CAPACITY BUILDING ACROSS HIGHER EDUCATION AND RURAL YOUTH IN WINNOVATORS SPACE

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ABSTRACT

This paper demonstrates the design as a hypothesis framework for developing cross-university students and mentors, and rural youth (aged 18-30) and regional business ecosystems capacity building practice approaches to support sustainable development goals. To support university students', mentors and the business partners' engagement and building agency and capacity with regional rural young women a gamified learning and co-working WINnovators Space (https://winnovators-space.eu/) with e-learning materials for self-learning and entrepreneurial mentored group challenges was developed. The Pilot study validates the capacity building practice approach with Winnovator Space in three countries involving young rural women, higher education students, academic and business mentors – Estonia (30), Slovenia (35), Serbia (25).

KEYWORDS

Capacity Building, Higher Education Practice, Rural Youth, Sustainability

1 INTRODUCTION – CAPACITY BUILDING ACROSS HIGHER EDUCATION AND REGIONAL COMMUNITIES

Recent decade has promoted universities to act out in regional development as innovation agents facilitating cross-border knowledge exchange (Broek et al., 2019). Goals for Education 2030 (Mundial & UNICEF, 2016), and sustainable action along the SDG 4 – providing lifelong learning for all, and SDG5 – considering gender equality in STEM education (Boeren, 2019) require educational institutions to step out as actuating actors in the society. Boeren (2019) recommended an interdependent approach that relates the development of individuals and the social structures around them at micro (e.g. socio-demographic and socio-economic factors, people's attitudes, confidence, interests, and motivation to learn), meso (structure of educational offers, forms of practices), and macro levels (e.g. legal, regulatory, financial, political, ideological factors). In our paper we aim to demonstrate one approach where higher education acts for society building shared capacity using a blended digital approach.

Capacity concept denotes systemic readiness. Morgan (2006) defines capacity as an emergent property in social ecosystems, an interaction effect that comes out of the dynamics involving a complex combination of attitudes, resources, strategies and skills, both tangible and intangible. Capacity as a state is an action potentiality of individuals within social and institutional contexts. "Capacity building" pertains to the building of the "capacity of institutions" as well as individuals (Wescott, 2002). It is a dynamic construct that has to be nourished in actions between different partners to solve challenges such as Education for Sustainable development Goals has.

Our design research aims for developing new types of capacity building practices between universities and society. The nature of capacity building expected from the universities in the direction of regions has changed over time. The more common is the training support approach where capacity building is defined as "enhancement of the skills of people and the capacity of institutions in resources management through education and training" (Cicin-Sain et al., 1998) that relates capacity building for communities foremost as the formal education provision activity. Our study explores the opportunities of capacity building by blending the formal and informal education provision modes. Capacity building requires Higher Education and Regional ecosystems to find new ways to orchestrate educational goals and formal education forms with the socio-economic and socio-cultural community life expectations and with the informal education opportunities in regions. Blending formal and nonformal educational opportunities is one of the capacity building forms that Higher Education institutions (HEI) develop to offer flexible education with equal access along SDG 4 and SDG 5.

HEIs are increasingly demanded to be sustainable development actors, building partnerships with regional business ecosystems, for example, in advancing business and STEM competencies and overall active citizenship mentality in remote areas. Agency development of people is one central educational goal, because agency is a state that relates personal characteristics and contexts with the opportunities and problem solving challenges one has in life, as well as with the enabling situations or constraints (Emirbayev & Mische, 1998).

Lifelong learning strategic documents that we list below have long related the agency with the concept of active citizenship that one can learn in various formal, informal and nonformal ways. Competences for active citizens are incorporated into many European agendas such as agenda *"The future of education and skills: Education 2030"* (Howells, 2018), the *"UNESCO learning objectives for sustainable development"* (Rieckmann, 2017), the "*Preparing our youth for an inclusive and sustainable world: The OECD PISA global competence framework"* (OECD, 2018) and the GreenComp, *"The European sustainability competence framework"* (Bianchi et al., 2022). In our design study we seek opportunities to blend formal HEI students' studies with informal and nonformal learning of young people in remote areas to develop their active citizenship and entrepreneurial, STEM and sustainability competences, as well as advancing a shared capacity between universities and regions.

The problem of this paper is the need to develop new digitally enhanced capacity building approaches through which HEIs may act out in the regional communities to promote learning for STEM, sustainability, entrepreneurship by blending formal and nonformal learning so that HEI students may support undermined young people who have fewer access to learning for innovation in teams.

The research question is formulated as the design hypothesis (Leinonen et al., 2008): *How can the universities grow the agency of higher education students to become change agents for the remote communities and help the undermined rural youth (18-30) to have equal access to entrepreneurial, stem and sustainability competencies in their regions?*

2. METHODS

2.1 Context of the Study

To achieve sustainable development goals in education for all Education 2030: Incheon Declaration and Framework of Action (Mundial & UNICEF, 2016) has stated that we need to promote equal access to education, developing flexible forms of learning that incorporate and blend formal, informal and nonformal approaches, enabling for learners different learning paces and spaces. This study is conducted in the frames of KA2 Erasmus+ project WINnovators (2021-2024) partnership aiming to explore the capacity building approaches in higher education teaching and learning that are directed to the regional communities, and particularly to young rural women in remote areas. The current study presents the results of our first ongoing Pilot with the developed approach. In the Pilot study we built a particular blended learning space consisting of the digital Winnovator Space in which we activated a learning community across higher education, regional rural ecosystems and business ecosystems in three countries – Estonia, Serbia and Slovenia.

2.2 The Design Process

We applied a participatory design-based research method, aligned to software and interaction *design as a hypothesis approach* (Leinonen et al. 2008) that aims for designing tools for complex social systems where the iterative and hermeneutic design process consists of four partly overlapping phases: contextual inquiry, participatory design, product design, and production of solution as hypotheses. Our design hypothesis states that the WINnovators approach aims for a new type of capacity building practice that unites universities and regions, and advances young people agency as active citizens competent to create STEM and sustainability related business ideas. Design as a hypothesis approach means that we are experimental and analytic, but we try to keep ourselves open to serendipity that helps to be flexible in our design solutions. We acknowledge that our Pilot with WINnovators approach design and application in practice may result in some failures, and some of the outcomes can be different than initially expected, that we try to document through the evaluation of the WINnovators approach.

The following Design as a Hypothesis Stages were followed:

- Contextual inquiry for defining the context for WINnovators approach
  i) Benchmarking the trends in inclusive education for active citizenship;
  ii) Identifying the local needs with an ethnographic exploration (observations and interviews with stakeholders in higher education, rural regions) about who-what-why-where could contribute for capacity building between higher education, rural ecosystems and businesses;
- II. Participatory design of Personas:

iii) Design thinking and Persona development (Cooper, 2003) to represent the HEI learners as potential change agents, and rural young women as community entrepreneurs and future leaders;

- III. Product conceptual design:

iv) The design of a WINnovators Competence Framework for active citizenship;

v) The design of gamified interaction principles for engagement between different stakeholders in informal and nonformal learning scenarios;

- IV. Production of software and interaction as hypotheses:

vi) The design of the eLearning course topics, and Teamwork Challenges;

vii) The design of the interactive WINnovators Space https://winnovators-space.eu/

- V. Testing the hypothesis in the Pilot in three countries

viii) The Design is formatively advanced by 'community' involvement: academics as the designers, higher education specialists and mentors; the students as learners, mentors, and change agents; the rural youth as learners, future entrepreneurs and active citizens; and the regional business ecosystem experts as mentors try out WINnovators approach, and track the process in the formative diaries.

ix) The usability survey of the WINnovators Space and analytics about active citizenship competences achieved will provide some impact indicators on how successful is the WINnovatost approach. The results of the survey are not presented in this paper, as the Pilot is still ongoing.

2.3 The Sample

The Pilot study sample was formed in three countries (Estonia, Serbia, Slovenia) using the convenience sampling method (accessibility in the partner universities), and the snowball sampling approach involving students and rural young women through design stages. In each piloting country the HEI students, HEI teachers and rural young women were teamed together to learn and experience the WINnovators learning practice in WINnovators space.

Estonia, N=30: HEI youth work students and teachers, youth workers in rural areas, young rural women representing three target groups: young adults in unsatisfied life situations, young mothers and young unemployed adults and/or school drop-outs.

Serbia, N=25: BADEN, the network of academic researchers from different universities, students from the computer science and business fields, the networked Serbian Association of Business Women, the female entrepreneurs, young rural women representing the Roma minority.

Slovenia, N=35: HEI teachers and students from the two-subject teacher study programmes Computer Science and Art Pedagogy, young women from vulnerable groups who have not completed their education and come from rural areas were contacted in cooperation with the Employment Service in the framework of the PUM-O project, which deals with young people who have not completed formal education, and with the Chamber of Commerce and Agriculture of Slovenia.

3. RESULTS ON THE WINNOVATORS DESIGN APPROACH

3.1 WINnovators's Design Hypothis on Capacity Building and Personal Agency

As we are following the *Design as a hypothesis* approach, in the following sections we will introduce step-by-step the results achieved in each design phase. This research addresses the research question: How can the universities grow the agency of higher education students to become change agents for the remote communities and help the undermined rural youth (18-30) to have equal access to entrepreneurial, stem and sustainability competencies in their regions?

Our hypothesis considers two levels of impacts from learning as a WINnovator.

1. The capacity between the different stakeholders can be built in problem-solving groups where learning for STEAM, sustainability and entrepreneurial competencies is supported. We assert that working together in teams will grow the agency of HEI and rural Youth to become more self-development driven and community goods driven as change agents. They will gain active citizenship competences that they can use in the future for common good. The indicators of capacity building are i) formed teams between HEI students and rural young women, who pursue jointly for digital team challenges on STEM, sustainability related topics, ii) active citizenship competences (WINnovator competencies) individuals have gained through learning together. This hypothesis may be validated tracing teamwork and active citizenship competences in WINnovator Space, and using formative reports.

2. At the institutional and regional level the joint capacity can be created between HEIs and the local stakeholder organisations. We assert that capacities as shared activity systems need to be built around shared teaching and problem-solving practices across organisational borders and revising institutional regulatory frameworks for formal learning. The indicators of capacity building across HEIs and local communities are: i) established and durable support systems through which it is possible to recruit young rural women to the WINnovators learning activities provided jointly with HEI students as change agents; and ii) established coordinated support actions provided to young rural women by the local communities and the universities. This hypothesis may be validated tracing offline and online networking activities that the WINnovator Space can enhance, and using the formative reports.

3.2 WINnovator's Space – a Shared Interaction Hub for Capacity Building

The first prototype of WINnovator Space for interactive learning was developed as a codesign result within the Consortium, engaging HEI experts and regional business and youth work ecosystems. We used the Persona approach (Cooper, 2003) to describe the needs of young people and HEI students in joint learning processes. Working closely with local partner organisations, we specified the target groups within the young women in vulnerable life situations, their specific characteristics and needs. Collected information and knowledge helped to develop the WINnovators e-learning materials and Challenge modules that may correspond to the development of young people's competences, offering self-fulfilment and a sense of achievement, as well as sufficient challenge and opportunities for experimentation.

WINnovators' Space represents the concept of "Edutainment": online content, gamification, interactivity, social media features, personal and team profile, messaging, file, pictures and videos uploading, person and team rankings promote learning in a virtual community. WINnovator Space promotes elearning from self-learning short lessons provided as learning nuggets. WINnovator Space is also a community space in which teams can be formed around problem Challenges that rural young women see in their entrepreneurial visions. The community space supports the roles of Mentors (from academia and business ecosystems), Change Agents (HEI students), and the WINnovators (young women in change). The interaction in the community is

built around the design ideas as Challenges that young women can try out with their supporters (Mentors and Change Agents). The role shift in agency is traceable with the badge system that associates active citizenship competences with progress.

3.3 WINnovators Space – a Gamified Motivation Space

The gamified motivational space was developed in WINnovator Space comprising the open badge (Jovanovic & Devedzic, 2014) system and leaderboards. The WINnovators open badges are related to competence dimensions. For open badges a competency framework was composed from several frameworks: Dig.comp 2.1 (Stephanie et al., 2017), GreenComp (OECD, 2018), Sustainability competencies (Dzhengiz & Niesten, 2020), Learning for the future, Competencies in education for sustainable development (Ece, 2011), Entrepreneurial competencies (Kyguolienė & Švipas, 2019), Innovation leadership competences (Vlok, 2012), Innovation competencies (Waychal, 2019) and Project management competencies (Dogbegah et al., 2011). The WINnovator competencies are grouped into the five competence dimensions that relate with the development of personal agency and group agency in the time of challenges: Learning to be, Learning to value, Learning to live and work together, Learning to comprehend and contribute and Learning to empower and lead. HEI students and young women who learn together can collect badges when they do individual learning or group challenges. In challenges, badges are awarded for completing a task or for creating a product that must be first assessed by the instructor and are therefore awarded manually. Some competencies in the WINnovators competency framework are difficult to identify in others, therefore there is a possibility of requesting a limited number of badges to oneself. Open badges can be requested by learners themselves, by their team members (change agents), or by the mentors. A leaderboard shows the active users and the ones who earned the most badges and aims to promote learning. The accumulation of competencies enables learners to move up the rank: bronze, silver, and gold levels of being a WINinnovator - denoting the state of active citizenship competencies and agency. Finally, the system issues WINnovators certificates to users.

The usability of the system will be evaluated with the survey at the end of the Pilot with users, and we do not present the results here since the pilot is still ongoing. The system also provides an overview of the competencies that we will use to demonstrate personal level gains in active citizenship as a result of WINnovators approach.

3.4 Testing the Capacity Building Hypothesis in WINnovators' Pilots

The training modules on the WINnovators platform are:

1. STEM/STEAM entrepreneurial communities for young women: general learning resources;
2. STEM/STEAM entrepreneurial communities for young women: challenges.

Within the first group of training practices, HEI students as well as young women in rural areas have the opportunity to gain competencies in the areas of project and teamwork management, development of websites, the time management, promotion of sustainable entrepreneurship, leadership, creative thinking, business creation plan, etc. The second group of training practice collection provides challenges in the field of using digital technologies in marketing, tourist services with gamified digital elements, development of digital learning communities, etc. For each e-lesson, an opportunity to earn a badge is defined, through the presentation of the lesson or by taking a test. In challenge learning modules the focus is on the collaboration among peers - students and young women working together, practice oriented learning with real-life connected activities and tangible outcomes or learning that can be transferred to young adults' daily activities or other spheres of life. The badges there must be requested by team-members and the awarding process is moderated by mentors.

The role of the HEI students as Change Agents in the initial phase of the training was to establish contact with the young women WINnovators and to advise them on the selection of appropriate learning units according to their needs and expectations. Within the online platform, teachers as Mentors have formed subgroups for specific challenges and invited Change Agents (students) and WINnovators (rural youth) to participate. By presenting students with the same challenges as participants and allowing them to expand their participation with gamification elements in the form of badges, a collegial relationship and sense of partnership between them was built. These connections can be sustained later as students move into their careers. Through networking, the collaboration in their local communities was fostered, where participants can act as agents of change and promoters of education to other potential candidates.

Case: Estonia. The engagement of young women in vulnerable life situations in Estonia was through youth and community workers at municipalities. 2nd year youth work students were involved through a course with the aim of preparing students for project work as part of the daily activities of a youth worker, to find and use funding for youth projects and to support young people in the implementation of projects. HEI youth work students are also working in local rural youth centres, and they reached out to potential participants. Specific tasks of HEI students were connected with problem-based, collaborative and situated learning that took place through challenge modules in WINnovators Space. A total of 5 teams were created, with students collaborating closely with the young participants to undergo a chosen challenge module. Through this process, they developed concrete project ideas, identified potential funders, and prepared the project proposal for each initiative. Out of these, 3 ideas focused on sustainability, aiming to create awareness about consumption behaviour and engage the community in finding practical solutions to reduce overconsumption through collective action. One initiative aimed to create a digital learning community of young people in a rural area, helping them develop skills in team leadership, community engagement, and planning collective activities. Another project aimed to raise awareness about various social issues relevant to young people by using comics, including digital formats. As the Estonian case was run some of the teams abandoned working within the WINnovator Space and started to use social media environments for interaction and project work. In the Estonian case the drivers of the WINnovators learning in regions activity were youth work HEI students, the HEI mentor met with students regularly to guide them but did not meet directly with the young women WINnovators. This self-driven approach built on the youth worker students' agency, and aligned with non-formal learning principles, but decreased the formal HEI control over the learning.

Case: Serbia. The women entrepreneurs in rural areas in Serbia have not completed business schools and colleges, and have the problem of how to digitally transform their business and to enter from the local market to the electronic market. In the case developed in Serbia, the regional ecosystem was supported by the following interactions between the partners: HEI teachers (Mentors) – young women (WINnovators): the HEI teachers were responsible for course development, presentation, maintenance and administration, as well as for fostering communication with young women; through their personal connections, the HEI teachers attracted the young women to take the courses. HEI teachers (Mentors) – HEI students (Change Agents): the teachers invited HEI students and trained them to become change agents and carry out immediate communication with the learners (young women). HEI administration – HEI students (Change Agents): university administration was asked to accept the students' participation in the WINnovators activities as (part of) the mandatory final year project / field work, and also to issue certificates of completing extracurricular activities where appropriate. HEI students (Change Agents) – young women (WINnovators): students contacted many of the young women to take the WINnovators courses based on their personal connections and origin. The Association of Business Women Serbia (ABWS) – university teachers (Mentors): ABWS was the major source of contacts with young women from rural areas. The pairs were formed from HEI students and young women to work in teams in WINnovator Space. The three HEI mentors from different universities run regular online meetings to meet the students and young women to facilitate their learning process. In the end the HEI mentors provided feedback to the teams.

Case: Slovenia. In Slovenia, the public administrative organisations - the Employment Service and the Chamber of Commerce and Agriculture of Slovenia were engaged to reach out young rural women. HEI teachers recruited upper year students from the Faculty of Education to participate in the project by introducing the project, its aims and objectives, and inviting them to participate. These students already acquire knowledge about working with vulnerable groups of people within the framework of the core pedagogical subjects and also have the relevant didactic knowledge that enables them to approach learning support more effectively, to find the appropriate interpretation of terms and concepts for the target audience, and to take into account the specifics of the subject didactics of the respective field, the psychology of learning, thus adapting better to the level of the learners. The teachers had an initial interview with the students, in which they explained in detail the process of the training and defined their role. They also informed them of their goal - to help the learner become a change agent in their local environment and spread knowledge and awareness about the importance of sustainable aspects of business. The mentor held weekly Zoom meetings with the teams, but after the individual elearning phase was completed and the teamwork with challenges had to start, most of the recruited young women stopped attending the WINnovator course and did not finish Challenges despite HEI students' attempts to contact them. The new group of young women was contacted to enter the learning process, some young women from this group also started to work in teams with HEI students on the challenges.

4. DISCUSSION - CAPACITY BUILDING ACROSS HIGHER EDUCATION AND REGIONAL YOUTH

Overall these three cases demonstrated that the application of the design hypothesis in learning environment design and practical application in HEI-regional distributed settings was partially successful, but we also faced many challenges that require technical advancements, and revisions in the process of engagement between Mentors-Change Agents and Winnovators to build Capacity and active citizenship competences.
In the current stage of the WINnovator Pilot we can validate our design hypothesis through two types of impacts:

The capacity between the different stakeholders was built more in individual elearning mode and less in the problem solving teams. We asserted that working together in teams will grow the agency of HEI and rural Youth to become more self-development driven and community goods driven as change agents. We managed to create 5 larger teams in Estonia, 16 teams where HEI students were paired with young women in Serbia, and in Slovenia 4 teams were initially created, but only 1 collaborative team continued where only one young woman was testing out the challenge level. Since the pilot is still ongoing we will get more formative evaluation data about the process from diaries of the HEI students and HEI mentors. We observed that not all the teams wanted to use the WINnovator space team area for their joint nonformal learning, and moved their work to the social media spaces. This may indicate that the platform still has some usability issues that we will get to know after the usability survey is finished at the end of the Pilot. The qualitative and quantitative findings of the process will help us to improve the engagement practices in teams, as well as the Winnovator Space and the gamification features for the next Pilots we plan in 2023-24.

According to the Leaderboard so far 22 HEI students and young women gained a number of badges (see Figure 1), which indicated only the moderate success, but the experiment is still ongoing and many learners are still actively studying. From our observations we found that participants gained active citizenship competences mainly from the elearning individual lessons, and they did not frequently request the competence badges for the work they did at the team challenges. The most popular badges requested for the team members were: Being a role model, inspiring engagement, motivating others, being open in thinking and communication, being a team player, caring of the others, being an inspiring leader, being able to accommodate in the challenges etc. Few persons were requesting badges for themselves as was possible. We also detected several technical requirements to make the requesting and awarding process in the challenges automatized after mentor approval. According to the Winnovator Space statistics most of the participants are still at the Beginner level of active citizenship, that indicates that there may be the need to change some of the criteria for the advancement in the WINnovator levels.

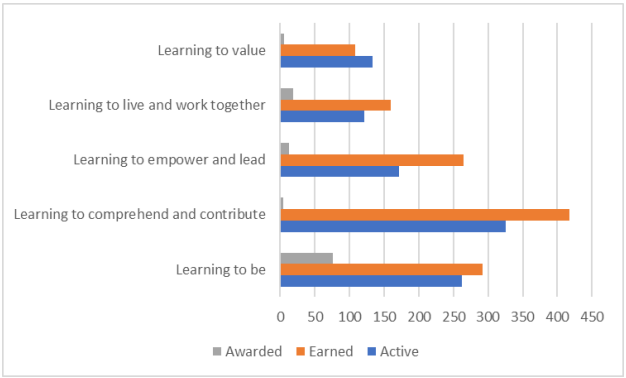

Figure 1. The overview of the badges the participants had obtained by the second half of the Pilot. (Active - students were still learning the lessons related with these competences, Earned - competences earned from completed lessons, Awarded - competences requested by teams during the teamwork)

At the institutional and regional level, the joint capacity was created between HEIs and the local stakeholder organisations. HEIs have built partnerships in the pilot cases with formal organisations and regional networks. We believe that HEIs can keep the capacity in these relations with formal organisations beyond short-term problem-solving events. We will follow these relationships during the Pilots to sustain them. An important element in joint capacity building was developing the link between the formal and nonformal learning structures that differ by their motivational elements. In two Pilots students were assigned with HEI course tasks to work with rural young women, in one Pilot it may be an extracurricular activity for students that requires regulative support to be credited. For students the course assessment provided an additional extrinsic motivation for participation.

The teams were supposed to work in the distant mode in WINnovators Space. The big challenge was that for regional young women the WINnovators learning activity is nonformal, and they do it from intrinsic interest. To keep them motivated and on track the local mediators were useful. In the Estonian case, the support came from local youth workers, either as current students or alumni of HEIs who acted as the mediating agents having trust relationships with local youth, and as alumni they are still connected with the university. In the Serbian case, the local mediators were business women from ABWS who mediated the youth to the BADEN network of HEI educators. In the Slovenian case the regional youth were motivated through a more formal approach created by their alignment to the Unemployment office and the Chamber of Commerce and Agriculture training programmes. This approach was not successfully keeping the young women to learn.

5. CONCLUSIONS

This study provided a preliminary view of how to build capacity and across university borders for SDG4 and SDG 5. The Piloting is ongoing for next two years, and will provide valuable impact on how to design new learning practices.

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