WEB-BASED TECHNOLOGICAL TOOLS TO SUPPORT THE DEVELOPMENT OF THE STUDENT OUTCOME "EFFECTIVE COMMUNICATION"

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Abstract

PIMECOE, an innovation and educational improvement project, is researching and developing a novel self-formative methodology for the improvement of the mastery level of the student outcome "effective communication", a quite demanded outcome by both our society and working market, that is typically assessed in the curriculum but rarely developed at the classroom.

The project aims to assess student's initial mastery level on the "effective communication" outcome through self-diagnostic tools, allowing them to detect all their weaknesses and strengths. Then, a self-formative itinerary is proposed to them, which includes a set of learning activities devoted to the improvement of their mastery level on this outcome in an autonomous way and at their own pace. To support the development of this methodology and to facilitate its application, all learning objects and tools have been deployed into the official PIMECOE's website, where all participants of this learning experience meet each other.

Therefore, in this article we present the PIMECOE's official website 1) as a centralised repository of the technological tools generated by the project, 2) as a medium of support for the development of the methodology, and 3) as a medium of dissemination of project's outcomes.

Keywords: effective communication, oral communication, student outcomes, self-diagnosis tools, auto-formative itinerary.

1 INTRODUCTION

In recent years, higher education institutions have experienced various changes conditioned by the demands of today's society, among them, the inclusion of transversal student outcomes [1] in the curricula. There exists a consensus between university and companies on the need for future professionals to master certain competences for their professional development, and this is reflected in the criteria of accreditation organizations such as the ENAEE [2] or the ABET [3].

One of the most demanded skills by companies and accreditation organizations is effective communication, and especially, the oral dimension of communication. That is the reason why universities have placed special emphasis on the evaluation of this competence in many subjects within the curriculum. However, this emphasis has not been reflected in promoting the development of training activities to improve the mastery level of this student outcome.

For this reason, the innovation and educational improvement project "*PIMECOE: Autodiagnóstico del nivel de dominio inicial de la competencia transversal "Comunicación Efectiva" y su mejora a través de un itinerario autoformativo*" [4] aims to provide a series of recommendations and tools for self-diagnosis and self-training of students in the oral communication outcome. In order to provide a broader availability, visibility and accessibility to the tools, methods and resources generated by the project, it was decided to create a website dedicated to the project, which would be as well the virtual meeting point of students and teachers in application of the learning methodology.

Thus, in this article we present the official website of the PIMECOE's project [5], describing its role as a 1) centralized repository of the technological learning tools generated in the project, 2) means of

supporting the development of the methodology, and 3) means of disseminating the results of the project.

The rest of the article is structured in the following manner. First, Section 2 briefly describes the PIMECOE project and the learning methodology. Secondly, Section 3 presents the project website, and then Section 4 give details about the use of the web as a central repository of the technological tools required for the development of the methodology. Then, Section 5 shows how the web responds to a series of use cases within the application of the methodology. Next, Section 6 shows the web as a means of disseminating the results of the project. Finally, Section 7 concludes the dissertation and proposes some future work.

2   THE PIMECOE PROJECT

"PIMECOE: Autodiagnóstico del nivel de dominio inicial de la competencia transversal "Comunicación Efectiva" y su mejora a través de un itinerario autoformativo" [4] is an innovation and educational improvement project (PIME/2017/B/025-14) funded by the Universitat Politècnica de València. Its main purpose is to create and provide students with a set of self-diagnostic tools that allow them to determine their mastery level in the student outcome "Effective Communication" at the beginning of the academic period, and proposes, based on the auto-evaluation results, a self-formative itinerary composed of different activities designed specifically to develop this outcome at the appropriate mastery level. The project began in September 2017, and it lasts for one year.

Thus, the methodology proposed in this project consists of the sequential application of the following steps:

1   Perform an initial oral communication activity by the student at the beginning of the academic period, which is evaluated by all his classmates and the teacher using an evaluation rubric.

2   Based on the personal experience during the oral activity, the student determines his/her strengths and weaknesses in relation to the basic and advanced indicators that define the different mastery levels of the competence, using a self-diagnostic tool.

3   Based on the results obtained in the self-diagnosis tool, a specific self-formative itinerary is proposed to the student to improve those indicators that do not meet the minimum required mastery level [6].

4   Provide feedback to the student about the evaluation results of the initial oral communication activity.

5   Development of a learning framework contract in which the student agrees with the teacher what, how and when will the student follow the proposed self-formative itinerary.

6   Individual work of the student on the self-formative activities agreed in the contract.

7   Perform a second oral communication activity at the end of the academic period, also evaluated by the teacher and classmates.

8   Provide feedback to the students about the final evaluation, verify the progress and the improvement in the mastery level of the competence, and check whether the objectives set out in the learning contract have been achieved or not.

9   Assessment of the methodology, tools and resources used, by the student trough a satisfaction survey.

In order to optimize the implementation of this methodology and to give more visibility to the project, we decided to create a web page to centralize the interactions of the different actors participating in the educational process.

3   THE PIMECOE'S WEBSITE

The website of the PIMECOE project [5] is a Wordpress blog [7] subscribed to the free plan offered by the company, conveniently customized to show a semi-static webpage of modern and attractive design, as shown in Fig. 1.

Figure 1. PIMECOE'S website home page.

The main objectives of this website are the following:

- Increase the visibility of the PIMECOE project.
- Provide greater accessibility to the tools and resources of the project to the different actors that participate in the educational process.
- Improve the productivity of the intervening actors.
- Disseminate the results of the project.

4   THE WEB AS A CENTRALIZED REPOSITORY OF LEARNING TOOLS

In order to improve the productivity of the participants and the efficiency in the application of the learning methodology described in Section 2, the tools and resources envisaged in this project have been digitally developed and centralized on the PIMECOE's website. Thus, the web constitutes a repository of technological and educational tools serving to the development of the proposed methodology. The repository comprises the following tools:

- **Student outcome's evaluation form**: web form developed using the Google Forms tool [8], in which teachers and students evaluate the mastery level of the oral communication skill of the student who performs an oral communication activity, through both a qualitative and quantitative evaluation. This form is accompanied with a rubric for the evaluation of the outcome to help with the quantitative assessment.
- **Self-diagnosis test**: another web form based on Google Forms in which students have to answer sincerely to a series of questions about their communication skills, divided into several thematic blocks, with responses over a Likert scale [9] that are mapped to the evaluation rubric.
- **Self-formative itinerary**: PDF document that specifies, based on the answers provided by the students in the self-diagnostic test, the set of activities in which the student should work to improve his/her mastery level [6]. These activities are hosted on the web as HTML pages.
- **Learning contract draft**: Word document consisting of a contract that must be adapted and signed by both the teacher and the student, according to the training needs identified in the self-formative Itinerary.
- **Satisfaction survey:** Google Forms-based web form in which students assess the methodology, tools and resources generated by this project, in order to collect valuable feedback to further improve the proposed framework.

5 THE WEB AS MEANS OF SUPPORTING THE DEVELOPMENT OF THE METHODOLOGY

As mentioned above, the PIMECOE website is the digital meeting point between teachers and students for the development of the proposed methodology. It offers several functionalities that respond to six use cases (UC) that are listed and described below:

- **UC1: A student evaluates an oral communication activity of a classmate**. A student, in the classroom and using his/her mobile phone, tablet or laptop, accesses to the corresponding section of the web and properly completes the *student outcome's evaluation form* to evaluate the oral communication activity made by a classmate. Student evaluations are automatically dumped into a spreadsheet file, which is afterwards processed by the teacher to obtain the overall results of each assessed student.

- **UC2: A teacher evaluates an oral communication activity a student**. It is proceeded in the same way as the UC1.

- **UC3: A student self-diagnoses his/her mastery level on the outcome**. A student, outside the classroom, accesses to the corresponding section of the website and performs the *self-diagnosis test*. Self-diagnosis data is automatically dumped into a spreadsheet file and sent by email to the student for later reference. Then, he/she downloads the *self-formative itinerary document* from the web to determine which are his/her recommended learning activities.

- **UC4: A student makes the learning contract.** A student, outside the classroom, accesses to the corresponding section of the web and downloads the *learning contract draft* that will be used as a basis to develop his/her own one, properly agreed and signed with the teacher.

- **UC5: A student performs self-formative activities.** The student, outside the classroom, accesses to the corresponding section of the web to perform the activities agreed in his/her *learning contract*.

- **UC6: A student provides feedback on the methodology and resources**. The student, outside the classroom, at the end of the academic period, accesses to the corresponding section of the web to answer to the *satisfaction survey*. The data filled into the form is automatically dumped into a spreadsheet file, which is afterwards processed by the teacher for its analysis.

6 THE WEB AS MEANS OF DISSEMINATING THE RESULTS OF THE PROJECT

Another purpose of the PIMECOE website is to disseminate the results of the project, both the communications derived from journals or congresses, and the results extracted directly from the pilot tests carried out in the five official university degrees in which the methodology is being implemented [4], as well as the tools and resources generated by the project. This will allow the educational community to know first-hand the PIMECOE experience, and will facilitate the implementation of the proposed methodology in other educational contexts.

7 CONCLUSIONS

In this article, we have presented the PIMECOE project and its website as a means of support for the efficient development of a self-formative methodology for the improvement of the mastery level of the effective oral communication student outcome. The website is also used for the dissemination of the results of the project in order to make available to the world educational community an innovative solution to develop a student outcome that is not typically worked in the classroom, but is evaluated and highly demanded in the labour market.

As future work, a possible and interesting improvement would be to design and develop an ad-hoc, dedicated web platform that offers complete and integral support to the development of the proposed methodology, that is: user management, tool design, automatic calculation of results, generation of immediate feedback, management of activities, monitoring of student activity, automatic adapted self-formative itinerary generation, etc.

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