Smart Ecosystem for Learning and Inclusion

December 2020

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Results of the assessment of the pilot's impact

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Universidad de la República, Uruguay (UdelaR)

Federico Henríquez y Carvajal University, Dominican Republic (UFHEC)

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EXECUTIVE SUMMARY

This deliverable is the report about the initiatives taken in different partner countries of the Smart Ecosystem for Learning and Inclusion project. This report aims to provide information about the country-specific results of SELI project initiatives, preliminary findings of initiatives regarding strengths, weaknesses, opportunities and threads as well as future plans for pilot tests with SELI learning platform in different contexts of using SELI platform in education with learners. Information about the capacity building and pilot tests provided as part of this report considering unexpected circumstances brought by Covid-19 pandemics. Partners planned to integrate the SELI Learning platform in their educational context in various ways.

1. Introduction

The SELI project involves several initiatives to enhance inclusive education through ICT. Among these initiatives, workshops were organized in different countries such as Brazil, Bolivia, Dominican Republic, Poland, Turkey and Uruguay with a focus on addressing specific inclusive education challenges in the countries. In each workshop, participants had the opportunity to learn about accessibility and discuss the importance of inclusive education in the classroom. Moreover participants were introduced to the SELI digital learning platform (https://seli.uazuay.edu.ec, https://vm2161.kaj.pouta.csc.fi/, https://seli.hacettepe.edu.tr/) which includes an authoring tool to assist the teacher to easily create lessons, a learning management system for teacher and student to organise their pedagogical activities, a digital storytelling tool, and blockchain infrastructure. Besides, the SELI digital learning platform supports teachers in the preparation of accessible didactic materials and providing accessible instructional contents to the students.

This report aims to provide information about results of initiatives regarding strengths, weaknesses, opportunities and threads conserning the SELI project in partner countries.

2. Methodology

In this study, case study approach used to explore real life experiences as part of SELI project. According to Creswell (2013) "[t]he case study method explores a real life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information… and reports a case description and case themes" (Creswell, 2013, p. 97). We have different cases from different countries based on specific contexts. In the present study, we conducted a SWOT analysis within faculty members as a SELI team and with pre-service teachers to learn from their experience of inclusive practice, document it and share it with other people. Data collected from the national teams from Bolivia, Brasil, Dominican Republic, Ecuador, Finland, Poland, Turkey, Uruguay. According to Munoz-Baell et al. (2011) recent researches has shown that SWOT can also be a very useful tool in educational settings (Herman 1993; Balamuralikrishna and Dugger 1995; Michael 1995; Fidler 1996; Tsiakkiros and Parshiardis 2002, Trainer 2004; Pailwar and Majan 2005). Because it focuses on the issues that potentially have the most impact, the SWOT analysis is useful when a very limited amount of time is available to address a complex strategic situation (Munoz-Baell et al. ,2011). In the present study, SWOT analysis presented as a two-by-two grid to the project team. Each quadrant outlined the **strengths, weaknesses (Internal factors), opportunities, and threats (external factors)** (SWOT). Internal factors are those strengths and weaknesses within the capacity of the team or organisation objectives. External factors are those that happen beyond the capacity of the team or organisation. Each national team of SELI project collected data from team members and target groups as optional based on questions distributed with Figure-1.

STRENGTHS (+) *What value can SELI project bring to inclusive education?* • *What is working well?* •What is making a difference? • What do we do really well?	**WEAKNESSES (–)** *List any competency deficits that SELI have for promoting inclusive education.* •What is not working optimally? •What is not making a difference? •What process needs improving?
OPPORTUNITIES (+) *List any external factors benefiting success of the SELI project.* • What needs to be improved or changed? • What should we start doing? • What should we stop doing?	**THREATS (–)** *List any hazards of working in the SELI project.* • What is threatening in our work? • Economic trends? • Financial threads? Costs?

Figure 1. SWOT analysis grid

Results were shared according to four category as strengths, weaknesses, opportunities and threats of SWOT analysis.

2.1. Research Question

- What is the perception of the national SELI team about the strengths, weaknesses, opportunities, threats of the SELI project

3. Workshops of SELI

In Turkey, workshops are integrated as part of two courses conducted in physical education and sport teaching programs. The first course was school experience and the second course was teaching practice. School experience took 14 weeks between September 2019 and 2020. During the course, an introduction to the SELI project is provided to the students. Students also participated in group works in order to get familiar with inclusive education-related topics such as stereotypes, prejudices, equality and justice, and diversity in the classroom. Second course was teaching experience that took 17 weeks with a 3 weeks extension because of Covid 19 pandemy. Teaching experience included active learning methodologies which involves objectives related to technology, pedagogy, and content knowledge.

On March 9-10, 2020, an international workshop was held within the Smart Ecosystem for Learning and Inclusion- ERANet17/ICT-0076 SELI project (co-financed by the National Centre for Research and Development, NCBiR) was carried out in Poland, Krakow. The project meeting was attended by scholars from Brazil, Czech Republic, Ecuador, Finland and Poland. On the first day an internal workshop was conducted, which was the basis of the SELI framework, while on the second day a test of the educational platform was carried out. Both meetings were attended by about 70 students, scientists, trainees and administrative staff. It was the first phase of testing the platform in Poland. Students from pedagogical faculties got acquainted with the operation of the SELi platform, they got to know how to create and share courses. Each of the students was responsible for preparing their own mini-courses. Due to technical difficulties with the operation of the platform, steps were taken to improve the functionality of the platform and further stages. The meetings in March were crucial to increase the effectiveness of activities in the following months. In the period from April to May the platform was installed on a server in Finland and courses in Polish were added to the SELI platform. From May to the end of June more than 230 Polish students completed the course. This, together with the stationary workshops, gives a result of over 300 students. The courses have proved particularly useful as an official supplement to the curriculum during the COVID19 pandemic.

In Brazil, during CBIE 2019 (Brazilian Congress of Informatics in Education), which took place from November 11 to 14, 2019 in Brasilia, the workshop “Creation of Inclusive Digital Educational Material” was held with twenty-five participants. Most of them were specialists who already work or were interested in the topic related to accessibility and digital inclusion. In the workshop the participants had the opportunity to know more about the elderly characteristics and declines. There was a lecture on recommendations for creating accessible educational material for the elderly. After the theoretical background, there was a group activity for designing accessible educational material for the elderly, with a free theme, but with a predefined task: the production of digital storytelling specific for elderly. Finally, the SELI authoring tool was presented to the audience. During this Workshop, the SELI authoring tool was being developed by the Ecuador team. Although the development of the tool is at the beginning of its implementation, the participants had implemented their projects and storytelling in the authoring

tool. At the end of the workshop, participants answered to a research, through a questionnaire, about the ease of creating accessible educational material, the ease of creating storytelling and the usability evaluation of the platform. The workshop participants pointed out some difficulties in using the tool, which was reported to the Ecuador team for the necessary improvements. At this stage, these difficulties were understandable, since the tool was still at the beginning of its development. With the results of the research, it was noticed that all participants understood that they can select or create accessible material for their classes. However, 60% of them pointed out the difficulty in preparing accessible content for their classes. After learning about the SELI platform, everyone agreed that it helped them to be more productive in building accessible material. But not all found the tool easy to use (40% of respondents). Probably because they were still getting familiar with the tool. It should be noted that it was still in the development stage. However, everyone agreed that the SELI platform would be useful, facilitating their work and optimizing their time in the production of accessible teaching material. But, when asked if the tool did everything they expected, 20% said it didn't and 40% were neutral and 40% felt that there were many steps to achieve their goal and expressed difficulties in using the tool without instructions. This denotes the need for improvements in the tool to meet teachers' expectations.

Regarding storytelling, everyone agreed to be a valuable classroom experience. Especially when it comes to the elderly, storytelling may provide various benefits as to promote social engagement and reminiscence. However, not all would use storytelling in their classes to complement their learning. Regarding the creation of storytelling on the SELI platform, everyone found it easy.

Despite the difficulties in using the tool, with some functional problems due to the stage of development, the participants realized the ease and usefulness in using SELI platform to support the preparation of their didactic and accessible materials. They encouraged the continuity of the project, pointing out the lack of tools for this purpose.

4. Results

This study has a number of results regarding perception of the national SELI team about the strengths, weaknesses, opportunities, threats of the SELI project? Result of SWOT analysis is summarised as below:

4.1 SWOT Analysis from Turkey

Results of the SWOT analysis conducted with Turkish team is provided below:

	Strengths	**Weakness**
Internal Factors	1.We were able to continue training at SELI during the epidemic period with pre-service teachers. 2.In the courses in SELI, we were able to follow up the learning activities of pre-service teachers. 3.We were able to cooperate with the pre-service teachers while determining the lesson times to create equal opportunities. 4.Along with the asynchronous lessons in SELI, we were able to perform synchronous lessons. 5.Integrating the SELI learning platform in the teaching practice course before the Covid-19 epidemic. 6.In order to continue school-faculty collaboration, we shared teaching practice course outcomes with teachers through digital tools such as SELI and Whatsapp. 7.We supported pre-service teachers to experience creating distance learning lessons on the SELI learning platform. 8.We were able to reach enough output to evaluate student participation during the epidemic period (% attendance at lesson, 2 digital story assignments and distance learning lessons created), 9.SELI supported student participation to be evidence-based. 10.Integrating digital storytelling to the SELI platform. 11.Having international cooperation as part of SELI project and the possibility to have a wider impact on inclusive education.	1.We did not have the possibility to observe that the courses created in SELI are really carried out at home. 2.Failure to test SELI with K-12 students because of Covid-19 pandemy 3.Failure to communicate effectively with teachers during the epidemic. 4.We could not share the lessons created by the pre-service teachers on the SELI learning platform with the students. 5.Weakening of development due to SELI's budget being cut. 6.Limited and slow video upload capacity in SELI.

External Factors	**Opportunities** 1.Equal access conditions for disabled students and others at SELI. 2.Due to the epidemic, we gained experience in the remote processing of teacher education courses. 3.We have experience in using the SELI learning platform and working remotely. 4.Due to the epidemic, it was easier for pre-service teachers to accept using the SELI 'learning platform. 5.It created an opportunity to move into blended teaching. 6. The epidemic caused an increasing budget invested in technology.	**Threats** 1.Every student does not have access to the internet, electricity, and computer. 2.Although the university had a commitment to provide computers to students, it was not possible. 3.Course hours are not suitable for every student due to the special situation of the students. 4.Students' being unable to focus on lessons due to epidemic anxiety, availability of distracting factors on the computer. 5.Failure to detect the dangers that may occur in lesson activities at home, 6.Distracting factors during distance education. 7.Ethical rules have not been created completely for distance education. 8.A budget is needed to continue using SELI after the project.

4.2 SWOT Analysis from Finland

Results of the SWOT analysis conducted with Finland team based on is provided below:

Internal Factors	**Strengths** 1.Partners developed new collaboration networks across EU, LAC through SELI. 2.Partners worked together to offer solutions to an important area of education, the inclusion of people with disabilities. 3.SELI provides an opportunity to develop new methods, techniques, tools to address educational exclusion.	**Weakness** 1.The medium of collaboration in SELI platform limited. Students would be more interested in collaborating and co-designing in the era of the pandemic that restricts physical meeting. 2. Implementation of courses is a bit cumbersome for teachers who are already used to some other platforms used for online learning. 3. Students could only socialize in the SELI platform to a minimal level. Features for socialization need to be improved. 4. The accessibility component of SELI could not be fully tested while implementing the courses since the platform was undergoing routine update. 5. Some modules in SELI open slowly. This could be problematic to users.

External Factors	**Opportunities** 1.Need for proper inclusive digital platform. 2.Need for something new to lower a gap in digital divide. 3.The discussion about equality, and inclusion rises awareness of the need 4.The Schools, Universities, NGOs, and other institutions responsible for the disadvantaged groups in the society are keen on inclusion and improving the learning outcome of people with certain disabilities. 5.Finland is financially quite stable for new opportunities and the government is usually providing budget to cater for education needs 6.Special education is open for opportunities. 7.Digital platforms and other technological tools are widely used in Finland. 8.Open discussion for equality among the politics etc. 9.Offers advantages for several stakeholders in Finland.	**Threats** 1.Pandemic may limit the funds in schools etc. to adapt new technology 2.Second waves of COVID-19 may cause instability. 3.At the current state of the society (unemployment etc.), adaptation of a digital platform for inclusive education might not be relevant discussion topic 4.Funds are limited in certain cases for educational use. 5.There is a lag in the adoption of new technology in the education settings. 6.It is ultimately up to the teacher whether he / she uses digital tools. 7.Rise of the right wing politics which is not quite happy to discuss equality, inclusion etc.

4.3 SWOT Analysis from Bolivia

Results of the SWOT analysis conducted with Bolivian team is provided below:

Internal Factors	**Strengths** 1.Strength integration between students and researchers/teachers in project activities. 2. SELI incorporates knowledge and support tools for inclusive contents and activities. 3.Students supporting the development of SELI platform have skills and capacity to work together. 4.Developers and researchers have engaged with the writing process of research papers and documentation for the project. 5.Team engagement with the participation in conferences,	**Weakness** 1.Development team centred in urgent tasks solution over the quality of research objectives, mainly in accessibility and inclusion. 2.SELI platform response is slow. 3.SELI platform has not the maturity to be a production software. 4.The development methodology is not well known by all members. 5.Technical documentation is not up to date; the development process has not been guided by a main architectural design.

	meetings and workshops that involves SELI project. 6.Constant and fluid communication between developers, researchers and support personnel.	
External Factors	**Opportunities** 1.Strengthened paradigms for inclusive ICT innovation in education. 2.Include undergraduate students with a research spirit. 3.Being able to easily promote because of the SELI platform features (like inclusive tool support)which are not present in the leading known platforms oriented to support courses. 4.Take advantage of COVID-19 niche for education supported by ICT.	**Threats** 1.Local team Bolivia has limited funds for the project. 2.Local team Bolivia did not receive funds from a government agency (the government decided the funds they give to the universities is sufficient). 3.The national COVID-19 quarantine measures prevent working normally in many project activities.

4.4 SWOT Analysis from Ecuador

Results of the SWOT analysis conducted with Ecuador team is provided below:

Internal Factors	**Strengths** 1.Integration of minimal working examples in areas of the project (Digital StoryTelling, blockchain, accessibility) using well-known collaboration tools (i.e. GitHub). 2.The platform offers the opportunity to tailor contents to students whose native language is not English. 3.While it is part of an LMS system it has features of open access as well.	**Weakness** 1.Knowledge transfer could be improved through more material (manuals and guides) for other partners to replicate the working architecture. 2.The platform takes longer steps for registration processes. 3.Colleges and universities mostly use Moodle, so it takes longer for both professors and students to get adapted to this new platform.

External Factors	**Opportunities** 1.Promote Open Source platforms to find volunteers to further develop the system. 2.Use digital sessions for training instead of one on one. 3.Massive education opportunities for a broader audience.	**Threats** 1.Situation change because of COVID19 makes it difficult to provide formation on the use of platforms to target groups (digital excluded adults). 2.There are other platforms in the market that offer the same features but under more user-friendly steps. 3.It still relies on connectivity factors.

4.5 SWOT Analysis from Poland

Results of the SWOT analysis conducted with Polish team is provided below:

Internal Factors	**Strengths** 1.Improving academic education in internal cooperation between researchers from the Pedagogical University and external experts; 2.Using a new, innovative e-learning tool; 3.Increasing the attractiveness of the teaching process; 4.Introducing an element of novelty in terms of content and form of knowledge transfer; 5.Involving teachers in testing courses on the platform; 6.Preparation of courses going beyond basic research, i.e. focused on school practice and adult education; 7.Maintaining international cooperation; 8.Supporting the educational process during the COVID19 pandemic by SELI platform; 9.Building a positive image by the Institute of Education as an institution implementing new e-learning platforms; 10.Collecting unique data on digital inclusion and prevention of cyber-bullying.	**Weakness** 1.Use of a reduced version of the e-learning platform (no full functionality); 2.Low speed of the platform; 3.Lack of fast technical support on the part of people responsible for building the platform.

External Factors	**Opportunities** 1.Establishing permanent cooperation with selected institutions involved in the SELI project; 2.Use the platform in other innovative activities; 3.Getting new research material; 4.To be able to prepare further internal and external projects to improve the SELI methodology.	**Threats** 1.The existence of problems with the functioning of the platform, which may affect: failure to achieve educational goals, lowering the reputation of the institution implementing the project, lowering students' motivation for e-learning; 2.Unable to use the full functionality of the platform; 3.Lack of fast and effective development of the platform may cause problems in relations with partners responsible for building and maintaining the platform; 4.The situation related to COVID19 may cause critical problems with further steps.

4.6 SWOT Analysis from Brazil

Results of the SWOT analysis conducted with Brazilian team based on Brazilian Workshop:

Internal Factors	**Strengths** 1. Helps the teacher to select or create accessible material for their classes, 2.Facilitates and guides the production of accessible educational material, 3.There is no need to create new teaching material to make accessible classes, as the tool allows the teacher to adapt existing materials, 4.Promotes the diversification of classes.	**Weakness** 1. Despite helping the teacher to create accessible teaching materials, a tool is not accessible, 2.Some accessibility items don't work, 3.Confusing icons, incomplete content insertion tabs, some difficult points to handle in SELI Learning Platform.

External Factors	**Opportunities** 1.Need for improvements in accessibility requirements, 2.Need for improvements regarding usability, 3.Help the teacher in the planning of the accessible didactic resource, 4.High demand for digital educational tools due to the need for virtual classes due to the pandemic, 5.Lack of accessible digital educational tools.	**Threats** 1.The tool may be useless if the teacher is unable to use it easily, 2.The tool may be useless if the teacher does not perceive its utility, 3.Responses to users' actions need to be quick so the users don't give up, 4.The tool may not serve all students with disabilities in the classroom, causing frustration.

4.7 SWOT Analysis from the Dominican Republic

In the following find the results of the SWOT analysis carried out with the Dominican Republic team:

Internal Factors	**Strengths** 1.Effective communication among t he Dominican team's collaborators. International cooperation with the o ther partners of the SELI project. 2.Inclusion of NGOs and institution s that comprehensively address disa bility. 3.The dissemination of the results of the project through scientific public ations, books, seminars,and congres ses. 4.Excellent relationship with main stakeholders.	**Weakness** 1.The lack of capacity in terms of human and technical resources for the d evelopment of the SELI learning platfor m. 2.Not being able to offer blockchain certifications yet.
External Factors	**Opportunities** 1.To improve the capacity building of the human and technical resource s while the investment and the know ledge and technological transferenc es of other partners.	**Threats** 1.The Covid-19 Pandemic. 2.Lack of time to finish the optimized version of Seli learning platform available. 3.Difficulty of managing the budget because of exchange rate changes of

	2.To start offering Blockchain Certification on the SELI learning platform. 3.To start using the SELI learning platform with the NGOs and institutions related to disability and inclusion 4.To expand the research lines on the SELI learning ecosystem. 5.The Development of the SELI learning platform and its accessibility. 6.Strengthen and expand relationships with the stakeholders to collaborate into the SELI project thematic.	dollar and euro during the project because of Covid 19 pandemics. 4.Delays of fund disbursement resulting from the national elections and the change of government administration.

4.8 SWOT Analysis from Uruguay

In the following find the results of the SWOT analysis carried out with the Uruguayan team:

Internal Factors	**Strengths** 1.project allows us to collaborate with international teams in publications and developments. 2.the possibility of remote working among international teams. 3.the possibility to implement a blockchain node in Uruguay as a future educational infrastructure. 4.The possibility to create a teacher's community of practice about inclusion 5.The implementation of specific courses, such as ones in smart learning environments.	**Weakness** 1.the software development process does not meet the time required for an adequate implementation of the courses on the platform. 2.the very huge academic heterogeneity among teams on key aspects of the project, such as accessibility and use of ICT in education. 3.The lack of internal technical seminars to reach a minimal common level.

External Factors	**Opportunities** 1.More attention to the need for ICT in education due to the pandemic. 2.Assist teachers with artificial intelligence tools to produce educational resources and experiences based on the Universal Learning Design paradigm. 3.Continue the international collaborations started within this project.	**Threats** 1. Educational institutions mandate teachers to use standard or commercial learning management systems. 2. It is very difficult to convince to use a new platform that is not interoperable with any other. 3.Promoting a tool to design accessible courses that itself is not accessible produces disbelief. 4. The overload of teaching staff due to covid-19 does not allow the pilot courses to be carried out as planned.

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