

Chatbots as a Learning Tool

Artificial intelligence in education

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Abstract

Artificial intelligence is entering the educational process as a new element influencing both pupils/students and teachers. This article explores the significant use of AI in the education process and provides insight into the perspectives of both parties – pupils/students and teachers. As part of our research, university students were asked about their views and experiences with AI in education. This allowed us to better understand their wants and needs. AI is viewed positively if it enhances the learning process and does not sabotage pupils/students' personal interactions with teachers. AI will help teachers with grading and generating tasks, saving them time and allowing them to focus more on interacting with pupils/students. AI will help teachers with assessment and task generation, saving them time and allowing them to focus more on interacting with pupils or students, helping them to better understand the needs of the classroom and tailor their teaching. A key point is preparing teachers to use AI effectively in the classroom.

Keywords: Artificial intelligence (AI), Chatbots, Effective use of chatbots in education

1 Introduction

At first glance, it would seem that artificial intelligence (AI) has spread very quickly in society, almost by leaps and bounds. But the truth is that it has gradually developed and slowly integrated itself into the technical tools we commonly use (for example: apps in smartphones to solve mathematical equations; apps that recognise plants or objects with links to eshops; apps for learning languages). AI has come among us and is not going anywhere. It will continue to improve. Just as calculators have made it easier for us to do maths, Google to find information, Google translator to translate from other languages, so too can AI tools help us in everyday life and in teaching.

It is nonsense to prohibit the use of artificial intelligence by pupils in the education process. Firstly, pupils/students will always find a way to use AI despite the ban (minimum own mobile phone) and then, where else but at school should pupils and students be guided to master the

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rapid technological advances that are changing the world. This is actually the biggest reason not to ban AI in the classroom. Today's pupils/students are entering a world full of generative artificial intelligence programs. For today's pupils/students to be good citizens in the future, they will need hands-on experience with AI. They should understand how this type of AI works, what its characteristics are, what strengths and weaknesses it has, and how it can be exploited (Roose, 2023). The goal of teachers should be to equip pupils/students with competencies for a future with AI.

Developed countries such as South Korea and the United States are already preparing intensively for the integration of artificial intelligence into the curriculum of primary and secondary schools. In the future, students are expected to possess, according to Kim et al (2021):

- 1) knowledge of artificial intelligence,
- 2) skills related to the use of artificial intelligence
- 3) and my own attitude towards artificial intelligence.

The Czech Republic is currently working on the development of an AI curriculum for primary schools with a focus on secondary schools. The curriculum is being developed by AI for Children in cooperation with the National Pedagogical Institute, a group of academics from prg.ai and Aignos, an association focused on AI education. The educational content should cover the following areas: understanding AI technologies, developing skills with AI applications and understanding the impact of AI on society (AI for Children, 2023).

In this context, we feel that there is a need to ascertain the views of future teachers of practical education on this issue.

2 Goals

Chatbots, as one tool for the practical application of AI technologies, are nowadays standardly used in customer service in various industries. In the form of virtual assistants, they replace human contact. But chatbots can also be a very interesting teaching tool. The main goal of this paper is to see if chatbots can be used appropriately in education.

The main goal breaks down into the following sub-goals, which we want to find out:

- How a chatbot can be used as a teaching/learning tool.
- How a chatbot can be used as a learning tool/tool in teaching.
- How respondents want to further their education in AI.
- How to constructively incorporate chatbots into teaching.

3 AI in Education

According to the National Strategy for Artificial Intelligence in the Czech Republic (2019), education plays a crucial role in minimising the potential negative impacts and maximising the

opportunities that AI brings to the economy and society. With the advent of AI, the National Strategy for Artificial Intelligence (2019) states that the education system needs to be adjusted to focus on lifelong learning through the following activities financially supported by the government:

- the development of methodological support,
- expanding the range of university study programmes and courses in AI, continuing professional education and retraining,
- development of digital competences and computational thinking of pupils and students,
- updating the framework education programmes,
- introducing appropriate elements for teaching AI skills at all levels of school.

Unicef (2023) states that children or youth make up a large proportion of AI users, but most AI systems do not allow young users to make informed decisions about how to interact with AI (how, when, what data is collected about them, how the data is used, how content is created for youth, etc.). Better information for children or youth about how companies, tools, platforms or individual content working with AI work is recommended as an appropriate solution to these negative impacts of AI on youth (Unicef, 2023).

Simply giving information to pupils/students without their active participation is not effective. The best learning outcomes for pupils/students will be achieved if they use and actively practice the ideas, knowledge and skills they are learning (Petty, 2009). Therefore, the best way to teach about AI technologies is to use them. How teachers, pupils and students can realistically and appropriately use one of the AI tools is the focus of this paper.

AI is a general term used to name activities where a machine does something that would normally require human intelligence (Lane, 2021).

There are many different techniques to get a machine to replace human intelligence.

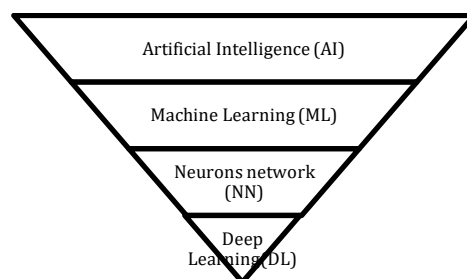


Figure 1: The relationship between AI and its components (Lane, 2021)

The most essential sub-form of AI is machine learning (a computer learns to solve problems using examples presented). One type of machine learning is the Large Language Model (LLM), also called generative AI because it can generate new content instead of just analysing existing data (Baker, 2023). This paper focuses on chatbots that are explicitly powered by machine learning. In doing so, we focus more on the practical applications of chatbots than on understanding the technology itself.

3.1 Chatbots

Chatbots were created for human-artificial intelligence communication. These are computer programs that allow users to interact with AI. Specific chatbots include ChatGPT, Bing AI, Google Bard, Perplexity, Copilot, etc. Chatbots mimic human conversation and are increasingly being used for customer service purposes, for example, in communicating with a customer to review a particular product or service, to answer common customer questions, as virtual assistants to order a product or service, to help select a product or service, and to answer questions about a product or service (Lane, 2021). But there are many more possible uses of chatbots. Baker (2023) predicts that chatbots are most likely to replace humans, who collect, analyse, use and disseminate knowledge of various kinds in their work. Generative AI technologies in the form of chatbots are likely to be used significantly across all industries, businesses and services. They are already being encountered in the following sectors, according to Baker (2023):

- medical research and development,
- biohacking,
- healthcare,
- education,
- media,
- marketing and advertising,
- legal,
- art,
- retail,
- financial services,
- research,
- search engines,
- library science,
- publishing.

3.2 Chatbots in Education

The use of GPT Chat in formal education raises concerns for many about cheating on homework. However, this concern can be overcome by the ability of teachers, pupils and students to use the potential of chatbots to the maximum. According to Roos (2023), schools should adopt chatbots as a useful school tool and in no way as a substitute for teachers or pupils/students. Roose (2023) gives several examples of how a chatbot can be helpful for teachers' work and pupils/students' learning:

- using chatbots to create outlines for essays (chatbot will help deepen understanding of the topic, and teach how to interact with AI models),

- The chatbot can tailor instruction to the specific learning style of individual pupils/students (for example, explaining Newton's laws of motion to a visual-spatial student),
- the chatbot will help with the genesis of ideas for activating pupils/students in the classroom (for example, it will write a script for production on any topic),
- A chatbot can serve as an after-hours tutor (for example, explaining Archimedes' Principle using language an eighth-grader would understand),
- pupils/students can discuss with the chatbot as if it were their debating partner (they can ask it, for example, to convince them that animal testing should be banned),
- Even the shortcomings of chatbots (such as the fact that their answers to factual questions are often wrong) can become useful for training critical thinking (for example, teachers can ask pupils/students to evaluate the chatbot's answers as a teacher would evaluate a pupil's/student's answers),
- The chatbot can also help teachers save time when preparing for a lesson (for example, to generate quizzes).

Andrew Herf (2023) from St. Joseph's College of Engineering in A Teacher's Prompt Guide to ChatGPT wrote many creative ideas for teaching with chatbots. ChatGPT can create, for example:

- worksheets including learning objectives and the criteria needed to master them,
- glossaries and definitions,
- arguments for and against,
- mind maps,
- their own stories,
- tasks and assignments adapted to the needs and abilities of each pupil or student,
- quizzes and tasks to verify information,
- curricula that meet the needs of pupils in terms of content and scope,
- basis for feedback, independence, self-reflection and monitoring of pupils' efforts,
- guidelines for motivating pupils and students,
- guidelines for assessing pupils and students,
- and much more (Herf, 2023).

For more examples of effectively incorporating ChatGPT into teaching practice, we recommend reading Andrew Herft's ChatGPT Teacher's Guide (2023). Table 1 shows examples of how a chatbot can help with teaching and learning according to Miller (2022).

Table 1: Examples of how a chatbot can help with teaching and learning (Miller, 2022)

| | Type of activity in the lesson | Description |
|----|---------------------------------------|---|
| 1. | A comprehensive source of information | A basis for effective conversation and discussion of the topic. |

| | | |
|-----|--------------------------------------|---|
| | | Use the chatbot as a source of information and answers to a variety of questions (especially for difficult material to understand). |
| 2. | A sample of good examples | When pupils and students see enough good examples, they realise what is good (a good essay, good reasoning, good logic), and they can imitate it (much like a writer or painter imitates the greats). |
| 3. | Remixing works | The pupil or student writes a story, essay, poem, report, or revision of the material and then asks the chatbot to remix the work for him/her as a nursery rhyme, children's book, etc., showing the pupils new opportunities. |
| 4. | Individualised educational resources | Create personalised learning resources (content, methods, forms, teaching aids) that are adapted to the content and pace of learning, needs and abilities of pupils/students. Ask him to define concepts, laws, and phenomena at different levels (for example, so that a 10-year-old child can understand it). |
| 5. | Feedback | For example, feedback on a written essay might look like a list of a few suggestions for improving it - add more examples, break it up into shorter paragraphs, use this phrase, etc. |
| 6. | Inspiration to prepare for teaching | Ask the chatbot to prepare the lesson for you - quizzes, discussion topics, examples, ... |
| 7. | Finding more resources for teaching | Ask the chatbot to supplement your personal learning by providing additional resources, materials, etc. |
| 8. | Creation of thematic plans | Ask the chatbot to write a topic plan for the lesson based on the curriculum documents provided. Then, modify the plan according to your needs. |
| 9. | Discussion participant | Incorporate it into think-pair-chatbot-pair-share discussions. Pupils or students think about the topic on their own, then discuss it with a classmate, then use the chatbot, discuss what they found with a classmate, and finally share their findings with the whole class. Let the pupils/students debate with the chatbot. They can ask the chatbot to refute some opinions or provide arguments. Use the chatbot to gain insight into big, intractable problems like world hunger. The chatbot will either solve the problem, provide insight into the resolution process, or tell you why the problem can't be solved. |
| 10. | Ask | Ask the chatbot again...and again...and again the same question. The chatbot will produce an original answer each time. Pupils or students can select the best-generated versions to create a better final product. |
| 11. | Peer review training | Rate the work of the chatbot. A chatbot has no feelings; it is easier to criticise its work than to risk negative feelings from |

| | | |
|-----|------------------------------|--|
| | | pupils/students because it has messed up. For example, have the chatbot write an essay and then have the pupils/students grade it according to the assessment criteria provided. |
| 12. | Repetition of the syllabus | Ask pupils/students to predict the response they will get from the AI. For example, "What do you think the chatbot will say when I ask it to summarise what you have learned in the past hour?". Pupils/students will recall knowledge from their memory, strengthening their long-term memory. The chatbot will probably not list everything; pupils/students will justify why and what is missing. |
| 13. | Teacher, after working hours | Use AI to provide one-to-one tutoring or coaching for pupils and students. |
| 14. | Advisor, expert, friend | Pupils and students can ask the chatbot for advice in various situations, e.g., stress management, relationships, mental well-being etc. The chatbot can thus replace advice from friends, family, strangers, etc. |
| 15. | Summary of texts | Use it to summarise texts (chapters, subchapters, scenes etc.). Summaries serve well for revision before a test, an exam, or from someone else's perspective. |

From these examples, it is clear that a chatbot can be a perfect tool for planning lessons and inventing different activities for pupils or students. Working with it is simple and fast. However, Baker (2023) also points out the negatives associated with the use of chatbots. Chatbot responses can be inaccurate and qualitatively different, answers that sound convincing can be wrong, conversations are not private, and the creative content generated is not currently protected by copyright law in the US or the Czech Republic. For a better chance of getting correct answers to the more difficult questions, we may recommend asking questions in English. In any case, however, it is advisable for the interviewer to critically evaluate the answers obtained before using them, for example, in teaching.

4 Methodology

A survey research method is used to determine whether chatbots can be used appropriately in education and in what specific ways. The questionnaire was filled out by students of Teaching Practical Education and Teaching Vocational Subjects at Masaryk University in Brno during the autumn semester 2023. 98 students were contacted, 30 students completed the questionnaire and the return rate was 31%. The questionnaire was distributed online via Google Forms and the results were processed using commonly used Microsoft Excel software. The main research question of the survey was set as follows:

- Where do respondents see the potential of using chatbots in education.

The following sub-questions were defined for the main research question:

- Where do respondents see the potential of using chatbots for learning?
- Where do respondents see the potential for using chatbots in education?
- In what areas of AI do respondents want to further their education?
- What form of education do they prefer?

The chatbot from OpenAI, ChatGPT, was used to demonstrate communication with artificial intelligence. ChatGPT was developed by OpenAI in November 2022. ChatGPT is available at <https://chat.openai.com/>, where you can start using it after logging in. The version of chatGPT that we use is 3.5. This version is unpaid and provides up-to-date information valid until January 2022.

5 Results of the Questionnaire Survey

30 respondents took part in the survey. Practical Teacher Education students made up 70% of the respondents, and Vocational Teacher Education students made up 30% of the respondents. Regarding the form of study, 57% of the respondents were full-time students, and 43% were students from the combined form of study.

The majority of respondents (80%) have tried interacting with a chatbot at least once. When asked what they could imagine using a chatbot for as a student, respondents selected the following as the most appropriate activities:

1. to summarise longer passages of text,
2. to design the structure of the text,
3. fast discovery of information otherwise difficult to find in the original sources,
4. getting immediate feedback,
5. to search for different sources of published information,
6. to stylistic reformulation of the text.

Activities that respondents would not use chatbot communication for included:

1. direct formulation of the text itself,
2. completion of a written assignment,
3. solving your homework,
4. generating an argument,
5. generating conclusions.

In Figure 2 on the left, two groups of respondents and their ideas about the use of chatbots are shown. A comparison of the group of respondents working with a chatbot and those not working with a chatbot showed that those who work with a chatbot can imagine using a chatbot in most activities, which we expected. A contrary result would be a very strong incentive for further investigation. Positive values are obtained for most activities, which means that they are more likely to say yes (+1) or definitely yes (+2) to imagine using a chatbot

in them. Exceptions are the activities of *formulating summaries of longer passages of text* and *getting feedback*. Respondents who have not yet worked with a chatbot see more potential for these two activities.

In Figure 2 on the right, we see a comparison between groups of respondents differing on whether they consider chatbots as a suitable or unsuitable tool for education. Here it can be seen that the group of respondents considering chatbots as a suitable tool for education logically also see more potential in using chatbots in the activities offered. The only exception is the activity where the chatbot is used *for completion of a written assignment*. For this activity, respondents who do not consider the chatbot to be a suitable tool for learning imagine some potential use of the chatbot. The second group clearly excluded this activity.

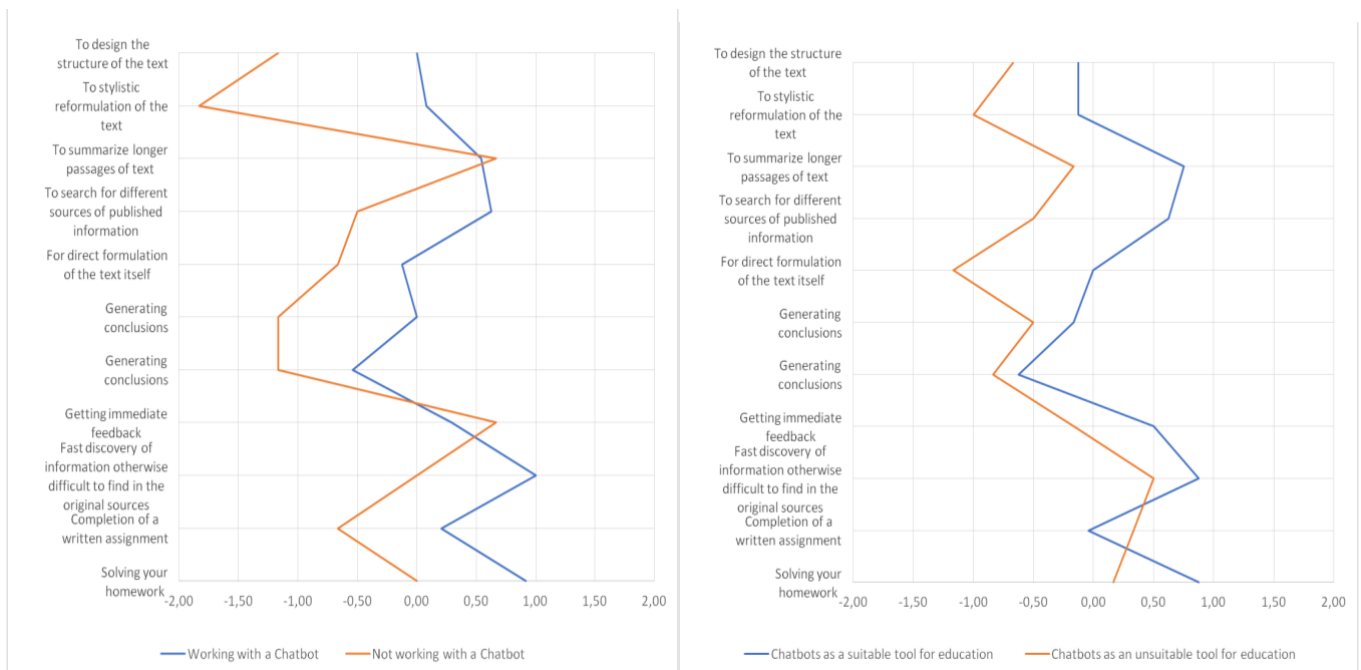


Figure 2: What can you imagine using a chatbot for in the role of a STUDENT?

Since the respondents were university student teachers, we asked them if they worked *under the guidance of their teachers with a chatbot in the classroom*. We found that only about one-third of the respondents (33%) use chatbots in their university education (30% rather use, 3% definitely use), and two-thirds do not (40% rather do not use, 27% do not use at all). Interestingly, the more significant potential for using chatbots in teaching is seen by those who do not use them under the guidance of their teachers, see Figure 3.

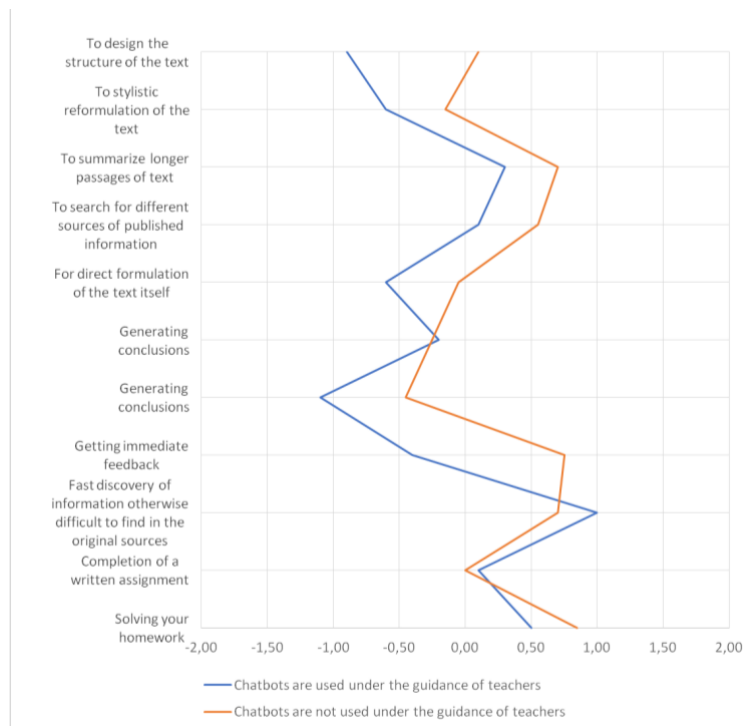


Figure 3: Potential use of chatbot in the role of STUDENT using and not using chatbots in teacher-led learning

In the next part of the questionnaire, we asked respondents to answer from the position of a teacher as their future profession. When asked what they could imagine using a chatbot for in their role as a TEACHER, respondents selected the following as the most appropriate activities:

1. generating ideas for activating pupils/students in the classroom,
2. generation of test tasks, assignments and questions,
3. to actively use AI in teaching (the chatbot acts as a teaching tool),
4. as an aid in the preparation of research or to find sources of published information, etc.,
5. to generate lesson preparations,
6. to generate patterns to motivate pupils/students,
7. to generate tasks and assignments tailored to the special needs and abilities of each pupil/student (individualised teaching),
8. to generate recommendations for other teaching materials.

Among the activities for which respondents would not use chatbot communication in the role of TEACHER, they included:

1. activities that replace the teacher during pupils/students' self-study at home (chatbot = after-hours teacher, virtual teaching assistant),
2. to generate pupils/student assessment guides,
3. as a pupil/student's discussion partner,
4. to the direct formulation of the text itself,

5. to generate lots of good examples (good essay, good reasoning, good logic),
6. to ensure better organisation and planning of teaching (preparation of the thematic plan for the year, ...).

The ideas about the possible use of chatbots in teaching from the TEACHER's position and from the perspective of different groups of respondents (working X not working with chatbots) are shown in Figure 4. Respondents not yet working with chatbots, compared to those already working with chatbots, are more able to imagine their use in activities where the chatbot is a virtual learning assistant for home self-study and for activities leading to the generation of recommendations for further learning materials. For all the other 12 activities offered, those respondents who already have some experience with chatbots see more potential for their use in the role of teacher in teaching.



Figure 4: What can you imagine using a chatbot for in the role of TEACHER?

The use of chatbots by pupils/students during education is considered appropriate by 80% of respondents. Compared to those who considered the use of chatbots as inappropriate, all of these respondents are more likely to imagine using the offered chatbot activities in their own teaching where they will be in the role of a teacher, see Figure 5.

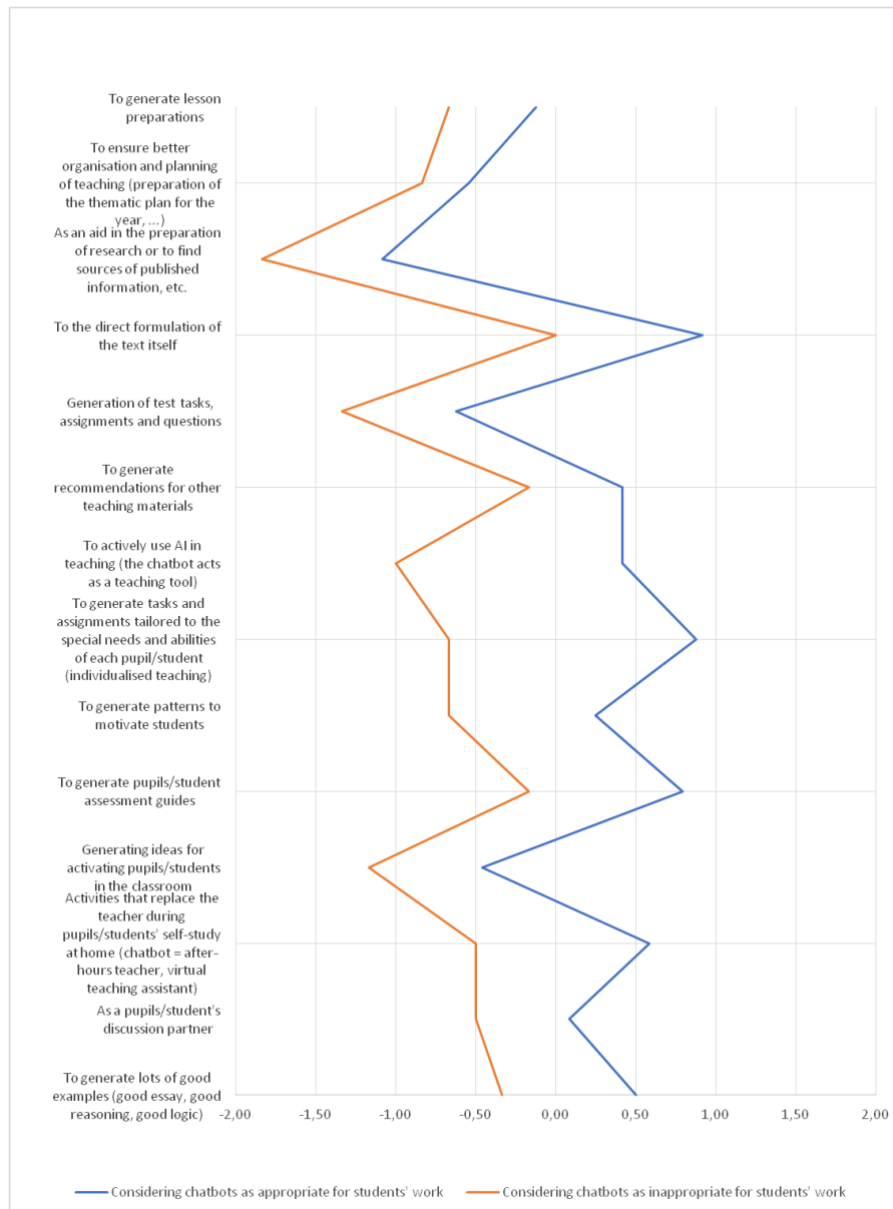


Figure 5: Potential use of a chatbot in the role of a TEACHER considering chatbots as appropriate or inappropriate for students' work in the classroom

90% of all respondents are interested in further education in AI tools for teaching and learning. Of the specific technologies using AI, the greatest interest was shown in the topic of image generation (73% of respondents), followed by general basics about AI (63% of respondents), generating personalised learning practices and methods (60% of respondents), and video generation (57% of respondents), see Figure 6 for more.

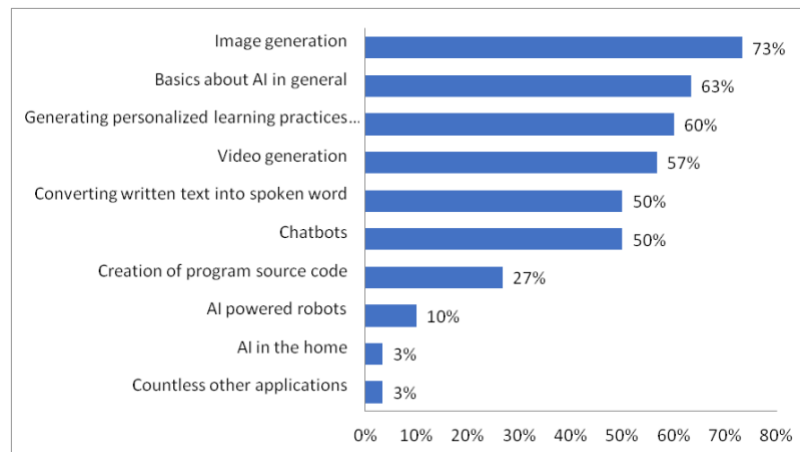


Figure 6: In which AI technologies would you be interested in further education?

What respondents clearly like most about communicating with chatbots is speed in various forms, such as a quick response in general, a quick search for information on a topic, or quick editing of text. According to the interviewees, another significant advantage of chatbots is the variability of answers and suggestions for possible solutions to tasks. Other advantages of chatbots are listed in Table 2 and were mentioned only sporadically. Table 2 also summarises the perceived advantages of AI in general. Again, speed is seen as the most significant advantage by the respondents. At the same time they emphasise that AI represents a future with great potential for use that will undoubtedly become a standard part of society.

Table 2: Perceived opportunity in communication with chatbots and in AI in general

| | Spotted opportunities | | | |
|-----|---|-----|--------------------------------|-----|
| | Chatbots | | AI in general | |
| 1. | Speed of reply | 40% | Speed of responses | 20% |
| 2. | Lots of possible solutions (variability of answers) | 17% | It's the future | 20% |
| 3. | Nothing | 10% | Solve the problem, give advice | 13% |
| 4. | Quality of answers | 7% | I don't like | 13% |
| 5. | Independent view, without emotions | 7% | Practical, easy to use | 10% |
| 6. | Structure | 3% | Creativity of solutions | 7% |
| 7. | Irresistibility | 3% | | |
| 8. | Creativity | 3% | | |
| 9. | Development of critical thinking | 3% | | |
| 10. | Links to original sources of information | 3% | | |

In contrast, the shortcomings and risks associated with using AI and chatbots in teaching and learning are listed in Table 3. The two groups of most frequently cited threats are loss of

ownership (encouraging laziness, merely taking in information without thinking, not developing one's own skills enough, resignation to self-exploration and analytical thinking) and error (wrong answers, unreliability, uncertain quality of answers).

Table 3: Potential threats perceived in AI in general

| Potential threats (AI in general) | | |
|-----------------------------------|--|-----|
| 1. | Losing one's ideas and encouraging laziness of pupils/students | 37% |
| 2. | Incorrect answers from AI | 37% |
| 3. | Risk of cheating | 13% |
| 4. | Does not use Czech sources or uses incorrect sources | 7% |
| 5. | Risk of misuse of personal data | 3% |
| 6. | Unethical use | 3% |
| 7. | Replacing humans with AI in the future | 3% |

6 Examples of Learning Activities with Chatbots

In this chapter, we would like to show concrete examples of constructively incorporating chatbots into teaching. We believe that to maximise the benefits of AI, it should be used as a tool rather than as a substitute for one's skills, in this case, the skills of the teacher and the pupils/students in the course of learning. In the following subsections and the appendix of this paper, two teaching methods in which chatGPT is used as a teaching tool are described - the *modified Think-pair-ChatGPT-share method* and the *dramatisation of teaching*.

6.1 Modified Think-pair-ChatGPT-share method

The use of paired discussion work in the classroom is appropriate to incorporate when pupils/students are very unresponsive to the questions asked or when the questions are too challenging (Petty, 2009). In paired discussions, pupils/students are given more time to think and have the opportunity to check their answers with a classmate, which, according to Petty (2009), increases their confidence and ability to respond to the teacher's questions.

The Think-pair-share method is a cognitive and communicative teaching method which, according to Čapek (2015), includes three basic steps:

1. Pupils/students think about the problem presented by the teacher,
2. correct and refine their ideas in pairs,
3. he shares his thoughts with the whole class.

A modification of the Think-pair-share method is to incorporate AI as a teaching tool. The scheme of the method is transformed into think-pair-ChatGPT-share. We added one

intermediate step in the form of GPT chat to the teaching method. Before presenting in front of the class, pupils/students will evaluate and sort their notes and ideas once more using the answers obtained from the AI. This step will provide a deeper exploration of the material discussed, add another angle and enhance students' critical thinking.

For a specific demonstration of the application of the modified Think-pair-ChatGPT-share method, the topic Marketing on social networks was selected from the curriculum of the thematic area Marketing basics for secondary vocational education with the final examination ISCED 2011 - P354 (the essence of marketing, market research, product, price, distribution, promotion). Nowadays, social networks are an integral part of marketing. For this reason, they cannot be ignored. Pupils/students should know how social media marketing works. At the same time, this topic provides room for discussion due to the different influences on social media users. A specific example of the Think-pair-ChatGPT-share method assignment, including a sample response from chatGPT, is provided in the appendix of this article.

6.2 Dramatization Methods

Dramatisation methods in teaching develop students' aesthetic sensitivity and social skills (Čapek, 2015). In the dramatisation method, literary, musical and dramatic arts are synthesised. Dramatization method is understood in its extended sense, and so we include other related activities in it:

- games imitating reality and stylised games,
- movement games,
- sound methods such as reading, discussion, recitation, singing, etc.,
- graphic methods such as mind maps, questionnaires and tests, posters, etc,
- working with objects (paper, props, costumes, etc.).

Drama in the classroom is an effective educational method that increases pupils/students' self-esteem, allows previously inexpressive pupils/students to shine, and promotes empathy, understanding of life experiences, and identification with characters in dramatic scenarios (Petty, 2009). An alternative to dramas, which should have powerful emotional instruction, is the teaching method of role-playing (Petty, 2009). Role-playing is very useful for developing interpersonal and social skills in pupils/students, particularly in business and service industries, as it allows them to practice skills in a safe, risk-free environment (Petty, 2009).

How can GPT chat help with the dramatisation of learning? According to Petty (2009), before the actual drama or role-playing, it is necessary to provide pupils/students with all the background information about the production and, where appropriate, show examples of good or really bad practice in order to achieve the stated learning objectives in the outcome (for example, practising asking questions when selling goods). GPT Chat can generate different scenario variations very quickly. Chat GPT can transform text into a story that can be used as a script for a production, or as an introductory motivational story in a lesson, or additional learning material for pupils/students' own learning. Chat GPT can transform text into a poem.

The poem can be recited by a pupil/student in class, can be the basis for a production, or can serve as a mnemonic for learning. The generated poem is not always perfect in all respects, so pupils may be encouraged to correct it before using it. A dramatization of specific learning content is provided in the appendix of this article.

7 Discussion

In this discussion, we consider the potential risks associated with using chatbots in the role of pupil/student. Activities such as formulating summaries of long text passages, suggesting text structure, providing feedback, and reformulating text represent using chatbots as a tool, not a substitute for learner work. These activities could be further developed with pupils and students to maximise their potential benefit. On the other hand, we see possible risks associated with using chatbots in activities such as *discovering information that is difficult to find in original sources*, *generating arguments and conclusions*, and *formulating their text*.

The risk of artificial intelligence replacing the original sources of published information is compounded by the impossibility of discovering the true original sources. It is likely to be quicker and more convenient for the pupil/student to find out the required information from AI, as opposed to finding it in its original form from books, articles, research results, etc. This runs the risk of the information being cited as if it was found from the original sources but was generated by the AI. Unless there is a critical evaluation of the information, there is a risk that misinformation will be spread. In the worst case, pupils/students and learners may leave their work to the AI altogether. Unfortunately, it is currently very difficult and unrealistic to reveal whether the work was written by the AI or by the pupil/student.

Another potential risk is the use of AI to formulate the text itself, i.e. to generate arguments and conclusions, or even to directly formulate the text itself, for example, when writing a thesis, term papers, etc. If it is about the pupils/students' own opinions on a particular topic and drawing his/her own conclusions on a particular issue, the pupil/student, as the author of the work, should formulate them independently. According to the current copyright law in force in the Czech Republic, the author of a work can only be a natural person, not an AI. Therefore, the work must be the result of the author's creative abilities. Given the undetectability of the use of AI in the writing of various works, the solution to this concern lies mainly in the ethical, responsible and honest use of AI.

8 Conclusion

This paper focused on chatbots in the educational process, specifically in teacher training. We pointed out the possible problems in using them but also showed the possibilities of constructively incorporating work with chatbots into teaching.

As part of the paper, we surveyed prospective teachers about how they envision or may already be using this tool in their preparation for teaching or during their studies. The

questionnaire was divided into a section where respondents answered questions about using chatbots in the role of a student. In the role of a teacher, they could express the opportunities that AI/chatbots offer or their concerns that using AI entails.

The questionnaire survey results show that 80% of respondents have experience communicating with chatbots. However, only 33% of the respondents work with chatbots under the guidance of a teacher in the classroom. Respondents answering from the position of a student who already has experience working with chatbots see more potential in activities related to chatbots in the classroom.

80% of the respondents from the position of a teacher consider it appropriate to use chatbots in the education of students. However, only 33% of them work with them in their college teaching, where they prepare for their future profession as a high school teacher. It was shown that if the respondents have experience working with chatbots, then they also see more opportunities and possibilities of using chatbots in various activities related to teaching their future students. 90% of the respondents are interested in further education in AI tools applicable to teaching.

The three main advantages and reasons why it is good to use chatbots and other AI tools in education, according to the survey respondents, are *speed*, *future technology*, and *variability of solutions/use*. Technology that offers acceleration of activities expands the repertoire of possible solutions and is one of the newest developments of the time. It clearly increases the efficiency of the work in our case of the teacher and his/her pupils/students. On the other hand, the respondents of the questionnaire survey are also aware of the negatives associated with the use of chatbots and, more generally, AI in teaching. The main concerns they see are the decrease in the level of their own abilities (thinking, researching), errors and cheating. We see a solution to eliminate these disadvantages in the way AI is used in education. AI in its various forms must be used as a tool, not as a substitute for one's own abilities, in this case, the abilities of the teacher and the pupils/students.

All of these benefits and risks are realised, which is why future teachers need to be exposed to them during their preparation for the profession during their university education. Teachers should be aware of the positives and negatives of working with chatbots and should actively draw their students' attention to it, so that they do not just blindly trust these tools but think about and critically evaluate the results obtained and whether they are realistic. For the same reason, it is still necessary for pupils to acquire a basic body of general and professional knowledge. This will minimise their being misled by fraudulent data and information.

The topic of integrating AI into teaching is a hot topic at the moment and it is necessary to pay attention to this topic to ensure that future teachers are prepared for student-teacher-teaching-practice collaboration through chatbots and other AI tools and that they develop it in the right direction if possible.

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9 Appendix

9.1 Example of the Think-pair-ChatGPT-share teaching method

Table 4: Proposed assignment for the Thing - pair - ChatGPT - share activation discussion method

| |
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| Subject: Basics of marketing |
| Topic: Social Media Marketing |
| Questions for discussion: |
| <ul style="list-style-type: none"> • What does it mean to be a product on social media? • Social networks as a tool for making money - for whom? • Tailored content - are social networks eavesdropping on us via mobile phones? • Sharing, reviews, comments - a good servant but a bad master? |
| Note: All students can work on all or only one topic in a pair. The topics can be extended so that each pair has a different topic. |
| Description of the activities in each phase: |
| <ul style="list-style-type: none"> • Think - write on a piece of paper what you can think of for each topic to discuss • Pair - compare your notes with a classmate in pairs, evaluate and sort your ideas • Chat GPT - ask the AI what it knows about each topic, critically evaluate the answers received from the AI and incorporate them into your notes • Share - share what you have learned with the whole class |

Note: The method of presentation in front of the whole class can take different forms (oral in the classroom, in front of the board, with or without a presentation, prepared in the form of a report, etc.).

Table 5: Sample ChatGPT response to the question What does it mean to be a product on social media (ChatGPT via chat.openai.com, 2023)

The statement that "the product of social networks is human" can be interpreted differently and often depends on the context in which it is said. Below are some possible interpretations of this statement:

1. **Personalisation of content:** This can refer to the fact that social networks track user behaviour, collect personal data and use this information to personalise the content users see. This means that they create specific content that matches each user's individual interests, preferences and behaviour.

2. **Social capital:** This may be relevant in the context of social capital, which is the value of social relationships and networks. Social network users can be considered "products" because their social capital (number of friends, followers, interactions, etc.) can measure their social influence or value in the online space.

3. **Social media addiction:** in the context of the psychological impact of social media, this could mean that people become 'products' in the sense that their thinking, behaviour and self-concept are influenced or shaped by social networks. For example, there may be comparisons with others based on their social media presence, which affects their perception of themselves.

4. **Economic perspective:** From an economic perspective, this may refer to the fact that social media users generate value for these platforms. Their activity, interaction and data provide the basis for ads and other forms of monetisation, making users a kind of 'product' or source of value for these platforms.

Overall, the statement can be interpreted differently, and its meaning can be influenced by a wide range of factors, including social, economic and psychological aspects.

9.2 Example of Dramatization of Teaching

Table 6: Proposed assignment for the dramatization of teaching Marketing mix

Educational programme: secondary economic education with the matriculation examination ISCED 2011 - P354

Subject: Basics of marketing

Topic: Marketing mix

Teaching content:

The 4P marketing mix is a method of determining product strategy and product portfolio. It comprises four components: Product, Price, Place, and Promotion. Product is the name of a product or service. Its characteristics from the customer's point of view are quality, reliability, brand, design, warranty, service and other services, etc. Price is the price of the product and the overall pricing policy of the company. Place (distribution channels) means how a product is distributed from its manufacturer to the final customer. Promotion means how the product is promoted.

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| <p>Some authors add other components to the marketing mix. For the services marketing mix, the 7P model is used: People, Process, Physical Environment, Politics, and Public opinion. People (somewhere as Personnel) are the people who facilitate the interaction between the service provider and the customer. Process means a more detailed focus on how the service is delivered. Physical environment (Physical evidence) describes the physical environment. Philip Kotler adds Politics and Public opinion to the marketing mix. Other authors inflate the marketing mix with Packaging, Personal selling and Passion. This may be unnecessary as these P's are already included in the Promotion.</p> <p>The 4P marketing mix looks at promotion from the perspective of the company (seller) An alternative to the 4P is the 4C marketing model, which describes the marketing mix from the customer's perspective.</p> <p>What is the marketing mix used for in practice? When developing a marketing strategy and marketing plan, it is important to understand precisely where you stand in the market and to work with the marketing mix. A well-crafted marketing mix will combine all the variables to meet the goals set.</p> <p>Source: Kotler & Keller (2013)</p> |
| <p>Suggestions for dramatising the curriculum</p> <ul style="list-style-type: none"> • Scenario in the form of a story or fairy tale - you don't want ChatGPT to generate a story/fairy tale based on the copied content to use as a scenario • A poem as a basis for dramatisation of the topic or as a mnemonic device - |
| <p>Note: Roles and instructions may or may not be accurately communicated to students. If you give the pupils freedom, they will feel more involved and enjoy adding details to the scenario.</p> |

Table 7: Poems from Chat GPT (ChatGPT via chat.openai.com, 2023)

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| <p>In a world of market and commerce where ideas intersect, the dance of the four Ps as the orchestra plays on stage.</p> <p>Product first as a hero in the series, quality, design, warranty - are his castle.</p> <p>Cena enters, striding out with grace, pricing strategy, in a package of harmony.</p> <p>Distribution as a dancer great, paths like trails in a labyrinth unreal.</p> <p>Graduation in the hand of a flashlight shining, advertising, PR, like the poet's creative verse.</p> <p>But let's not forget the people, the process, and the environment, that adds to the mix the beauty and comfort we take from nature.</p> <p>The light in the darkness is politics and public opinion, that influences dance marketing, with refinement and a sense of social direction.</p> | <p>Four letters are dancing on the store's stage, Product, Price, Place and Promotion, as the notes in the tact.</p> <p>A product like a bright star in the sky, Quality, brand, design, everything that brings us closer to the love in the heart of the customer.</p> <p>Price, as the notes of the music tuned, pricing strategy, in a world of money like a magic hammer playing.</p> <p>The place, the dance of distribution, the roads like handcuffs, from the manufacturer to the customer, as the handcuffs connected.</p> <p>Graduation, to the rhythm of advertising and promotion, music of words that persuades the customer to sing along.</p> <p>People and process, dance services personal, in a physical environment where well-being grows like a flower in spring.</p> |
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|---|---|
| <p>And so these P's play together in harmony, in a marketing dance where goals are met with love and passion beautiful.</p> | <p>Politics and public opinion, they play their part, in this symphonic mix where marketing is a beautiful and clever art.</p> <p>And so we spin, to the rhythm of the marketing mix, where all the Ps together form a melody of success, like a beautiful symphony in the night.</p> |
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Table 8: Story (ChatGPT via chat.openai.com, 2023)

The story of a marketing mix that reflects the reality of today's market economy

In a city where the buildings rose to the sky and the streets pulsed with activity, there lived a businessman named Alex. His business was modern and dynamic, just like the market economy he followed. He knew that to compete in the business world, he needed a precise plan, and that included the right marketing mix.

Alex started with Product, his product range, which had to align with current trends and customer needs. Quality, design and high value were the key factors that allowed him to offer products considered the best on the market.

Price has become his strategic tool. He monitored price movements in the market, studied the competition and reacted sensitively to changes in demand. Pricing became like the notes in an orchestral piece, where every change impacted the overall harmonic picture.

Location and distribution were like a transportation network in a modern city. Alex focused on online platforms and rapid distribution to make his products available to customers quickly and efficiently. It was the dance of the modern age, where trails led through digital spaces.

Graduation has become digital theatre. Social media advertising, influencers, and modern PR strategies created a compelling story about his brand. Every post and every ad was like a piece of the puzzle that shaped the overall picture.

People and processes were key elements in its modern business model. Alex invested in technology to make processes efficient and simple. His team was like a well-tuned orchestra, where each member had a role in creating a unified sound.

The physical environment of his store was digital, and yet he was able to create an atmosphere of comfort and trust. It was a virtual business world where customers could shop comfortably while feeling part of a community.

Politics and public opinion became factors that Alex watched with caution. The economy was like a shifting orchestra, with political decisions and public sentiment influencing the tone of the entire sector.

And so Alex, with this modern marketing mix, has steered his business to success in the ever-changing market economy world. It was a story of adaptation, innovation and the ability to read the notes the market was playing.