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Systematic review of Erasmus+ projects labelled as good practice and related to e-learning and ICT: Some case studies

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ABSTRACT

This article focuses on the methodology applied for the review of European educational projects, within the framework of Erasmus+, labelled as good practices and that are related to electronic learning or the use of Information and Communication Technologies (ICT) in education. In addition, some of the projects that have passed all the research phases and have proven to be sustainable over time are analyzed. The projects presented represent different educational sectors and propose learning systems through ICT with the involvement of students and/or teachers. As they are good practice projects, the article can contribute both to the use or transfer of the resources developed in these projects, and to be able to inspire new projects in those lines of work. The main factors that have contributed to the success of the projects are their usefulness for the educational community beyond the time of funding, the use of innovative methodologies applied with teachers and students, establishing them in the participating institutions. Another notable fact is the good collaboration and rapport between all the project partners who worked to get common objectives.

1. Introduction

The society in which we live is very volatile and requires constant adaptation to be productive and competitive. Education must be able to prepare people with the appropriate training to meet these demands. Continuous training is going to be increasingly necessary and for this purpose electronic learning, eLearning and the use of ICT are of great help [1–4]. Every day new research works, and projects are carried out and implemented in educational centers to meet these challenges.

Education is the key that contributes to economic and social development, so its adaptation to the needs of the labor market is vital. Given the imminent extension of the use of technology in all areas of our lives, both at work and at personal level, students have numerous tools that they can use on their mobile phones or with other electronic devices. Internet access and the multiple options available make it necessary to change the traditional approach of educational systems to go beyond the transmission of knowledge and work on the development of skills through dynamic and active teaching practices using these emerging technologies that are available to everyone [5].

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Within this framework, teachers are the cornerstone for achieving efficiency in any educational model, since if they manage to create a good learning environment through active methodologies fostering creativity, they can ensure that students acquire the skills they need at professional level. It is about planning practices focused on the student, as well as proposing educational strategies to provide value and support in the teaching-learning process. At university level, it has been shown that working on computational thinking, offering different study options adapted to the individuality of learning through gamified environments helps to improve motivation, avoiding dropout, without losing quality in teaching [6].

Digitization can contribute to the improvement of education. On the one hand, in schools numerous data are collected from the daily teaching process, they can be analyzed to see how to improve teaching methods and ensure that students learn in a motivated way [7]. With this data analysis, useful information can also be provided so that the administration can make political decisions at an educational level. This can help to improve the relationship between agents working in the field of technology and education, which up to now has not been very agile; in fact, it has been changing and going, depending on the moment, from situations of enthusiasm to others of skepticism [8].

The potential that digital technology provides cannot be lost sight of. Some examples of educational technology trends are: Artificial intelligence (AI) [9,10], learning analytics [11], robotics [12], etc. All these technologies, considered intelligent, can achieve educational systems with greater equity, which improve efficiency and also achieve a better return on the investment made in them [13].

In the field of digitization, the use of mobile phones is widespread, so using it to promote learning can be an asset. Mobile learning (m-learning) offers the potential to increase learning opportunities in communities that are in remote locations, so that training reaches them with the devices they use every day. However, m-learning challenges are numerous, such as infrastructure, which is not always well developed in remote locations or rural areas, or less training and access to ICTs. It is essential to overcome these barriers so that everyone can benefit from this methodology [14]. Additionally, it is needed to implement educational contents in an innovative way based on a well-designed curricula [15]. To be effective, it is also required that a good teacher training plan be carried out with due recognition, because as previously indicated, teachers as guides in the learning process are the most important agents in the teaching puzzle, without losing sight of the need for investment in infrastructure and reduction of inequalities in the access of ICT and education [16,17].

Another methodology based on digitization that favors learning is the use of games in education, although the game for the sake of the game does not contribute anything, it is very important to understand the characteristics of the students to carry out a good design and application of educational practices based on games. It is interesting to know the relationship between the physical well-being of students and digital technologies, defining what is the role played by the game and how it can help or cut off learning. Sometimes the pressure to be the first, to seek perfection, can hinder the process. In the same way, it is necessary to have the knowledge for making informed decisions with a critical spirit and with well-founded reasoning. So, it is important to teach students to take care of their health and seek their well-being through the agile use of technology and with protection against possible damage due to lack of knowledge [18].

It could be highlighted the international projects developed within the framework of the Erasmus+ Programme that involve different educational institutions from different countries working on a topic of interest for all of them. These projects can be an example to follow and transfer to similar institutions in the educational field and research them. In the Erasmus+ Project Results Platform (E + PRP - https://bit.ly/3sZMYXt) you can find all the projects of the program and they are labelled with different type of acknowledgments, including those that have been considered good practice. Good practices provide innovative actions with solutions to certain problems, also achieving an improvement [19]. However, one cannot lose sight of the fact that these are actions that depend to a great extent on the subjects and contexts in which they are carried out, therefore, they require a detailed analysis for being adapted to other environments [20].

For all this, knowing projects developed and tested in the classroom can be very useful to inspire the design of new projects, as long as they are adapted to the reality of the environment in which they wish to be transferred. Hence, this article describes the methodology followed for the revision of Erasmus+ good practice projects related to e-learning or ICT and some examples of them that passes all the research phases [21–23].

The following sections include materials and methods (methodology followed for the revision of Erasmus+ good practice projects related to e-learning or ICT), results, discussion or conclusion, references, figure captions and tables.

2. Materials and methods

As a basis for the research methodology, the method for Systematic Research Projects Reviews (SRPR) has been used [24–26]. It consists of four stages: study definition, selection definition, project selection and analysis (Fig. 1).

After carrying out the first phases of searching for projects, defining the characteristics of the sampling and filtering, the analysis was divided into four phases (Fig. 2).

1. Firstly, an in-depth review of the data from the E+PRP projects with the results obtained, the institutions that participated in them, etc. The previously mentioned Erasmus+ project database, E+PRP, was used as the main element for the start of the research, with which the sampling of projects that were good practice and were related to e-learning or the use of ICT in education. This gave way to an initial research database with a series of projects from different educational sectors in actions KA1 and KA2 [22,27].
2. Secondly, a questionnaire or survey was designed to be sent to the project coordinators to obtain information regarding their success and the use of ICT. The initial database was used to carry out a preliminary analysis of the information available for each

Fig. 1. Phases for the revision of projects.

Fig. 2. Phases for the research.

project, and then contact those who met the established requirements for them to fill out a questionnaire that would allow more specific information to be obtained on different factors of interest to the investigation.

3. Thirdly, a phase of interviews with the projects that have shown to have useful results over time and with schools, teachers or students involved. With the information gathered through the questionnaire, different analyses were carried out and with those projects that had shown to generate results that have been used and are used once the funding period ended, which also had educational centers involved in the activities, as well as their teachers and/or students, it was proposed to conduct an interview. The purpose of the interview was to gather more data on the success factors of these projects.
4. A final phase of focus groups with the most outstanding projects that had passed the previous phases. The objective of this phase is to delve into the success factors of the most outstanding projects, so that ideas could be exchanged as a group about what had made those projects successful, how ICT and e-learning had been used and what possibilities of the future they saw.

According to British Educational Research Association (BERA) [28] and the Ethics Committee of the University of Salamanca, the entire process of obtaining information from people has been carried out by obtaining their prior permission to participate, this being a voluntary process, and no personal data from the participants is stored, focusing on their opinion about the participation in the Erasmus + program and the lessons learned at institutional level.

The sequence followed for the mapping and filtering of projects is based on PRISMA [29,30], which has been adapted from the literature review for the review of research projects used in this study (Fig. 3).

2.1. Sample selection criteria

The sample selection criteria in the different phases, as represented in Fig. 3, have been.

1. First phase: review of the link of the projects with the main theme of eLearning/teaching with ICT, reviewing the title, summary, and theme fields. In addition to checking that they were from the Erasmus+ 2014–2020 program. In total, 1549 projects have been eliminated, including duplicates and those that were not from the Erasmus+ 2014–2020 program,
2. Second phase: check the established inclusion criteria: connected with eLearning, good practice, KA1 and KA2 and with educational centers. In this case 8509 of all those that do not meet the inclusion criteria.

The discarded projects between the first and second phases are due to.

- They are not from the Erasmus+ 2014–2020 programme.
- The topic of the publication does not have a well-identified relationship with eLearning or the use of ICT in education.
- They are not good practice.
- They are not from the KA1 and KA2 shares.
- Does not involve educational centers.
- The project file does not allow access to the project website, contact information and the generated resources.

3. Third phase: with the projects that have carried out the questionnaire, an analysis of the information provided has been carried out and the most significant inclusion criteria have been verified again to pass the interview phase.

Specifically, for the interview phase, only projects that met specific requirements were taken into account.

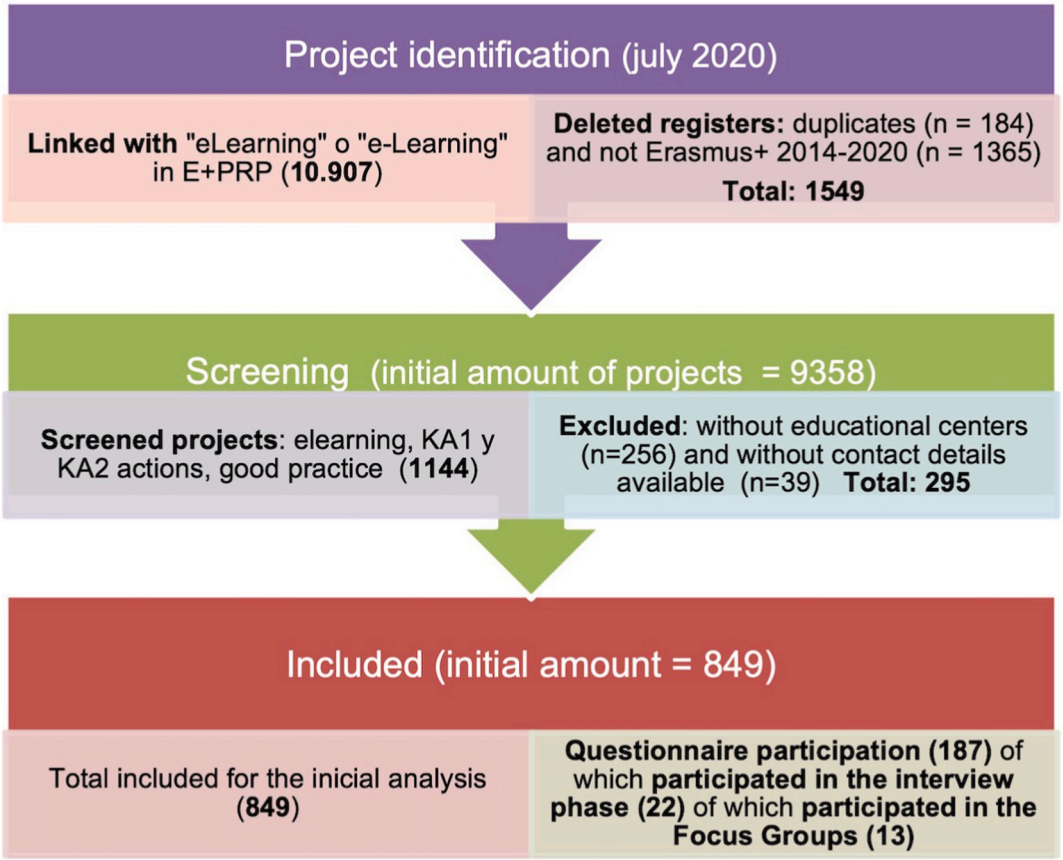

Fig. 3. Systematic review with the PRISMA methodology adapted to projects revision.

- projects in which educational centers were involved,
- with students and/or teachers,
- and had been sustainable over time, beyond the funding period.

57 which met the criteria were selected, of which 22 voluntarily participated in the interviews..

4. Fourth phase: it has been based on analyzing the information collected from the E+PRP and the survey among the projects selected in the previous phase and the quality evaluation has been applied to them, considering those that had had the greatest impact on the students and/or teachers to carry out the focus groups and that were still useful.

A total amount of 14 projects were selected from which the interview had been carried out and which had proven to meet the quality requirements. Although all the projects are related to the use of eLearning or ICT in education and are good practices, some have been excluded for the following reasons.

- The use of ICT in education or eLearning is very superficial.
- No real impact is observed in specific educational contexts.
- They do not continue to use the results today.
- No satisfactory response is obtained from the coordinating and/or partner institutions of the project.

In summary, they have reached the last phase with 14 best valued projects and 13 of them participated in the focus groups.

Each one of these projects that have passed all the phases has been reviewed in depth to be able to give an answer to the questions that are posed for this research.

In the subsections that appear below, the development of the questionnaire or survey, the interview and the focus groups are explained in more detail.

2.2. Survey

The questionnaire or survey has been designed taking as a reference different theories related to the development of questionnaires, in which information is offered on the type of questions to be asked (open or closed), which methodology is most suitable for the development, how to write the questions so that they are easy to understand and complete, as well as how many questions to include to avoid tiring respondents and discouraging their participation [31–33].

The structure of the survey consisted of 21 questions, 19 of which were closed with dichotomous options and there were 2 free response questions. Regarding the time, it was prepared so that the time to complete it was approximately 15 min, although at the end the average time was 20 min.

The questionnaire is divided into six sections, each of them related to an aspect of interest for the study [34] (Fig. 4).

1. The first has to do with the data to identify the project, institution and contact for later phases.
2. The second is related to general aspects regarding the factors that may have contributed to the success and educational methodologies used.
3. The third seeks to analyze the participation of the students and the use of ICT that they have made in the project.
4. The fourth has to do with the participation of teachers, how they have used ICT in the project and the training they have received,
5. The fifth deals with other aspects related to the use of the results, their use beyond the funding period, the usefulness they had during the pandemic, the cost-benefit ratio, etc.
6. And the sixth and last are two open questions so that the coordinators could explain in a few sentences what worked well and those things that could be improved.

For writing the questions, various questionnaires that served as inspiration were reviewed, such as those related to the International Computer and Information Literacy Study (ICILS) from the International Association for the Evaluation of Educational Achievement (IEA) [35,36] as well as Programme for International Student Assessment (PISA) Global Crisis Questionnaire Module [37,38] and Teaching and Learning International Survey (TALIS) [39,40] from Organization for Economic Co-operation and Development (OECD). Likewise, the Erasmus+ Program Guide indicates characteristics and indicators of impact and dissemination that are significant when considering projects as good practice [41]. The good thing about using these sources is that they are all contrasted and validated.

2.3. Interview

Qualitative research uses the interview linked to a specific research problem as one of its instruments. For it to meet its objective, an appropriate strategy needs to be used, so that a design is planned and carried out based on the key elements of the research. It is also necessary to consider which actions are the most convenient to collect the objective information. All these factors must be focused on the objectives that have been decided for the study, based on which the type of interview that is most appropriate is selected, always seeking to guarantee that the technique used is viable [42,43].

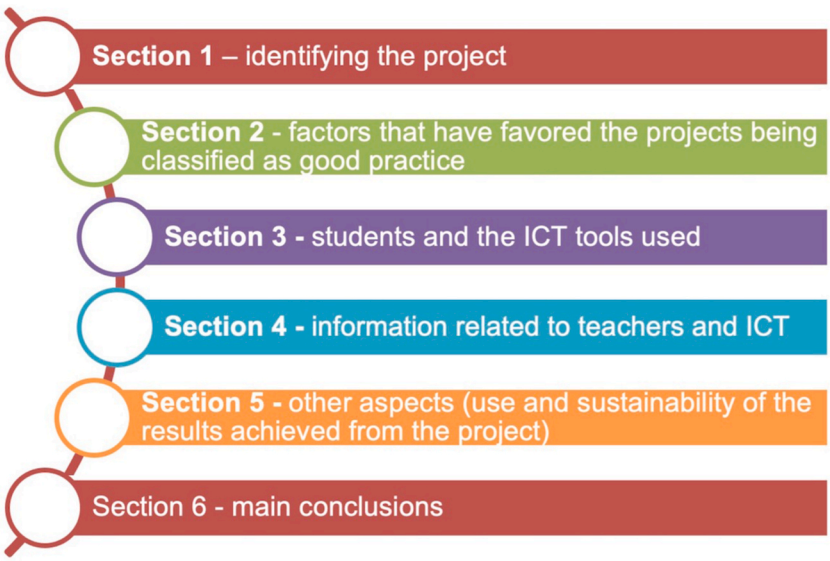

Fig. 4. Questionnaire sections.

In the case that applies to us, a type of semi-structured interview has been chosen in which the same script is used, but the people interviewed are free to express themselves and present their points of view freely and it is not necessary to force the order of the questions, they are can be done naturally by creating a climate of trust that allows for the collection of richer information [33,42–44].

The areas that were defined as key to delve in the interview were.

1. First, to better understand the participation of teachers and students and their development during the project.
2. Second, how useful the results and resources obtained in the project have been and are, their dissemination and transferability beyond its completion.
3. Third, how they were used during the pandemic.

An interview script was developed based on these three areas [27] and the methodology that has been used to develop the interview has been carried out with the following steps (Fig. 5).

1. Questions related to the aforementioned themes were posed while the interviewees were sought to assess the validity of the questionnaire that had been filled out prior to the interview. In this way, the interview fulfilled two functions: to extract valuable information on the success factors of the projects and to validate the questionnaire designed in the previous phase.
2. When developing the questions, the link with the sections previously worked on in the survey was analyzed, in order to cross-reference data and expand the information collected in it [27].
3. To be able to validate the interview script itself, the two initial interviews were used as a basis, in which it was verified whether the questions posed could obtain sufficient information and with the required relevance. Feedback was obtained from all the participants on both the development of the interview and the questionnaire.
4. The organization of the interviews was done as follows:
   a. An email to the project coordinators that met the established requirements.
   b. Confirmation of those interested in participating. The date and time for the interview was agreed with them using Google Meet.
   c. Before the day set for the interview, the information available on the project in the E+PRP was reviewed and collected and included in the file prepared for the script in a background section.
   d. The interview was carried out in a friendly manner and transcribed what was said in it.
   e. At the end of each interview, all the annotations were passed cleanly, and they were sent to the interviewees so that they could review it and confirm if they agreed with what was collected, and they returned it with possible corrections or additional information if they considered it necessary.

When all the interviews were finished, a data analysis was carried out through categorization to obtain quantitative data on the most significant qualitative information. Currently, more in-depth analyses are being carried out that will be published once the work is complete.

2.4. Focus group

The focus groups have been designed to obtain relevant information in relation to three key aspects of the research (Fig. 6).

a) Key aspects for good practices or success stories.
b) Impact detected in the teaching-learning process with the use of technology.
c) Potential of eLearning and digital technologies.

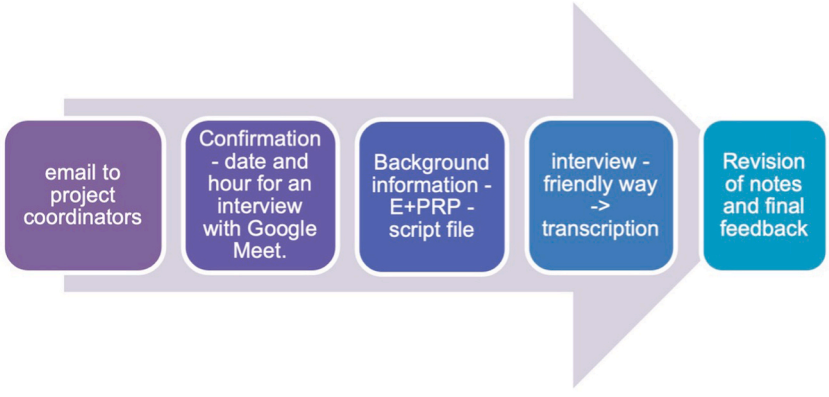

Fig. 5. Interview steps.

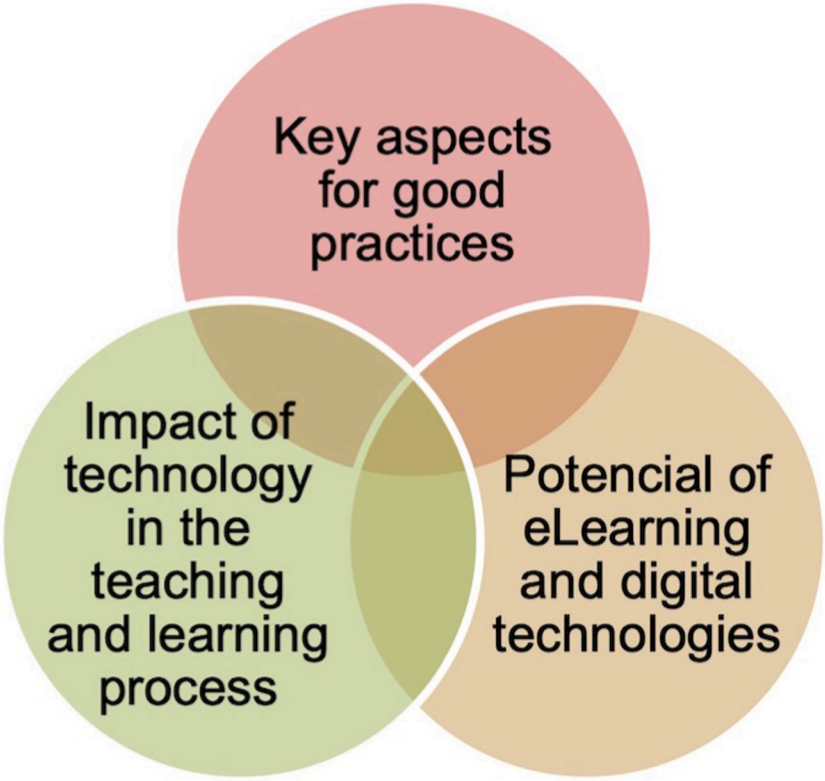

Fig. 6. Aspects discussed in the focus groups.

To carry out the groups, the most outstanding projects among the interviewees were chosen in order to gather information with regard to the aspects mentioned through guided debate in groups of between 5 and 10 people [45–47].

The projects chosen were those whose results or resources had proven to be very useful beyond the project closure and which had used different technological resources.

Taking the previous factors into consideration, it was decided to create two groups: one focused on projects in the school education (SE) sector, the sector with the largest number of Erasmus+ projects, and another with the rest of the educational fields: Higher Education (HE), Vocational Education and Training (VET) and Adults Education (AE).

3. Results

The principal figures regarding the mapping, screening, and participation in the different steps of the research were (Fig. 7).

a) 1144 projects were linked to "eLearning" or "e-Learning" terms, catalogued as good practice and of key actions KA1 and KA2 (first requirements), 256 of them did not involve any educational institution and in 39 cases it was impossible to find any way of contact.
b) 849 project coordinators were contacted, 187 of them filled in and sent the survey.
c) 58 projects comply with the requirements for the interview phase, 22 of them accepted to participate.
d) 13 projects were involved in the focus groups.

3.1. Main results from the questionnaire

To contact the coordinators of the projects to complete the survey, a collection of the contact details of the coordinators of the selected projects was carried out through the platform and the websites of the projects or institutions. All of them were contacted by email, achieving adequate participation with representation of all educational sectors and key actions. It was sent between December 2020 and January 2021; the responses were collected until May 2021 and the response rate was the 22 %.

Different articles been published with partial results with the data collected in the survey [22,48–51] and the most notable of the main sections (from the second to the fifth) are described below.

In the second section of the questionnaire related to the success factors, the ones that have been highlighted the most by the coordinators are.

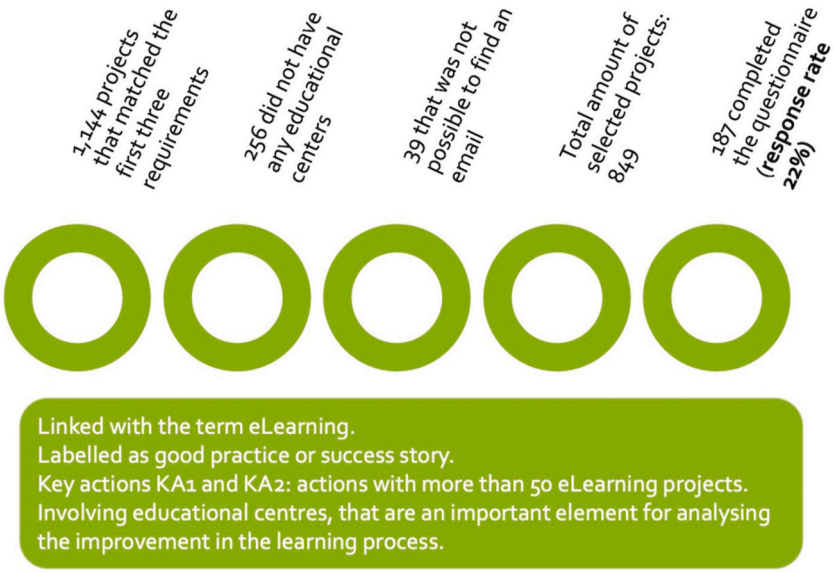

Fig. 7. Survey response rate.

1. The projects were focused on the real and specific needs of both students and teachers of the educational field to which the project belonged.
2. A good collaboration and coordination of all partners throughout the process (before, during and after it).
3. Usefulness of the project and its products over time, they continue to be used and updated.
4. Active participation of teachers and students from the project educational field.

In the third section of the survey, related to the use of ICT among students, the coordinators highlight the following aspects.

1. The educational field with the greatest representation has been SE.
2. The ICT tools most used by students within the framework of the projects were focused on basic skills related to office automation, presentations, and collaboration platforms.
3. Regarding the ICT devices used by students, the most common were laptops and desktop computers.

The fourth section, devoted to the use of ICT among teachers as well as training activities, the main facts that could be pointed out are.

1. It coincides with the students regarding the educational field of the project, highlighting the SE, followed by VET, HE, and AE.
2. The computer tools they used were of the same type as the students (office automation, presentations, and collaborative education environments). In addition, image and video editing, use of network resources and digital learning environments are mentioned as the most used.
3. As for the most used ICT devices, laptops and desktop computers also stand out, although in some educational sectors the use of tablets and smartphones is also very common.

Regarding the fifth section that asks additional aspects, the following should be indicated as most relevant: almost the 50 % of the projects, whose coordinators completed the survey, state that they have obtained positive results with sufficient funds for their completion, in addition to allowing the institutions to continue using them once the project's funding period had ended. They have also proven to be useful during the pandemic.

There are variations between educational fields, although they are not very pronounced, specifically AE is the most differentiated sector, something that is normal because this type of education and the people who participate on it present, in general, significant differences with respect to the other educational sectors.

3.2. Main results from the interview

The interview phase was carried out between the months of December 2021 and May 2022 with the coordinators or partners of the projects shown in Table 1.

Table 1
Projects that participated in the interview phase (In green letter the mobility projects).

Field	Project	Title
SE	2014-1-FI01-KA201-000714	Your Entrepreneurial Skills - Y.E.S for Future
VET	2014-1-CY01-KA202-000274	Infusing entrepreneurial skills in the corporate ICT environment - Intraprise
VET	2015-1-HU01-KA202-013555	Flip IT! – Flipped Classroom in the European Vocational Education
HE	2016-1-PL01-KA203-026652	Innovative Education towards Sustainable Food Systems
HE	2014-1-RO01-KA203-002940	Massive open online courses with videos for palliative clinical field and intercultural and multilingual medical communication
SE	2017-1-DE03-KA219-035459	Fun And Curriculum Oriented Exercises for: Information Technology
SE	2014-1-HR01-KA200-007171	Boys Reading
YF	2016-1-PT02-KA205-003182	Summer e-CHALLENGE: Acquiring Soft & Digital Skills Through Non-formal Free-time Practices
SE	2017-1-PT01-KA101-035487	TECEMOS - Tecer Espaços Criativos e Motivacionais Olhando o Sucesso
SE	2014-1-DE03-KA201-001563	Die Jugend prägt Europa - Fertigung einer Münzpresse zum Prägen einer Europamünze
VET	2019-1-HR01-KA102-060621	Intelligent solutions for Digital Europe
SE	2016-1-SE01-KA219-022105	On the road
SE	2017-1-PT01-KA201-035847	Education in Mathematics in Game-based Immersive Contexts
AE	2017-1-EL01-KA204-036189	Developing Skills in Dealing with Emergencies: Civil protection for people
VET	2015-1-IT01-KA202-004733	Innovation in the Cloud bridging Universities and Businesses
VET	2016-1-DE02-KA202-003273	Fit for E-Commerce
SE	2014-1-BG01-KA201-001435	Choose Your Future
VET	2014-1-ES01-KA202-004368	Training on Safety Assessment and Management for New and Innovative Children's Products
SE	2015-1-ES01-KA201-016210	Development of skills through art and emotional intelligence, to improve learning and situations of social exclusion.
VET	2017-1-ES01-KA102-036683	Internationalization of Nurse Assistant Education-3
VET	2017-1-ES01-KA202-038232	E-commerce of safe children's products: a common view for SMEs, consumers, and authorities
SE	2017-1-ES01-KA219-038105	Take the e + train
SE	2014-1-FI01-KA201-000714	Your Entrepreneurial Skills - Y.E.S for Future

The distribution of projects by educational fields has been as follows:10 from SE field (KA201, KA219, KA200, KA101), 8 from VET field (KA202, KA102), 2 from HE field (KA203), 1 from AE field (KA204) and 1 from the Youth Field (YF – KA205) that involves SE students. As it can be seen, there have been more projects interested in participating in the interviews from the SE and VET sectors, although it must be considered that they are also the ones with the greatest representation both in the platform E + PRP and in the selection of projects made.

In general, some common factors can be summarized in all the projects analyzed in the interview stage and that coincide with some of the issues already raised in the second section of the questionnaire.

1. They responded to the needs of the students, staff in training, trainees, and/or teachers or trainers for whom the project was directed.
2. They focused on innovative issues with an impact on the real life of the institutions for which the project was developed.
3. The products, results and materials developed in the projects have the characteristic of allowing their continuous updating, expansion, and their transferability to other related educational agents.
4. These results of the project are still used today, have been adapted and integrated into the teaching processes of the institutions, and have even been included in the study plans, curricula, optional subjects, etc.
5. Another aspect that everyone has highlighted as very important for success is the good relationship, coordination and collaboration with the partners that has favored carrying out consecutive projects and has even given rise, in some cases, to the creation of networks.

6. Regarding the use of ICT, although in all the projects they were essential for their development and for the resources that were generated, the use made of technology was rather complementary to channel and facilitate communication and processes of teaching, but they were not the main objective.

In short, a good design, well thought out, planned according to real needs is key in all cases and of course it is essential that the projects are implemented in the day-to-day activities of the institutions so that they have continuity and an impact.

3.3. Main results from the focus groups: examples of Erasmus + projects

As regards to the focus groups stage, two sessions were carried out with the division by educational fields specified previously. They were done at the beginning of July 2022 and Table 2 shows the projects that participated on each session. Something common in all these projects is that they have proved to be of used over time.

The main ideas that have resulted from the discussions held in the focus groups have been the following.

1. Reasons for success:
   a. Based on an in-depth analysis of the needs, involving all the actors, innovative in nature so that they last over time and focused on European goals.
   b. Precise and well-defined planning and design of the project, simple and with an adequate duration and with clear goals.
   c. Motivating and attractive educational topic and materials adapted to each situation.
   d. All activities must have a clearly practical approach, with attractive and modern methodologies, which encourage the participation of all interested agents.
   e. Training activities that allow the project products to be known, used effectively, results must be integrated.
   f. Team building, partners with the same needs that are fully involved, that are known and reliable, while complementing each other with different capacities.
   g. Good and well-planned management and a good leadership.
   h. Continuous dissemination of the activities carried out in the project, with open materials so that they can be used by everyone
2. Guarantee the impact in the educational process:
   a. Improvement in concrete professional skills as well as digital competencies.
   b. Problem solving and practical approach.
   c. Training, tutoring, and mentoring along the process.
   d. Digital tools with attractive environments to foster the participation of all interested agents.
   e. A well-defined methodology.
   f. Exchange of good practices and recommendations with good communication channels.
   g. Opensource materials.
   h. Curriculum integration.
   i. Find a balance between face-to-face and online training.
3. Potential of ICT and eLearning:
   a. Most of the focus group projects have online training, games that reinforced their use in the wake of the pandemic. This trend was reinforced by the pandemic: new research fields are opening, and they cannot be ignored. It is essential to work on it and benefit of all the possibilities that are arising with eLearning and digital technologies.
   b. The projects work on issues that are still valid or active, that solve real social needs and that thanks to the digital platforms allow flexibility in access to training materials, facilitate the exchange of ideas between people/agents with the same needs and interests, keeping projects alive.
   c. All this requires good training in digital tools, using a well-defined methodology with clarity on the skills to be covered, and the modules or materials needed, as well as monitoring and support to be able to identify new skills that may arise and that could be the motivation for future projects.
   d. The methodology is also key to train in critical thinking, creative thinking, the ability to differentiate what is true and what is false, the reliability of information, making efficient use of resources, guarantee the security in communication, etc.
   e. eLearning cannot be left behind, it must be given a boost by taking advantage of this trend for all the benefits it brings from flexibility in learning at any time and in any environment, in addition to being able to better attend to diversity. Although, we must find a way to coexist with other traditional methodologies and not lose focus on the need for face-to-face and practical interaction as well, as a key aspect of socialization and learning.
   f. There are also challenges as for example the maintenance of the products beyond the funding period, to achieve the desired sustainability of the projects over time and many fields remain to be explored in artificial intelligence, augmented reality, data analysis, robotics, cybersecurity, etc. that are beginning to emerge, and it is a challenge to adapt them to current social needs.

In conclusion, the debates in the groups have shed light on many aspects that are key to carrying out successful projects and, in addition, proposals for future lines of work have emerged in the field of the use of technologies in education, which represent a challenge.

Table 2
Selection of projects for the focus groups (FPS: Focus group section).

Field	FPS	Project	Main results
SE	1st focus group (SE). One of them is from the Youth Field (YF), but it was applied with SE students.	2017-1-DE03-KA219-035459 - Fun and Curriculum oriented Exercises for: Information Technology	1) Logbook: language survival guide 2) Quiz available in the languages of the schools & in English 3) Android App with the quiz Project website eTwinning space
SE (YF)		2016-1-PT02-KA205-003182 - Summer e-CHALLENGE: Acquiring Soft & Digital Skills Through Non-Formal Free-time Practices (SeC)	1) SeC eLearning platform 2) SeC Dissemination Handbook 3) SeC Trainings 4) Project website
SE		2017-1-PT01-KA201-035847 - Education in Mathematics in Game-based Immersive Contexts	1) Clash of Wizardry | Handbook | The Magic of Training Maths in a Game (4 languages) 2) Class follow-up activity 3) Clash of Wizardry | Trailer 4) Clash of Wizardry | Tutorial 5) Android and Apple App Clash of Wizardry 6) Different usability test (8)
SE		2014-1-BG01-KA201-001435 - Choose Your Future	1) Online course Building online personal portfolio (5 sections)
SE		2015-1-ES01-KA201-016210 - Development of skills through art and emotional intelligence, to improve learning and situations of social exclusion.	1) Methodology INTEGRARTE
SE		2017-1-ES01-KA219-038105 - take the e + train	1) Online platform with the materials in eTwinning space Project website The e + train story materials (video, methodology)
VET	2nd focus group (VET-HE-AE)	2014-1-CY01-KA202-000274 - Infusing entrepreneurial skills in the corporate ICT environment - Intraprise	1) State of the art analysis report of management practices and organizational culture in the ICT sector in partner countries 2) Report on the needs of intrapreneurial training in ICT sector 3) Theoretical framework of the Intrapreneurship Training program 4) "INTRAPRISE" learning/training material
HE		2016-1-PL01-KA203-026652 - Innovative Education towards Sustainable Food Systems	1) guide for innovative education towards sustainable food systems 2) E-learning module 'Sustainable Food Systems & Diets 3) Intensive Study Programme 'Sustainable Food Systems & Diets' 4) Educational materials for the Intensive Study Programme 'Sustainable Food Systems & Diets' 5) Programme of the Small Research Projects 6) Analysis of students' understanding of the 'Sustainable food system' and expectations towards education within this subject area
HE		2014-1-RO01-KA203-002940 - Massive open online courses with videos for palliative clinical field and intercultural and multilingual medical communication	1) Baseline Research on Country Palliative Care Procedures 2) National research about the procedures on palliative medicine in Romania, Belgium, Italy and Spain 3) Comprehensive interdisciplinary MOOC which offers 20 fundamental palliative medicine procedures

(*continued on next page*)

Table 2 (*continued*)

Field	FPS	Project	Main results
AE		2017-1-EL01-KA204-036189 - Developing Skills in Dealing with Emergencies: Civil protection for people	1) Compendium 2) Greek and Italian survival guide for schools 3) 1st questionnairy report 4) 2nd research for Civil protection 5) Agreement on continuation and extension of cooperation. Creating a network of citizens for civil protection 6) The CPP project at the 12th annual International Conference in Seville 7) About 112-3rd gymnasium Aegaleo – video 8) European Organizations of civil protection 9) Scenario of an earthquake simulation
VET		2016-1-DE02-KA202-003273 - Fit for E-Commerce	1) Fit for E-Commerce - E-Book PDF-Format IOs 1, 2 and 3 2) e-book chapters: - Setting up an online shop - Facilitating Online Marketing - Basics of Internet Programming 3) Handbook
VET		2014-1-ES01-KA202-004368 - Training on Safety Assessment and Management for New and Innovative Children's Products	1) SAMNIC video presentation 2) Leaflet of SAMNIC project in Spanish, English, Czech 3) MOOC - Website of SAMNIC project
VET		2017-1-ES01-KA202-038232 - E-commerce of safe children's products: a common view for SMEs, consumers and authorities	1) e-COM 4 CHILDREN INTERACTIVE COMIC (EN, ES, CS, IT, PT) 2) e-COM 4 CHILDREN adaptive MOOC (EN, ES, CS, IT, PT) 3) e-COM 4 CHILDREN training materials (EN, ES, CS, IT, PT) 4) VIGNETTES OF THE e-COM 4 CHILDREN INTERACTIVE COMIC 5) GUIA BÁSICA DE USO DEL MOOC ADAPTATIVO e-COM 4 CHILDREN 6) e-COM 4 CHILDREN video presentation 7) e-COM 4 CHILDREN project website 8) Leaflet of the e-COM 4 CHILDREN project in English, Spanish, Italian 9) e-COM 4 CHILDREN project website

4. Discussion or conclusions

This article presents the methodology applied to review Erasmus+ projects classified as good practice and related to e-learning and/or use of ICT. In any case, these are projects in the field of interactive education through educational applications.

The projects that have reached the last phases of the data collection process through interviews and focus groups have also been presented. These projects are characterized not only for having been considered a good practice, but also because they have proven to be useful beyond the funding period and even during the pandemic and confinements experienced in 2020.

The main objective is to publicize the methodology followed for the analysis and provide examples of inspiring projects that have had an impact on educational processes, managing to motivate students or apprentices and teachers or trainers in the teaching-learning process in a very effective way.

Each example that is indicated in the article presents a concrete solution to respond to real needs associated with an educational field, in addition they approach the social reality that students face. The solutions and resources developed in the projects are open and remain available for the use of the school community and have proven to be very useful. This applies both to the institutions that developed and participated in the project, as well as other related organizations and the educational centers themselves that can use all the educational resources provided in their teaching practices.

The fact of giving information about these projects with their resources can provide education professionals with tools that help them improve educational practices and discover new methodologies. Likewise, they can serve as inspiration to transfer and adapt these good practices in other educational contexts.

The most relevant results that have led to the success of these projects are based on.

1. An innovative design of solutions to real needs, proving to be effective in its purposes.
2. Its products or results are available to all users, a fact that also facilitates their transferability and their impact on other educative institutions.
3. They have involved the main agents (students, teachers, apprentices, trainers, companies, associations, etc.) to test the effectiveness of the materials and implement them in the institutions.
4. They have contributed to make them part of the day-to-day activities of the institutions, adapting them to the context, integrating them into their educational practices, updating them and making them sustainable and useful over time.
5. Good coordination and management between project partners linking consecutive projects.
6. In the same way, they have prepared dissemination materials and carried out training so that they reach and become known by the greatest number of interested people possible.

Some challenges presented by the projects is how to achieve constant updating in the face of the continuous advancement of technologies. Aspect that conditions some educational projects that are developed with subsidies, but that are not capable of continuing to update them after the fact of the technological changes that are emerging. Hence, certain limitations have been identified during this research.

- The ongoing evolution of European educational projects. Given that the initial sample was collected in 2020, subsequent calls have introduced numerous projects that have both commenced and concluded. These projects could offer supplementary insights, either reaffirming the findings from the initial sample or presenting fresh evidence of interest.
- Influence of voluntary participation on sample composition. The inclusion of projects in the survey, interview, and focus group phases relied on the voluntary engagement of project coordinators selected from the initial sample. This dynamic introduces the potential for results to be influenced by this factor. However, it has been observed that the sample's representativeness was satisfactory and aligned with the context of the projects in question.
- Sustained viability of exemplary practice projects. Over the research duration, indications have surfaced suggesting that a significant portion of projects designated as exemplars of good practice carry out their activities solely during the funding period and subsequently experience neglect.
- Connectivity with ICT and/or eLearning. Notably, within this domain, it is important to acknowledge that despite using terms like "e-Learning" or "eLearning" in project searches within the E + PRP database, the resultant projects didn't consistently exhibit a direct correlation with the eLearning methodology. While most of these projects did incorporate ICT for e-learning purposes, the utilization of digital tools in most instances remained supplementary.

If we consider the described limitations some lines of future research can be established in relation to with this area of study such as.

- The review of specific projects of a specific methodology related to the object of interest of this study (mLearning, uLearning, bLearning, etc.). The field of mobile digital technologies provides numerous possibilities to explore the results obtained from the different programs and projects that are carried out with these methodologies and assess how they can improve skills, as well as how to overcome possible risks.

- Analysis of projects that work on innovative methodologies such as those related to artificial intelligence, data mining and robotics, which have not yet been widely explored and whose advances, when properly used, will serve to structure teaching processes in a way that be more efficient and effective.
- Thoroughly analyze the real sustainability of projects over time, essential to assess whether they have been useful or not, given that projects that are only valid for the period in which they are developed for funding do not have a real impact on the system and the people who participate in it. It is essential to achieve projects that produce lasting results and that adapt over time.
- Delve into how the maintenance of the results obtained is carried out, knowing better the strategies that allow projects to have a projection in the medium and long term.
- Deepen the quality of the resources that are generated in the projects and to what extent they are appropriate to achieve the training of the people for whom they are developed.
- Carry out an analysis of the impact that the results of the projects have produced and produce in the teaching-learning processes: improvement in academic performance, employability, training, etc. This aspect is essential to be able to determine if the results of the projects have provided a real impact on the people to whom they were addressed.

One way to achieve sustainable projects is through the creation of an infrastructure in the institutions and, as previously indicated, that they are included in educational practices and study programs.

It may also be useful to have the support of the Administration or other collaborating institutions to update the resources. In the same way, if the institutions form networks with which they develop successive projects trying to improve or expand related aspects, or work on new projects framed in the same line of research, they will be able to expand the scope achieved with these projects.

The indicated aspects have undoubtedly been the most outstanding so that the projects that are the subject of this article have managed not only to be considered as good practice, but also to have continued to be alive until today.

In conclusion, taking these guidelines and others that are discovered by analyzing this type of project as a reference, in addition to offering educational resources available to schools, inspire them to develop new successful projects.

CRediT authorship contribution statement

María Goretti Alonso de Castro: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Francisco José García-Peñalvo:** Writing – review & editing, Supervision, Project administration, Methodology.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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