Smart
Ecosystem for
Learning and
Inclusion

December 2020

D1.3

Final Status Repsort

PREPARED BY:
Friday Agbo;
Solomon Oyelere

PROJECT DESCRIPTION

Acronym:	SELI
Title:	Smart Ecosystem for Learning and Inclusion
Coordinator:	University of Eastern Finland
Reference:	ERANet17/ICT-0076 SELI
Type:	ICT
Program:	ERANet-LAC, SEVENTH FRAMEWORK PROGRAMME (FP7)
Theme:	ICT platform for learning and inclusion
Start:	01 January, 2019
Duration:	24 months
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CONSORTIUM

University of Eastern Finland, Finland, (UEF), Coordinator
Hacettepe University – Turkey (HUT)
Pedagogical University of Cracow, Poland (PUC)
Universidad Central "Marta Abreu" de Las Villas, Cuba (UCLV)
Universidad del Azuay (UDA) & University of the Armed Forces-(ESPE), Ecuador
Universidad de la República, Uruguay (UdelaR)
Universidad Federico Henríquez y Carvajal, Dominican Republic (UFHEC)
Universidad Galileo, Guatemala (UGG)
Universidad Mayor de San Simón, Bolivia (UMSS)
Mackenzie Presbyterian University, Brazil (MPU)
Universidad Tecnológica de Panamá, Panama (UTP)

DELIVERABLE DESCRIPTION

Number:	**D1.3**
Title:	**SELI Final Status Report M24**
Lead beneficiary:	**UEF**
Work package:	**WP1**
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Type:	**Report (R)**
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Authors:	**Solomon Sunday Oyelere**, UEF
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	Lukasz Tomczyk, PUC	**Gabriel Barros**, UDA
	Margarita Zambrano, ESPE	**Darwin Munoz**, UFHEC

DOCUMENT SIGN-OFF

Version	Date	Name and surname of the contributor	Role	Document Status	Institute
1	31.12.2020	Friday Agbo	Researcher	Prepared the report	University of Eastern Finland
2	22.2.2021	Solomon S. Oyelere	Work Package Leader	Reviewed the report and approved	University of Eastern Finland

ACKNOWLEDGEMENT

TABLE OF CONTENT

EXECUTIVE SUMMARY

This final status report highlights the progress of SELI project from the M14 to M24 in terms of WP deliverables and completion of tasks. Although this status report focusses on M14-M24, however, an overview of the progress and achievements from all work packages of SELI project from M1-M24 are presented in Section 3. Moreover, the overall objectives of the project were achieved as the learning platform was successfully developed and pilot testing was conducted in partners countries. In addition, the agenda and summary from SELI final meeting held virtually in December 2020 are provided. In sum, the report revealed that SELI project commenced and progressed smoothly with some few challenges mainly on funding delays and the COVID-19 pandemic in 2020.

1.   PROJECT OBJECTIVES

From the project proposal, the areas of focus of the SELI project are new pedagogy and methods, new learning environments, and digital training of educators including higher education teachers, preservice teachers, and trainers in the social service sectors. The objective of this solution is to improve learning results, address the competence needs of educators, renew instruction by conducting learning analytics, and encourage lifelong learning for the benefit of disadvantaged groups in society. Innovative technologies and pedagogical methods such as blockchain, global sharing pedagogy, open access, and educational data mining will be adopted in the project to develop a state-of-the-art form of learning intervention.

2. PROGRESS WORK AND ACHIEVEMENTS BASED ON MILESTONES

This report indicates that the SELI project has progressed well within the proposed objectives as highlighted by the achieved milestones in Table 1.1:

Table 1.1 Milestones achieved in M1-M24

Milestone No.	Milestone Name	Lead Beneficiary	Delivery date	Achieved Yes/No	Actual achievement date	comments
D1.1	Agendas and minutes of kickoff	UEF	30 April 2019	Yes	30 April 2019	o Project kick-off meeting was successfully completed. o Project communication channels and dates are set
D1.1.1	Agendas and minutes of midterm meeting	UEF	30 January 2020	Yes	17 January 2020	Midterm meeting agenda is included in the midterm report found in the link http://seliproject.org/uploads/reports/Deliverable1.2.pdf
D1.2	Midterm status report	UEF	28 February 2020	Yes	28 February 2020	Midterm report is ready and found in the link http://seliproject.org/uploads/reports/Deliverable1.2.pdf
D2.1	Databank and report containing all relevant ICT-based technologies,	PUC	30 April 2019	Yes	30 January 2020	Databank: Link – https://bit.ly/3ciViqI Publication achieved – Publication list

	and pedagogy to support learning and inclusion					
D.2.2	Report on educational use of blockchain, global sharing pedagogy, digital storytelling, personalized learning	PUC	30 June 2019	Yes	30 January 2020	Publication achieved Book titled: ICT for learning and inclusion in Latin America and Europe. Link: https://bit.ly/2V84Grs
D2.3	List of all events participants	PUC	30 June 2019	Yes	30 November 2019	Google disk available online – https://bit.ly/3bcWagq
D2.4	Stakeholders dialogue, indicating which solutions is most suitable	PUC	30 August 2019	Yes	30 November 2020	Qualitative data was collected through expert interviews https://bit.ly/2RBm8SY
D3.1	Open access digital learning platform	UDA-ESPE	30 August 2019	Yes	First version ready. 28 February 2020. Second and stable version ready 31 December 2020	A stable version of SELI platform is accessible: https://vm2161.kaj.pouta.csc.fi/
D3.2	User's manual and tutorial from digital learning system	UDA-ESPE	30 August 2019	Yes	31 December 2020	User manual for SELI learning platform is accessible from https://vm2161.kaj.pouta.csc.fi/manual/home.html

D4.1	Course report	MPU	21 December 2020	Yes	21 December 2020	This report provides information about pilot courses implemented in SELI Platform. http://seliproject.org/uploads/reports/D4.1%20Course%20Report.pdf
D4.2	Executive summary of workshop events	MPU	21 December 2020	Yes	21 December 2020	This deliverable describes the capacity building workshops, its organization and realization during the period covered in the report. http://seliproject.org/uploads/reports/D4.2%20Executive%20summary%20of%20workshop%20events.pdf
D5.1	Consortium communication, dissemination and exploitation plans	UTP	30 April 2019	Yes	30 May 2019	The first version of Consortium communication dissemination was delivered
D5.2	Project website in English and Spanish	UTP	30 April 2019	Yes	30 April 2019	The first version of the project website has been running since March 2019. An updated version of SELI project website is found in the link: http://seliproject.org/
D5.3	Leaflets in English and Spanish	UTP	30 April 2019	Yes	31 December 2020	Delivered by every partner during SELI activities
D5.4	Electronic newsletter	UTP	30 April 2019	Yes	First newsletter delivered 30 April 2019	First newsletter is found in the link https://us4.campaign-archive.com/?u=7c63ca4dd968795c4d4916657&id=4ca70de305

					Second newsletter delivered 31 December 2020	and the second newsletter is available in the link https://us4.campaign-archive.com/?e=[UNIQID]&u=7c63ca4dd968795 c4d4916657&id=bb3c8f7a0b
D5.5	Printed posters	UTP	30 April 2019	Yes	31 December 2020	Posters were printed by partners organizations hosting different SELI events.
D6.1	List of Pilot tests scheduled and participants	HU	1 December 2020	Yes	30 December 2020	Ready and delivered as report of the planned pilot tests with participant. Link to the report is http://seliproject.org/uploads/reports/D6.1%20L ist%20of%20pilot%20tests%20scheduled%20and% 20participants.pdf
D6.2	Results of the assessment of the pilot's impact	HU	15 November 2020	Yes	30 December 2020	The deliverable is ready and can be downloaded from this link. http://seliproject.org/uploads/reports/D6.2%20R esults%20of%20the%20assessment%20of%20the% 20pilot%E2%80%99s%20impact.pdf
D6.3	Report on capacity	HU	15 December 2020	Yes	30 December 2020	Deliverable is ready and is being published as a book.

2.1   SELI Final Meeting

The main objective of the final meeting was to gather reflective feedback from each SELI project partner organizations regarding their contributions in different work packages, highlight lesson learned, share their experiences in terms of successes and challenges. This meeting was aimed to bring to conclusion the SELI project and specific activities in the final meeting were:

- to review the SELI project and how it has progressed within two years.
- to evaluate and comment on partners contributions
- to allow partners make presentations about their experiences or on other topics.
- to share idea on the sustainability of SELI objectives and future direction.

Date	Event	Venue
December 16 2020	Final Meeting	Online, coordinated by UEF, Finland

2.2   Agenda and summary from SELI Final Meeting

Table 1.2 Final meeting invitation and agenda

Opening remark

16:00 – 16:05
- Highlights of the meeting agenda, presenters - the moderator.

16:05 – 16:10
- Opening remark – SELI Project Coordinator.

Presentations
- **16:10 - 16:20 - 1st Presentation**
  Presenter: Professor Matti Tedre (SELI Principal Investigator- School of computing, University of Eastern Finland)
  Topic: State-of-the-art of computational thinking

- **16:20 - 16:30 - 2nd Presentation**
  Presenter: Łukasz Tomczyk, PhD, Pedagogical University of Cracow, Poland.
  Topic: From techno-ignorance through techno-optimism to techno-realism - about the challenges of implementing e-learning and other new media solutions in education.

- **16:30 - 16:40 - 3rd Presentation**
  Presenter: Darwin Muñoz, Ph.D, Federico Henríquez y Carvajal University, Dominican Republic.
  Topic: SELI Project: The Dominican Republic Contribution.

- **16:40 - 16:50 - 4th Presentation**
  Presenter: Maria Amelia, Universidade Presbiteriana Mackenzie, Brazil.
  Topic: Accessibility and Instructional Design on SELI Platform.

- **16:50 - 17:00 - 5th Presentation**
  Presenter: Gabriel Juan Barros Gavilanes, Universidad del Azuay, Ecuador.
  Topic: Implementing Blockchain and Digital Storytelling for a Smart environment for learning and Inclusion.

- **17:00- 17:10 - 6th Presentation**
  Presenter: Dra. Ing. Regina Motz, PhD, Universidad de la Republica, Uruguay.
  Topic: The various ways that a Smart Ecosystem for Learning and Inclusion can impact education stakeholders.

- **17: 10- 17:20 - 7th Presentation**
  Presenter: MSc. Vladimir Abel Costas Jáuregui, Universidad Mayor de San Simon, Bolivia.
  Topic: Experiences in the implementation of a learning analytic dashboard to the Smart Ecosystem for Learning and Inclusion.

- **17: 20- 17:30 - 8th Presentation**
  Presenter: MSc. Özgür Yaşar Akya, Hacettape University, Turkey
  Topic: Digital Storytelling integrated communities of practice in the context of SELI Learning Platform.

- **17: 30- 17:40 - 9th Presentation**
  Presenter: MSc. César Javier Villacís Silva, Universidad de las Fuerzas Armadas - ESPE, Ecuador
  Topic: Computational Thinking for Inclusive Education during the COVID-19 Pandemic using SELI Platform.

  17: 40- 18:00: Comments from participants and closing remark.

2.3 Summary from final meeting

- The meeting started at 16:00 Finnish time (GMT +2) and had 29 persons in attendant including members of the SELI partners from 8 countries and volunteered masters and doctoral students that participated in different aspects of SELI project from partners institutions such as Finland, Uruguay, Ecuador, Turkey, and Brazil.

- As highlighted in the meeting agenda, the meeting began with an opening remark from the SELI coordinator in Finland, Solomon Oyelere, who retrospectively gave the background and overview of the objectives of SELI project and how it was planned to impact the society. Some of the impacts include training and transferring of knowledge to educators who will transfer such knowledge to the disadvantaged students in the respective partners' countries, and creation of an open-access learning platform based on innovative technologies and pedagogies.

- The meeting progressed with more presentations from each partner countries being represented to talk about different topics that relate to SELI project. In total, the meeting had ten (10) presentations where each presenter took 10 to 15 minutes to give their talks.

- At the end of all presentations, Solomon gave closing remarks by thanking everybody for their support and contributions within the two years SELI project; especially the programmers and instructional designers. He anticipates the continuation of the project and collaborations by creating new milestones to keep the project sustainable. The meeting ended at 18:27 (GMT +2).

3. PROGRESS REPORT ON ALL WORK PACKAGES

Presentation of Work Package 1

Table 2.1a. WP1

<table>
<tr><td colspan="8" align="center">WP1 – Project coordination (UEF)</td></tr>
<tr>
<td>Description of activities (M1-M24)
Provided by:
Solomon Oyelere, UEF
WP Leader</td>
<td colspan="7">In the course of the first 4 months of the SELI project, the coordinator has worked on creating the implementation of project planning and scheduling, including conducting the project kick-off meetings, set-up of the Strategic Management Committee (SMC), and the set-up of monitoring and quality assurance committee.</td>
</tr>
<tr>
<td>Deviation or problems</td>
<td colspan="7">There are no significant problems encountered during this period for WP1</td>
</tr>
<tr><td colspan="8">Deliverables submitted during the reporting period</td></tr>
<tr>
<td>Deliverable No.</td>
<td>Deliverable name</td>
<td>Type</td>
<td>WP No.</td>
<td>Delivery date from project proposal</td>
<td>Delivered (yes/ no) and status (draft/final)</td>
<td>Actual delivery date (or forecast)</td>
<td>Comments on progress</td>
</tr>
<tr>
<td>D1.1</td>
<td>Kickoff meeting report</td>
<td>Report</td>
<td>1</td>
<td>30 April 2019</td>
<td>Yes, final</td>
<td>30 April 2019</td>
<td>Set-up of the Strategic Management Committee (SMC) completed.
Set-up of monitoring and quality assurance committee completed.</td>
</tr>
</table>

							Set-up of communication channels and meeting dates completed
D1.2	Midterm Report	Report	1	28 February	Yes, final	30 March 2020	Midterm report was delivered in M14. (http://seliproject.org/uploads/reports/Deliverable1.2.pdf)
D1.3	Final status report	Report	1	31 December 2020	Yes, final	30 December 2020	Final status report is ready.
D1.4	Final Report	Report	1	31 December 2020	Yes. Final	30 December 2020	Final report is ready.

Presentation of Work Package 2

Table 2.1b. WP2

WP2 – Need analysis, requirements and stakeholders dialogue (PUC)							
Description of activities (M1-M24) **Provided by: Lukasz Tomczyk WP Leader**	Activities in WP2 have progressed well within this period until the end of the project.						
Deviation or problems	No problem						
Deliverables submitted during the reporting period							
Deliverable No.	**Deliverable name**	**Type**	**WP No.**	**Delivery date from project proposal**	**Delivered (yes/ no) and status (draft/final)**	**Actual delivery date (or forecast)**	**Comments on progress**
D2.1	Databank and report containing all relevant ICT-based technologies, and pedagogy to support learning and inclusion	Report	2	30 April 2019	Yes, Final	30 April 2019	Ready with Databank: Link – https://bit.ly/3ciViqI Publication achieved – Publication list
D 2.2	Report on educational use of blockchain, global sharing	Research	2	30 May 2019	Yes, Final	30 June 2020	The deliverable is ready.

	pedagogy, digital storytelling, personalized learning						Publication achieved Book titled: ICT for learning and inclusion in Latin America and Europe. Link: https://bit.ly/2V84Grs
D 2.3	List of all events participants	Report	2	30 June	Yes, Final	30 June	Ready with Google disk available online - https://bit.ly/3bcWagq
D2.4	Stakeholders dialogue, indicating which solutions is most suitable	Research	2	30 August	Yes, Final	30 November 2020	Report is ready. Qualitative data was collected through expert interviews. Link to report: https://bit.ly/2RBm8SY
D 2.5	Catalogue of best solutions and practice	Research catalogue	2	30 August 2019	Monograph book.	10 February 2020	Ready. Link to book: https://depot.ceon.pl/handle/123456789/17957

Presentation of Work Package 3

Table 2.1c. WP3

WP3 – Design and Implementation of Technological Environment (UDA)							
Description of activities (M1-M24) **Provided by: Gabriel Barros and Margarita E. Zambrano WP Leaders**	Activities include study, plan, and creating a digital learning environment based on blockchain technology, workshop-based digital storytelling as a method in global sharing pedagogy, flipped learning and personalized pedagogy						
Deviation or problems	No problem						
Deliverables submitted during the reporting period							
Deliverable No.	**Deliverable name**	**Type**	**WP No.**	**Delivery date from project proposal**	**Delivered (yes/ no) and status (draft/final)**	**Actual delivery date (or forecast)**	**Comments on progress**
D3.1.1	Requirements Specification for the platform	Report	3	22 April 2019	Yes, Final	31-May 2019	Some documents are available in Spanish
D3.1.2	Open access digital learning platform	Software	3	30 August 2019	Yes, Final	28 February 2020	Stable version of SELI platform is accessible: https://vm2161.kaj.pouta.csc.fi/
D3.2	User's manual and tutorial for the digital learning system	Document	3	30 August 2019	Yes, Final version	31 December 2020	The link to user manual for SELI learning platform is https://vm2161.kaj.pouta.csc.fi/manual/home.html

Presentation of Work Package 4

Table 2.1d. WP4

WP4 – Development and implementation of the pedagogical aspects and knowledge transfer to the teachers (MPU)							
Description of activities (M1-M24) **Provided by: Ismar Frango Silveira WP Leader**	Activities include the definition of Instructional Design metamodels in order to help the content creators. This includes interface mockups, accessibility guidelines and the definition of pedagogical patterns for content organization.						
Deviation or problems	No problem was encountered						
Deliverables submitted during the reporting period							
Deliverable No.	**Deliverable name**	**Type**	**WP No.**	**Delivery date from project proposal**	**Delivered (yes/ no) and status (draft/ final)**	**Actual delivery date (or forecast)**	**Comments on progress**
D4.1	Course reports containing course activities, strategies and feedback	Docume nt	4	May 2020	Yes, Final	23 December 2020	Report on SELI pilot courses implemented in the final version of the platform is found in the link http://seliproject.org/uploads/reports/D4.1%20Course%20Report.pdf
D4.2	Executive summary of all teaching the teachers' events	Docume nt	4	May 2020	Yes, Final	21 December 2020	Report on the capacity building workshops can be found in the link http://seliproject.org/uploads/reports/D4.2%20Executive%20summary%20of%20workshop%20events.pdf

Presentation of Work Package 5

Table 2.1e. WP5

WP5 – Dissemination and Exploitation (UTP)							
Description of activities (M1-M24) **Provided by: Nilda Y. Cervantes WP Leader**	During this period the activities were focused on the development and implementation of the SELI website. The dissemination, exploitation and dissemination plans were prepared based on the project's objectives						
Deviation or problems	Problem related to access to fund was recorded which affected some deliverables in this WP.						
Deliverables submitted during the reporting period							
Deliverable No.	**Deliverable name**	**Type**	**WP No.**	**Delivery date from project proposal**	**Delivered (yes/ no) and status (draft/final)**	**Actual delivery date (or forecast)**	**Comments on progress**
D5.1	Consortium communication, dissemination, and exploitation plans	Plan Document	5	30 April 2019	Yes/Final	May 10th	Plans for Consortium communication dissemination was delivered
D5.2	Project SELI Website in English and Spanish	website	5	30 April 2019	Yes/Final	31 December 2020	SELI project website can be accessed in this link http://seliproject.org/

D5.3	Leaflets in English and Spanish	Leaflet	5	Months 6, 18	Yes/Final	31 December 2020	Delivered by every partner during SELI activities
D5.4	Electronic newsletters	Newsletters	5	Months: 1,4,8,12,16,20,24	Yes/Final	First newsletter delivered 30 April 2019 Second newsletter delivered 31 December 2020	First newsletter is found in the link https://us4.campaign-archive.com/?u=7c63ca4dd968795c4d4916657&id=4ca70de305 Second newsletter is available in the link https://us4.campaign-archive.com/?e=[UNIQID]&u=7c63ca4dd968795c4d4916657&id=bb3c8f7a0b
D5.5	Printed posters	Posters	5	Month 12	Yes/Final	December 2020	Posters were printed by partners organizations hosting different SELI events.

Presentation of Work Package 4

Table 2.1f. WP6

WP6 – Small-scale Validation and Pilot Studies (HU)	
Description of activities (M1-M24) **Provided by: Özgür Y. Akyar WP Leader**	The focus is on conducting a real-life evaluation of the digital learning environment through small-scale **validation by the candidate teachers and trainers.** The aim is to ensure that the knowledge transfer in WP4 is successful and the target group is able to extend the knowledge to the original beneficiaries.
Deviation or problems	WP6 had progressed smoothly within this period.

Deliverables submitted during the reporting period

Deliverable No.	Deliverable name	Type	WP No.	Delivery date from project proposal	Delivered (yes/ no) and status (draft/final)	Actual delivery date (or forecast)	Comments on progress
D6.1	List of pilot tests schedule and participants thereof	Document	6	30 May 2020	Yes, Final	30 December 2020	Ready and delivered as report of the planned pilot tests with participant. Link to the report is http://seliproject.org/uploads/reports/D6.1%20List%20of%20pilot%20tests%20scheduled%20and%20participants.pdf

D6.2	Results of assessment of the pilots' impact	Document	6	30 May 2020	Yes, Final	30 December 2020	The deliverable is ready and can be downloaded from this link http://seliproject.org/uploads/reports/D6.2%20Results%20of%20the%20assessment%20of%20the%20pilot%E2%80%99s%20impact.pdf
D6.3	Report on capacity building and pilots	Document	6	30 May 2020	Yes, Final	30 December 2020	Deliverable is ready and is being published as a book by the Turkey partners (Hacetepe University).

4. PROGRESS REPORT FROM PARTNERS THAT ARE NOT RESPONSIBLE FOR WORK PACKAGES

4.1 Bolivia

This report shows the participation and progress of Bolivia's partner in the activities of SELI project from M14 to M24. This participation and progress state the involvement of SELI-Bolivia staff in the activities of the project.

4.1.1. Work Packages Progress

a. WP1 Project Coordination and Management

The activities related to local coordination and management was:

- The partner Bolivia has a principal local researcher, who attends the meetings by zoom along the 2020 year. The principal researcher at Bolivia is Vladimir Costas.
- Bolivian partner principal researcher coordinates the working during pandemic COVID-19 to see to the smooth running of the university offices and following the virtual work of the team. Ask to permit external access to the learning analytic server.
- Virtual participation in the Final meeting from 16 of December. by Vladimir Costas talking about "Experiences in the implementation of a learning analytic dashboard to the Smart Ecosystem for Learning and Inclusion".

b. WP3 Design and Implementation of Technological Environment

The Bolivian partner is supporting the development of the platform, together with the other international partners.

The two Bolivian students helping in the development tasks are working freely without fund support.

The following tasks have the participation of the Bolivian team:

- Analysis, Design and implementation of the Learning Analytics Component.
- Analysis, experimentation, and development support in Blockchain and Badges implementation
- Testing plan and testing of SELI platform.

c. WP4 Development and implementation of the pedagogical aspects and knowledge transfer to the teachers

The Brazilian team designed and delivered the basis on instructional design and templates for the tasks. The Bolivian partner with the Brazilian guides has conducted the following tasks:

- Defining learning content for the pilot course
- Planning and implementation of courses
- Generation of course design

The result is a course plan designed with the SELI platform tool. The course title is "Problem solving with computational approach"

d. WP5 Dissemination and exploration

- Five documents, between papers and chapters, presented together partners to distinct publishers:
  - "A Study About ICT Use and Inclusion by Pre-service Teachers in Bolivia". Authors: Vladimir Costas, Leticia Blanco, Marcelo Flores, Nelson Ferrufino. Chapter published in the book "ICT In Teaching and Digital Inclusion – The Perspective of Selected Countries from Latin America, Caribbean And Europe". Published in: Publications of the University of Eastern Finland General Series No 33, 2020. Publisher: University of Eastern Finland. Electronic ISBN: 978-952-61-3441-3 (PDF). ISSN: 1798-5862. Permanent link: http://urn.fi/URN:ISBN:978-952-61-3441-3
  - "A Study About ICT Use and Inclusion by Teachers in Bolivia". Authors: Vladimir Costas, Leticia Blanco, Marcelo Flores. Chapter published in the book "ICT In Teaching and Digital Inclusion – The Perspective of Selected Countries from Latin America, Caribbean And Europe". Published in: Publications of the University of Eastern Finland General Series No 33, 2020. Publisher: University of Eastern Finland. Electronic ISBN: 978-952-61-3441-3 (PDF). ISSN: 1798-5862. Permanent link: http://urn.fi/URN:ISBN:978-952-61-3441-3
  - "ICT in schools and intercultural education in Bolivia. Challenges of digital inclusion". Authors: Vladimir Costas, Leticia Blanco. Chapter published in the book "ICT and education in the perspective of experts from business, government, academia and NGOs In Europe, Latin America and Caribbean". Publisher: Universidad del Azuay. e-ISBN: 978-9942-822-61-1.
  - "Are teachers techno-optimists or techno-pessimists? A pilot comparative among teachers in Bolivia, Brazil, the Dominican Republic, Ecuador, Finland, Poland, Turkey, and Uruguay". Authors: Łukasz Tomczyk, Vladimir Costas Jáuregui, Cibelle Albuquerque de La Higuera Amato, Darwin Muñoz, Magali Arteaga, Solomon Sunday Oyelere, Özgür Yaşar Akyar, Mariana Porta. Published in: Education and Information Technologies, Volume 25, Issue 6, November 2020.

- o "SELI: Ecosistemas inteligentes para el aprendizaje y la inclusión". Authors: Mariana Porta, Regina Motz, Lukasz Tomczyk, Solomon Oyelere, Maria Amelia Eliseo, Maria Viola, Valeria Farinazzo, Vladimir Costas Jauregui, Özgür Yaşar Akyar. Published in: Tópos #12, Noviembre 2020.
- Bolivia collaborated in the newspapers presenting two news about work progress by the SELI Bolivia team.
- Following the plan for communication and dissemination, Bolivia team was supporting in the publication of events and news on the website http://seliproject.org/

e. WP6 Small scale validation and pilot studies with the target groups, Real-life evaluation

Due to the pandemic COVID-19 issue, the Bolivia team must change the original plans for the pilot course, the new course title is "Problem solving with computational approach"; this course is oriented to assistant teacher aspirants in the subject of programming at the Universidad Mayor de San Simón.

The pilot course was conducted during the first and second week of December 2020. The findings, target teacher group and beneficiaries are described in the reports of project SELI, the Bolivian team report title is "Virtual education with inclusion and Digital divide in Bolivia".

The Bolivian team collaborated in the report of capacity building and SWOT analysis; the document is ready and in printing progress led by the SELI Turkey team.

4.1.2. Bolivian partner team

- Vladimir Costas J. (principal researcher)
- Marcelo Flores S. (researcher). Part-time support for activities during 2019.
- Nelson Ferrufino (researcher). Part-time support for activities during 2019.
- Leticia Blanco (University teacher). Part-time support for activities.

In the project, two undergraduate students of the degree in Computer Science and Systems Engineering have been incorporated, who wanted to participate, for academic interest, in project activities:

- Bernardo Causin
- Alvaro Yapu

Both students have collaborated in the project since 2019 up to the end of the project.

4.1.3. Fund issues
Up to this report, Bolivian partner has no funds to cover this kind of activities.

4.2   The Dominican Republic

This report shows the participation and progress of Dominican Republic partners in the activities of the SELI project from M14 to M24. This participation and progress state the involvement of SELI-Dominican Republic staff in the activities of the project.

4.2.1. Work Packages Progress

1.1 WP1 Project Coordination and Management

The activities related to local coordination and management was:

- The partner Dominican Republic has Dr. Darwin Muñoz like the principal researcher who attends the meetings by zoom along the 2020 year and coordinates the activities of the SELI-Dominican team.

- Presentation of the lecture *"SELI Project: The Dominican Republic Contribution"*.

4.2.2 WP2 Need analysis, requirements and stakeholder dialogue

With the database obtained of this work package the Dominican Republic contributed to the project with the publication of the Paper *"Are teachers techno-optimists or techno-pessimists? A pilot comparative among teachers in Bolivia, Brazil, the Dominican Republic, Ecuador, Finland, Poland, Turkey, and Uruguay"*. Authors: Łukasz Tomczyk, Vladimir Costas Jáuregui, Cibelle Albuquerque de La Higuera Amato, Darwin Muñoz, Magali Arteaga, Solomon Sunday Oyelere, Özgür Yaşar Akyar, Mariana Porta. Published in: Education and Information Technologies, Volume 25, Issue 6, November 2020.

4.2.3 WP3 Design and Implementation of Technological Environment

The Dominican partner supported the development of the platform, together with the other international partners with the testing of the SELI platform.

4.2.4 WP4 Development and implementation of the pedagogical aspects and knowledge transfer to the teachers

The Brazilian team designed and delivered the basis on instructional design and templates for the tasks. The Bolivian partner with the Brazilian guides has in progress the following tasks:

- Defining learning content for the pilot course of the Dominican Republic

- Planning and implementation of courses

- Generation of course design

The result is a course plan designed with the SELI platform tool. The course title is *"SCRUM methodology applied to education"*.

4.2.5 WP5 Dissemination and exploration

- Meetings with NGOs and Government agencies for the promotion, diffusion, and invitation to collaborate with the SELI Project.

-Publication of the papers:

- *"ICT in education: the situation of Dominican Republic"*. Authors: Darwin Muñoz, Angel Puentes, Gloria Sanchez-Castillo, Cinthia De la Rosa-Feliz. Chapter published in the book: *"ICT for learning and inclusion in Latin America and Europe"*. Cracow: Pedagogical University of Cracow. DOI 10.24917/9788395373732.4

- *"The role of ICT and its pedagogical contributions to education in the Dominican Republic: Advances in educational innovation for inclusion and technological literacy from the perspective of higher education institutes, policymakers, and ministries"*. Chapter published in the book *"ICT and education in the perspective of experts from business, government, academia and NGOs In Europe, Latin America and Caribbean"*. Publisher: Universidad del Azuay. e-ISBN: 978-9942-822-61-1.

- *"The role of the dominican teacher in the use of information and communication technologies"*. Authors: Darwin Muñoz, Angel Puentes, Gloria Sanchez-Castillo, Cinthia De la Rosa-Feliz, Hugo Parada. Chapter published in the book *"ICT In Teaching and Digital Inclusion – The Perspective of Selected Countries from Latin America, Caribbean And Europe"*. Published in: Publications of the University of Eastern Finland General Series No 33, 2020. Publisher: University of Eastern Finland. Electronic ISBN: 978-952-61-3441-3 (PDF). ISSN: 1798-5862. Permanent link: http://urn.fi/URN:ISBN:978-952-61-3441-3.

- *"The role of the dominican student in the use of information and communication technologies"*. Authors: Darwin Muñoz, Angel Puentes, Gloria Sanchez-Castillo, Cinthia De la Rosa-Feliz, Hugo Parada. Chapter published in the book *"ICT In Teaching and Digital Inclusion – The Perspective of Selected Countries from Latin America, Caribbean And Europe"*. Published in: Publications of the University of Eastern Finland General Series No 33, 2020. Publisher: University of Eastern Finland. Electronic ISBN: 978-952-61-3441-3 (PDF). ISSN: 1798-5862. Permanent link: http://urn.fi/URN:ISBN:978-952-61-3441-3.

- *"Are teachers techno-optimists or techno-pessimists? A pilot comparative among teachers in Bolivia, Brazil, the Dominican Republic, Ecuador, Finland, Poland, Turkey, and Uruguay"*. Authors: Łukasz Tomczyk, Vladimir Costas Jáuregui, Cibelle Albuquerque de La Higuera Amato, Darwin Muñoz, Magali Arteaga, Solomon Sunday Oyelere, Özgür Yaşar Akyar, Mariana Porta. Published in: Education and Information Technologies, Volume 25, Issue 6, November 2020.

- *"Blockchain Technology to Support Smart Learning and Inclusion: Pre-service Teachers and Software Developers Viewpoints"*. Authors: Solomon Sunday Oyelere, Umar Bin Qushem, Vladimir Costas Jauregui, Özgür Yaşar Akyar, Łukasz Tomczyk, Gloria Sanchez-Castillo, Darwin Munoz, Regina Motz. Published in: World Conference on Information Systems and Technologies (pp. 357-366). Springer.

-Newsletter publication: Design, redaction, and collaboration for the 1st SELI project's dissemination newsletter.

-Newsletter publication: Design, redaction, and collaboration for the 2nd SELI project's dissemination newsletter.

-Paper in the editing process: The Dominican team in collaboration with others SELI partners is collaborating in the elaboration of the paper *"COVID-19, Changes in*

Educational Practices and the Perception of Stress by Higher Education Teachers in Latin America" for and indexed journal.

Following the plan for communication and dissemination is supporting the publication of events and news on the website http://seliproject.org/.

4.2.6 WP6 Small scale validation and pilot studies with the target groups, Real-life evaluation

Due to the pandemic COVID-19 issue, the Dominican team must change the original plans for the pilot course for Deaf people. The new course title is *"SCRUM Model applied to education"*, this course is oriented to students of Education career from the Universidad Nacional Pedro Henríquez Ureña (UNPHU) in the Dominican Republic, and the course had a duration of 16 hours. The piloting was carried in the of September-December 2020. It should be noted that in view of the global pandemic, the opportunity has arisen to promote e-learning education and there are students who have basic skills in the use of virtual learning platforms.

The Dominican team collaborated in the report of capacity building and SWOT analysis; the document is ready and in printing progress, led by the SELI Turkey team.

On the other hand, the Dominican team is in the final editing process for a indexed Paper about the Dominican Republic workshops.

4.2.6 International meetings

The Dominican Republic attends by zoom to all synchronization meetings along the 2020 year, and to the SELI Final meeting in December 2020.

4.2.8 International Events and Publications

The Dominican partner had a participation in a virtual panel with others SELI partners with conference *"The Dominican Republic experience in the transition from traditional education to e-learning driver by Covid-19"* in the framework of the international conference *"Transformations and consequences in society due to covid-19 pandemic"*, September 5th, 2020, Pristina, Republic of Kosovo.

4.2.9 Dominican Republic partner team

- Dr. Darwin Muñoz (principal researcher)
- Dr. Angel Puentes (researcher)
- Hugo Parada, MSc (researcher)
- Cinthia De la Rosa, MSc (research assistant)

4.2.10 Fund issues

The Dominican partner has part of the fund of the Government agency to cover this kind of activities, the other part was covered by UFHEC.

Due the pandemic COVID-19 issue, the Dominican Republic had had some delayed in the money disbursements.

5. DEVIATION, PROBLEMS, AND CORRECTIVE ACTIONS

The following problems were encountered:

a.   The following partners could not secure funding in the project: Universidad Central "Marta Abreu" de Las Villas (UCLV), Cuba; Universidad Galileo, Guatemala

b.   The development of the learning system was initially delayed due to late funding issues. However, a stable version of the learning environment was successfully developed, and pilot test were conducted by partners countries on SELI learning platform.

c.   Bolivian partner participated in the project without funding.

d.   Due the global pandemic of COVID-19 virus, the partners of SELI project could not carryout most of the planned face-to-face activities with the students and other stakeholders, therefore, had to adjust its plan, switch to online for continuous and smooth execution of the tasks. In addition, meetings were held regularly using online platforms.

6. PROGRESS REGARDING PERFORMANCE INDICATORS

The SELI project performance indicators are given by the achievement of the project milestones as indicated in the project proposal for this reporting period (M1-24). Table 1.7 shows details of the achievement.

Table 1.7. Performance indicators of project achievements M1-M24

Milestone No.	Milestone name	Lead beneficiary	Delivery date from project proposal	Achieved yes/no	Actual delivery date	Comments
M1	Databank accessible online	PUC	Month 3	Yes	30 June 2019	Databank: Link – https://bit.ly/3ciViqI
M2	Reports accessible online	PUC	Month 6	Yes	30.01.2020	Book: ICT for learning and inclusion in Latin America and Europe. ISBN 978-83-953737-3-2.
M3	Workshop 1 conducted	PUC	Month 8	Yes	November 5 to 14, 2019	Meeting and workshop conducted in Brazil
M4	Open access digital learning platform	UDA-ESPE	Month 8	Yes	2nd and a stable version 30.12.2020	Stable version of SELI platform is found here: https://vm2161.kaj.pouta.csc.fi/
M5	Creation of document and soft copy user's manual and tutorial	UDA-ESPE	Month 11	Yes	2nd version: 30.12.2020	Link to the second version of the manual is here https://vm2161.kaj.pouta.csc.fi/manual/home.html
M6	Workshop 2,3	MPU	Month 13	Yes	Workshop 2: Dominican Republic, 13-17	All workshops were successfully completed

					January 2020 Workshop 3: Uruguay, 6-19 February, 2020	
M7	Website online	UTP	Month 2	Yes	30 April 2019	Project website is ready and running
M8	Posters disseminated to the target audience	UTP	Month 12	Yed	June 2019 and January 2020	Pasters were designed and provided in different meetings, activities, and events held partner's countries for the purpose of awareness and dissemination of SELI project.

7.   EFFORT OVERVIEW

Table 3.1 shows the percentage effort (PM) that each partner has spent during the period M1- M4.

Table 3.1. Reported PM effort per partner (M14-M24)

Organization	WP1		WP2		WP3		WP4		WP5		WP6		Total	
	PM (proposal)	Spent	PM (proposal)	Spent	PM (proposal)	Spent	PM (proposal)	Spent	PM (proposal)	Spent	PM (proposal)	Spent	Total Spent	% Spent
UEF	26	26	12	12	10	10	14	14	14	14	20	20	96	96	100
PUC	2	2	8	8	2	2	5	5	3	3	4	4	24	24	100
HU	8	8	11	11	9	9	7	7	15	15	22	22	72	72	100
UdelaR	2	2	5	5	6	6	7	6	14	14	14	7	48	40	83.33
UDA-ESPE	5	5	7	7	23	23	5	5	2	2	6	6	48	48	100
UFHEC	4	4	8	8	6	6	20	20	3	3	7	7	48	48	100
UTP	1	0	5	1	4	0	2	0	8	3	4	0	24	5	21
MPU	2	2	3	3	2	2	8	8	3	3	6	6	24	24	100
UGG	3	0	2	0	9	0	1	0	5	0	4	0	24	0	0
UMSS	11	9	4	6	2	3	6	6	6	6	7	6	36	36	100
UCLV	7	5	6	7	6	0	2	0	4	0	11	0	36	12	33,33
Total PM	71	63	71	68	79	61	77	71	77	63	105	78	480	405	84.375

8. Publication List

A list of scientific publications from SELI project are given below.

Journal Articles

1. Porta, M., Motz, R., Tomczyk, L., Oyelere, S., Eliseo, M. A., Viola, M., Farinazzo, V., Akyar, O. Y. (2020). SELI: Ecosistemas inteligentes para el aprendizaje y la inclusión.
2. Tomczyk, Ł., Jáuregui, V. C., Amato, C. A. D. L. H., Muñoz, D., Arteaga, M., Oyelere, S. S., ... & Porta, M. (2020). Are teachers techno-optimists or techno-pessimists? A pilot comparative among teachers in Bolivia, Brazil, the Dominican Republic, Ecuador, Finland, Poland, Turkey, and Uruguay. *Education and Information Technologies*, 1-27.
3. Tomczyk, Ł., Muñoz, D., Perier, J., Arteaga, M., Barros, G., Porta, M., Puglia, E. (2019). ICT and Preservice Teachers. Short Case Study about Conditions of Teacher Preparation in Dominican Republic, Ecuador, Uruguay and Poland. *Knowledge International Journal*, 32(1), 15-24
4. Tomczyk, Ł, & Włoch, A. (2019). Cyberbullying in the light of challenges of school-based prevention, *International Journal of Cognitive Research in Science, Engineering and Education* (IJCRSEE), 7(3), 13-26 DOI: 10.5937/IJCRSEE1903013T
5. Tomczyk, Ł. (2020). Digital literacy and e-learning experiences among the pre-service teachers Data. Data in Brief, 106052. doi:10.1016/j. dib.2020.106052
6. Tomczyk, Ł., Mróz, A., Potyrała, K., & Wnęk-Gozdek, J. (2020). Digital inclusion from the perspective of teachers of older adults - expectations, experiences, challenges and supporting measures. *Gerontology & Geriatrics Education*, 1–16. doi:10.1080/02701960.2020.1824913
7. Tomczyk, Ł. (2020). Attitude to ICT and Self-Evaluation of Fluency in Using New Digital Devices, Websites and Software among Pre-Service Teachers. *International Journal of Emerging Technologies in Learning* (iJET), 15(19), 200. doi:10.3991/ijet.v15i19.16657
8. Tomczyk, Łukasz, Martins, V., Eliseo, M., Silveira, I., Amato, C., & Stošić, L. (2020). ICT and education in Brazil - NGO, local government administration, business and higher education expert perspective. *World Journal on Educational Technology*: Current Issues, 12(4), 401 - 424. https://doi.org/10.18844/wjet.v12i4.5198
9. Tomczyk, Ł., Potyrała, K., Włoch, A., Wnęk-Gozdek, J., & Demeshkant, N. (2020). Evaluation of the Functionality of a New E-Learning Platform vs. Previous Experiences in E-Learning and the Self-Assessment of Own Digital Literacy. *Sustainability*, 12(23), 10219. doi:10.3390/su122310219
10. Wnęk-Gozdek, J., Tomczyk, Ł., Mróz, A. (2019). Cyberbullying prevention in the opinion of teachers. *Media Education* (Mediaobrazovanie). - 2019, Vol. 59, iss. 4, s. 594-607. DOI: 10.13187/me.2019.4.594
11. Potyrała, K. and Tomczyk, Ł., 2021. Teachers in the lifelong learning process– examples of digital literacy. *Journal of Education for Teaching*, pp.1-19. https://www.tandfonline.com/doi/full/10.1080/02607476.2021.1876499

Conference Proceedings

1. Martins, V. F., Tomczyk, Ł., Amato, C., Eliseo, M. A., Oyelere, S. S., Akyar, Ö. Y., ... & Silveira, I. F. (2020, July). A Smart Ecosystem for Learning and Inclusion: An Architectural Overview. In International Conference on Computational Science and Its Applications (pp. 601-616). Springer, Cham.
2. Eliseo, M. A., Oyelere, S. S., da Silva, C. A., Silveira, I. F., Tomczyk, Ł., Hercovici, M., ... & Martins, V. F. (2020, June). Framework to Creation of Annex I 209 Inclusive and Didactic Digital Material for Elderly. In 2020 15th Iberian Conference on Information Systems and Technologies (CISTI) (pp.1-6). IEEE.
3. Akyar, Ö. Y., Demirhan, G., Oyelere, S. S., Flores, M., & Jauregui, V. C. (2020, April). Digital Storytelling in Teacher Education for Inclusion. In World Conference on Information Systems and Technologies (pp. 367-376). Springer, Cham.
4. Martins, V. F., Amato, C., Tomczyk, Ł., Oyelere, S. S., Eliseo, M. A., & Silveira, I. F. (2020, April). Accessibility Recommendations for Open Educational Resources for

People with Learning Disabilities. In World Conference on Information Systems and Technologies (pp. 387-396). Springer, Cham.

5. Oyelere, S. S., Silveira, I. F., Martins, V. F., Eliseo, M. A., Akyar, Ö. Y., Jauregui, V. C., ... & Tomczyk, Ł. (2020, April). Digital Storytelling and Blockchain as Pedagogy and Technology to Support the Development of an Inclusive Smart Learning Ecosystem. In World Conference on Information Systems and Technologies (pp. 397-408). Springer, Cham.

6. Oyelere, S. S., Qushem, U. B., Jauregui, V. C., Akyar, Ö. Y., Tomczyk, Ł., Sanchez, G., ... & Motz, R. (2020, April). Blockchain Technology to Support Smart Learning and Inclusion: Pre-service Teachers and Software Developers Viewpoints. In World Conference on Information Systems and Technologies (pp. 357-366). Springer, Cham.

7. Tomczyk, L., Oyelere, S. S., Amato, C., Martins, V. F., Motz, R., Barros, G., ... & Muñoz, D. (2020). Smart Ecosystem for Learning and Inclusion assumptions, actions and challenges in the implementation of an international educational project. In Adult Education 2019-in the Context of Professional Development and Social Capital. Proceedings of the 9th International Adult Education Conference. Czech Andragogy Society.

8. Martins, V. F., Amato, C. A., Eliseo, M. A., Silva, C., Herscovici, M. C., Oyelere, S. S., & Silveira, I. F. (2019, October). Accessibility recommendations for creating digital learning material for elderly. In 2019 XIV Latin American Conference on Learning Technologies (LACLO) (pp. 81-86). IEEE.

9. Martins, V., Oyelere, S. S., Tomczyk, L., Barros, G., Akyar, O., Eliseo, M. A., ... & Silveira, I. F. (2019, November). A blockchain micrositesbased ecosystem for learning and inclusion. In Brazilian Symposium on Computers in Education (Simpósio Brasileiro de Informática na Educação-SBIE) (Vol. 30, No. 1, p. 229).

10. Tomczyk, L., Oyelere, S. S., Puentes, A., Sanchez-Castillo, G., Muñoz, D., Simsek, B., ... & Demirhan, G. (2019). Flipped learning, digital storytelling as the new solutions in adult education and school pedagogy. Adult Education 2018-Transformation in the Era of Digitization and Artificial Intelligence.

11. Şimşek, B., & Akyar, Ö. Y. (2020, April). In Search of Active Life Through Digital Storytelling: Inclusion in Theory and Practice for the Physical Education Teachers. In World Conference on Information Systems and Technologies (pp. 377-386). Springer, Cham.

12. Tomczyk, L., Eliseo, M. A., Costas, V., Sanchez, G., Silveira, I. F., Barros, M.-J., Amado-Salvatierra, H., Oyelere, S. S. (2019). Digital Divide in Latin America and Europe: Main Characteristics in Selected Countries. 2019 14th Iberian Conference on Information Systems and Technologies (CISTI). doi:10.23919/cisti.2019.8760821

13. Tomczyk, Ł. (2020). Experiences with e-learning as a challenge for the effective training of future generations of teachers In So, H. J. et al. (Eds.). Proceedings of the 28th International Conference on Computers in Education. Jhongli City: Asia-Pacific Society for Computers in Education, p.628-633.

14. **Martins, V., Oyelere, S. S., Tomczyk, L., Barros, G., Akyar, O., Eliseo, M. A., ... & Silveira, I. F. (2019, November). A Blockchain Microsites-Based Ecosystem for Learning and Inclusion. In Brazilian Symposium on Computers in Education (Simpósio Brasileiro de Informática na Educação-SBIE) (Vol. 30, No. 1, p. 229) http://dx.doi.org/10.5753/cbie.sbie.2019.229**

Book chapters

1. Oyelere S. S. & Tomczyk Ł. (2020). Styles of Using ICT by Turkish Physical Education Pre-service Teachers. ISSN: 1798-5854. https://erepo.uef.fi/handle/123456789/23468

2. The role of the Dominican teacher in the use of information and communication technologies.
https://www.researchgate.net/publication/344291533_THE_ROLE_OF_THE_DOMINICAN_TEACHER_IN_THE_USE_OF_INFORMATION_AND_COMMUNICATION_TECHNOLOGIES

3. Tomczyk, Ł., ICT AND TEACHERS IN POLAND–PILOT STUDY. https://www.researchgate.net/publication/344015485_ICT_AND_PRE-SERVICE_TEACHERS_IN_POLAND_-PILOT_STUDY

4. Arteaga M., Tomczyk L.; Barros, G. Oyelere S.S. (2020) Exploring needs of ICT for Enhancing Inclusive Education in Turkey: Challenges of ICT Integration in education through the views of experts from business, government and university sectors. ISBN978-9942-822-61-1.

5. Parada H., Puentes A., Rosa-Fellz C.D., and Munoz D.,2020. The role of ICT and its pedagogical contributions to education in the Dominican Republic: Advances in educational innovation for inclusion and technological literacy from the perspective of higher education institutes, policymakers, and ministries. https://www.researchgate.net/publication/343386137_The_role_of_ICT_and_its_pedagogical_contributions_to_education_in_the_Dominican_Republic_Advances_in_educational_innovation_for_inclusion_and_technological_literacy_from_the_perspective_of_higher_educ

6. Tomczyk, Ł. 2020. ICT in schools and non-formal education in Poland. Challenges of digital literacy development, modernisation of education system and digital inclusion through new media from the perspective of experts from business, education and NGO

7. Barros, M.J. and Barros-Gavilanes, G., Digital Literacy and ICT in Learning and Inclusion-Ecuador. *ICT for learning and inclusion in Latin America and Europe*, p.97. https://www.researchgate.net/profile/Juan_Barros_G/publication/343254072_DIGITAL_LITERACY_AND_ICT_IN_LEARNING_AND_INCLUSION_-_ECUADOR/links/5f1fb8a8a6fdcc9626b9ea7c/DIGITAL-LITERACY-AND-ICT-IN-LEARNING-AND-INCLUSION-ECUADOR.pdf

8. Akyar, Ö.Y., Yüksel, Y., Bilgin, E., Şimşek, B. and Demirhan, G., 2020. ICT in Learning and Inclusion–Turkey. *ICT for learning and inclusion in Latin America and Europe*, p.191. https://www.researchgate.net/publication/339200546_ICT_IN_LEARNING_AND_INCLUSION_-_TURKEY

9. Oyelere, S. S., Tomczyk, L., Bouali, N., & Agbo, F. J. (2019). Blockchain technology and gamification-conditions and opportunities for education. Adult Education 2018-Transformation in the Era of Digitization and Artificial Intelligence. https://erepo.uef.fi/handle/123456789/7905

Edited Books

1. Tomczyk, Ł. & Oyelere, S. S. (2019). ICT for learning and inclusion in Latin America and Europe. Cracow: Pedagogical University of Cracow. DOI 10.24917/9788395373732, ISBN 978-83-953737-3-2. https://depot.ceon.pl/handle/123456789/17957

2. Oyelere S. S. & Tomczyk Ł. (2020). ICT in teaching and digital inclusion: the perspective of selected countries from Latin America, Caribbean and Europe. ISSN: 1798-5854. https://erepo.uef.fi/handle/123456789/23468

3. Arteaga M., Tomczyk L.; Barros, G. Oyelere S.S. (2020). ICT and education in the perspective of experts from business, government, academia and NGOs. e-ISBN978-9942-822-61-1 http://publicaciones.uazuay.edu.ec/index.php/ceuazuay/catalog/book/110