ICT tools highlighted and their usefulness during the pandemic

Erasmus+ projects related to eLearning

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ABSTRACT

The work presented in this paper is the result of research on Erasmus+ projects, related to the educational field and with a connection to eLearning, that have been classified as good practice or successful story. This publication shows some of the results obtained from administering a survey to the project coordinators. Specifically, it focuses on the responses collected from two sections of the survey that have to do with the possible factors considered the reason for being successful projects and their main characteristics. At the same time, it is explored the sustainability of the project results over time and how they have been useful in the pandemic. The main findings show that the results have been positive with sufficient funds to be able to carry them out and with the capacity to go on using them once the grant period has ended. Additionally, they have also been useful on the occasion of COVID-19.

CCS CONCEPTS

• **Applied computing** → Education; Interactive learning environments.

KEYWORDS

Learning, ICT, students, teachers, European projects, eLearning, pandemic, COVID-19

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1 INTRODUCTION

This paper is related to the paper published in the TEEM'2020 congress on "Methodological guide for the successful use of digital technologies in education: Improvement of learning through European educational projects" [1–3] and some of the results got so far. The main focus is placed on what are considered project success factors, their main characteristics and the ability to continue using the results generated in the projects even in the COVID-19 pandemic [4–7].

It has been considered important to see the projection of the results of the projects beyond the funding period and in the pandemic because it has been demonstrated a great need to be able to adapt to changes, especially our educational centers, teachers, students, and families. They had to change suddenly for a period to distance learning methodologies using ICT [8, 9] and, in some countries, there are still with school closures [10]. The great need in improving technological competence, especially in education, has become evident. In the field of higher education, the digital transformation of teaching and the existence of a methodological and skills crisis due to the COVID-19 pandemic have been emphasized [11–13] and criticized [14–16].

The European Union and the Erasmus+ programme promote the development of European educational projects in order to improve educational systems and teaching-learning processes [17–19].

Due to these detected needs, the main goal of the work presented on this paper is to delve into what makes projects successful and how to make their results last over time by adapting to new situations. This is presented in the following sections: first, the methodology that is being used for the analysis is briefly analyzed, then the main findings will be explained and finally the conclusions will be provided.

2 METHODOLOGY FOR THE RESEARCH

It has been taken as an advantage the use of the systematic reviews of research projects [20, 21], that provides a perfect approach to analyze the projects because it gives an overview of the current trends allowing to identify the lacks and opportunities. In this way it is easy to define new developments in the field of research. Furthermore, with this method It is possible to compare between finalized projects and get an idea of how technological ecosystems in the area evolve.

It is a research method adequate to analyze project databases with a systematic procedure as well as mapping projects [2, 3]. The process involves four stages: study definition, screening definition, projects' selection, and analysis. At this stage it is being carried out the analysis of the responses got by a survey designed to gather more detailed information on key aspects of the projects as regards to their degree of success and the ICT tools used.

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2.1 Sections of the survey to be considered

The survey has been designed with 6 sections of which only two of them are the reason of this paper:

- Global project aspects section (Q004 and Q005): aimed at global aspects that allow determining the factors that have favored the projects being classified as good practical or success story.
- Other project aspects (Q0013-Q0019): devoted to other project characteristics related to the use and sustainability of the results achieved from the project, including how useful they have been in the pandemic for COVID-19, among other aspects of interest.

With these two sections, the most important conclusions can be drawn about what project coordinators consider as the reasons for their success, as well as the main characteristics that define them and their ability to last over time and adapt to new situations.

2.2 Questions included on the chosen sections

Table 1 shows the questions included in the chosen sections of the survey: Q0004 and Q0005 are from the "Global project aspects" section and Q0013 to Q0019 from "Other project aspects" section.

3 MAIN FINDINGS

The first results to take into account are the educational fields most represented in the projects analyzed which have been Secondary Education (41%) and Vocational Education and Training (35%), followed by Higher Education (24%) and Adults Education (20%). These results match with the initial distribution of projects, in which the predominant sector also corresponded to School Education (Early Childhood Education, Primary Education, Secondary Education and Baccalaureate) followed by Vocational Education and Training (VET) [2, 3].

Table 2 shows the shows the distribution of the number of projects in the different educational sectors. On the left it is presented the initial sample, in the middle those resulted after excluding the projects that did not have educational centers or the contact email was not found and on the right the projects that have completed the survey. As it can be seen the percentages vary a little, but the representation of the main educational fields is very similar in those three groups.

Following sub-sections show the results obtained in the questions of the survey sections chosen for this article.

3.1 Global project aspects

In this section there are two questions asked, one to know the main factors that have led to the project being classified as good practice and / or successful story and another related to the main results of the project in relation to electronic learning (eLearning, ICT).

3.1.1 Main success factors. As it can be seen in Figure 1 the most frequent responses are: it attends to the real and concrete needs of students and teachers of the project educational sector (80%), coordination and collaboration of all project partners before, during and after the project (77%), sustainability of the project over time, as it continues to be used and updated (63%), participation and involvement of teachers from the project educational sector (61%), participation and involvement of students from the project educational sector (57%), Use of appropriate ICT tools to improve teaching (52%), interaction between students and teachers in the project educational sector (49%) and demonstrated increase in students' motivation towards the learnings worked on the project (49%).

3.1.2 Main ICT or eLearning results. Figure 2 presents the results regarding the main results of the project in relation to electronic learning (eLearning, ICT) where the most chosen responses were: the increase in digital learning resources available for the teaching and learning process (digital educational tool packages, interactive educational video games, robotics, digital methodological guides, curricular designs on the implementation of ICT, etc.) (57%), digital textbooks, workbooks or worksheets (42%), establish or improve an online learning support platform (39%) and Online courses – training (37%).

3.2 Other project aspects

Other important findings as regards as other characteristics that are important in any project are those get in this section of the questionnaire:

- **Other types of personnel different from students and teachers**: 52% of management teams of educational centers and 40% enterprises.
- **Other types of activities (not ICT)**: 57% Knowledge of culture, 54% improved creativity, 51% language improvement, 41% Teacher training courses for specific subjects and 41% observation practices to educational practices of other teachers, not related specifically to ICT but to a specific professional field.
- **Dissemination activities**: the most used means of dissemination are social networks (Twitter, LinkedIn, Facebook, etc.) (80%), posters (roll-up posters, posters, brochures, newsletters, etc.) (76%), broadcast over the internet (website, blog, wiki, etc.) (71%), videos (68%) and seminars or courses (64%).
- **Future plans**: the 54% plan to request new funded projects to expand the scope of research started in this project and the 52% think to go on improving the project results through continuous evaluation.
- **Cost-benefit balance**: the 74% valued very positive in terms of results and indicated that the cost has been covered with the grant received.
- **Obstacles**: 40% of the projects considered that the cost of maintaining the results, improving them and continuing to research in this line of work cannot be assumed by the partner institutions.
- **The extent in which the results and products achieved with the project helped to better cope with education during the COVID-19 pandemic**: 51% considered that they have been very useful to us and we have seen that we were better prepared, the 26% affirmed they have improved some or the resources as a result of the situation experienced during this crisis and 6% have realized that they had become obsolete or out of date and did not serve us for the new situation.

Table 1: Survey questions – 2nd and 5th sections

Question code – Question - Options
Q0004 - What do you consider to be the factors that have led to the project being classified as good practice and / or successful story? (multiple choice)
[SQ001 -It attends to the real and concrete needs of students and teachers of the project educational sector]
[SQ002 -Participation and involvement of students from the project educational sector]
[SQ003 -Participation and involvement of teachers from the project educational sector]
[SQ004 -Interaction between students and teachers in the project educational sector]
[SQ005 -Implementation of project practices in the school curriculum and / or didactic programming of the educational centers involved in the project]
[SQ006 -Use of appropriate ICT tools to improve teaching]
[SQ007 -Development and implementation of efficient products for learning with electronic media (ICT, eLearning)]
[SQ008 -Demonstrated increase in students' motivation towards the learnings worked on the project]
[SQ009 -Demonstrated improvement in student learning after the initial evaluation and after the implementation of the products developed in the project]
[SQ010 -Demonstrated improvement of ICT skills in teachers after the initial evaluation and after the implementation of the products developed in the project]
[SQ011 -Mastery in the use of ICT tools by teachers]
[SQ012 -Coordination and collaboration of all project partners before, during and after the project]
[SQ013 -Transfer and adaptation of the products in other centers or institutions of the educational sector for which the project was carried out]
[SQ014 -Sustainability of the project over time, as it continues to be used and updated]
[SQ015 -Other]
Q0005 - What have been the main results of the project in relation to electronic learning (eLearning, ICT)?
[SQ001 - Digital textbooks, workbooks or worksheets]
[SQ002 - Recorded lessons or other digital materials from other sources (khan academy, coursera)]
[SQ003 - Videoconferences held synchronously and recorded (Google meet, Microsoft teams, zoom, webex, etc.)]
[SQ004 - Lessons broadcast on television or radio]
[SQ004 - Increase in digital learning resources available for the teaching and learning process (digital educational tool packages, interactive educational video games, robotics, digital methodological guides, curricular designs on the implementation of ICT, etc.)]
[SQ006 - Establish or improve an online learning support platform]
[SQ007 - Online courses – training]
[SQ008 - Other]
Q0013 - In addition to teachers or students from educational centers, what other types of personnel have participated in the project? (multiple choice)
[SQ001 - Management teams of educational centers]
[SQ002 - Educational inspectors]
[SQ003 - Educative Administration]
[SQ004 - Trade unions]
[SQ005 - Chambers of Commerce]
[SQ006 - Associations]
[SQ007 - Enterprises]
[SQ008 - Other institutions]
[SQ009 - Other]
Q0014 - Apart from the activities related to the use of ICT to improve learning, what other types of activities have been carried out in the project? (multiple choice)
[SQ001 - Internships in companies of a specific professional sector by students and / or teachers]
[SQ002 - Observation practices to educational practices of other teachers, not related specifically to ICT but to a specific professional field]
[SQ003 - Teacher training courses for specific subjects]
[SQ004 - Accreditation and / or certification of skills]
[SQ005 - Language improvement]
[SQ006 - Promotion of collaboration between educational centers]
[SQ007 - Improved creativity]
[SQ008 - Knowledge of culture]
[SQ009 - Inclusion of people with special needs or disadvantaged groups]
[SQ010 - School life]
[SQ011 - Sustainability and respect for the environment]
[SQ012 - Entrepreneurship]
[SQ013 - Job search techniques]
[SQ014 - Volunteering]
[SQ015 - Other]

Q0015 - What dissemination activities have you developed in the project? (multiple choice)
[SQ001 - Posters (roll-up posters, posters, brochures, newsletters, etc.)]
[SQ002 - Videos]
[SQ003 - Seminars or courses]
[SQ004 - Broadcast over the internet (website, blog, wiki, etc.)]
[SQ005 - Media (television, radio, newspaper articles, etc.)]
[SQ006 - Social networks (Twitter, LinkedIn, Facebook, etc.)]
[SQ007 - Other]
Q0016 - What future plans do you have in relation to the project? (one choice)
[SQ001 - Continue to improve project results through continuous evaluation]
[SQ002 - Continue researching educational improvements beyond the project with own funds]
[SQ003 - Request new funded projects to expand the scope of research started in this project]
[SQ004 - Other]
Q0017 - What has been the cost-benefit balance of participation in the project? (one choice)
[SQ001 - It has been very positive in terms of results and the cost has been covered with the grant received]
[SQ002 - It has been very positive in terms of results, but it has been necessary to use additional funds]
[SQ003 - The expected results have not been achieved in relation to the grant received]
[SQ004 - Other]
Q0018 - What obstacles do you consider that could prevent the continuity of use and improvement of the results, as well as further research on the project's theme? (multiple choice)
[SQ001 - The results are currently meaningless, out of date and require a fundamental rethinking]
[SQ002 - The cost of maintaining the results, improving them and continuing to research in this line of work cannot be assumed by the partner institutions]
[SQ003 - The people who worked on the project are gone and continuity is difficult]
[SQ004 - Other]
Q0019 - To what extent have the results and products you achieved with this project helped to better cope with education during the COVID-19 pandemic? (multiple choice)
[SQ001 - They have been very useful to us and we have seen that we were better prepared]
[SQ002 - Resources have been improved as a result of the situation experienced during this crisis]
[SQ003 - We have realized that they had become obsolete or out of date and did not serve us for the new situation]
[SQ004 - Other]

Table 2: Survey questions – 2nd and 5th sections

Chosen Projects			Final chosen projects after exclusions			Project survey respondents		
Field	Amount	%	Field	Amount	%	Field	Amount	%
School Education	457	40%	School Education	423	50%	School Education	88	47%
VET	222	19%	VET	193	23%	VET	42	22%
Higher Education	125	11%	Higher Education	120	14%	Higher Education	26	14%
Adult Education	128	11%	Adult Education	73	9%	Adult Education	17	9%
Youth	191	17%	Youth	23	3%	Youth	8	4%
Sports	5	0%	Sports	3	0%	Sports	2	1%
Transversal	16	1%	Transversal	14	2%	Transversal	4	2%
Total	**1144**		**Total**	**849**		**Total**	**187**	

[a] distribution of projects by educational fields according to the different phases of the sample screening.

In general, for more than 50% of the projects surveyed, it can be said that the results have been positive with sufficient funds to be able to carry them out and with the capacity to continue using them once the grant period has ended. Besides, they have also turned out to be useful on the occasion of COVID-19. Small variations are observed between educational systems, although they are not very pronounced. The sector that differs the most is Adult Education, a fact that is normal because it is a different target audience and encompasses continuous training processes.

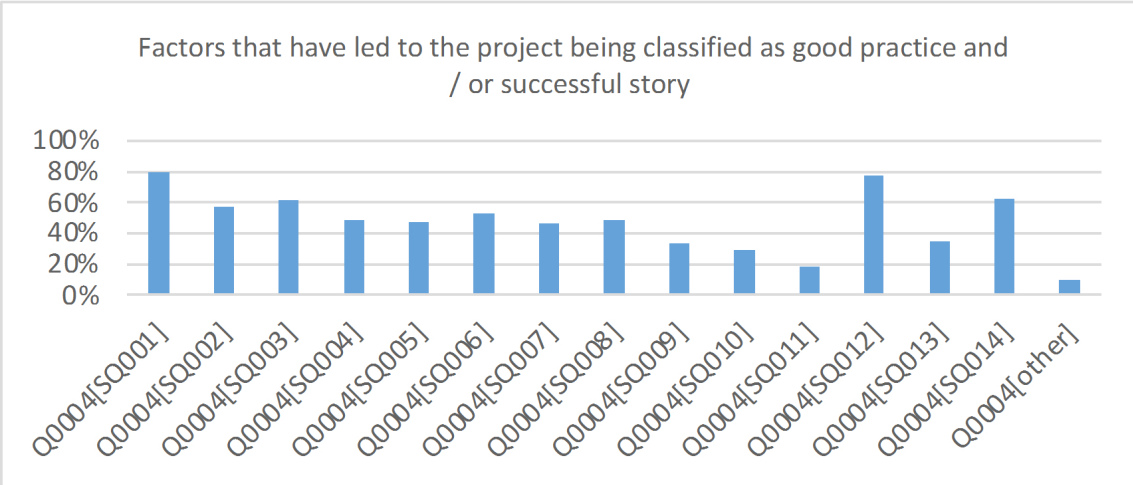

Figure 1: Factors that have led to the project being labelled as good practice and / or successful story

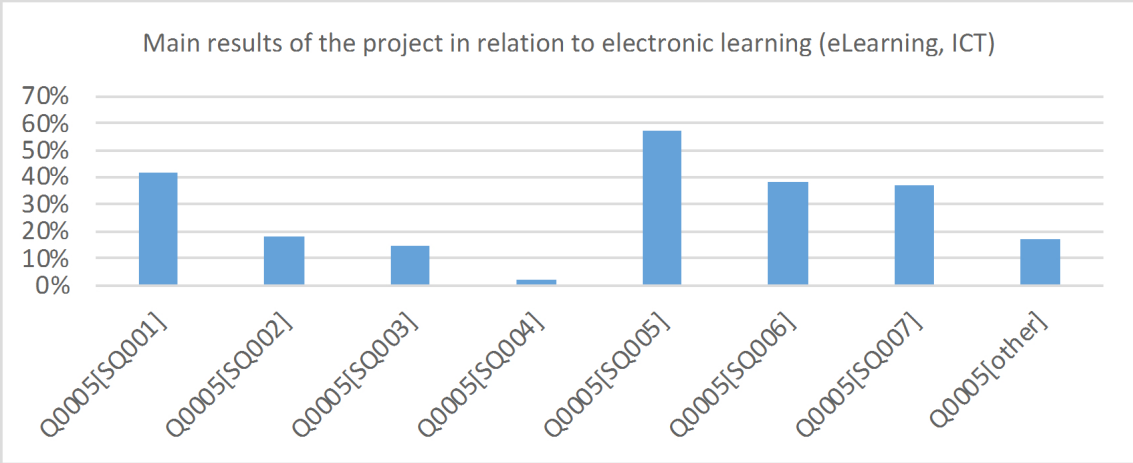

Figure 2: Main results of the project in relation to electronic learning (eLearning, ICT)

4 CONCLUSIONS

The work presented on this paper shows the main results obtained with the survey implemented for the analysis of Erasmus+ educational projects labelled as good practice or success story and linked with the term eLearning. The data presented here would help to understand the factors that have led to the success of the projects and how useful are the results achieved by them once the funding period has finished.

It is very interesting to notice that the design of those projects attended to real and concrete needs of students and teachers of the project educational sector and coordination and collaboration of all project partners before, during and after the project was a really important factor.

In relation to electronic learning (eLearning, ICT) the most important action has been the increase in digital learning resources available for the teaching and learning process (digital educational tool packages, interactive educational video games, robotics, digital methodological guides, curricular designs on the implementation of ICT, etc.).

Furthermore, the results have been positive with sufficient funds to be able to carry them out and with the capacity to continue using them once the grant period has ended. Besides, they have also turned out to be useful on the occasion of COVID-19, with small variations are observed between educational systems.

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