

A MODEL FOR DEVELOPING STUDENTS' SOFT SKILLS USING LEARNING ANALYTICS

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Abstract: This article proposes a new model for assessing and developing students' Soft Skills using Learning Analytics and Artificial Intelligence (AI) technologies. While traditional assessment systems focus on academic knowledge, the current labor market also considers Soft Skills, in particular, skills such as communication, teamwork, critical thinking, and leadership, to be important. The article discusses the advantages of assessing these factors through AI, the mechanisms for determining the individual approach to the student using Learning Analytics, as well as the trajectory of personal development. The research is conducted on the basis of synthetic test and question-answer data (synthetic dataset). Each student's response is analyzed by an AI model and classified as "Good", "Average", or "Poor". The results are saved in CSV and Excel formats and visualized through diagrams. This methodology simplifies digital monitoring in educational institutions and allows for accurate identification of each student's Soft Skills level, as well as providing them with appropriate guidance. The article concludes with information about the AI architecture, platform description, and assessment system components required for the project.

Keywords: Soft Skills, artificial intelligence, Learning Analytics, test answers, assessment, personal development, AI model.

Introduction

One of the important tasks of the modern education system is to form students not only with theoretical knowledge, but also as socially and professionally mature specialists who are in step with the times. While traditional assessment systems often reflect the level of knowledge of the student, personal and social competencies, i.e. Soft Skills, remain unassessed [1]. Skills such as communication, teamwork, problem solving, critical thinking and leadership occupy an important place in today's labor market. Therefore, early identification and development of Soft Skills should become an integral part of the educational process.

In recent years, Learning Analytics technology has enabled real-time monitoring, analysis, and personalized learning [2]. This paper presents a model for assessing and developing Soft Skills based on test and question-and-answer data using Learning Analytics and Artificial Intelligence (AI). Based on artificially generated data, the AI model analyzes student skills and generates individualized assessment results. This approach opens up innovative opportunities for digitally monitoring, developing, and analyzing Soft Skills.

The essence of Soft Skills and Learning Analytics

Soft Skills are a set of personal, social and communicative skills that reflect a person's ability to work in a team, communicate, approach problems and make decisions. UNESCO, OECD and other international organizations recognize Soft Skills as 21st century skills. They include: emotional intelligence, leadership, flexibility, time management, creativity and critical thinking [3, 4, 5].

Learning Analytics is the process of collecting, analyzing, and interpreting data about students' learning activities, with the main goal of improving the quality of education and applying a personalized approach. With the help of this technology, student activity, mastery level, participation, and even Soft Skills indicators can be analyzed [6, 7, 8].

Using AI, natural language processing (NLP), text analysis, and machine learning techniques can be used to automatically assess students' communication, problem-solving, or teamwork skills based on written texts [9, 10]. This process uses sentiment analysis, transform models (e.g., BERT, RoBERTa), and classification algorithms [11, 12]. The results are presented to students through numerical analysis, visualization, and personalized feedback.

An artificial intelligence-based approach to soft skills assessment

This study proposes an artificial intelligence-based approach to assess students based on Soft Skills. The model works through the following key steps: uses a set of artificially created tests and questions and answers as an alternative to real data. This data set is structured in the form of open-ended responses written by students to questions that reflect soft skills. Each response is pre-evaluated by human experts and marked for training the model.

Sample question:

"If you encounter a problem while working in a group, what do you do?"

Answer:

"I discuss the problem with the group members and we can find a solution together."

Model **transformers in the Python programming language** and **scikit-learn** libraries. Texts are analyzed based on Natural Language Processing (NLP) and their emotional, semantic and communicative content is evaluated using transformer models. Each answer is classified into one of the following classes according to Soft Skills indicators: "Good", "Average", "Weak".

The AI model evaluates responses based on the following criteria:

- **Positivity and trustworthiness** (sentiment score > 0.9 - "Good")
- **Creative and multifaceted approach** (presence of key phrases)
- **Elements of communication and collaboration**
- **Decision-making or problem-solving style**

The model results are saved in **CSV** and **Excel** formats. Statistical analysis is performed for each student along with their grades. The number of grades, percentages, and indicators are visualized through diagrams. These results can be monitored by the teacher or coach, as well as help determine the direction of the student's personal development.

Results and analysis

Skills were assessed using an AI model based on 6 artificially generated student test responses

The model's program is shown in Figure 1 below.



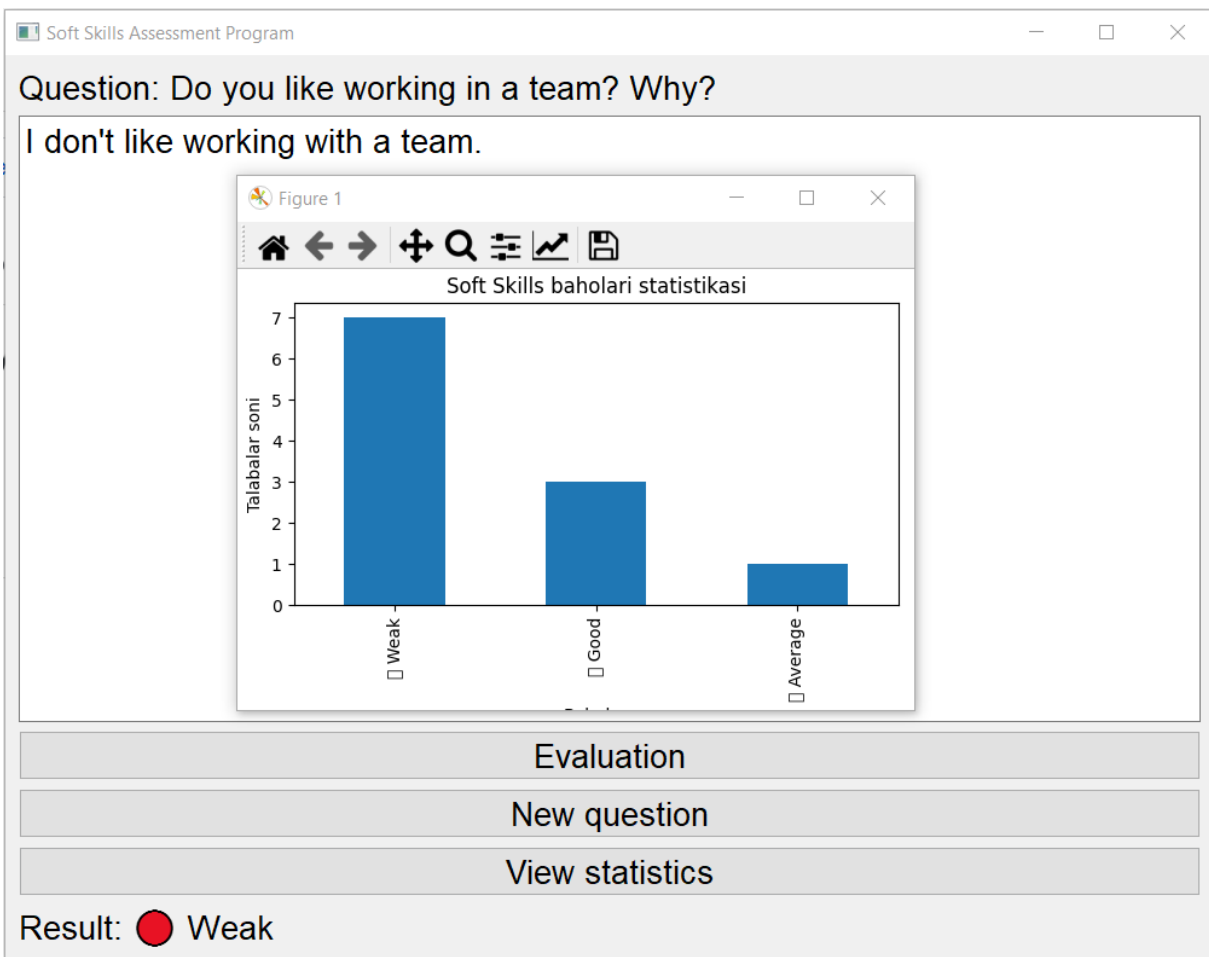


Figure 1. Result of program.

The program is very simple to use. The questions in the database are displayed sequentially. After writing the answer to each question, if you click the evaluation button, the result is displayed based on colors. A New Question button has been created to make answering questions optional. Using it, you can skip to the next question without answering the question. The View Statistics button displays the results of the students recorded in the database in the form of a diagram.

Each student was assigned a skill level of “Good”, “Average” or “Poor” and the results were analyzed. The following table presents the assessed student responses and their scores:

Table 1.
Students Soft Skills Assessment

No.	Student	Answer (briefly)	Evaluation
1	Ali	Working in a team, solving problems together	Good
2	Layla	Prefers to work alone	Weak
3	Jamshid	Maintains a positive attitude in difficult situations	Average
4	Nigora	Doesn't like to talk to others	Weak
5	Sardar	Leads, takes into account the team's opinion	Good
6	Amen	Always criticizes, thinks he is right	Weak

- Good: (2 students)
- Average: (1 student)
- Weak: (3 students)

According to the results :

- 33% of students (2) achieved high Soft Skills scores;
- 50% of students (3) received a poor grade;
- Only 1 student's skills were rated as average.

This shows that most students are not focusing on skills such as communication, teamwork or critical thinking. AI-based analysis allows teachers to identify weaknesses and provide methodological support based on a personalized approach. Charts and statistical analysis also help to monitor the effectiveness of planned training sessions on the development of Soft Skills.

Conclusion

Skills using Learning Analytics and Artificial Intelligence tools. The study developed an AI model based on artificially generated test and question-and-answer responses, and each response was evaluated based on communication, collaboration, and problem-solving skills.

The results show that students have varying levels of soft skills and many have weaknesses. Therefore, such AI-based assessment systems can help teachers and educational institutions identify students' non-academic development levels, provide individualized support, and revise curricula.

Through this approach, it will be possible to digitally monitor Soft Skills, identify development trajectories, and develop personalized learning strategies. In the future, it is planned to test this system with real data, integrate it into educational programs, and automate it through Telegram or a web-based AI system.

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