

Exploration of digital technologies in higher education: teachers' perceptions

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Abstract — This study was developed under an ERASMUS + KA2 project started in December 2018 and developed by four H.E. institutions. In a first stage, it aims to understand the H.E. teachers learning environment, the access of teachers to technology, their perceptions and use of digital resources for teaching and learning. With this aim, a survey was carried out to teachers of higher education in Germany, Poland, Portugal and Slovenia, with 88 replies being obtained. Data analysis shows the teachers' recognition of the growing importance of ICT, and also the lack of knowledge of some of these technologies.

Keywords— *Soft Skills, Higher education, enhanced learning; ICT; ERASMUS+*

I. INTRODUCTION

The project "The system of support for academic skills in the process of shaping soft skills of their students" (<https://wspaerasmus.wixsite.com/supportsystem>) provides the construction, experimentation and dissemination of pedagogical activities with the objective of motivating H.E. teachers to change their practices, and contribute to the development of students' Soft Skills. These activities will include aspects such as the educational use of technologies, creativity, reflexive thinking, communication, interculturality as well as other social skills. The research work, at this stage of the project, was oriented to the teachers' inquiring in order to perceive what practices do they use related to the development of the students' soft skills (that will constitute the first output of the project). These results will support the construction of teacher training courses, under the following subjects: 1. Teaching how to learn - teaching through experimentation, experience and other methods activating students; 2. Shaping attitudes of innovation, creativity, critical thinking and teamwork skills during regular classes; 3. Using ICT in the teaching process of any subject; 4. Intercultural entrepreneurship - how to include intercultural aspects in regular classes. Each national team will be responsible for developing the project within one of these courses and the Portuguese team is responsible for the theme "Using ICT in the teaching process of any subject". The theoretical framework is under construction.

II. METHODOLOGY OF THE STUDY

An exploratory study was developed based on a questionnaire survey [1], [2] to identify the perspectives of higher education teachers on the areas of the Soft Skills' project (Output 1), as well as possible training needs, in order to guide the design of the training courses (Output 2).

The online survey was structured in five blocks of questions: the first one is related to personal identification and the following four themes, related to the four thematic areas / training courses outlined above. Each partner of the project elaborated the questions related to area / course under his / her responsibility. The questionnaire survey includes simple open and closed questions (simple factual and opinion questions), multiple choice and Likert scales (closed lists, partial agreement statements or questions).

The final version of the survey was carried and 88 answers were collected. The distribution of the collected data is presented below:



Graph 1 – Number of answers by partner

All partners have developed the treatment of the answers: each team was responsible for the cross-sectional analysis of the responses of the corresponding thematic block. In the following part we will analyze the group of questions developed by the Portuguese team with the answers of teachers from all the countries involved in the study.

III. DATA ANALYSIS

The aim of the group of questions related to "Using ICT in the teaching process of any subject" is to assess the learning environment, including understanding the access of teachers to technology, their perceptions and use of digital resources for teaching and learning [3].

Regarding the teacher's perception about the impact of the technological changes in society, it was possible to identify 4 major categories of changes: 1) access to information, 2) communication, networking and collaborative work, 3) use of collaborative educational platforms, and 4) the use of internet, mobile phones, tablet, are also referred to as a change.

Related to the proposes of the use of technologies, the majority of respondents consider that the alternatives presented are important (4) or very important (5), specifically in the aspects of information use (*use digital resources available for learning*) and communication (*communicate with students, the school and the community*). Related to the *design and producing their own digital learning resources*, the percentage of answers obtained with values 4 and 5 is about 75%, while for *use digital resources available for learning* is 91%. These answers seem to indicate less use of technologies for the design and production of educational resources.

We used a scale similar to identify the teachers' level of knowledge on the technologies. Among the tools listed, *Spreadsheets* and *electronic presentations* are those with the best level of knowledge of the respondents, with about 88% and 97% of answers with values 4 or 5, respectively. In contrast, *Video editing* (38%) and *Web page design* (36%) appear with the lowest values. The lesser-known digital tools, right after, are *Multimedia authoring* and *Digital audio* with 49% and 41% respectively. These results seem to confirm that respondents reveal little knowledge about information production tools.

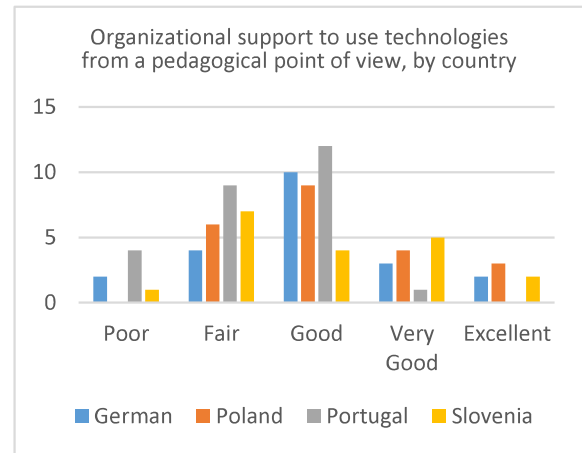
We also have collected information about the frequency of use of ICT tools: *Images* with 88% and *Presentations* with 92% that the respondents show a more frequent use (5 and 5). In contrast, *Social bookmarking*, *Blogs*, *Social networking*, *Audio recordings* and *Simulations/ animations 2D / 3D*, in accordance with the previous point, are the items with the lowest utilization, 15%, 18%, 30%, 32% and 35%, respectively.

Regarding the use of the technologies in the teaching and learning process, the analysis of the answers situated in the two highest values of the scale (4 and 5) shows that only two technologies appear with values greater than 50%: *Learning Management systems* with 70% and *Video / audio Online* with 57%. On the other hand, there are significant percentages in the lowest values for the following items: *Digital Portfolios* (59%), *Social Media* (45%), *Educational Games / simulations* (37%) and *Online collaboration tools* (31%). The data seems to reveal that the inquired do not have a frequent use of the collaborative tools.

When teachers rate sentences related to the use of technologies, they highlight that *Technologies promote new opportunities to organize teaching and learning* (91%) and that *Technologies improve access to education and training* (89%).

When asked to identify the digital tools they use in their classroom, and the pedagogical activities they promote with it, we have collected very diverse answers. The predominant digital tools in the responses are the *Powerpoint* and the *Moodle /e-learning platform*. The *Powerpoint* is used for presentations. While the *Moodle/e-learning platform* promotes different pedagogical functions such as: 1) sharing knowledge through videos /audio, written materials, among others. 2) The interaction between students and between students and the teacher, promoting debates and clarifying doubts. 3) Conducting evaluation through online tests. Digital tools with fewer references are google docs, Kahoot or statistical software like E-Views, Statistic or SPSS. Possibly google docs is less referenced because Moodle allows document sharing. In the case of software such as Eviews, Statistics and SPSS, they are used in more specific areas.

The teachers' perceptions about the level of pedagogic support in their organization to use ICT reveals a normal distribution around the Good value with a slight slope towards the Fair. When organizing the responses by country (graph 2), we can see that the answers from Poland consider their support to be Fair or better while the Portuguese realize that the support in their institutions is not excellent. The two other countries represent a normal distribution of values:



Graph 2. Organizational support by country

We also have found out that more than half (55%) of the respondents do not know or do not recognize advantages in participating in personal or professional learning networks.

Regarding the safe use of technologies, the aspect that obtained greater consensus was the credibility of sources and sites while the one that obtained the greatest dispersion of valorization was the access to illegal information.

IV. SOME FINAL REMARKS

A first aspect to emphasize is the importance that the majority of respondents attribute to digital technologies. However, they reveal little knowledge of the ones destined to audio, video and multimedia edition as well as those that allow building Web pages. As for the use of technologies in the context of teaching and learning, we have verified that the learning management systems are the most used as well as the existing audio and video resources. The collaborative aspects from Web 2.0 seem to be little valued not only for participation in learning networks but also for the relatively low use of collaborative tools, e-portfolios or social networks. This data is very useful and will support the development of teacher training modules in the following stage of the project.

V. REFERENCES

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