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Cross-platform application development for measuring program competencies and learning outcomes in the bologna process

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Abstract

This application forecasts learning outcomes from a sentence based on sentence's verb to detect outcome learning outcomes. Application uses .NET Core API & .NET Standard technology for possible future multi-platform support. It uses Bloom's taxonomies to determine the potential learning outcomes and export the final document as a ". json" file which is a special text format. One data package for a sentence is including these titles:

- Methods
- Techniques
- Approaches
- Strategies
- Classifications
- Measure & Analysis

and learning outcomes forecasts underneath these titles. According to the previous version, the changes:

- UI transformed to new design language "Fluent Design", which is introduced by Microsoft.
- Assistant mode for one sentence with Q&A style chat UI.
- Support for dictionary in different areas.

Keywords: Bologna process, measurement and evaluation, learning outcomes forecast program, acquired learning outcomes, cross platform development, xamarin framework, .net core, .net standard, uwp, cocoa framework

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1. Theoretical Framework

Providing quality in higher education is; comprehensive, systematic and regular evaluation and improvement of quality for a higher education institution's education, training, research activities and administrative services. (European Association for Quality Assurance in Higher Education, 2009). After effective common works for creating European Higher Education Area and Bologna Process (EHEA) and European Research Area (ERA) from European countries, it is formed by the Bologna Process, which includes 48 countries as of 2018 and was developed with the support of following processes. Targeted at EHEA is; not to make uniform the higher education systems of member countries but establishing a balance between diversity and unity. Protecting the unique differences between higher education systems and make them comparable and harmonious with each other is the main goal. With this, simplified transition between a country or higher education system to others and increasing the mobility of students and instructors is planned (YÖK, 2009). Inside the works which are running in this context, strengthening European higher education, raising quality levels and establishment of quality assurance systems in certain standards that have been agreed upon in higher education systems became the most important agenda topic.

With participation in the Bologna process in higher education of Turkey (2001), the importance of quality in higher education and comparable builds, more needed started for studies aims developing these processes. More important preparation before applying the Bologna process in Turkey and starting the quality management processes in institution is; preparing strategic plan that fundamental of quality management, so determine how to perform the quality management for which goals in which timespan with which methods is stated.

The Ministerial Conference at 2015 (Yerevan Communiqué, 2015) indicates that; improving the quality and importance of learning and teaching is the first goal of the EHEA. Final declaration mentions that study programs should enable students to improve the competencies that can best satisfy personal and societal needs, through effective learning tools and activities. Such student-centered learning' should be supported by transparent descriptions of learning outcomes and workload, flexible learning paths and appropriate teaching and assessment methods'. Benefits of digital technologies should also be fully exploited in this context. The Yerevan Communiqué also indicates that actively involve students in curriculum design and in quality assurance as well as other stakeholders like academics is necessary. Learning and teaching are most important areas for higher education reforms in the Bologna Process. In this context, the question can be raised as to whether and to what extent national and institutional strategies cover this area.

Within a survey conducted by the European University Association (EUA) in 2017 (European Higher Education Area and Bologna Process, 2018), the works that includes a national strategy for learning and teaching from higher education institutions. Among around 300 participating institutions, 78% of the respondents responded positively to showing either a strategy dedicated to learning and teaching or a wider strategy including learning and teaching in higher education among other matters. Commonly, authorities want to develop their own learning and teaching strategy (60 % of institutions reported this) and/or to meet specific benchmarks for learning and teaching (56 % of institutions reported this) from institutions. National strategies also often promote the revision of teaching methods and approaches (47 % of institutions reported this) as well as various teaching enhancement initiatives (46 % of institutions reported this). Moreover, they commonly provide support for both curricular reforms and the development of specific learning and teaching approaches (46 % of institutions reported this).

The main goal of the Bologna Process is supporting self-development goals and social needs with knowledge, skills and competences which are suits best of the students. Continuous development for structural reform tools (degree structures, qualifications frameworks, credit systems, quality assurance

etc.) aims a better-quality learning experience, promoting mobility and as a result improving the quality of higher education.

The correct and systematic use of European Credit Transfer and Accumulation System (ECTS) and its rules in higher education institutions across Europe can make a highly important contribution to student centered teaching and learning. Using a combination of the learning outcomes approach and student workload in program design puts the student in the center of the teaching and learning process. An approach like this; helps what they will achieve clearer for academic staff and students. In addition to this, guides in monitoring and, eventually, adapting programs, teaching material and methods to different modes of delivery and student populations.

According to report (European Higher Education Area and Bologna Process, 2018), The "European Learning and Teaching Forum" launched by European University Association last year and it's showed the potential of collaboration in learning and teaching, with tangible benefits for higher education institutions, staff and students. While training programs which are allows flexible learning and different learning methods supports the social mobility and continuous professional development, enabling learners to access and complete higher education at any stage of their lives.

Also, About the European Trade Union Committee for Education (ETUCE) believes that this should include the professional right not to use standardized teaching tools and instead to choose methods that seek to develop students' intellectual capacities and their critical thinking and creativity. At the same time, educators in higher education (European Trade Union Committee for Education, 2018) must be best equipped with pedagogical tools and methods to meet the requirements of human and digital developments in existing and future societies.

As a result, suggestions for the development of teaching processes and therefore measurement materials in Bologna Process are highlighted boldly. This status making Bologna Program and Course Information supported with more realistic, richer methods and techniques more compulsory. In this context, software's that will facilitate this process has begun to be needed.

2. Application Features

Our application runs on these fundamental principles in sequential order:

1. Gathers input from user. It will be occurred in two ways;
 - a. On assistant user interface, one-by-one chat with simple Artificial Intelligence.
 - b. Text from a textbox. Multiple sentences split by points.
2. After that, with the aid of action-based dictionaries, sentences are subject to some inspections.
3. The result responded by two ways, depending on activated mode;
 - a. On assistant user interface.
 - b. An XML (a specialized text file format) file output to dedicated folder in file system if bulk data mode activated.

2.1. Application Modes

2.1.1. Bulk Data Mode

Users input data into textbox. After clicking the “OK” button, sentences split by points, and sent to inspection. You can find the sample user interface below

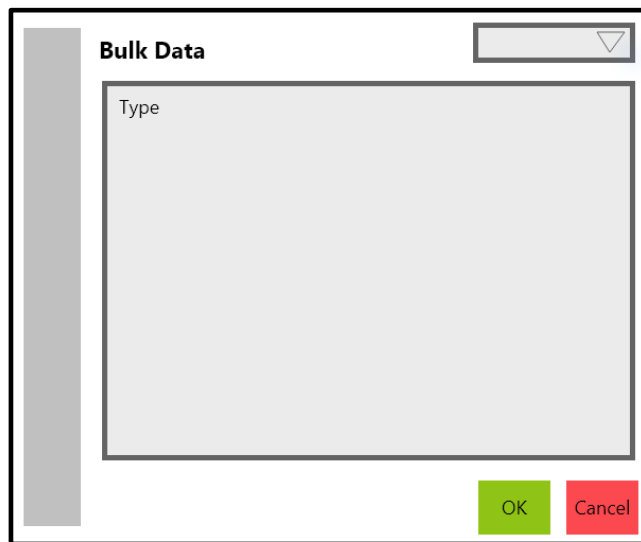


Figure 1. Bulk Data Mode

2.1.2. Assistant Mode

When user input a sentence, the assistant responses with result. If no result obtained or wrong input detected, it will give an error message. You can find the sample user interface below.

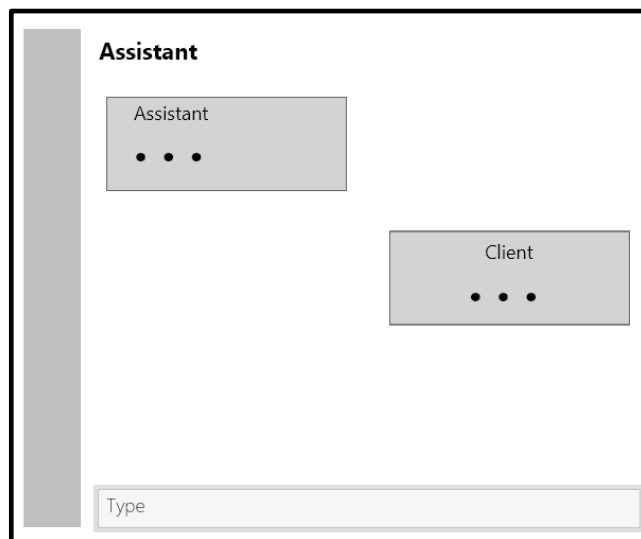


Figure 2 - Assistant Mode

2.1.3. Suggest Verb Mode

Users can propose verbs to application managers as they would be under the earning areas for adding to the dictionaries by administrators. You can find the sample user interface below.

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The image shows a dialog box titled "Suggest". It contains five input fields, each with the placeholder text "Type". The third and fourth fields have a downward-pointing arrow on the right side, indicating they are dropdown menus. At the bottom right of the dialog box, there are two buttons: a green "OK" button and a red "Cancel" button.

Figure 3 - Suggest Verb Mode

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