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PRINCIPLES OF DEVELOPING LESSON PLANS WITH THE SUPPORT OF ARTIFICIAL INTELLIGENCE

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Abstract

This article analyzes the pedagogical foundations and principles of developing lesson plans with the support of artificial intelligence. In addition, based on the results of a survey conducted among higher education instructors, the study examined educators' level of use of artificial intelligence tools, their attitudes toward these technologies, and the existing challenges associated with their implementation. Findings revealed that artificial intelligence contributes to more effective lesson planning, saves time, and enhances opportunities for the personalization of education. At the same time, issues related to pedagogical supervision, information security, and the reliability of generated content were identified as important concerns requiring further attention. Based on the research findings, the study proposes key principles for developing lesson plans with the assistance of artificial intelligence.

Keywords: artificial intelligence (AI), lesson planning, lesson plan, digital pedagogy, educational technologies, personalization, generative AI.

Introduction

The digital transformation of the education system is having a significant impact on the professional activities of teachers, particularly on the process of lesson planning. In recent years, because of the development of Artificial Intelligence technologies, opportunities for automatically developing lesson plans, adapting educational materials, and approaching students' needs individually have expanded.

The education system of the XXI century is characterized by the rapid development of information and communication technologies. In particular, the emergence and widespread popularization of Artificial Intelligence technologies are bringing significant changes to the mechanisms of organizing, managing, and evaluating the educational process. On a global scale, the policy of digitalizing education is considered one of the important factors in improving the quality and effectiveness of education. Experts of UNESCO also emphasize that while digital technologies create new opportunities in education, they also require reconsideration of pedagogical processes.

One of the most important components of the educational process is lesson planning. A lesson plan is a pedagogical document that combines the teacher's goals, methods, resources, and assessment methods into a single system. A well-developed lesson plan serves for the effective organization of the lesson, students' activity, and the improvement of educational outcomes. Benjamin Franklin's famous statement, "By failing to prepare, you are preparing to fail," also clearly expresses the place of planning in education.

In traditional educational practice, lesson plans were mainly developed based on the teacher's experience and methodological knowledge. In this process, all stages of the lesson were strictly determined in advance, and the possibility of making changes during the process was limited. Modern education, however, requires the principles of flexibility, differentiated approach, and learner-centeredness. For this reason, the role of digital technologies and Artificial Intelligence tools in lesson planning is increasingly growing.

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Today, generative artificial intelligence systems such as ChatGPT, Gemini, Claude, Microsoft Copilot and others have the ability to develop lesson objectives, activities, assessment criteria, and educational materials within a short period of time. However, how pedagogically grounded these technologies are and the criteria and principles of applying them in lesson planning have not yet been sufficiently studied.

In this regard, the purpose of this article is to analyze the theoretical foundations of developing lesson plans with the help of Artificial Intelligence, to study the attitudes of higher educational institution teachers toward these technologies, and to develop the main pedagogical principles that should be followed in creating lesson plans.

Theoretical Foundations and Digital Transformation of Lesson Planning

In pedagogy, lesson planning is considered one of the main conditions for organizing the educational process effectively. Richards and Bohlke (2011) describe a lesson plan as a systematic representation of the activities carried out by the teacher during the lesson, the methods used, and the expected outcomes. According to them, a lesson plan enables the teacher to create a general map of the lesson, identify possible problems in advance, and organize the educational process consistently.

Traditional lesson plans usually have a linear structure. The teacher determines each stage of the lesson in advance and follows this sequence during the lesson. Although such an approach ensures order and control, it limits the possibility of taking into account the individual needs of all students.

With the development of digital technologies, the concept of lesson planning is also changing. Digital lesson plans are developed in an integrated manner with interactive resources, multimedia materials, online assessment tools, and cloud technologies. In this process, the teacher can monitor the lesson process in real time and make changes to it when necessary.

Artificial Intelligence technologies are bringing this process to a new stage. Generative AI tools can automatically develop lesson objectives, learning activities, differentiated tasks, and assessment criteria. This provides an opportunity to save the teacher's time and focus more on creative activities.

Nevertheless, it is not possible to fully automate lesson planning. This is because the educational process is closely connected with the human factor, and each class, each group, and each student has unique characteristics. Artificial Intelligence can provide effective results only as a supporting tool.

Research Methodology

In the study, a survey was conducted in order to determine the level of use of Artificial Intelligence tools among teachers working at Perfect-university. A total of 10 teachers participated in the research. The respondents consisted of educators working in different subject areas, and their teaching experience covered a period ranging from 1 year to 20 years.

The survey was organized through the Google Forms platform. The questions were aimed at identifying teachers' experience in lesson planning, the level of use of Artificial Intelligence tools, the advantages and disadvantages of these technologies, as well as their opinions regarding future prospects. The obtained data were analyzed based on descriptive-statistical analysis, and the respondents' answers were grouped according to their content.

Research Results and Analysis

The results of the survey showed that there are significant differences in teachers' lesson planning practices. A significant portion of the respondents stated that they do not regularly prepare written lesson plans or prepare lesson plans in a shortened form. This situation indicates that experienced teachers often organize lessons based on their personal experience.

The results obtained regarding the use of Artificial Intelligence tools showed that ChatGPT is the most frequently used platform. A large proportion of respondents noted that they had used

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ChatGPT in developing lesson plans. Some teachers also reported using Gemini and other AI platforms.

During the research, the respondents particularly emphasized the following advantages of Artificial Intelligence:

- rapid development of lesson plans;
- offering new methodological ideas;
- creating assessment criteria;
- preparing educational materials;
- saving time for creative activities.

These results are also consistent with international studies. Holmes and colleagues (2022) noted that artificial intelligence can reduce teachers' administrative workload and expand opportunities for personalizing education[1]. At the same time, respondents also expressed certain concerns. The most frequently mentioned problems were related to the fact that information generated by AI is not always reliable, does not fully take pedagogical context into account, and in some cases provides incorrect recommendations. This indicates the necessity of pedagogical supervision in the use of Artificial Intelligence tools.

Sun'iy idrok yordamida dars rejalarini ishlab chiqish tamoyillari

Tadqiqot natijalari va nazariy manbalar tahlili asosida sun'iy idrok yordamida dars rejalarini ishlab chiqishning quyidagi tamoyillari taklif etiladi.

1. Pedagogik maqsad ustuvorligi tamoyili. Dars rejasining markazida texnologiya emas, balki ta'lim maqsadi turishi kerak. Sun'iy idrok faqat ushbu maqsadga erishishga xizmat qiluvchi vosita hisoblanadi.

2. O'quvchi markazlashganlik tamoyili. AI yordamida yaratiladigan lesson planlar o'quvchilarning yosh xususiyatlari, tayyorgarlik darajasi va ehtiyojlariga moslashtirilishi lozim.

3. Moslashuvchanlik tamoyili. Sun'iy idrok tomonidan ishlab chiqilgan reja qat'iy hujjat emas, balki o'qituvchi tomonidan tahrir qilinadigan va rivojlantiriladigan model sifatida qaralishi kerak.

4. Pedagogik nazorat tamoyili. Yakuniy qaror har doim o'qituvchi tomonidan qabul qilinishi lozim. AI tavsiyalari tanqidiy tahlil qilinishi va tekshirilishi zarur.

5. Ishonchlilik tamoyili. Sun'iy idrok tomonidan taqdim etilgan ma'lumotlar ilmiy manbalar bilan solishtirilishi va verifikatsiya qilinishi kerak.

6. Axborot xavfsizligi tamoyili. O'quvchilarning shaxsiy ma'lumotlari va baholari sun'iy idrok tizimlariga kiritilganda maxfiylik talablariga qat'iy rioya etilishi lozim.

7. Ijodkorlikni qo'llab-quvvatlash tamoyili. AI o'qituvchining ijodiy faoliyatini cheklamasligi, aksincha, yangi g'oyalar va innovatsion yondashuvlarni shakllantirishga xizmat qilishi kerak.

Principles of Developing Lesson Plans with the Help of Artificial Intelligence

Based on the results of the research and the analysis of theoretical sources, the following principles for developing lesson plans with the help of Artificial Intelligence are proposed.

1. *Principle of pedagogical goal priority.* At the center of the lesson plan should be not technology, but the educational goal. Artificial Intelligence is considered only a tool serving to achieve this goal.

[1] Holmes, W., Bialik, M., & Fadel, C. *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Boston: Center for Curriculum Redesign, 2022.

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2. *Principle of learner-centeredness.* Lesson plans created with the help of AI should be adapted to students' age characteristics, level of preparedness, and needs.

3. *Principle of flexibility.* The plan developed by Artificial Intelligence should be considered not as a fixed document, but as a model that can be edited and developed by the teacher.

4. *Principle of pedagogical supervision.*The final decision should always be made by the teacher. AI recommendations should be critically analyzed and verified.

5. *Principle of reliability.* The information provided by Artificial Intelligence should be compared with scientific sources and verified.

6. *Principle of information security.* When students' personal data and grades are entered into Artificial Intelligence systems, confidentiality requirements should be strictly observed.

7. *Principle of supporting creativity.*AI should not limit the teacher's creative activity; on the contrary, it should serve to generate new ideas and innovative approaches.

Discussion

The results of the study showed that teachers have a positive attitude toward Artificial Intelligence technologies. The respondents evaluated AI tools primarily as a means of saving time and facilitating methodological activities. This result is consistent with international experience.

At the same time, teachers emphasized that despite the unlimited capabilities of technologies, the role of the teacher will remain preserved. Indeed, Artificial Intelligence cannot assess students' emotional states, social relationships in the classroom, and cultural context at the human level. Therefore, the "human and Artificial Intelligence collaboration" model is emerging as the most appropriate approach in the educational process.

In the future, as generative AI tools become more advanced, it may become possible to create individual learning trajectories, develop adaptive lesson plans, and establish pedagogical systems that adapt to students' needs in real time. However, this process should be developed in harmony with pedagogical, ethical, and legal norms.

Conclusion

The development of Artificial Intelligence technologies is creating new opportunities in the education system. The results of the study showed that Artificial Intelligence tools can simplify the lesson planning process, reduce time expenditure, and offer teachers new methodological ideas. According to the survey results, the majority of higher education institution teachers have a positive attitude toward the use of Artificial Intelligence technologies. However, issues related to the reliability of information, pedagogical supervision, and information security remain relevant.

The principles proposed in the article—principle of pedagogical goal priority, learner-centeredness, flexibility, pedagogical supervision, reliability, information security, and support for creativity—serve to form the theoretical foundations of developing lesson plans with the help of Artificial Intelligence. Adherence to these principles makes it possible to use Artificial Intelligence technologies effectively and responsibly and contributes to improving the quality of education.

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