own elaboration based on questionnaire data.

5.4. Expectation 4

In contrast, although there was one group that did not receive assistance or interact with the teacher, 82% of both groups indicated the need for teacher participation in content explanation (see Figure 4), a result that aligns with the study by Ausat and his colleagues (2023). From this result, it can be concluded that although it may sometimes be comfortable and flexible for students to work independently and autonomously, they are aware of the need for a person who can guide and orientate them in their training and learning. This information does not agree with the results that were expected to be achieved for Expectation 4, as we expected to find a greater need for teacher participation only in the working group that combined the use of ChatGPT and personal tutoring with the teacher.

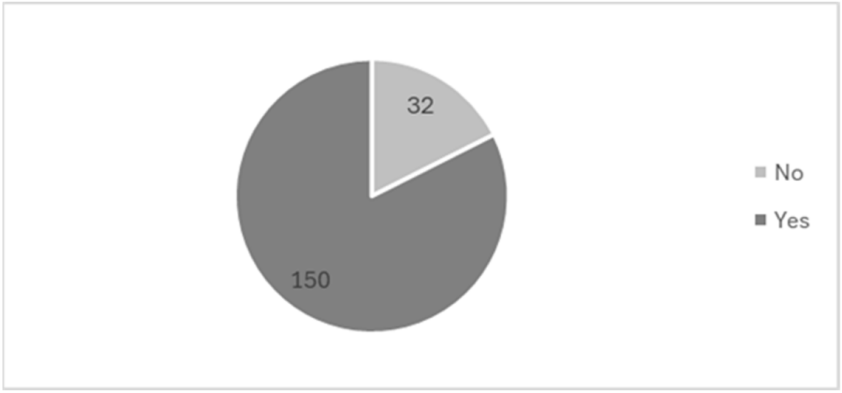

Figure 4. Need for teacher involvement. Source: own elaboration based on questionnaire data.

5.5. Expectation 5

Finally, also an interesting result is that a similar response was obtained from both groups (60% and 62%) on the question of whether ChatGPT or ChatGPT + tutoring would be sufficient to pass a final exam in a subject (see Figure 5); therefore, Expectation 5, which postulated that students who were in the group that combined the use of ChatGPT with one-to-one tutoring with the teacher would perceive that they were better prepared to pass a subject exam than those who only had the artificial intelligence tool, presents results that are not expected.

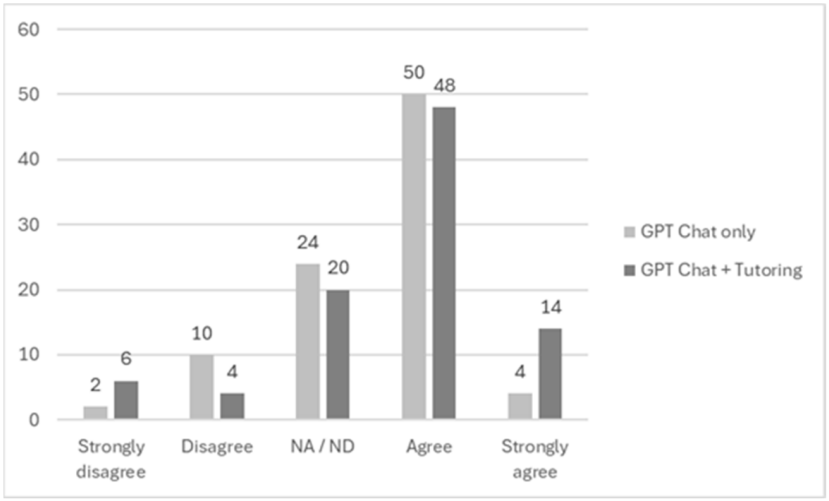

Figure 5. Preparedness to pass the final exam. Source: own elaboration based on questionnaire data.

These data are of interest because it suggests that students are still aware that assessment continues to be carried out through theoretical content and not through practical applications or implications. In light of these observations, it would be beneficial for administrators and educational institutions to assess the necessity of modifying the current evaluation paradigm since students seem to perceive that they are only evaluated in a single direction and that they feel that competences, skills, values or social implications are a plus but that they must first pass in terms of the theoretical content of a subject since this is how they will be evaluated. As educators, it is imperative to consider whether the current assessment paradigm, which relies solely on the memorisation of theoretical content, is an accurate reflection of students' aptitude levels.

As a final comment, it is noteworthy that of the 92 students with whom a personal tutorial was held, in no case did ChatGPT return any information or input related to values or social implications, nor did any of them think to ask the tool about these aspects. However, when the teacher opened up this learning channel to them in tutorials, it had a significant impact and generated interest, as they perceived the need for the teacher to actively participate in teaching, but perhaps from a less theoretical and more practical application perspective.

6. Discussion and Conclusions

The presented study focuses on analysing how the integration of artificial intelligence digital tools, specifically ChatGPT, with the personalised interaction provided by an academic tutor affects the development of soft skills, competences and values in university students [28], with a particular focus on eco- innovation, the current topic of interest to the generation of students participating in the study, and with a clear projection outside the context of the university, oriented towards the professional market. Throughout the research, expectations were posed that sought to examine whether the combination of technology and personalised tutoring would improve the students' perception of the relevance of the subject matter studied, as well as their understanding and mastery of it and the need or otherwise for the use of artificial intelligence tools in the classroom, among other aspects.

The results revealed that the integration of ChatGPT with personal tutoring improved the students' perception of how a subject could enhance their skills, competences and values. Likewise, the expectations addressing the increase in the perception of the social implications of the subject studied and the perception that the understanding and mastery of the subject would improve were confirmed, evidencing a greater understanding on the part of the students when the use of ChatGPT was combined with tutoring. The European Framework of Digital Competencies for Citizenship [29] identifies five major basic competencies that organisations demand. These competencies are the search for

and management of information and data, communication and collaboration, the creation of digital content, security and problem solving. In this study, we have worked on the development of three of these: the search for and management of information to build the theoretical topic; communication and collaboration (only the Chat + tutoring group) to delve deeper into the information collected; problem solving, having to make appropriate decisions based on the objective and resolving issues specific to the topic and the tool.

Nevertheless, there were no differences between the two groups studied in terms of the necessity for teacher participation in the explanation of the content or the perception of the sufficiency of using the tools to pass a final exam. However, both groups considered the teacher's involvement in the classroom to be of great relevance. These findings point to the necessity of acknowledging the intricacy of the educational process and the variety of factors that influence it. While technology and personalised interaction can be valuable tools to enhance the educational experience, their effectiveness may vary depending on the context and the individual characteristics of students.

In conclusion, the synergy between technology and personalised tutoring is presented as a possible effective strategy to promote the development of soft skills and improve students' perception of the relevance and applicability of academic content. For the university, this implies the importance of adopting a balanced approach that integrates technological tools with meaningful human interactions to optimise the teaching and learning processes. This involves not only providing access to advanced technology but also encouraging the active participation of faculty in the design and implementation of pedagogical strategies that maximise the potential of these tools to the benefit of students [30]. Furthermore, the need to think carefully about a change in focus in terms of the evaluation system is highlighted, not only focusing on theoretical content but also on the measurement of students' soft skills and abilities, as it is through these that their future employability will increase and not through a greater accumulation of theoretical content. Ultimately, this approach will help prepare students more comprehensively to meet the challenges of the 21st century and to thrive in an increasingly digitised and globalised environment.

7. Limitations and Future Lines of Research

Although stratified random sampling was used, the sample of 182 students could be considered limited for generalising the results to a wider population. A larger and more diverse sample could provide more representative and robust results. The study was conducted at a private university in Spain and with students from a specific programme, which limits the generalisability of the results to other educational contexts and student populations. To enhance their external validity, it would be beneficial to replicate this study across a range of courses, programmes and universities, which would facilitate a more comprehensive understanding of how the integration of technology and tutoring affects soft skill development in diverse educational contexts. The study was also based on the use of a specific tool, ChatGPT, whose effectiveness and perception may vary depending on students' familiarity and previous experience with the technology.

As lines of future research, it is recommended that the study be replicated with a larger and more diverse sample, including students from different educational levels and programmes, and that a more in-depth and specific statistical analysis should be carried out, oriented towards predictions of the causalities between the variables studied, rather than trends.

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

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors on request.

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