AI, Floristics and Soft Skills: Can ChatGPT Present a New Model of Floristics Lesson Based on Improving Students' Soft Skills?

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Abstract: The use of artificial intelligence has a profound impact on many fields, including education and research. This study was conducted at the higher education and training Oujda to explore the effectiveness of artificial intelligence/ChatGPT as a pedagogical tool and its ability to create a new model of Floristics lessons with a focus on enhancing students' soft skills. The following soft skills were targeted: communication, public speaking, teamwork, creativity, critical thinking, time management, and self-management. The results show that the collaboration between students and ChatGPT was a valuable resource for accessing diverse perspectives, fostering creativity, and improving students' analysis skills and critical thinking. Despite the challenges faced by ChatGPT, including ethical concerns and data biases, AI could be a pedagogical tool, educators must align AI with learning objectives, making balance between AI and human interaction to reinvent the way of teaching.

Keywords: ChatGPT, education, soft skills, biology lesson, pedagogical tool.

人工智能、植物学和软技能：聊天谷氨酰胺磷酸酶能否提出一种基于提高学生软技能的植物学课程新模式？

摘要:

人工智能的使用对包括教育和研究在内的许多领域产生了深远的影响。这项研究是在乌季达高等教育和培训机构进行的，旨在探索人工智能/ChatGPT作为教学工具的有效性及其创建新的植物学课程模式的能力，重点是提高学生的软技能。针对以下软技能：沟通、公开演讲、团队合作、创造力、批判性思维、时间管理和自我管理。结果表明，学生与ChatGPT之间的合作是获取不同观点、培养创造力、提高学生分析技能和批判性思维的宝贵资源。尽管ChatGPT面临道德问题和数据偏见等挑战，但人工智能可以成为一种教学工具，教育工作者必须使人工智能与学习目标保持一致，在人工智能和人类互动之间取得平衡，以重塑教学方式。

关键词：聊天室、教育、软技能、生物课、教育工具.

1. Introduction

As indicators of success in the labor market and in

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life, there has been an increasing focus on competencies, skills, and values. These competencies are alternatively referred to as critical competencies and soft skills [1]. Quality human capital comes from a quality education process. A carefully designed and well-planned education system is critical for developing human capital. Soft skills fulfill an important role in shaping an individual's personality. It is of great importance for every student to acquire adequate skills beyond academic or technical knowledge [2]. Institutions of teacher education play an important role in producing highly knowledgeable and skillful human capital because during students' university time, educators have major influence on the development of their students' soft skills [3].

Embedding the training of soft skills into hard skills courses is an effective and efficient method of achieving both an attractive way of teaching a particular content and an enhancement of soft skills [2]. Higher education in Morocco has issued amendments mandating the inclusion of soft skills in curricula. Since the development of the Strategic Vision Reform (2015-2030) [1], in his speech on August 20, 2018, His Majesty the King clearly called for the urgent implementation of measures that target a better match between training and employment as well as a reduction in unemployment. According to his speech, the Ministry of Higher Education and Scientific Research has launched a national plan to accelerate the transformation of the ecosystem of higher education, scientific research, and innovation [4], and the Minister of Higher Education stressed the importance of soft skills in educational reform. As a result, there is now more pressure on academic institutions to improve the soft skills of their students [4]. However, teachers have not received any training or instructions pertaining to the instruction of soft skills, which is why their competency development in Soft Skills became a crucial factor to improve [4]. This is a call to innovative thinking about new methodologies of teaching and learning.

The aim of the high school of education and training is to provide the public and private education sectors with quality teachers to meet the growing need for teachers in the primary and secondary education sectors. There are certain skills and attributes that are familiar across all sectors. A teacher's career is based on the acquisition of knowledge and skills related to the role of educator, development of personal skills and attributes including communication, public speaking emotional intelligence, problem-solving, critical thinking, creativity, organization and time management in addition to the use of educational technologies.

We found that our students were still inadequately prepared to think critically and that they possessed less than satisfactory other soft skills levels; therefore, instead of teaching soft skills as a separate module, we consider that the transversality of these skills requires

the development of a new teaching methodology, a very effective and efficient way of doing this is to include soft skills training into the teaching of hard skills [2].

This study falls within the framework of innovation in education following the call launched by the Moroccan Ministry of Higher Education; it is based on exploring the effectiveness of using IA as a pedagogical tool and its ability to present a new model of floristics lessons (hard skills) with a focus on enhancing students' soft skills.

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We address the issue of innovation in education by analyzing the following questions:

- Can the involvement of students in lesson design help enhance their soft skills?
- What Soft Skills should future teachers improve on?
- Can ChatGPT be used as a pedagogical tool?
- What innovative solution can the collaboration between students and Chat GPT present to enhance their soft skills?

This study addresses these issues through experiences conducted with students from the higher education and training schools in Oujda. The study is divided into three parts: the first part is a bibliographical overview of soft skills; it highlights the soft skills essential for future teachers and discusses the relationship between technology and education; the second part covers the methodology followed during the study; the last part is devoted to the presentation of the results their discussion as well as the conclusion.

2. What Are Soft Skills?

Soft skills are personal attributes that enhance an individual's interactions, job performance, and career prospects. Hard skills tend to be specific to a certain type of task or activity [3]. According to [5], it is crucial to apply "a range of non-academic attributes, such as the capacity to cooperate, communicate, and solve problems, frequently referred to in higher education as generic or soft skills." In addition, they argue that "unlike academic or disciplinary knowledge, which is subject- based, content-specific, and formally tested, soft skills consist of a variety of competences that are independent of formal curricula, albeit frequently developed by them, and rarely assessed directly" [6]. This quote clarifies the current state of higher education. Although soft skills are considered crucial for students, they are rarely taught or assessed in higher education. In addition, soft skills can be evaluated using subjective rather than summative

evaluations [6].

Based on the research findings obtained, seven soft killings were identified and chosen to be implemented in all teacher education institutions. They are [3]:

- Communicative skills
- Thinking and problem-solving skills
- Teamwork force
- Lifelong learning and information management
- Entrepreneur skill
- Ethics, morality, and professionalism
- Leadership skills

2.1. Important Soft Skills for Future Teachers

Table 1 details future teachers' soft skills.

Table 1 Soft skills for future teachers [3]

Skills	Description
Communication skills	Teachers are expected to be fluent and communicate effectively. They should be able to convey their thoughts in both written and oral form. They are also expected to be active listeners who provide the necessary responses.
Critical thinking and problem-solving skills	Teachers should be able to think critically, creatively, innovatively and analytically, which includes the ability to apply knowledge. The elements that they must possess in this aspect are the ability to identify and analyze complex situations and make justifiable evaluations. They should also can expand and improve their thinking skills and provide ideas and alternative solutions.
Team work	Work skills involve the ability to cooperate with people from various social and cultural backgrounds to achieve common goals. In order to build a good working relationship with his/her peers, it is essential that they are respectful toward others' attitudes, behaviors, and beliefs. From time to time, they are also expected to assume the role of a leader and a group member interchangeably.
Lifelong learning and information management skills	In acquiring skills and knowledge, novice teachers should be able to self-regulate their learning independently. They should have the skills to search for relevant information from various sources and be able to manage such information efficiently. They should also be receptive to new ideas and be able to develop an inquiry mind.
Entrepreneurship skill	This skill involves novice teachers' abilities to venture into business and work-related opportunities while creating risk awareness. This skill includes the ability to identify business opportunities and prepare, build, and explore business plans, which eventually lead to self-employment.
Ethical and professional moral skills	Novice teachers are expected to practice with high moral standards in relevant professional practice. They should also be able to understand the effects of the economic environment and social-cultural factors on their respective professional practices. In relation to ethical issues, they should be able to analyze and arrive at decisions on matters concerning ethics. Beyond the working environment, they should be able to practice good ethics while having a sense of responsibility toward society.
Leadership skill	This skill entails the ability of novice teachers to lead in various activities. Novice teachers should have knowledge of basic leadership theories, which will enable them to lead a project. It is also essential that they understand the role of a leader and a group member and be able to perform these roles interchangeably

2.2. Technology-Based Innovative Solutions to the Teaching and Learning Process

2.2.1. Technology and Education

Today, knowledge and information are the main keys to obtaining productivity, competition, wealth, and comfort. Therefore, human beings have concentrated on approaches for gaining better quality of education, which became in the 21st century the center from which all changes and developments in the 21st century [7].

This era is often regarded as the era of technological development. It plays a major role in every field, and one such field where its presence is utmost is in the education sector. With the advancement in technology, education among people has begun to proliferate, and there is continuous research on the impact of technology involvement on education. How can it make education easier, joyful, and accessible and prepare students to be competitive and ready to work [8].

Educational technology has three aspects. First, the most obvious one is technology as a discipline for teaching and learning. The second aspect is the technology of learning, and the third aspect is the technology of teaching [9].

Today, it is essential for teachers to possess not only the art of teaching but also the technology of teaching as foundation for this art [10].

2.2.2. Technology for Innovative Solutions to the Teaching and Learning Process

"Educate to Innovate"

Today technology serves as a useful tool in enhancing teaching skills and learning ability. Both teachers and students use various technologies to achieve specific academic goals [11] and improve the quality of education (efficiency, optimal, true, etc.). The teacher is no longer the center of the classroom; rather, he or she serves as a middleman between information and students. Instead of listening passively, students are now active in gaining, rearranging, and displaying information [7].

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2.2.3. AI and Education

Since its release in November 2022, Generative Pertained Transformer (ChatGPT) has caused a global buzz over generative artificial intelligence (AI). Despite some critical views, large language models such as ChatGPT represent significant advancement in AI, and they are here to stay. Experts in education and innovation have stated that since ChatGPT and other generative AI tools are a part of young people's lives and will continue to be so, ways must be found to incorporate them into education [12]. Therefore, AI applications are being utilized in higher education for computerized assessment, personalized learning, or smart education to support teaching staff. AI has changed the paradigm of education; it is more about co-education. One of the main purposes of learning is to train students to analyze core literacy and ability that cannot be possessed by a series of machines, such as speculative ability, practical, cooperative communication, teamwork, creativity, empathy, etc., to inspire curiosity and help students establish a sense of lifelong learning, rather than simply acquiring memory knowledge [11].
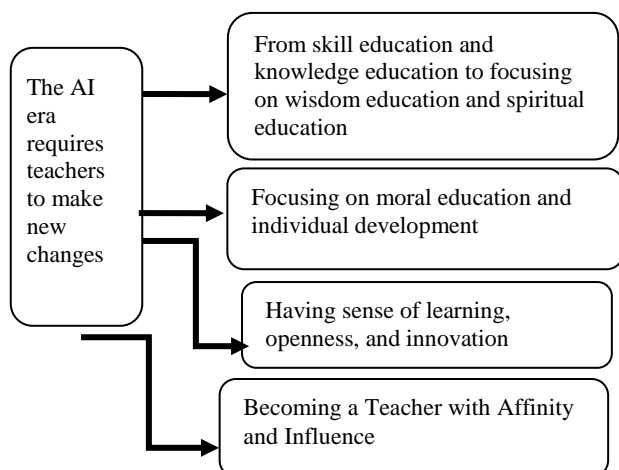

Fig. 1 Teachers' perspectives on the IA era (Developed by the authors)

However, it should be recognized that the application of Chat GPT in the field of education also faces many challenges, such as data quality, knowledge reserves, privacy protection, ethical issues, etc. [13].

2.2.4. AI and Biology

The implementation of AI in the field of biology has been diverse in various fields, such as medicine, industry, agriculture, and animal husbandry. The use of AI in biology is primarily concerned with studying molecular interaction networks and cell behavior [14]. The development of AI for biologists can be a solution to solving various research problems, such as investigating and integrating complex mechanisms at various scales (from genes, cells, organisms, populations, and ecosystems) and developing theoretical engines to understand biological and ecological systems at very large scales, all of which would be very limited without the integration of AI [15].

3. Methodology

Innovative teaching involves practicing and using new, modern approaches to teaching and exploiting creativity.

Taking some risks [7], this study is based on creating interactions and collaboration between students and chat ChatGPT 3.5, and between students themselves, with the aim to engage them to participate actively and be fully immersed in the learning process and creating a new form of biology lesson based on their innovativeness, creativity and capacity to generate new ideas that involve critical thinking and imagination while enhancing their communication, public speaking, problem solving, teamwork and emotional intelligence.

The study is carried out on the floristics course with students from the life and earth sciences sector. After dividing the course into 5 chapters, the students into 5 teams, subjects were chosen randomly.

Table 2 Distribution of chapters and teams and soft skill designation

Chapters	Teams	Soft skills
Diversity and systematic distribution of bryophytes and pteridophytes	1	Communication Team-work Public speaking
Diversity and systematic distribution of gymnosperms	2	Creativity Critical thinking
Diversity and systematic analysis of angiosperm monocots	3	Problem solving Emotional intelligence Time management
Diversity and systematic analysis of angiosperm dicot I	4	
Diversity and systematic analysis of angiosperm dicot II	5	

The results were presented during a session which lasts 3 hours, where 2 hours are devoted to students presenting their work and one hour was allocated to the supervisor to complete or correct the content presented by the students. It is up to students to find the ideal spatiotemporal distribution for the progress of their sessions. The following instructions were imposed on the students:
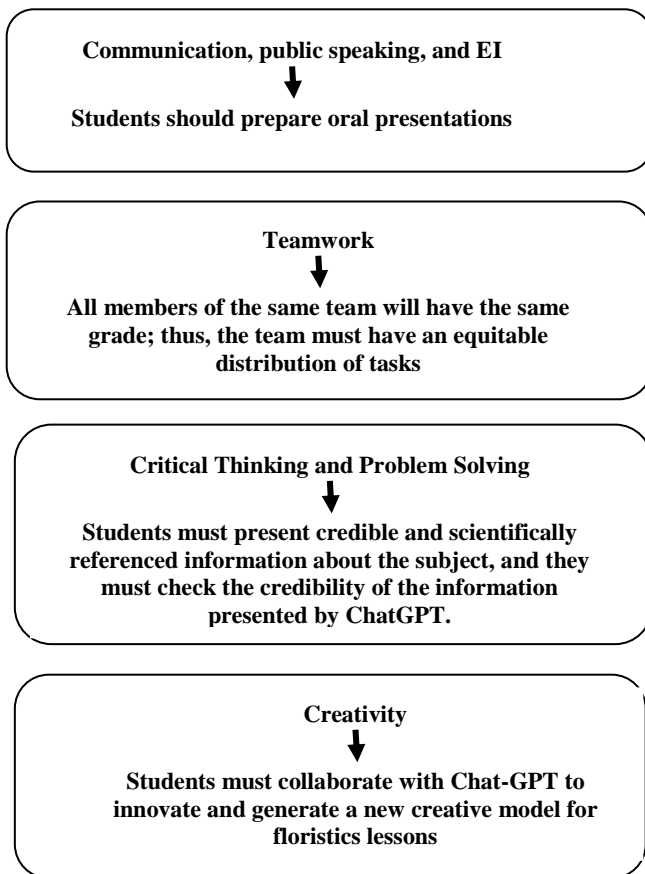
Communication, public speaking, and EI

↓

Students should prepare oral presentations

Teamwork

All members of the same team will have the same grade; thus, the team must have an equitable distribution of tasks

Critical Thinking and Problem Solving

↓

Students must present credible and scientifically referenced information about the subject, and they must check the credibility of the information presented by ChatGPT.

Creativity

↓

Students must collaborate with Chat-GPT to innovate and generate a new creative model for floristics lessons

Fig. 2 Instructions imposed on students

In addition to the skills mentioned above, students found themselves faced with other skills that they had to develop during their work like:

➢ ability to develop team spirit
➢ collaboration, cooperation
➢ empathy
➢ absence of rivalry

Collaboration with ChatGPT consists of

➢ Generating scientific content that covers the selected chapter of the floristic literature
➢ Creating innovative lesson types
➢ Proposing learning activities
➢ Highlighting the importance of asking appropriate questions and developing appropriate prompts

4. Results and Discussion

The Partnership for 21st-century learning includes Learning and Innovation; they define these learning and innovation skills as creativity and innovation, critical thinking and problem solving, communication, and collaboration [16]. In this study, we attempt to determine the utilitarian value of ChatGPT and its effectiveness when used as a pedagogical tool. We accepted the challenge of being co-learner and adopted a student-centered approach, this through the involvement of students in the process of preparing the lesson, starting from the planning of the course, its sequencing, and the spatiotemporal organization of the course session. We obtained the following results:

Table 3 Proposed activities during the session

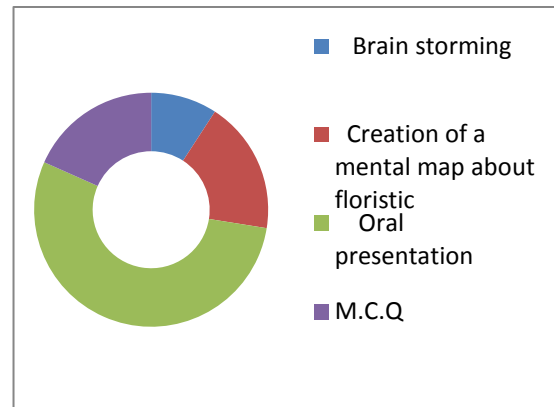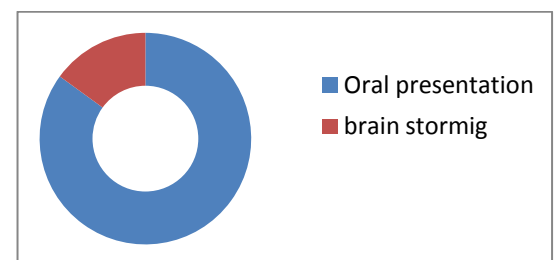| Team	Proposed activities during the session
1	- Brain storming
	- Creation of a mental map of floristic features
	- Oral presentation
	- M.C.Q

Fig. 3 Distribution of the proposed activities during session for Team 1 (Developed by the authors)

Table 4 Proposed activities during the session

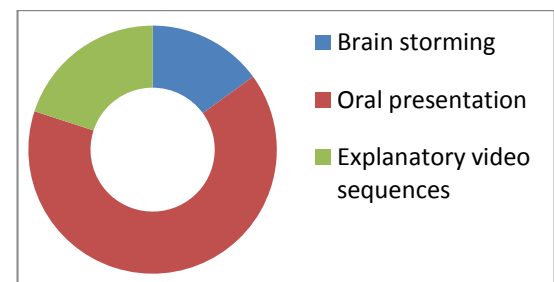| Team	Proposed activities during the session
1	- Oral presentation
	- Brain storming

Fig. 4 Distribution of the proposed activities during session for Team 2 (Developed by the authors)

Table 5 Proposed activities during the session

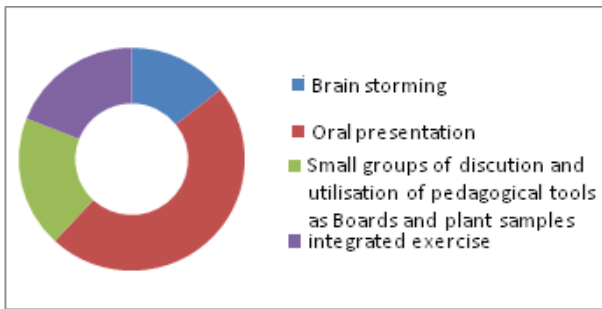| Team	Proposed activities during the session
3	- Oral presentation
	- Oral presentation
	- Explanatory video sequences

Fig. 5 Distribution of the proposed activities during session for Team 3 (Developed by the authors)

Table 6 Proposed activities during the session

Team	Proposed activities during the session
4	- Brain storming
	- Oral presentation
	- Small groups distributing and using pedagogical tools such as boards and plant samples

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- Integrated exercise

Fig. 6 Distribution of the proposed activities during session for
Team 4 (Developed by the authors)

Table 7 Proposed activities during the session

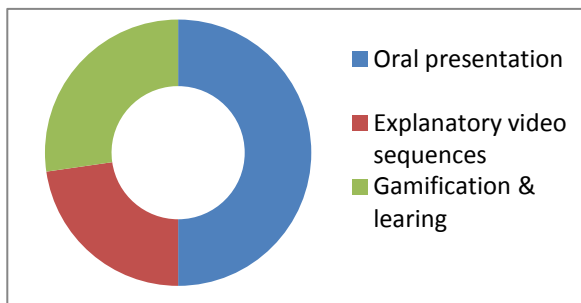| Team	Proposed activities during the session
5	- Oral presentation - Explanatory video sequences - Gamification and learning integration of a quiz presented as a game: The students created an application as a quiz on their mobile phones. The results were simultaneously projected on the board, with a reward for the winners.

Fig. 7 Distribution of the proposed activities during session for
Team 5 (Developed by the authors)

Several challenges were observed during the study such as

➢ Lack of experience in preparing oral presentations; thus, certain groups of students did not achieve the goals;

➢ Some students could not integrate into their groups, which affected the quality of their work;

➢ Lack of presence, confidence, and assertiveness during oral presentations Great fear of criticism, which led some groups to opt for repeating the content presented by previous groups;

➢ Linguistic barrier: Some students have a very low level of French, which creates a real obstacle to communication;

➢ Lack of critical thinking about the content presented by ChatGPT;

➢ Lack of precision in the presented information, inappropriate choice of explanatory figures and sometimes poor use of the documentation;

➢ Lack of precision in the presented information, inappropriate choice of explanatory figures and sometimes poor use of the documentation.

The integration of student–AI technology interactions in learning can complement the limitations of traditional teaching. Students learn more quickly when they are actively involved in the use of technology and they discover a lot more [17], observation in this study's findings AI was used as pedagogical tool by students, they were invited to think creatively and innovatively to create a new model of floristics lesson and accompanying it with appropriate learning activities, they had the freedom to plan the course and the spatiotemporal organization of the class, they were invited to contribute to the establishment of a new teaching methodology centered on the development of their skills, the student's engagement and enthusiasm was beneficial for both teachers and learners, who became more aware of their own learning abilities and how to improve them to deepen their understanding of the subject, and improve their research and analysis skills by comparing the information presented by ChatGPT with that taken from scientifically credible and referenced documents. The students were able to highlight the quality of the data and the aberrations that ChatGPT presented, which had a positive impact on their critical thinking regarding ChatGPT limitations, quality, and accuracy.

Moreover, students discovered their EI, communication, and public speaking skills limitations while they had to engage in open-ended class discussions about their work, but at the same time, they had the opportunity to improve their higher-order thinking in general and computer or ICT skills.

This study implies that teachers should be encouraged to use a variety of instructional strategies to increase students' involvement in lesson design and to consider them as the main actors of their own learning. The right to make mistakes is affirmed as an educational principle, with the aim of creating a dynamic environment that promotes reflection and participation [18]. An instructor became a facilitator rather than a primary source of information, fostering student engagement and autonomy [2] and moving toward an active learning process rather than a passive one.

Therefore, education is very special: it is about two parts: 'teaching' and 'education'. 'Teaching' refers to the transfer of knowledge. This part of the work AI can do better than people by providing new perspectives; 'education' refers to the cultivation of character and encourages students to explore the unknown, to discover, and to create. This part is hard to replace by AI; efforts should be made to seek new educational models and teaching methods, create more flexible and efficient educational environments, focus on students' comprehensive development, and improve the quality and effectiveness of education and teaching [10].

Certainly, ChatGPT has impressive capabilities in creating materials such as visual presentations, targeted and relevant information, and lesson plans; however, these should be seen as a starting point for users (both teachers and students) who should add their

knowledge, analyze, and criticize the results to reach a final product [9].

However, it is imperative for higher education institutions to consider the challenges associated with integrating generative artificial intelligence tools into educational settings and academic curricula [19].

5. Conclusion

ChatGPT is not the first or last innovation impacting the education sector. The results of this study show that the involvement of students in the design of a new form of floristics lesson with a focus on their soft skills and collaboration with IA/ChatGPT was beneficial. They became more engaged, enthusiastic, dynamic, confident and open to constructive critics.

We also noted that they became more aware of their own learning abilities and how to improve them to deepen their understanding of the subject and improve their research and analysis. A similar result was observed when IA was used as a tool to improve students' critical thinking skills when used in English classes, students developed critical thinking abilities such as inference and self- regulation [17]. Additionally, the use of AI capabilities has had a noticeable impact on students' motivation to experience an improvement in their confidence levels when it comes to English pronunciation and communication using chat Box. [20] In another study, IA had a significant impact on students' self-efficacy and making them feel more capable of handling academic challenges [19].

Building bridges between AI and education holds promising potential in developing and honing students' soft skills; however, teachers should accept the challenge of being co-learner, adopt a student-centered approach, and involve students in the process of preparing and designing lessons. Nowadays, it is important to understand what place must be occupied by pedagogical technology in the professional activity of teachers. The application of IA technologies, such as ChatGPT, brings numerous advantages to education; however, there are also potential concerns, such as excessive reliance on technology potentially weakening students' initiative [21] and unequal access to technology, leaving some students unable to fully benefit [21], ethical issues related to AI such as data privacy, data bias, security, social impact, transparency, in addition to its convenience.

Future research suggestions in the field include the following:
✓ To complete this work through qualitative study.
✓ Develop new approaches to effectively train educators on how to integrate IA/ChatGPT into their teaching practices.
✓ Design guidelines that describe interactions between students and IA/ChatGPT and highlight best

practices for students IA/ChatGPT responsibly, constructively, effectively, and ethically promoting data analysis, information evaluation, critical thinking.
✓ Developing a new assessment methodology and evaluation.

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