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IRIS

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Ministry for Foreign Affairs of Finland

FINNISH NATIONAL AGENCY FOR EDUCATION

TUDARCo

TURKU AMK
TURKU UNIVERSITY OF APPLIED SCIENCES

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The Trajectory of the IRIS project

Trajectory of the IRIS project

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Introduction

The Tanzanian Tumaini University Dar es Salaam College (TUDARCo) and the Finnish Turku University of Applied Sciences (TUAS) have collaborated from 2012 onwards. In the beginning, the partnership was based on the North–South–South Library and Information Studies Network, a domain of five higher education institutions (HEI) from Africa and three from Finland. In 2016, TUDARCo and TUAS started bilateral collaboration and applied funding for the project IRIS from the HEI ICI, the Higher Education Institutions' Institutional Cooperation Instrument.

IRIS, Introducing Reverse Innovation to Higher Education Institutions in Tanzania concentrates on active pedagogy development through innovations and community interaction. The innovation pedagogy of TUAS is an active teaching and learning approach that combines theoretical knowledge and practical skills together. TUDARCo in turn was prepared to reform the pedagogical thinking to improve learning outcomes, motivation of teaching staff and interaction with surrounding communities. The intention of the project is not to transfer the pedagogy from Finland to Africa but rather develop an active pedagogy model suitable for the Tanzanian context. Tanzania is an extremely diverse society and collaboration provides an interesting and complex environment to test and develop TUAS' innovation pedagogy further. In addition, the project IRIS allows partners to review the reverse innovation model in practice in respect of human right principles such as equality, non-discrimination, participation and inclusion, accountability and transparency.

The project IRIS committed to the theory of change through result-based management that emphasises achievements, how the actions influence on change instead of what has been done. The chain proceeds through inputs, outputs, outcomes to impacts that are long-term changes.
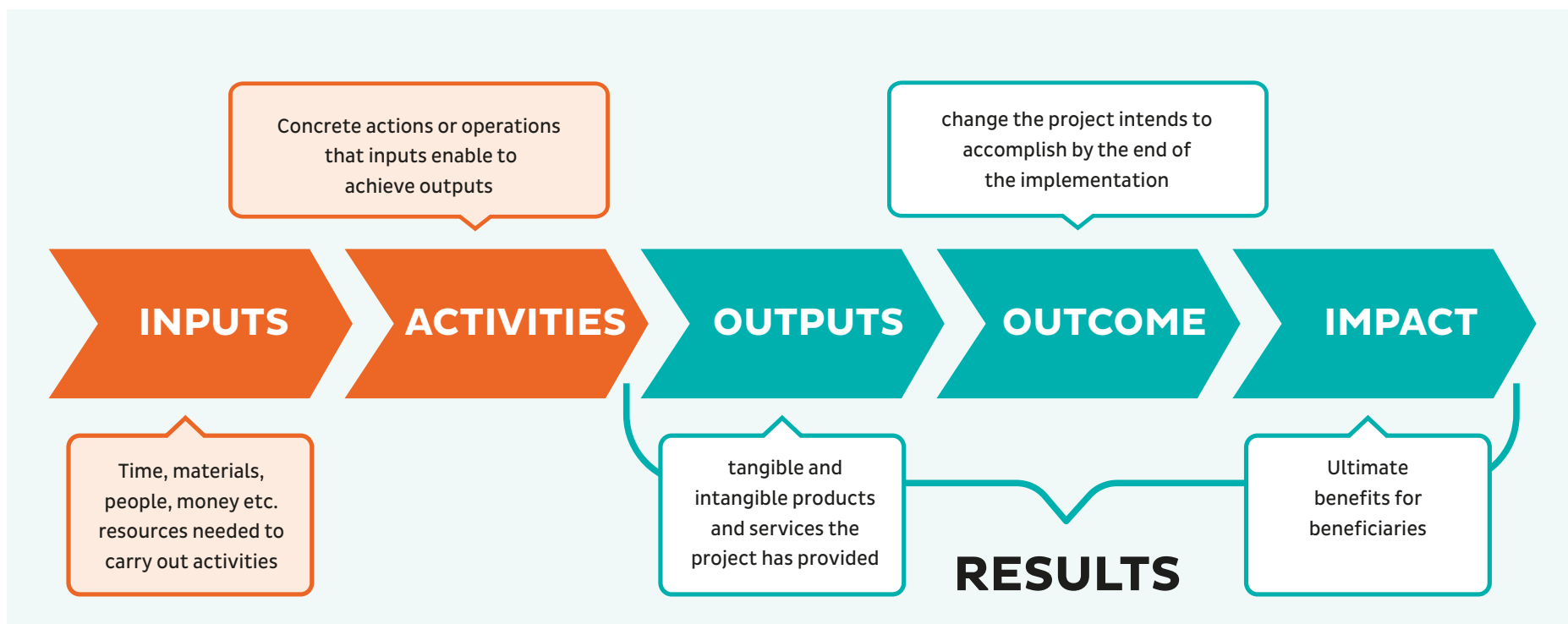
Figure 1. The results chain.

In this publication, we will cover the trajectory of the project IRIS from 2017 to 2020. The project team members present their views and experiences of IRIS, how the development project managed to tackle the challenges and reach the goals successfully. The abbreviation IRIS stands for Introducing Reverse Innovation to Higher Education Institutions in Tanzania. In fact, at the beginning of IRIS, the project team in both TUAS and TUDARCo were rather uncertain about the reverse innovation concept. Traditionally, innovations are considered to arise from the countries of science and technology whereas products are sold to the developing world with high costs. In reverse innovation thinking, the concept has been turned upside down. The

idea arises from a community and it is processed locally and not in another society. Grassroots innovation thinking was connected to IRIS, which provided a good platform to pilot and examine the concept of reverse innovation regarding needs of local community and active teaching and learning approach in complex environments. The first chapter, *The Art of Enabling Reverse Innovation – a Complexity-Based Approach* is relevant contribution of **Harri Jalonen** to the discussion on the concept of reverse innovation.

The expressed the ultimate goal of the project IRIS is "to increase the active role of HEIs to cultivate ideas arising from communities,

to support communication, concrete collaboration and information sharing which promote participation and equality in the society". This aim was agreed to reach through the following three result areas:

» Pedagogy model development that embraces the active learning and teaching approach regarding local needs, multi-disciplinary interaction and knowledge creation.

» Establish interactive relationships between university, entrepreneurs and local communities.

» Improve library and information services to support access to information.

Each result area is viewed in more detail in the publication. The paper of **Gertrude Ntulo** and **Markku Rajala** focuses on developing and piloting the teaching and learning elements included in the FinTan pedagogy model. Especially, Ntulo and Rajala review experiences of tackling the challenges and adaption of the active learning model to TUDARCo. *Bridging the Gap Between Community and HEIs: A Case of* micro-entrepreneurs of **Julius Tweve** and **Nancy Macha** in turn concentrates on the second result area. The authors not only present how the new relationships and networks were established but in addition they clarify the nature of local entrepreneurship and how local needs were implemented into learning processes. The text of **Riikka Kulmala** and **Gideon Ntunga** indicates how the IRIS project improved library and information services applying service design methods. Participatory workshops with library professionals, library students and teachers generated service models based on information needs micro-entrepreneurs had indicated.

One of the main goals piercing all result areas of IRIS is to increase active dialogue and concrete collaboration between different sectors in society. Therefore, the project emphasizes the importance of effective communications in increasing awareness and engagement to its stakeholders such as HEI communities, entrepreneurs, NGOs, authorities and library professionals, for example. The article of **Sinyati Tira** and **Paula Ailio** indicate the importance of external and internal communication.

The final chapter of **Petri Uusikylä** *Endeavour to Innovate – Learning Experiences from the IRIS Project* examines the change the project IRIS generated. Uusikylä reviews the project from the perspective of evaluation and he highlights IRIS as a platform of learning at the levels of society, community, university and individual.

Melting borders through social identity

In addition to innovation process concepts, complexity thinking and theory of change, we may argue that the social identity theory is connected to IRIS. The theory of social identity highlights the meaning of group membership and relations between individuals and variety of groups in society (Tajfel 1982). According to Mor Barak (2017), memberships of social groups are significant, and people tend to categorize themselves and others rather through group connections than by paying attention to individual characteristics. However, people often belong to several groups at the same time and in addition, they tend to leave groups quite easily and change from one group to another. Nevertheless, long memberships, some of them even lasting a lifetime, are not exceptional. Tajfel (1974; 1981) maintains the dynamic nature of social identity, which means that people stay in one group only as long as the membership is significant for them. Identity building and groups are connected to each other because it seems that groups offer people not only membership but also a meaningful platform to build their identities (Tjafel & Turner 1979).

According to the theory by Tajfel (1982), social identity is built through three stages, which are social categorization, social identification and social comparison. To shortly describe the first, social categorization refers to the group identification, which is done by individuals themselves or by others, and simply this can be done through profession, religion or political connections, for example. During the second phase, social identification, people evaluate the significance of groups and especially, they compare their own attitudes and norms with the values of the group they include in or tend to include in. The group approach might be compatible and so an individual is willing to adopt normative ways to act, behave and communicate as a group member. The third and last stage is social comparison in which the members evaluate and

compare the ingroup with other groups. This means that the people who are members of a group establish an ingroup, whereas from their perspective others who are not participants in this certain team form outgroups. The language use and interaction may concretize the difference between the ingroup and outgroups and clarify social identity steps. From the perspective of the ingroup, the pronoun "they" indicates others, people of outgroups, whereas the personal pronoun "we" refers to us, the ingroup members. *We* share similar awareness and perceptions among the group whereas *they* have other and different views compared to ours among our ingroup. According to the social identity theory, members of a group have tendency to favour their own group members over the others. The social identity theory maintains that people wish to be part of teams that enjoy positive and distinguishing identity. (Tajfel 1978; 1982.)

Although the perspective of social identity is not explicitly written into the project plan of IRIS, implicitly the objective to foster local communities and increase interaction between different groups aims at a positive collective identity. The active pedagogy approach of IRIS bases on the idea that local communities are engaged in the learning process. This means that learning is not only observed through credits, competencies and degrees university students receive during their studies but learning actions also support and benefit local communities. The active learning process is inclusive, recognizes the needs of communities and attempts to find solutions to challenges that real working life faces. The collaborative and active learning approach of IRIS invites different groups of society to operate close to each other, expands the mutual understanding between "us" and "them" and decreases separation in society. Interaction between working life and universities is not usual in Tanzania but quite the opposite, communication occasions and platforms are missing, and a variety of groups rather operate separately than in close partnerships. Business skills and entrepreneurship are learned mainly in theory and therefore graduate students often have only a limited level of practical business skills. Realistic income opportunities, however, are mainly in the private sector and in own business ideas which, require pragmatic planning skills and competence to start and run business in practice. Moreover, the gap between universities and working life has

not encouraged students to build networks during their studies and therefore after graduation their working life references are small. At the same time, micro-entrepreneurs would like to develop their business and update their skills, but they do not have enough resources. One of the major progress steps of IRIS happened when the team stepped out of TUDARCo campus and encountered the micro-entrepreneurs who run their own business in the neighbourhood. Finding out that micro-entrepreneurs have an amount of challenges that could be solved in collaboration with students diminished invisible fences between the local community and higher education.

Melting borders through access to information

Among the key areas for business growth is access to information. We may argue that information is one of the critical factors in the world and access to information is significant for all individuals, communities and societies, thus that each of them is able to learn and go forward. Official information refers to strategic, political and legal level guidelines produced by authorities. These high-level policies guide not only the public sector or NGOs but also private businesses and show entrepreneurs the direction the society should proceed to. Development and innovations depend largely on resources and networks, which are conducted through policies. For example, public finances can be directed to certain kinds of alliances so that they benefit common inteest. Local authorities, in turn, supervise regional environments and they are aware of economic profiles, social structures and active operators in the area. There is no doubt that from a variety of perspectives, increasing the activity of entrepreneurs to develop their business is a positive issue and developing economy benefits all community members, one way or another. Without knowing the official guidelines, however, the risk increases that entrepreneurs are not aware of the possibilities and their efforts are not fruitful and do not meet common interests.

One important area of IRIS has been enabling local communities and micro-entrepreneurs to reach official information through libraries.

Picture: Markku Rajala and Getrude Ntulo at work.

The process started from mapping information services and through mapping, information services were typed, and their contents were identified, analyzed, located and eventually matched with entrepreneurs' needs, perceptions and preferences. In so doing, the gaps were identified and new services such as Entrepreneurs' Information Help Desk were designed to fulfil the needs and thereby improve not only entrepreneurs' but also entire communities' access to information.

Towards common understanding

Ways to work together and common understanding start to develop in the beginning of the project. Thus, the first steps require time and patience, especially in the case that partners come from different countries. Such is the case in the IRIS project, so before taking off, Finnish IRIS team members travelled to Tanzania to meet colleagues of TUDARCo to set team building. The kick-off meeting on 13th June 2017 was the concrete start of the activities of the project and a Finnish external evaluator was introduced and established in the project team. The project was noticed and the kick-off meeting was covered by several Tanzanian media, television channels and newspapers.

We may argue that the start of the project IRIS was excellent. The kick-off gathering was not only interaction between project members, but a number of stakeholders were included in the discussion. Collaboration with the **Commission for Science and Technology**

Picture: Sinyati Tira in a library.

(COSTECH), **School of Library, Archives and Documentation Studies** (SLADS), **Small Industrial Development Organization** (SIDO), **University of Dar es Slaam** (UDSM), **Tanzania Library Service Board** (TLSB) and **staff and students of TUDARCo** started practically on day one.

To be able to become successful, a project requires management-level support and their visible engagement to the goals. The Deputy Provost responsible for Academic Affairs at TUDARCo emphasized that the weak university-industry linkage requires attention and, in the future, active collaboration with working life is essential. In the context of IRIS, the community of micro-entrepreneurs is the linkage to industries and through this, the project is in line with the Tanzanian development agenda such as the Sustainable Development Goals (SDGs) 2030, Tanzania development vision 2025 and the National Strategy for Poverty Reduction. The IRIS project addressed this gap. The Vice Rector of TUAS, in turn, maintained that innovation pedagogy is a flexible tool that supports not only active teaching and learning processes but also networking with communities and working life. Rooting collaboration to curricula can ensure that universities are included in continuous interaction with working life and a link to industry is not optional.

The main objective of the IRIS project has been the capacity building of the partner institutions and empowering the surrounding communities through HEIs. These were reached by strengthening active pedagogical skills of teaching staff, enabling multidisciplinary cooperation, creating an inclusive communication environment

for HEI, community members, micro-entrepreneurs and organizations and encouraging all to innovation. However, in order to achieve the IRIS project goals, it was necessary to build strong teamwork. McEwan et al. (2017) refer to teamwork as a range of interactive and interdependent behavioural processes among team members that convert team inputs (e.g., member characteristics, organizational funding, team member composition) into outcomes (e.g., team performance, team member satisfaction). This definition was truly reflected in the IRIS project. Project IRIS organized into a Pedagogy team, Entrepreneurs team and Library and Information Services team. Each team had a clear connection to the three results curricula improvement, entrepreneurial skills and learning outcomes and improving access to official information. All areas were divided in clear parts that indicated the progress of the project. For example, curricula improvement was achieved by four steps: active pedagogy training, designing the new pedagogy model, piloting the new pedagogy model, and implementing new pedagogy to curricula.

The active project board has been of significant support in the implementation of the project. The board members from both partner countries represent higher education, research, micro-entrepreneurs, libraries and NGO's and their main role has been advisory. However, committed members have followed the project closely and participated in project activities.

Active pedagogy in practice

As planned, the TUDARCo IRIS team members attended an pedagogy training organized by the IRIS team of TUAS. The intention of the training was to offer an experience of the innovative pedagogical approaches and practices used at TUAS. The training introduced the concept of innovation pedagogy, activating learning and teaching methods, working life orientation and a variety of applications in practice for example, integration between studies and Research, Development and Innovation (RDI) activities. Apart from that, the flexible curricula of TUAS, which include a variety of elements such as a multidisciplinary approach, internationalization, entrepreneurship, versatile and development-oriented assessment, were covered. Specifically, the

training followed TUAS' Business Academy innovation pedagogy model. Through participatory and hand-on workshops, the TUDARCo IRIS team were in deep innovation pedagogy waters and they tested various active pedagogy methods in practice. The training changed the mind-set. Most lecturers in Tanzanian HEIs have received their education in a conventional, rather instructive or even behaviourist educational system (Lwoga, 2012). According to this system, the teacher is a guru and the role of students is to receive and store knowledge instead of actively processing or creating it. On the other hand, Konst & Scheinin (2018) assert that the task of a teacher is not to lecture but rather to support, encourage and guide to make lifelong learning happen and utilization of feedback possible. This is what was realized and learnt during the training.

Community approach

As mentioned above, active pedagogy includes the community members and working life operators in the learning process. In IRIS, one group of representatives of working life were micro-entrepreneurs who run their business near the TUDARCo campus. The project encountered 150 entrepreneurs, identified their needs and implemented selected needs to the new pedagogy pilots. Could we call this a kind of reverse innovation process? Small local needs are recognized, the most suitable of them are offered to students' teams to resolve them, and the result benefits learning and business and might be the seed for further development. As emphasized by Konst and Scheinin (2018), "education needs a change in direction, from traditional knowledge-based to mosaic-like competences". Not only that, but "teachers have a role to promote learning" (Konst & Scheinin 2018). In fact, this was done during the piloting of the new innovative elements. During the piloting sessions, teachers were able to promote learning by emphasizing the acquisition of competences (knowledge, skills, performance, and attitudes) and qualities which enabled students to self-evaluate during the learning sessions, using for example the Motorola approach as will be explained in the proceeding chapter.

Apart from piloting pedagogy, engagement of micro-entrepreneurs to the IRIS project and their motivation to continue interaction with

Picture: The indicator.

TUDARCo was high on the agenda. One example of this is a micro-entrepreneurs' breakfast event organized in April 2018 at TUDARCo. A number of entrepreneurs was invited and attended the event, which was also expected to expose students to the micro-entrepreneurs community. Moreover, the event offered students a chance to exploit not only entrepreneurial thinking and skills, but also to learn what kind of challenges real business faces. Androutsos and Brinia (2019) observe that through that process, students would acquire innovative, collaborative and co-creative skills and competences in an experimental and real-world way. In addition, the event offered participants an option to meet authorities and information providers such as Tanzania Bureau of Standards (TBS), Tanzania Foods and Drugs Authority (TFDA), financial institutions, COSTECH and SIDO. micro-entrepreneurs had a chance to hear an inspirational speech from one of the most influential motivational speakers in Tanzania, Eric Shigongo. He is an entrepreneur and a TUDARCo student pursuing a Bachelor of Arts degree in Mass Communication. His speech did not only change the mindsets of micro-entrepreneurs but also of staff and students who were present. During the breakfast event, micro-entrepreneurs had a chance to showcase their works, sell some of it and network.

Discussions based on shared experiences and research was a much-used method in IRIS. For example, during the second pedagogy training in TUAS, head of Education and Research Jaana Kallio-Gerlander presented the big picture of university industrial cooperation whereas Dr Harri Jalonen focused on reverse innovation. Service design methods, in turn, were applied in a workshop that focused on library services. The workshop participants were librarians from public and academic libraries, information service specialists, and students and teachers in library and information studies. On purpose, the service design workshop was conducted at the venues of Tanzania National Central Library. The authentic environment and opening words of director of Tanzania Library Services Board, Dr Alli Mcharazo, encouraged library professionals to participate in the activity. Literature by Marquez and

Downey (2015) and Mager and Sung (2011) on service design reveals that service design should take a holistic, co-creative, and user-centred approach to understand customer behaviour for the creation or refining of services. On the other hand, Polaine and colleagues (2013) assert that services do not operate in a vacuum, but rather in tandem with other established services. It is through this lens that services are refined and improved or even created to meet user needs and expectations.

Deeper into active pedagogy

Androutsos and Brinia (2019) indicate that the UNESCO 2030 agenda highlights creativity, entrepreneurship and innovation as key enablers for sustainable development. However, in some HEIs' curricula, entrepreneurship education is not featured enough. Not only that, but also teaching methods and learning practices do not provide enough opportunities for students to be creative and innovative. According to Androutsos and Brinia (2019), there is a gap between real-world needs and education methods and practices regarding the current and future societal needs. As this gap was identified earlier in the text, it was necessary to organize advanced active pedagogy training to enrich active pedagogy skills. This training was organized in September 2018 in Finland and the main goal was to extend active pedagogy skills, not only through a variety of innovation pedagogy approaches, but also including the management level and department of Future Learning Design of TUAS in the discussion. The intention was to present a kind of holistic view thus that pedagogy thinking and development in the university requires commitment of all levels. In addition, the theoretical approach was included in the discussions and especially complexity thinking and theory of change. A more practical perspective was involved through event production, pitching and communication trainings.

The IRIS team visited a variety of environments, such as the Firma at TUAS. The Firma is a student-run company performing ICT-related projects like website design, graphic design, mobile applications and games as a part of their study assignments. Students with rather minimal supervision complete the study projects. However, the Firma is most of all a learning environment so it provides safe conditions for students to test and make mistakes before they enter real-life companies. According to Kettunen, Kairisto-Mertanen and Penttilä (2013), "problems are solved and innovations are created in groups and networks in working life". Apart from that, the authors continue by noting that "group-based learning is superior in comparison with individual learning for relatively complex problem-solving tasks". It is on this basis that students at the Firma learn by doing in groups and network with working life. It was noted that it is better to fail at the Firma than to fail in a real company. Androutsos and Brinia (2019) observe that in order to foster entrepreneurship, young adults and future innovative entrepreneurs should not be limited by fear of failure.

Another practical learning environment is the Citizen's Helpdesk where ICT students from Turku University of Applied Sciences help people with their IT problems and learn important skills such as customer service and ICT-related problem solving. Connecting students with working life while they are pursuing their studies at the university of applied sciences is crucial. Kettunen, Kairisto-Mertanen and Penttilä (2013) note that "learning in one type of setting (university setting) is not accessible when the learner is moved to another setting (working life)". Based on these facts Kettunen, Kairisto-Mertanen and Penttilä (2013) advise to create education systems that provide room for students to practice what they learn at the university of applied sciences and working life.

An invitation to the IRIS team to visit Paulig venues offered a concrete experience how industry–university linkage works. Finnish Paulig is an international company in the food industry and one of the main products of Paulig is coffee. The coffee roastery imports coffee beans from Tanzania among other countries. The International Coffee Partner (ICP) project is practical work among coffee-growers operating in the Mbeya and Mbozi regions in Tanzania. The goal of the partnership is to enhance coffee-growers' skills and business, and to support their families' lives. Paulig gave IRIS an assignment to assess the perception of the beneficiaries of International Coffee Partner (ICP) programme in Tanzania and particularly case of Kilimanjaro. The assignment was significant step for the project, and it challenged the IRIS team to combine all elements of active pedagogy.

Presentation of the new model

Androutsos and Brinia (2019) indicate that "innovation, collaboration, and co-creation" are the skills of the 21st century and the new active innovation pedagogy model of TUDARCo was designed through these mentioned skills. The interactive process of the IRIS team, students, micro-entrepreneurs and library professionals was co-creation in practice. The OECD (2019) observes that collaboration, digital tools, and the interaction with users are the key competences for the youth, young adults, and the human capital of the economy.

The IRIS project plan presents an innovation event called Tanzanian Innovation Pedagogy Event (TIPE) that was finally organized in March 2019 during the Dar es Salaam Innovation Week. The innovation week concentrates on social innovations and it is organized by the Human Development Innovation Fund (HDIF). The selection process picks the innovative ideas and presentations that are presented to the audience during the week, which was titled *Scaling and Sustaining Innovation for human development*. The innovation pedagogy model completed in the project IRIS was named the FinTan Pedagogy Model and FinTan was successfully selected to the innovation week. The IRIS workshop and stand S*caling and sustaining innovations in education* gathered a wide range of stakeholders; private and public sector, NGOs, authorities, micro-entrepreneurs, university staff and students. At the COSTECH venues, the model was presented and shared to a large audience in a showcase planned by TUDARCo students. The academic side event was arranged at the Tanzania Central National Library and it particularly inspired university teachers and students and library professionals but besides some micro-entrepreneurs wanted to hear presentations and participate in discussions.

Some outcomes

One significant outcome of the IRIS Project was inclusion of the FinTan Pedagogy Model to the new courses designed in the curriculum of TUDARCo. As a matter of procedures, the curriculum was presented to TUDARCo academic organs and approved and later submitted to Tanzania Commission for Universities (TCU) for validation and approval. In May 2019, the curriculum was accredited by TCU.

Another significant outcome was interaction with micro-entrepreneurs. A total of 120 micro-entrepreneurs were mapped and later 70 of them continued fruitful communication with TUDARCo.

Moreover, an information help desk was planned and implemented to support access to official information among micro-entrepreneurs. Concretely entrepreneurs' information help desk is situated on the TUDARCo campus and it is run by the university library staff and students.

Furthermore, in the HDIF innovation week, IRIS managed to share the FinTan Innovation Pedagogy Model with other HEIs and created new connections with companies. A good example is an agreement between ESS Creative and Legal foundation and TUDARCo of student assignments.

Conclusion

With this report book of IRIS, it has been realized that producing competent and knowledgeable graduates is a prerequisite to any university. As noted by Kettunen, Kairisto-Mertanen and Penttilä (2013), innovation competencies (knowledge, skills and attitude) are "learning outcomes needed for the innovation activities to be successful". In fact, methods used in teaching and learning practices matter a lot and how teachers and students interact constitute a base for learning and thus enable the forming of innovation competencies. The current Tanzania National Development Policy and strategies to alleviate poverty and the ambition to become a middle-industrialized country will not be fulfilled if universities do not address community needs. Innovation pedagogy, which facilitates the university–industrial linkage to solve community needs and working life demands, can be a solution. By adopting the FinTan innovation pedagogy model, universities will not only be the pioneers of change and early adopters but will also be a unique university which produces unique graduates who are competent, knowledgeable, full of practical skills and capable of competing in the labour market and creating new employments to others. The HEI's management, teaching staff and students need to embrace the change and be flexible enough to influence the changes.

Picture: Paula Ailio and
Gideon Enock walking.

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The Art Of Enabling Reverse Innovation – a Complexity-Based Approach

The Art of Enabling Reverse Innovation – a Complexity-Based Approach

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Introduction

> *"If you hear advice from a grandmother or elders, odds are that it works 90 percent of the time. On the other hand, in part because of scientism and academic prostitution, in part because the world is hard, if you read anything by psychologists and behavioral scientists, odds are that works at less than 10 percent."*
>
> **Nassim Nicholas Taleb** in *Skin in the Game***.**

This chapter is neither praise for grandmothers nor an argument against science and academic institutions. This chapter is about reverse innovation. Reverse innovation is an innovation for the poor that potentially transforms the lives of the people in rich countries (Govindarajan & Trimble 2015). Innovation is called 'reverse' as it challenges many assumptions about how innovations originate and diffuse. A car that costs only 2000 USD or a portable electrocardiogram (ECG) for less than 1000 dollars are tempting value propositions, which will also be noticed in economically developed countries. Grandmothers can play important roles in reverse innovation as they can help to understand the lived experiences in the particular context. On the other hand, academic research is needed and/or requires for the generalization of the particularities with concerns or observations.

This chapter explores the enabling conditions for reverse innovation. The chapter builds on the conviction that the black box of reverse innovation cannot be opened with the concepts developed mainly for the world of scientific and technological innovations. Therefore, in order to shed light on the black box, this chapter leans on complexity thinking and particularly on its metaphorical and critical pluralist schools (Richardson 2008). Adapting Rogers's (2003) division of innovation process into two phases, ex ante and ex post of the innovation decision, this chapter focuses on understanding ex ante conditions, not explaining how reverse innovation can end up on the shelves of multinational companies' stores in developed countries.

Reverse innovation – a new paradigm or old wine in a new bottle?

A paradigm refers to a set of assumptions about the nature of reality. Consequently, a paradigm shift means "a change in the basic assumptions…within the ruling theory of science" (Kuhn 1962).

Innovation paradigm consists of several assumptions, such as that innovation can manifest itself in a new or improved product, service, process or system. Similarly, innovation is about incremental, radical or disruptive change, innovation outcome is uncertain and risk, the novelty of innovation is context-specific. On the other hand, innovation adoption and diffusion are complex processes and innovation embraces diversity and creativity. A history of innovation tells a story where scientists make breakthroughs by continuously and rigorously exploring the unknown. Though serendipity (i.e. the accidental discovery of something valuable) occasionally plays an important role, the innovation process itself has been seen as consisting of sequential activities such as knowledge gathering, persuasion of key stakeholders, making 'go' or 'no-go' decision and in case of a 'go' decision, the implementation of innovation (Rogers 2003). The project IRIS planned for go decisions which included all the aspects of this assumption.

The dominant view in the literature has been that innovation is something that arises from advances in science and technology.

Developing countries have been more or less on the sidelines. This is understandable, as high-end innovations require consumers who have purchasing power. Things are, however, changing. There have always been "stripped-down" innovations, which are "good enough" and affordable for consumers with low income. During the last 15 years, innovation researchers have witnessed a development where multinational corporations (MNCs) from medical equipment industry to telecommunications and from food industry to infotainment have invested in innovation actions in low-income countries.

The development called for new concepts and theoretical frames. Reverse innovation coined by Vijay Govindarajan (also known as 'cost', 'good-enough' and 'frugal' innovation, see more Zeshky et al. 2014) refers to those innovations which are first adopted by developing countries and low-income markets before they diffuse to developed and wealthy countries (Govindarajan & Trimble 2015). Like all innovations, reverse innovation means unleashing creativity for seeking novelty and changes in an uncertain and complex process. For example, concepts of open innovation (Chesbrough et al. 2006), user innovation (von Hippel 2005) and social innovation (Mulgan et al. 2007) share many similarities with reverse innovation. They all pay attention to everyday needs, roles of end users and the interactions between 'innovators' and their environment.

However, as reverse innovation first takes place in the developing world and is then adopted by the developed world, it fundamentally challenges many assumptions related to science-intensive and technology-oriented innovations. It does so, because it praises the 'less is more' thinking. Reverse innovation suggests a turn in the flow of innovation from 'west-to-east' to 'east-to-west' (Govindarajan & Ramamurti 2011). Govindarajan describes the counterintuitive nature of reverse innovation as follows: "… sometimes it's easy to see why a poor man would want a rich man's products, but it is not easy to see why a rich man would want a poor man's product" (Govindarajan & Euchner 2012: 13).The problem arises when the creators' mindsets contradict with the unique economic, social and technological contexts of adoption and diffusion of reverse innovation (Winter & Govindarajan 2015). Reverse innovation poses new dilemmas which cannot be solved without a mindset change. Zeschky

et al. (2014: 271), have suggested that in order to succeed in reverse innovation, "Western MNCs may need to reconsider the subsidiary's role of a local adaptor and transform it into a value-creating innovation" and even into "a new type of centre of excellence, i.e., one that focuses and specializes on the development of frugal – as opposed to advanced – product innovations". Reverse innovation means that "the innovation loci and foci are changing and there is a need to update innovation management theories, models and frameworks" (Simula et al. 2015: 1567).While intuitively thinking the 'less is more' approach sounds easy to implement, however, it might be as Taleb (2018: 25) suggests "it is harder for us to reverse-engineer than engineer".

Complexity thinking in innovation literature

Complexity thinking refers herein to a multidisciplinary approach in which comprehensive, holistic thinking replaces a worldview where simplifying causal relations and reductionism as well as a linear reasoning, control over matters and predictability are emphasized (cf. Mitleton-Kelly 2003, Krakauer 2019). Complexity thinking assumes that events and phenomena are interwoven in way that they cannot be separated. While the whole is constructed of parts, the whole cannot be reduced to its parts. This also means that complexity qualitatively differs from complicated. Cilliers (1998), for example, explains the difference as follows "a jumbo jet is complicated, but a mayonnaise is complex". A jumbo jet can be manufactured with detailed instructions and mayonnaise can be made with a good recipe, but only the jumbo jet can be taken to pieces and built again. Making mayonnaise is an irreversible process: when soybean oil, whole eggs, vinegar, water, salt, mustard, sugar and other ingredients have once been blended, they cannot be separated in any meaningful way. Similarly, innovation is a blended process whose result emerges through interaction within and between ideas, people and circumstances. The ownership of ideas can be traced, but even the best idea will fail if not supported by the people.

Complexity thinking has been used in different ways and for various purposes in innovation research. It has increased understanding, for example, on innovation processes, adoption and diffusion of innovation, innovation management and leadership and innovation policy. Frenken (2007) explored technological innovation and found out that complexity theory provides a useful approach for analyzing complex interaction structures between components of technologies as well as between agents engaged in collective invention. Chae (2012) developed an evolutionary framework for service innovation. Complexity theory allowed him new possibilities for capturing multidimensionality of service innovation and exploring service innovation strategies. Matei & Antonie (2015) used complexity theory for studying complexity-based insights on social innovation. They speak in favour of decentralization and self-organization and emphasized the need for building adaptive capacity. Chica et al. (2013) argued against thinking that links organizational learning, innovation and internationalization through causal linearity. Instead, they propose a dynamic theoretical model that has mutual causality at its core. Based on ideas originating in complexity theory, they suggested two different complex systems models. One is characterized by adaptive learning, incremental innovation and low internationalization, whereas the other is characterized by generative learning, radical innovation and global internationalization. Carlisle & McMillan (2006) described how innovation ability is, both in short and long terms, a key property of complex adaptive systems who try to navigate in an uncertain environment and make use of "the edge of chaos". Mendes et al. (2016) offered the complexity leadership theory, in which they argue and explain how learning and innovation emerge and affect organizational performance. Hall & Clark (2010) used the complex adaptive systems approach for describing opportunities and challenges of innovation policy. They suggest that adaptation capacity should be recognized as a key developmental priority when linking together new configurations of actors and resources to innovate solutions in ever-changing contexts. Bressers & Gerrits (2015) relied on complexity thinking in evaluating national knowledge and innovation programmes. They proposed a framework for evaluation that takes systemic complexity into account and helps to avoid the temptation of trying to reduce and simplify complexity.

A brief review of research literature shows that complexity thinking offers opportunities to explore, describe, analyze and to some extent

also explain innovation in many levels and different contexts. The next section will turn to show how some key complexity concepts can be used in the context of reverse innovation.

Reverse innovation through complexity lenses

Complexity thinking emphasizes interactions that produce unpredictable behaviour which, however, is constrained by order-generating rules. The power of complexity thinking arises from its ability to provide a coherent approach to regularities of irregularities of the behaviour of complex systems – i.e. systems (e.g. organization, team, groups) whose properties or characteristics result from the interactions within the system and between the system and its environment. It is believed that complexity thinking resonates with the fundamentals of reverse innovation as they both resist the management approach based on linear logic and causal reasoning. They both also resist the notion of determinism – the idea that any initial condition has only one, inevitable outcome. There are so many and interlinked causes behind reverse innovations that the outcome is practically unpredictable (cf. McCrystal et al. 2015).

Enable self-organization

Self-organization refers to a spontaneous and endogenous process of organizing through increasing and decreasing information (Mitleton-Kelly 2003). It occurs when a complex system exchanges information, operates and is constantly shaped by the actions of other entities. Self-organization can be described as a chain in which the production of information is followed by imbalance or chaos, which requires the reduction of information, which in turn implies a reorganization of the complex system. Adapting Prigogine& Nicolis (1989), it can be argued that a system's ability to generate and reduce information determines its self-organization capacity.

Self-organization is an important enabler factor for reverse innovation for two interlinked reasons: reverse innovations arise from localized interactive processes and they require the ability to manage uncertainty. The locality means know-how about the needs, expectations and constraints of potential innovation adopters. Zeschky et al. (2014), for example, studied the organization of reverse innovation in MNCs and found out that in order to succeed, the design and development of reverse innovation should be located in the MNC's subsidiary based in a resource-constrained environment. Local people know local challenges and opportunities. People grown up and trained in developed countries do not know what it means to live in a resource-constrained and therefore they are not able to understand the local needs. To absorb local requirements and to adapt local constraints, Govindarajan (2009) also speaks for the local teams. According to him, local teams can learn fastest the unknowns and resolve uncertainties through experiments. Self-organization happens when local teams exchange information, take actions, and continuously adapt to local markets instead of the imposition of an overall plan by top management. Accordingly, the focus of management should be shifted away from a delivery capability to interaction capability.

Promote emergence

Emergence refers to high-order structures that arise from the interaction of systems components. Emergence is an interactive process which creates an emergent whole that is more (or less) than the sum of its parts (Mitleton-Kelly 2003). The emergent entity is not just composed of constituent parts. Emergent entities can interact with the parts from which they emerged. The process known as downward causation means that the emergent entity also exerts some degree of influence or constraints on its components (Blitz 1992).

There where self-organization emphasizes the process of increasing and decreasing information in a beneficial way, emergence directs the attention to the structures that simultaneously arise from and fuel self-organization. While Zeschky et al. (2014) stress the importance of the locality of reverse innovation, they also argue that local development teams need access to corporate resources such as technological know-

how, existing platforms and corporate marketing and sales. Similarly, Govindarajan (2012) emphasizes change "from below and above", by which he means the two-part approach where local teams generate ideas from below and top management orchestrates changes from above. Reverse innovation emerges through local interactions but not in an organizational vacuum. Assumptions, values, beliefs and practices create the organization's innovation culture which influences on what can and what cannot emerge. Innovation culture is enacted through feedback processes, which are crucial for the emergence of reverse innovation for two reasons: positive feedback stimulates ideation and increases local teams' degrees of freedom, while the role of negative feedback is to balance local ideas with strategic goals and help to create a route from opportunities to market.

Embrace diversity

Diversity refers to a state or quality of being different in some way. Diversity is seen as prerequisite source for unpredictable self-organizing and the emergence of novelty. Many scholars have argued that without diversity there is no difference that makes a difference (e.g. Holland 1995, Mitleton-Kelly 2003.)

Reverse innovation is innovation with the local people, not for the local people. Govindarajan (2012), for example, has stressed that reverse innovation embraces emerging-market knowledge and expertise in way that shatters the dominant mind-sets in MNCs. Instead of educating product designers about local needs and "parachuting them into an emerging market for a few days", reverse innovation calls for engaging potential innovation adopters at the beginning of design process (Winter & Govindarajan (2015). Similarly, Zeschky et al. (2014: 271) have pointed out the importance of a 'frugal mindset' which "is best developed by maintaining an R&D unit in a resource-constrained environment that exposes engineers to the severe living conditions of poor customers". Zeschky et al. (2014), Winter & Govindarajan (2015), and many others speak for diversity as it helps to generate innovation initiatives which fit with their context. The more diversity within the initiators, the more absorptive capacity (cf. Cohen & Levinthal 1990)

they have and the less susceptible they are to confirmation bias (cf. Nickerson 1998). Diversity feeds the polyphony of perspectives (Hazen 1993), which is extremely important for reverse innovation, because it helps to make sense of local needs, wishes and constraints and lays the foundation for the legitimacy of innovation.

Support co-evolution

A system's survival depends on its ability to adapt to the evolution of one domain or entity, which is partially dependent on the evolution of other related domains or entities (Mitleton-Kelly 2003).Co-evolution builds on connectivity within the system and between the system and its environment points out that actions by any actor may affect (constrain or enable) the related actors (and systems).

The rationale behind reverse innovation "is not that people in developing countries are willing to accept lower quality and products based on sunset technologies" (Winter & Govindarajan 2015). Instead, reverse innovation builds on the idea of creating "optimal solutions, not watered-down ones, using the design freedoms available in emerging markets" (ibid.). Similarly, the co-evolution argument highlights the importance of the identification of enabling and constraining factors. Reverse innovation is not an island. Quite contrary, they are initiated, designed and adopted in a particular context with many interconnected elements. To understand social and economic factors, Govindarajan (2012) suggests an ethnographic approach (Govindarajan & Euchner 2012). To him, traditional market research based on questionnaires has no value. Instead Winter & Govindarajan (2015) encourage to observe potential users in their everyday environment and study the pros and cons of the technical landscape. This enables not only the identification of problems but also creative solutions to solve them.

Exploit attractors

A complex system co-evolves with its environment through various serial phases, but its behaviour is limited by dominant attractors. An attractor is a dynamic organizing principle, a kind of magnet to which a system's behaviour converges over time (Holland 1995). Sometimes a system may undergo a significant type of change, a phase transition into a new phase dominated by different attractors (Nicolis & Prigogine 1989).

Due to attractors, each system has its own characteristic set of behaviours, assumptions and cognitive patterns (Mitleton-Kelly 2004). Attractors can inspire thinking differently, support ideation and promote continuous change. On the other hand, they may also produce functional (how things are done), cognitive (how things are seen) and political (what is seen possible) lock-ins which limit the ability to change (cf. Grapher 1993). Reverse innovation is a difficult endeavour as it challenges many presumptions about how innovations are initiated, designed and implemented. It also asks casting off many existing practices. Winter & Govindarajan (2015), for example, found out that innovation designers in MNCs "struggle to get away from existing technologies" and face it difficult to digest "the idea that time-tested products, with modifications, won't appeal to lower-income customers". The resistance to change the mind-set can be rooted deep in organizations and therefore Govindarajan (2012) speaks for setting audacious targets and clear communication from the top management. In complexity language, there is a need for attractors which sponsor phase transition that breaks symmetry and provides multiple new choices. The system's dominant behaviour must be perturbed before a "reverse-innovation friendly" attractor can be set.

Conclusions

It can be argued that reverse innovation builds on effectuation logic (cf. Sarasvathy 2001). This is to say that reverse innovations emerge through the local processes where a set of means is given, and the focus is on selecting between possible effects that can be created with that set of means.

Reverse innovation is a resource-constrained innovation with potentially transformational consequences for many industries and provides new opportunities for industry frontrunners. Reverse innovation also

represents a paradigm shift as it has changes how innovation is framed and questions many assumptions related to creation, adoption and diffusion of innovation. Perhaps reverse innovation requires a kind of 'skin in the game' attitude (cf. Taleb 2018: 24), i.e. accepting that "you may not know in your mind where you are going, but you know it by doing" it is in a form of learning by doing.

This chapter suggests that complexity thinking provides a potentially useful approach to reverse innovation as it helps to understand the emergence of innovation through the process of self-organization. It explains how reverse innovations are always enabled or constrained by social, economic and technological factors in the particular context. It also provides insights on how these constraints can deal with diversity and how attractors can deliberately be used for promoting a reverse innovation mindset.

The chapter concludes with the following five propositions: i) self-organization promotes reverse innovation by improving the ability of local people to exploit contingencies, ii) reverse innovation emerges when local initiatives resonate both with local needs and the organization's strategic goals, iii) diversity enables a polyphony of perspectives and supports the legitimacy of reverse innovation, iv) co-evolution points to the systemic nature of reverse innovation and highlights intrinsic design freedoms in emerging markets and v) the reverse innovation mindset can be promoted through a strategic use of attractors.

Taking complexity seriously means accepting that in trying to build a representation of enabling conditions for reverse innovation, the picture is necessarily incomplete (cf. Cilliers 2005). Managing reverse innovation is art as much as science (cf. Richardson 2008). However, we can comfort ourselves with the idea that knowing something that is very likely true is better than knowing nothing at all.

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Developing the FinTan Innovation Pedagogy Model for Higher Education Institutions

Developing the FinTan Innovation Pedagogy Model for Higher Education Institutions

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Introduction

Tanzania is one of the developing countries with a population of 54,199,163 people. About 70% of the population is made up of young people aged 15-35 (National Bureau of Statistics, 2016). However, statistics show that only 27% of these young people are employed (National Bureau of Statistics, 2016). Based on the above-mentioned statistics it can simply be generalized that that majority of young people in Tanzania are unemployed.

This situation is alarming and calls for stakeholder's attention. Since academic institutions such as colleges and universities play a major role in preparing and producing individuals for industrial life, they, therefore, constitute a significant part of the stakeholders concerned. The major question is that, to what extent do Higher Education Institutions (HEI)produce graduates with relevant and sufficient competencies, knowledge and skills to help them become self-independent and capable of employing themselves and creating employment opportunities for others. This question has for a long time remained unanswered.

Various national policies frameworks such Tanzania National Development Agenda, Sustainable Development Goals (SDG); National Development Vision (TDV) 2025-35; The second National Strategy for Growth and Poverty Reduction and the current Five Year Development Plan (FYDP II) 2016-2021 with a theme; "Nurturing Industrialization for Economic Transformation and Human Development" calls for competent and skilled graduates from HEIs all over the country, however, there has been little attention on how to get there particularly on HEIs teaching and learning methods.

Producing competent and skilled graduates require a good curricular with strong teaching and learning pedagogy among other things. One of the proven pedagogy in producing competent and skilled graduates is the Innovation pedagogy. In the context of this paper, Innovation pedagogy is the type of active teaching and learning which allows students to build up skills that enables them to create solutions/ new solutions or add value to their organizations, companies or community they are working with. It is a kind of pedagogy through which, learning and teaching correspond to the needs of the community and their working life. The emphasis is on applying learning and teaching methods creatively in a value-adding way to allow students to take full responsibility in reaching their goals and becoming succesful citizens (Konst and Scheinin, 2018). In addition to knowledge and skills that they acquire in the classroom, they also acquire innovation competencies required in working life environment.

Higher education pedagogy in Tanzania

The history of Higher Education Institutions (HEIs) in Tanzania dates back to the independence era with only one university college, the University of London with only one Faculty, the faculty of Law was established. In late 1970 and 80s, there were only four public universities. In recent years we have witnessed a number of both public and private universities and university colleges. According to TCU (2019), the number of universities and university colleges is 49 as of March 2019. Throughout their existence, these HEIs have made a significant contribution to the development of the country in various areas. However, alongside these achievements, in recent years there have been allegations about competences of the graduates. This has catalyzed HEIs and the regulatory bodies to rethink about the pedagogy used. Various efforts have been in place to contain this situation such as meetings, training, and workshop with a view of changing from traditional to modern active teaching and learning methods, but the demand is still very high especially on innovation pedagogy.

Studies by TUDARCo, (2017) and Surya (2016) show that in most universities, the lecture method dominates all the teaching and learning sessions. It is closely followed by seminar presentations and rarely discussion methods. Other methods like interactive lectures, flipped classrooms and project-based learning are rarely used. This situation is largely attributed to the fact that most of the classes are too large to use interactive approaches, the presence of unsupportive teaching and learning facilities and insufficient knowledge and pedagogical skills on part of instructors.

Although most curricular are flexible such that they can allow instructors to use various methods of teaching and learning, the guidelines provided by TCU are in one way or another limiting factor for them to be innovative as most of the learning hours are dedicated to lecture or class contact hours as indicated in Table 1 below .

Table one indicates the allocation of teaching and learning activities in HEIs in Tanzania. From the table, it is seen that only a few hours are dedicated to practical sessions, a situation that limits student's acquisition of practical skills which might be a factor for the allegations of incompetent graduates.

A study conducted at TUDARCo (2017) on innovation pedagogy practiced at the institution revealed that lecture method, group discussions, seminars, questions and answers approach featured as dominant and prevailing teaching and learning approaches used very often. Findings further showed that the approaches which are rarely used at TUDARCo comprise of practical's, case study and storytelling, simulation, context-based learning, hand-on activities, collaborative learning, and real projects. Additionally, other approaches which were rarely applied include industrial visitations, open online platforms such as the use of MOOC's, and MOODLE's, guest speaker, video games and video shows.

The findings above suggest that most of the teaching and learning processes take place in the classroom where lecturers present their topics and students take notes. This is a common approach not only at TUDARCo but also in other universities and colleges in Tanzania. There are several reasons attributed to the use of these dominant methods. These are, for example, ratio of students per lecturer is usually not appropriate; teaching and learning infrastructure in most

Learning Activity	1 Unit = 3 Credits (30 Learning Hours)	2 Units = 6 Credits (60 Learning Hours)	3 Units = 9 Credits (90 Learning Hours)
Lectures	15 Hours	30 Hours	45 Hours
Independent Study	5 Hours	10 Hours	15 Hours
Seminars/Tutorials	5 Hours	10 Hours	15 Hours
Assignments	3 Hours	5 Hours	8 Hours
Practical Sessions	2 Hours	5 Hours	7 Hours
Total	**30 Hours**	**60 Hours**	**90 Hours**

Table 1. Allocation of Hours to Different Learning Activities (Tanzania Commission for Universities 2014).

of the universities and higher institutions do not provide conducive environment for some of the methods to be used; lecturers do not have adequate skills on applying innovation pedagogy in their teaching and learning as observed by Surya (2016). Most of them are experts in their areas of specialization but they lack pedagogical aspects.

Introducing reverse innovation pedagogy at TUDARCo

For the last decade employers in Tanzania suffered from massive unskilled and incompetent graduates with high-grade certificates which do not necessarily match with their job performance. In most cases, the blame is on HEIs and their pedagogy (Surya 2016). Consequently, there is a rise in unemployed graduates who cannot either employ themselves or employ others. As earlier noted, this situation raises several questions and one being the type of HEIs curricular and the type of pedagogy used in daily teaching and learning.

In trying to fill this gap, Tumaini University Dar es Salaam College (TUDARCo), as one of the HEIs, in collaboration with Turku University of Applied Science (TUAS) pioneered to introduce an innovation pedagogy model for higher learning institutions in Tanzania. The journey to reverse innovation pedagogy started with a kick-off meeting conducted at TUDARCo followed by two phases of intensive training organized by the TUAS team, conducted at TUAS, Finland as described in chapter one. A lot of pedagogical skills and insights were shared with the TUDARCo team during the training. TUDARCo team was exposed to the Finnish way of learning particularly the business academia mode of teaching and learning. Elements like ice breaks, reading cycles,

training sessions, and problem-based projects were shared. The team was also exposed to evaluation as processes where elements like peer evaluation, individual and coach evaluation were shared. Knowledge about innovation pedagogy elements and how they are used in the teaching and learning process was then shared with students and faculty members at TUDARCo. It was received with mixed feelings just like any innovation. After some formal and informal discussions, the concept and was gradually accepted and some elements like reading cycles, interactive lectures, seminars/training sessions, were slowly adopted. Sahin (2006) puts clear that innovation may have been invented a long time ago, in this case, some elements of innovation pedagogy, but if individuals (TUDARCo faculty members) perceive it as new, then it may "still be an innovation for them". This situation is justifiable as observed by Roger's Diffusion of Innovation (DIO) theory that in any innovation there are innovators who adopt new ideas like technologies, concepts, and behaviors in early stages; early adopters, early majority, late majority, and the laggards. It was also expected that Innovation pedagogy at TUDARCo will follow the same trend.

Being a university that strives to produce a graduate who will not only excel academically but practically shape the future, TUDARCo embraced innovation pedagogy. Penttilä (2016) and Henningsen (2016) argued that Innovation pedagogy is all about finding solutions and implementing them, regardless of whether they are novel solutions to the problem or they add value to the improvement of the solutions used to solve the problem. The emphasis is on solving community problems. For example, business students are learning topics on business proposal write up in class, they should go to the community and find out companies, individuals who require business proposals and they don't know how to do it. They should develop a business proposal for these individuals as part of a class assignment or practical work instead of writing a long essay or a take-home essay on business proposal write up. Similarly, students who are learning a course on the law of contract, instead of writing long essays or take-home assignments about it, should go to the community, find out people who require contracts and construct workable contracts as part of their class assignments. However, for this linkage between HEI and community problems to work out, there is a need for close communication between the two parties. On the other hand, HEI pedagogy should be flexible enough and competent based to allow students to acquire more knowledge and practical skills, experience and attitude to be able to innovatively address community needs that may arise in any working environment.

In Tanzania and many other developing countries, it is a custom that research problems are usually defined by researchers themselves in HEIs and very rarely by the community even though the needs arise from the community itself. This is probably the reason why most solutions provided by HEIs in Africa do not meet the needs of the community. HEIs through their daily teaching and learning, research and consultancy, should get problems from the community and device workable solutions to solve community problems. In the context of this paper, this is reverse innovation.

Developing a new model

TUDARCo in collaboration with Turku University of Applied Sciences (TUAS) through the IRIS project and in response to the current market demand, TCU and College directive to review all curricular in accordance with the guidelines for University Qualification Framework (UQF), embarked on reviewing its current curricula in the spirit of improving the quality of program and incorporate innovative teaching approach. In fulfilling these obligatory requirements, a new model, the FinTan Innovation Pedagogy Model was developed.

FinTan Innovation Pedagogy Model is a medley of elements adopted from the Finnish and Tanzania innovative teaching and learning approaches. These include interactive lectures, reading cycles, training sessions/seminars, real-life assignments, projects, and independent studies. There is also an academic environment that encompasses teaching and learning environment and on the other side, there is the community/society from which the needs to be solved by HEIs arises.

The model generally advocates active teaching and learning methods. It focuses on innovation pedagogy where HEI, students and the community work together in finding solutions to various challenges

facing the community. In his education for self-reliance, Mwalimu Nyerere (1967) insisted on producing capable, well-skilled graduates who are beneficial to the community. In this case, HEIs are supposed to produce self-reliant individuals who can employ themselves and create employment for others. Similarly, Paulo (1921– 1997) in his education philosophy on education for liberation, wanted people to be freed from all forms of oppression and poverty. He wanted education to be a means of liberating people. These two education philosophies call for active innovation pedagogy form HEIs which will lead to the production of multi-skilled, competent, innovative graduates capable of working effectively and efficiently in any work environment. Unfortunately, most HEIs in Africa and other developing countries are far away from achieving this dream. In trying to fill this gap, TUDARCo developed the FinTan model with practical elements for African and other developing countries. The model consists of two major elements; Academic environment and the community.

Academic environment

Academic environment refers to a range of diverse physical locations, contexts, and cultures through which learning takes place. It ranges from physical resources and facilities like lecture halls, libraries, computer rooms and laboratories to modern technologies used in teaching and learning, skilled human resources, learning culture and the curricular involved. The conducive academic environment promotes the culture of productivity in learning where students become creative, innovative and autonomous in performing their learning tasks (Singh 2014 ; Bellaineh 2017).

For learning to take place there should be a web of social relationships as teachers and students interact whether formally or informally. When teachers treat learners as co-partners in learning, the results are usually good and impressive. Learners will fill that they are part and parcel of the learning process; they will be motivated, more innovative, creative in applying knowledge and skills gained to solve community problems.

Teaching and learning in HEIs in Tanzania are dominated by lecture methods where a teacher becomes the center of learning and students become passive learners who listen and take notes of whatever is being taught. This is called the banking system where teachers are depositors and students are depositories according to Paulo Freire (Surya, 2016). This method kills creativity and student autonomy in learning. To address this problem the FinTan model proposed active learning with interactive lectures. This is a type of teaching method where a lecturer uses more than one method of teaching in a single session. For example one may use a few minutes for a lecture, then students may be grouped and given the assignment to discuss and present what they have discussed. This method is applicable in both large and small lecture-based classes and is designed specifically to suit the environment where lecture method cannot be completely replaced, but rather enhanced and punctuated through creating interactive classroom experience and at the same time maintaining lecture as the primary content delivery mechanism. Techniques such as think-pair-share, demonstration and role-playing can be used to foster active engagement and enhance the value of the lecture method. This type of lecture can also be referred to as a participatory lecture.

Active learning involved several other teaching and learning methods like seminars. This is a learning approach that brings together students through their teams for detailed presentation and discussion of a particular subject or aspect which requires comprehensive coverage more than what interactive lectures can offer. Most of the topics for the seminar come from the lectures and this can either be before, during or after the lecture.

Another aspect of active learning is reading circles. These are conducted to increase the understanding of the theoretical and practical aspects of subjects studied. Students in their teams are allocated topics and articles or books to read in a given period and do the related assigned tasks before the reading circle is done. During reading circle sessions the lesson learned is discussed and shared. Finally, the common idea that summarizes and supports learning is made. Reading cycles are useful in student projects as they go through reading series to familiarize themselves with their project and find practical solutions suitable in

meeting the needs of their project. Topics of the reading circles arise from the project and the community (customer). Giving theoretical background but also techniques and tips on how to create solutions, also giving tips which can be tried out in project work.

Projects, both short term and long term projects which may take up to one year may be practiced by students. These projects aim to allow students to turn their knowledge and theoretical background learned in class into practice by providing solutions to community needs. Students divide themselves into teams of 4 to 8 students, select a project to be done based on what they have learned in class and work on it to provide the needed practical solutions. These projects are supervised and facilitated by one or two coaches/facilitators (Lecturers).

Practical Training; this is done at the end of each academic year for first and second-year students. Generally, students are attached to various companies for eight weeks to work as the employed staff does and are evaluated by their immediate supervisor on daily bases and the university lecturer at least once or twice. In the proposed new pedagogy practical training takes 40% and 60% is covered by the major project done in the particular academic year.

Evaluation is done in two major ways. The first one is Progressive evaluation which is a 360 evaluation process. The whole learning process before and after each assigned task done in teams is evaluated. It is divided into the individual evaluation, peer evaluation, and coach's evaluation. The project is also evaluated as part of continuous assessment. In the whole process of evaluation, the "Motorola approach" is used where each evaluator asks four basic questions;

1. **What was good?**

2. **What have we learned?**

3. **What could have been done differently?**

4. **What to take on board?**

All processes involved in project execution are evaluated. For example how reading cycles, training sessions, laboratory works, and fieldwork were involved. The evaluation also includes assessing the actual products, produced at the end of the project and project reports. Examinations are also part of the end of process evaluation which carries 60% as per Tanzania Commission for Universities regulations.

The community

Universities all over the world are recognized as a source of knowledge, innovations and technology transfer to the community. They are thought to be the think tanks in providing solutions to various social-economic problems facing the community. However, for many decades there has been a gap between industries and the community in many developing countries including Tanzania (Surya 2016; Association of African Universities 2012). Universities have triple roles; teaching, research, and consultancy or community outreach services. The problem is with the third role, community outreach or linkage. It is expected that through teaching and learning and research activities carried out in universities, solutions for various social-economic problems facing the community can be provided. Unfortunately, this is not the case. Universities in Africa are being blamed by not carrying out this third and crucial role effectively (Association of African Universities,2012).

In trying to address the above gap, TUDARCo through the newly introduced model, the FinTan model, used micro-entrepreneurs as a pilot to link what the students are learning in class and community problems. More details are presented in the next chapters of what was done and how it was done.

Piloting the FinTan model

The first pilot phase was conducted from April to June 2018. It involved a single course named Information Sources and Services (LIS 111). The course had 4 credits and 60 learning hours it involved 25 undergraduate students from the Department of Library and Information Studies. The second pilot phase was conducted from October to February 2019. It involved three courses namely Research Methods (LIS 205); Information Services for Africa Development (LIS 203) and Business Information (BIM 209). These three courses had 4 credits and 60 learning hours each with a total number of 60 students. In the active learning part, piloted elements involved interactive lectures, reading cycles, training sessions, projects, and the evaluation phase. In linking innovation pedagogy to solve community problems, micro-entrepreneurs residing close to the university were involved. The Paulig Company which imports raw coffee from Tanzania to Finland was a real-life case study.

Teaching and learning at TUDARCo particularly at the Department of Library and Information Studies has changed. It has changed from one way teaching method with a lecturer/instructor dominating to interactive sessions with a lot of learning activities in a session. Instructors are now using more than one teaching and learning approach in a single class with students as a center of learning. The results of using this method are impressive as witnessed by both lecturers and students.

Lecturers from the faculty of Education and Mass Communication Department have started using innovation pedagogy to solve real-life problems. It also came to our attention that other lecturers too are using some FinTan model elements knowingly or unknowingly. When asked what they have done some faculty members had this to share;

> **Instructor 1:** *"If I have a topic on environmental pollution, I gave my students a small project to integrate what they have learned in class into a real-life situation. I was surprised to see what students can do. They came up with practical solutions to solve environmental pollution along one of the Indian Ocean beaches"*

> **Instructor 2:** *"Through a small project, my students did a wonderful documentary on teaching and learning environment to people with disabilities at the college, he added; the students enjoyed doing it"*

These responses show that it is possible to implement some elements of the innovative pedagogy into teaching and learning activities. Faculty members have also learned that students are capable of organizing themselves and work together with very minimum or without supervision. Another lesson is that when learning becomes student-centered, learning becomes more meaningful and enjoyable. With regard to the current curricular being used at the college one of the instructors had this to say;

> *"The curriculum is flexible as it allows one to introduce new things in the course outline and re-arrange it based on the needs of the learners"*

Generally, TUDARCo curricula are flexible enough to allow lecturers to use various teaching and learning approaches. Lecturers may be able to implement all or some of the innovation pedagogy elements such as reading cycles, training sessions, practical and interactive lectures. However, the challenge is that the TUDARCo teaching and learning environment may not be that supportive to allow the use of some methods. Almost all lecture rooms have fixed chairs and some classes have a big number of students. For example, the Faculty of Law and the Faculty of Business Administration have big classes of about two hundred (200) or more students per class, a situation which makes difficulties in implementing some elements of innovation pedagogy like reading cycles or training sessions. Interactive lectures might be suitable for big classes and evening sessions as attested by one of the lecturers who teach evening classes;

> *"I now use interactive lectures for evening classes. Students became more active and interactive"*

Formal learning
Academic enviroment

STUDENTS · ACADEMICS · PUBLIC SECTOR · PRIVATE SECTOR · NGO

Active learning

Practical learning
Working life enviroment

» Experiences
» Networks
» Degrees
» Knowledge
» Skills

» Common tools & Best practices
» Collaboration & Partnership
» Innovation & Development
» Co-creation & Co-designing

» Capacity building
» Social cohesion
» Attitudes & Awareness
» Mutual understanding
» Regulation & Accreditation

Results » **Outcome »** **Impact »**

Active learning Interface between university and working life: projects, assignments, workshops
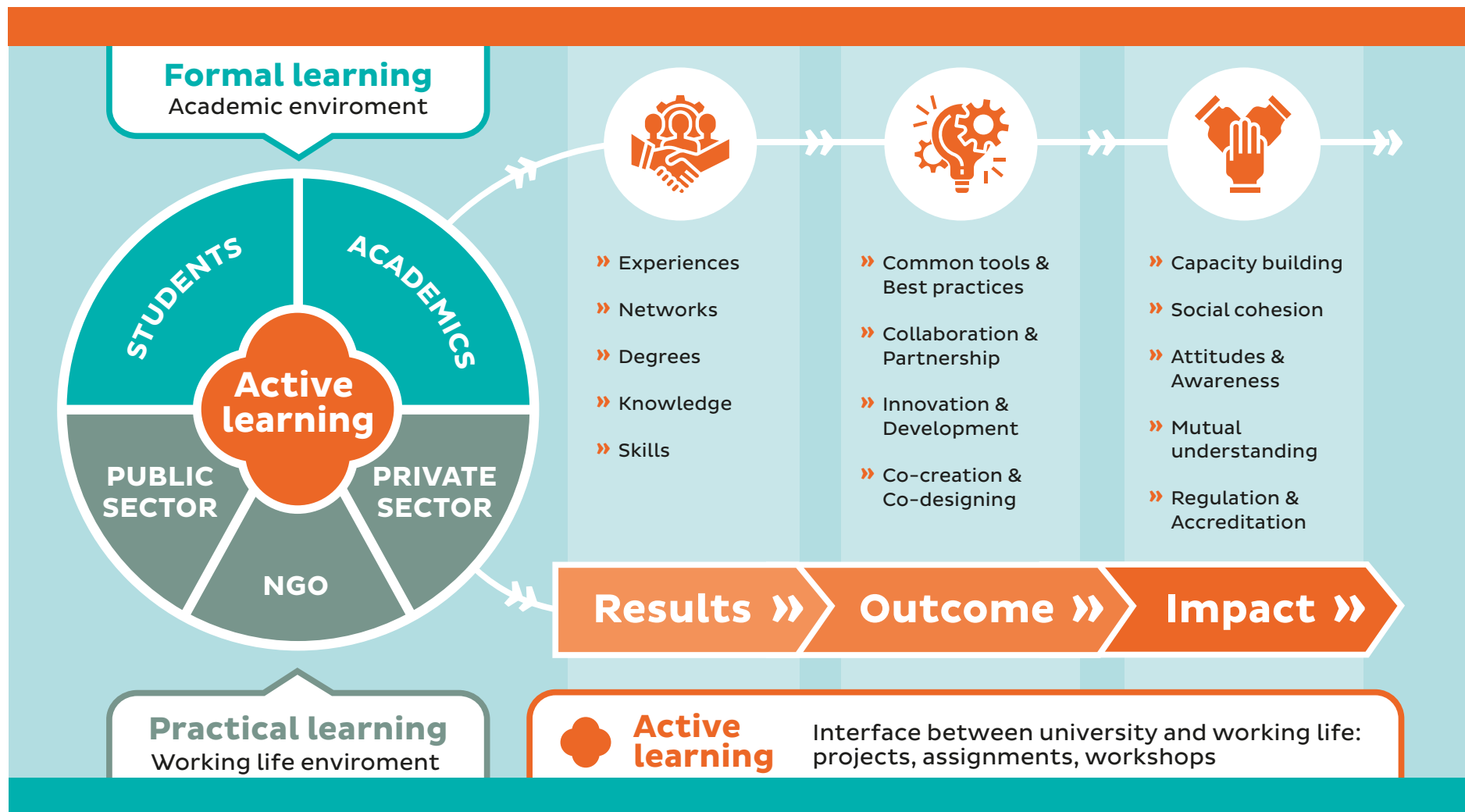
Figure 1. The FinTan Innovation Pedagogy Model.

In the teaching and learning process, lecturers need to be innovative in finding out which approach suits best in their classes. Apart from the fact that the environment and facilities at the university may not support lecturers to be innovative enough in their teaching and learning practices, some of them are not innovative simply because they lack competences and skills on innovative pedagogy. One of the students involved in pilot classes happily said this

> *"I am happy with these new active teaching and learning methods; they have helped me to build self-confidence, enhanced my team working spirit, time management and helped me to be a hard worker"*

Students did their reading circles to enrich their projects. Fourteen teams were doing different projects, each team had various sessions for a reading cycle. Topics were selected by students themselves; this made them be active readers, helped them to search various databases and information sources ranging from informal sources to formal sources. Through reading cycles they were able to learn and uncover a lot of innovative ideas for their projects and their daily social life as attested by one of the students;

> *"Reading cycles helped me to get a lot of information from various sources of information. I have realized that I can do a lot of things just by reading various articles"*

One of the students had this to say about seminar presentations;

> *"Personally seminar presentations made me read a lot to prepare myself. I have also gained confidence and presentations skills"*

Some training sessions took place during pilot phase one and two. Training sessions were student-driven and the topics for training emerged from their projects. Fourteen teams did their projects. The scheduled timetable which occupies two hours per session was not enough. Most of the training sessions were done on Fridays which was reserved for student's project activities and personal studies. Through training sessions, students were able to learn multiple skills such as presentation skills, communication skills, and teamwork. It also helped

students to sharpen their language skills and build confidence to speak to a large audience as attested by one of the students;

> *"Training Sessions has helped me in building self-confidence and speaking in front of people anywhere and at any time"*

Training sessions were followed by an active discussion and feedback. Presenters received feedback from them. This helped the presenters to evaluate their presentation and get more information on how to improve their training sessions. On the other hand, it also helped the students to inculcate a culture of receiving the feedback positively and work on it for further improvement of their work.

Another piloted element was conducting projects. Students divided themselves into teams. Each team comprises of 4 to 8 students and they were assigned coaches to guide them in the course of doing their projects. A total of fourteen independent teams were formed. Each team had a chairperson, secretary, treasurer, and other team members. Based on the piloted courses each team selected a project to work with to solve community problems. Project topics ranged from information service provision and training to ICT based projects. Each team had a meeting schedule where they arrange for reading cycles, training sessions, and project progress meetings. They used files and portfolios to record everything that is done for their project because at the end of the day the whole process involved in doing their project is evaluated and the grades contribute to their final grades.

Students were able to plan and manage their project activities. They learned to supervise themselves and organize their project activities. They learned a crucial role of team working and time management. They had more than five courses running at the same time and they had to work on their projects. They worked very hard to ensure that they effectively and efficiently accomplish both tasks as required. Some of the students had the following to share;

> *"It was not easy, we had a lot of assignments......but our teamwork has not just ended in class; we are planning to do something big together..."*

Another one said;

> *"I have acquired skills in data collection and analysis. I have also learned that Micro-entrepreneurs need a lot of information and it is our duty as information professionals to address their information needs as much as we can"*

Active teaching and learning methods helped students to gain multiple skills. One of the students had this to say;

> *"I am happy with these new active teaching and learning methods; they have helped me to build self-confidence, enhanced my team working spirit, time management and helped me to be a hard worker"*

One of the projects which were done by students was a research-based assignment provided by a real company based in Finland to research the social-economic benefits of certified and conventional farmers at Mamsera village in Rombo. One team consisting of four students took the assignment. They wrote a proposal, prepared data collection tools, collected data, analyzed it and wrote a report.

Picture 1. Students collecting data at Mamsera village in Rombo (Field data 2019).

Pictures 2 and 3. Students collecting data at Mamsera village in Rombo (Field data 2019).

Evaluation

Evaluation forms the basis of the teaching and learning process. According to the rules and regulations stipulated by the Tanzania Commission for Universities (TCU), all higher learning institutions in Tanzania should examine their students. The examination should consist of continuous assessment (Coursework) and the final examination. Continuous assessment is flexible and differs from one lecturer to another in terms of assignments, tests, and coverage. It carries 40% while the final examination (End of semester written examination) carries 60%. The two pilot phases were not complete without evaluation. Evaluation of the pilot courses consisted of two parts; continuous assessment (Course work) and the final examination. The continuous assessment consisted of 40% which focused on evaluating the whole learning process and the final written examination consisted of a mandatory end of semester written exam which carries 60%.

The continuous assessment covered all piloted innovation pedagogy elements i.e reading cycles, training sessions, projects, and one written test. Among these, it was only the written test which was evaluated by the lecturer/coach alone. Marks distribution tested on aspects like the ability of an individual to work in a team, critical thinking and argumentation, ability to effectively communicate with others, flexibility and commitment in working with others in a team and as an individual. Other aspects considered during the evaluation were the ability to engage others in a class presentation, individual creativity in projects and the end product for a project. Apart from formal evaluation, students had a chance to provide feedback and air out their opinion on innovation pedagogy. One of them had the following views.

> *"The evaluation session was very useful to me, not only in classroom sessions but also in my daily life. I have developed the habit of evaluating myself by asking the big four questions; what is good? What was not good/ what could have been done differently? What lessons have I learned and what to put into practice"*

Through the use of FinTan approach students are actively engaged in the learning process. The engagement of students referred here ranges from simple questions and answers in the classroom to organized problem based learning exercises and simulation to practical experiential learning in the community outside the university environment, popularly known as University – Industrial Linkage (UIL). The target is to make learning both theoretical and practical by putting theoretical aspects learned through lecturers, learning sessions and reading cycle immediately into practice through projects that provide solutions to real-life problems.

Conclusion

In conclusion, the process of developing a new active teaching and learning model for Higher Education Institutions in Tanzania led to several insights to students, teachers and other education stakeholders. Both theoretical and practical training matters related to innovative pedagogy utilizing the synergy of the Finnish and Tanzanian education systems were identified and utilized with the primary focus on improving the connections to working life that is integrated into the curricula.

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Bridging the Gap Between Community and HEIs: a Case of Micro-Entrepreneurs

Bridging the Gap Between Community and HEIs: a Case of Micro-Entrepreneurs

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Introduction

As pointed out in chapter one above**,** the second result area concentrated on improving entrepreneurial skills among higher education and strengthening learning outcomes by learning by doing. The outcome of this result area aimed at bridging the gap between industry and higher education institutions in Tanzania. Attention was paid to the need of female micro-entrepreneurs who are one important stakeholder group. In Tanzania, the full potential of the micro-entrepreneurs' sector has yet to be tapped, due to the existence of several constraints hampering the development of the sector. These constraints include an unfavorable legal and regulatory framework, undeveloped infrastructure, limited access to information, poor business development services, and limited access of micro-entrepreneurs to finance, an ineffective and poorly coordinated institutional support framework etc. It is for this reason that the IRIS project was developed to address the constraints and to tap the full potential of the sector by involving HEIs. The emerged needs of micro-entrepreneurs were the seeds which were cultivated by student teams in continuous communication with TUDARCo members and entrepreneurs. The activities supported directly the learning programs.

With limited information and statistics on micro-entrepreneurs' operations especially in the developing countries – Tanzania being one of them – there is general agreement that the sector faces limited access to credit, accuracy information and this is considered as a serious barrier. The sector has a huge potential for creating employment, generating income, contributing to foreign exchange earnings and the overall economic development and poverty

alleviation. In order to achieve it, the first activity was to map out and find the micro-entrepreneurs' communities. The activity included several sub activities. The students were able to manage the data collection and analysis as a part of their research skills studies. Finally, students made a selection, together with their supervising lecturers, about the micro-entrepreneurs meeting the IRIS criteria and being selected. The selection criteria included characteristics as size, gender, development needs and the capital of the company.

Engagement of selected entrepreneurs and to motivate them to concrete collaboration was done as a second activity. Active networking supports not only micro companies (entrepreneurs) who would find support from each other and learn from others, but also students and staff who got new links to the community. The third activity was to identity the needs of the selected micro-entrepreneurs. The identified needs were developed, researched and worked by the HEI students as part of their studies. The fourth activity which is continuous and sustainable is to implement real working life and its needs into the FinTan pedagogy model. The benefits of the model have led to review the current curriculum to add the innovation gained. Therefore, this chapter is a combination of the four interwoven activities, namely mapping, engagement and networking, identification of information needs and finally entrepreneurs are linked with higher learning institutions.

Mapping of the micro-entrepreneurs

The mapping of the micro-entrepreneurs was conducted in Kinondoni and Ilala municipals within the Dar es Salaam region. It included five wards. The plan was to reach 130 micro-entrepreneurs, however a total of 121 micro-entrepreneurs were mapped. The students were selected to distribute the research clearance letters in order to get permission for data collection. As research procedures demand, the request was granted for the period of 12 months from September 2017 to September 2018, including both mapping and identification of information needs. The study employed a questionnaire as a tool to collect primary data. The questionnaire was developed and administered randomly by

students to micro-enterprises' leaders, and individuals in different identified wards.

The findings include information obtained from the micro-entrepreneurs' community based on gender, age, business types, business location, and capital. The gender of micro-enterpreneurs was taken into consideration. This is because gender differences determine the number of micro-entrepreneurs conducting business in Tanzania as well as innovations in business. Out of 121 micro-entrepreneurs, it was noted that the majority of them were female by 64%.

The age of respondents was also taken into consideration. It was important to know the age of micro-entrepreneurs in order to predict the future trend of which age category is mostly involved in micro and small business. The finding shows that many micro-entrepreneurs were aged between 20–30 (37.19%) followed by 31–40 (33.06%) with small differences; the number for the age 60 and above was 2 (1.65%). The findings indicate that more youths engaged themselves in businesses than adults. In a general perspective, the unemployment rate faces the youth in developing countries including Tanzania. Currently most youths including graduates do face difficulties in finding jobs and therefore, micro and small business become one possible way to address the problem. Fortunately, after sometimes they have more potential of being employed compared to other adults. The main reason was lack of entrepreneurship mind be part of the course in Higher education Institutions, currently the government has directed all curricular to have courses on entrepreneurship courses.

Generally, the majority of female entrepreneurs are aged between 25 and 40 years and have a low level of education. On the one hand, these female entrepreneurs are a potential motor for the economy to generate jobs and reduce poverty. On the other hand, multiple obstacles continue to impede their capacity to start and grow businesses in sectors that generate high-quality jobs. Although many women have an untapped potential for entrepreneurial development, they are often impeded by the lack of the necessary capacities, skills and resources. They face more disadvantages than men due to legal impediments, cultural attitudes, less mobility and their businesses

tend to be younger and smaller than men's. All these areas came through in the report, to varying degrees. Indeed, as the different types of business were identified, it is noted that food processing, handcraft, textile, agri-business, and ICT related such as web design, graphics, and branding are the main types of business operated. There were thirty-nine different types of business conducted by the micro-entrepreneurs surveyed.

Research consistently shows that micro-entrepreneurs are concentrated in the informal, micro, low growth and low profit areas, where entry barriers are low but price competition is intense (Nchimbi 2003; Stevenson and St. Onge 2005; IMED 2010; UNIDO 2013; ILO WES 2013). These include trade, food vending, tailoring, batik making, beauty salons, decorations, local brewing, catering, pottery, food processing and charcoal selling. Higher education institutions have a role to play in order to make sure such challenges are addressed.

Another item mapped was the capital, since every business requires financial resources in order to start trading and fund growth (Olawale & Gware 2010). Enough financial support can help a business to sustain its growth and competitiveness in local, national, and international markets (Mansor 2005). Several cross-country studies have shown a positive correlation between access to finance and capital increase, firm growth, and productivity (Butler & Cornaggia 2011; Rahman 2011). The findings show that the majority of micro-entrepreneurs' capital ranges from 1,000 to 500,000 Tsh which was 73 (60%). .

The findings show that the startup capital of entrepreneurs differs, which determines the level of business. As for micro entrepreneur's ranges from 100.000 –5.000.000 TZH (Tanzanian shilling) which falls under small and medium enterprises category. The capital identified sends a signal that the majority of the micro-enterprises have low capital, which as a result affects even the plan of paying tax. On the other hand, it can be noted the business growth is in the infant stage because of the low capital they start with. It is high time for Universities to make an intervention through giving the right information in relation to funding sources.

Referring to other literature, it is indicated that the mapping of financial service providers reveals that most providers do not consider women as a specific target group. There are 32 registered commercial banks in Tanzania and none of these has a specific focus on female entrepreneurs, but some commercial banks such as Community Rural Development Bank (CRDB) and Standard Chartered have Small and Medium Enterprises (SMEs) windows, which focus on both men and women-owned SMEs. In addition, some banks have specific savings products for women. Semi-formal and informal financial service providers are focusing on Women – Owned Enterprises (WOEs). Micro Finance Institutions (MFIs) are leading in serving WOEs compared to formal financial providers. For example, the three leading MFIs in Tanzania, Brac, Finca and Pride, use Information and Communication Technology (ICT) tools in their operations and have a larger female customer base. In connection to the education level, the surveyed micro-entrepreneurs show that they are in low level, and as a result cannot meet this requirement of ICT tools.

Pictures are one of the sources among the main source of evidence. The following are some of pictures which were taken during the mapping of micro-entrepreneurs surveyed.

The main challenge was the motivation of micro-entrepreneurs to participate in the IRIS Project.

Along with the mapping activity, the motivation of micro-entrepreneurs was very important in order to participate in the project. Students were given an opportunity to brainstorm ways of motivating and encouraging them, and Facebook as social media was the option based on their environment. During the visitations, students motivated the micro-entrepreneurs to willingly participate in the IRIS project by elaborating the objectives of the project and how they will benefit from participating. They were encouraged for and trained to use social media in advertising their business. The students also assisted them with opening Facebook accounts and Facebook pages. As a result, the majority were motivated. Students insisted on making follow-up on the progress of their businesses as one of the ways to find out how successful the motivation was. The following are some of the selected challenges:

Picture 1. Amiri (a student) collecting data for mapping of micro-entrepreneurs' phase at Kinondoni municipal

Pictures 2 and 3. Nancy Macha soliciting information from entrepreneurs, one making Maasai culture accessories and another is a tailor, pictures were taken at Mwenge and Sinza.

1. Since most micro-entrepreneurs are very small businesses, they are not registered, and they don't pay tax, either. Majority of them were frightened and resisted to cooperate and provide information, thinking the students were from a government agency.

2. Most of them don't own smartphones, and thus it was difficult for the students' teams to open Facebook accounts.

3. Some of the micro-entrepreneurs try to do one business after the other, while for others they change their business locations as well and for a few of them, the phone numbers provided did not work, which makes it difficult to reach them.

4. Lack of awareness of using new technology devices and their applications to advertise their products or services.

The mapping of entrepreneurs' community was a crucial activity to contact numbers of companies. It also provides a general clear picture of the entrepreneurs' businesses. The participation and interaction of micro-entrepreneurs during motivation was a new hope to them and the IRIS project team as well and close follow-up continues in order to improve the businesses.

Engagement and networking

Engagement

The introduction of an entrepreneurship course in all programs aims to facilitate students' acquisition of knowledge and skills that promote job and employment creation skills. In fact, HEIs in the country and TUDARCo in particular need to create the new framework for teaching and learning that emphasizes multidisciplinary learning environments and project-based learning, as well as setting up the learning environment with fresh and flexible furniture and learning spaces. The approach behind the project IRIS is reverse innovation, which refers to the idea that everyday life could be supported by simple and low-price innovations which can benefit communities on a large scale. In the context of university education and learning, the idea of reverse innovation is connected to the need arising from local communities, working life and entrepreneurs. This need can be cultivated in collaboration between the university and community members. To start with, the project has included SMEs located in Dar es Salaam to see how TUDARCo, through this project, will empower them in the day to day business. Therefore, the study started by mapping them, finding their information needs and writing reports presenting the baseline information.

In order to identify the baseline information of Small and Medium-sized Entrepreneurs (SMEs) the survey was conducted around Dar es Salaam City. Research clearance letters were obtained from the regional office to allow researchers to collect data from different wards. Four wards were involved in this study, namely Kawe, Ubungo, Sinza and Ilala, which were used during mapping and establishing the information needs of micro-entrepreneurs. Simple random sampling was used to collect data from selected SMEs. A structured interview was used to collect information from SMEs in relation to the baseline information of respondents, such as capital, number of employees, and business status at large. The students were supervised in the data collection and analysis as a part of their studies in research skills, and in turn students are introduced to real working life.

The findings of the study include the business location, capital, number of employees, distribution of SMEs by sector and types of license they have. The findings show that the majority, 33 (66%), of entrepreneurs involved in this study are female. In Tanzania, particularly in Dar es Salaam region, small business are occupied by women. It was necessary to find out the location of each micro-entrepreneurs operator in Dar es Salaam region. The purpose of this question was to make sure that when networking, each entrepreneur will be able to know and access the entrepreneur networked with. The findings show that majority of the entrepreneurs 30 (60%) are allocated nearby the roadsides. The findings show that the majority of these businesses are not permanent. This can be proved by the City authority, as they are not allowing or giving permanent business licenses to such located businesses. As it was noted in the report of information needs of SMEs, the majority of them had a temporary license.

Range	Frequency	Percent
1-3 One to three	20	40
3-5 Three to Five	10	20
5-7 Five to seven	6	12
7-9 Seven to Nine	5	10
9-11 Nine to eleven	4	8
11-13 Eleven to thirteen	4	8
13- Thirteen and above	1	2
Total	**50**	**100**

Table 1. Number of employees (Field data 2018).

The determination of the number of employees working in each business center was paramount to gauge their status. The number of employees in each entrepreneurship was determined by asking the owner to mention the number of the employees she or he has. Respondents managed to mention the average number of employees per day or per month. However, they comment that the numbers of people mentioned are not stable because they leave the work every day. The expectation of having a bigger salary is high. Table 1 on the left contains a summary.

The findings above show that many of the selected micro-entrepreneurs have less than five employees. The situation was supported by one of the juice makers, who commented that …."*mmmm, ni gharama sana kuwa na wafanyakazi wengi kwenye miradi hii midogo, kwani utatakiwa kuwahudumia sehemu ya kulala hata matibabu akiugua".*

It means that it is very expensive to employ many workers in such a small business, and the reasons are several; some of them are accommodation and medical services when they get sick. The explanation given by such juice maker might be correct, but the main reason is salary.

The coverage of their marketing was also established, it is equally important as we determine how wide a service the SMEs provide. The coverage of the marketing will also help to measure how far the IRIS project has contributed to expand the services among the entrepreneurs in Tanzania. The study noted that the majority were working within marketplaces, within the street and others within the wards. A few pointed out that their coverage is within the district, region and all over the country. The findings prove that there is a need to empower SMEs on marketing strategies through different ways such as the use of social media tools, through networking, having a website, and through radio or television, whereby students will work closely with SMEs' operators by educating and designing social media use.

Another item included in the questionnaire was to find out the distribution of SMEs by sectors or types of business involved. A total of twelve (12) types of business or sectors were identified to be involved in their business in different locations as pointed out above. Among them, the majority of the micro-entrepreneurs were involved in minor petty business. This sector is involved by many individuals because the capital is low and location for their business is not formal; many of them are located along the roads. Other types of business identified by sectors were making oil and petroleum jelly, sewing, garden flower and decoration, poultry keeping, gas

supply, cloth dying, drawing, food catering, beauty and health care and brick making.

The findings above portray that the majority of the SMEs are from the modest business which include juice makers, fruit sellers and soap makers to mention a few. The reason behind this is the low capital they have as pointed out earlier on. It is the role of higher education institutions, HEIs, and other stakeholders of SMEs to educate financial institutions to make sure they find out means to help SMEs financially so as they can improve their business.

As per government procedures and regulations, no one is allowed to make any business without a permission or license. From this viewpoint, it was important to find out the types of license the individuals have in the business. The findings show that the majority 27(54%) of the entrepreneurs have a temporary trade license,. while some of them have professional registration as a way of making business in the city. Other types of license include professional registration (12%), local authority license (12%), temporary license (16%) and others had no license 6%. From this perspective, it was important to know the reason behind this; one of the entrepreneurs in minor business had to say "*kuwa na leseni sio mchezo, utapata wapi hela za kulipia, kwani biashara zetu hazmalizi mwaka tunabadilisha*". He meant that having a license is not a joke, how can you be able to have money to pay for it, because our business in many cases do not survive more than a year, we do change frequently. From the above observation it is very difficult for micro-entrepreneurs to have a permanent trade license. This is negative to the government because no tax will be collected and individuals will have no development in their business.

Networking

In any business, whether with profit or no profit, networking is very important. In the same vein, it was important in this project to find out how SMEs will be networked. micro-entrepreneurs were asked to agree or disagree by saying yes or no to whether they have any network in their day to day operations. The majority, 76% of them, said they have

no network in their day to day business. However, 24% comment that they have networking practices within their day to day operations.

Further they were asked to identify the kind of networks they have in getting raw materials. The following are responses from the micro-entrepreneurs: **Ans:** *My network of raw material is common where some raw materials have been found here in Tanzania and in neighboring countries. I normally order or follow them I got from Kigoma, Burundi, and Uganda*. Other response is **Ans:** *social networks, my relatives and Women development Groups,* **Ans**: *I usually get raw materials from local markets found at Tegeta and Kariakoo (by visitation),* **Ans**: *I usually get raw materials from Tandika* and the last one is **Ans**: *Through phone*. From the above situation it is shown that networking among micro-entrepreneurs is not very clearly known, because mentioning places of getting materials is not the meaning of networking. It is the role of this project to educate them in order they benefit from the project.

After knowing the situation of networking practices and the actual baseline of their business, it was important to prepare an event at which all micro-entrepreneurs involved in the project to meet, therefore a breakfast motivation event was organized. Fliers and invitation cards were used during the process of inviting them to the event. The event involved different activities such as speeches from motivational presenters, networking practices, and sharing experience among SME operators. Different micro-entrepreneurs were invited as were other stakeholders such as financial institutions. micro-entrepreneurs were given an opportunity to display their products as well and tell more about their products to participants, which was a successful. They even helped to know each other in the form of type of business they have, types of raw materials required and marketplaces. It was an opportunity to share their information related to the business and in turn create a network. There were two main types of networking established, one was individuals networking with each other and the second was networked through a WhatsApp group and Facebook account.

It is a fact that the lack of networking activities affects business practices of SMEs, as networking brings unity and provides information

on various business opportunities. It allows for experience sharing, exchange of knowledge, skills and technology, promotes confidence, influences changes in policies, regulations, training programs and programs' contents. The study by Olawale and Gware (2012) also emphasizes the importance of networking among beneficiaries.

Other authors point to the fact that networks account for differences between SMEs regarding their likelihood to succeed. Networks might also explain why SMEs are likely to upgrade in a particular country (Loewe et al., 2013). Olawale and Gware (2010) observed that networking has a positive impact on the SMEs' performance and increased legitimacy that in turn influences access to external finance and tapping of resources in an external environment successfully. In this regard, networking can help SMEs to access information on markets, resources such as finance, advice or support, together with access to official documents that are usually not easily accessible.

Identification of information needs

The survey was conducted around Dar es Salaam City, and as a matter of procedures, the research clearance letters were processed. They were obtained from the regional office from different wards in order to collect data to identify the needs of entrepreneurs. The survey covered four wards, namely Ubungo, Kawe, IIala and Sinza. Simple random sampling was used to collect data from different micro-entrepreneurs. A structured interview was used to collect information from micro-entrepreneurs in relation to demographic features of respondents, location of business, reasons for establishing a business, and challenges facing micro-entrepreneurs in running such business.

Since the project aimed at linking theory and practice, the students were organized with a supervisor during the selection of criteria and were considered as per plan characteristics such as size, gender, development needs and location of the informal company. They were divided in small groups for data collection and analysis was done with one team selected as a part of their studies in research skills.

The findings show that the majority (59.6%) of entrepreneurs involved in this study are female. In Tanzania, particularly in the Dar es Salaam region where population is large compared to other regions and cities, the majority of small business operators are women. One of the important elements in the entrepreneurship sector is experience or time spent in the same business. It was necessary to include one question to solicit information about experiences. The experience varied significantly, however (36.2%) of the entrepreneurs indicated that they have been in their business about three years. Also, some (6.4%) indicated that their experience is less than one year. The number of employees in each enterprise was determined by asking the owner of business to mention the number of the employees she or he has. The majority of the owners pointed out that they have employed between 1–3 people. Since the majority of enterprises are very small, it becomes difficult to employ many people to assist them in their business. This is caused by different factors, including low capital to startup businesses: as the businesses are not growing becomes difficult also to employ more people.

Reasons for starting a business

The study intended to find out the reasons for starting a business. The study came up with different answers, but the majority of them saw a good business opportunity (51%) as the main reason to start a business. Other reasons were after having capital, as a mean of survival, lost my previous job, wanted to supplement the income, wanted to be rich, having capital, could not find a job elsewhere, try out a business idea, support the family income, there are no other means of survival and was encouraged by friends, the majority are youth who are graduates, find it difficult to get job and a business opportunity became a solution to the problem while looking for other means to survive.

Another item which was included in the study was to find out the distribution of micro-entrepreneurs by sectors. The majority of entrepreneurs were involved in very small business 10 (21.2%). This sector is involved by many individuals because the capital is low as well as their business locations are not recognized by the government since they change from one place to another often. The table below provides a summary of the distribution of entrepreneurs by sectors.

Sectors	F	%
Carpentry	2	4.3
Sewing	4	8.5
Garden flower and decoration	4	8.5
Food catering	2	4.3
Gas supply	4	8.5
Cloth dying	4	8.5
Making oil and petroleum jelly	5	10.6
Brick making	1	2.1
Beauty and health care	2	4.3
Petty business	10	21.2
Poultry keeping	5	10.6
Drawing	4	8.5
Total	**47**	**100**

Table 2. Micro-entrepreneurs by sectors (Field data 2018).

Problems in starting a business

Higher education institutions can be able to make an intervention in addressing entrepreneurs or industry problems when they are identified or known. Addressing this aspect, it was necessary to have a question which aimed at addressing such problems. The following question was posed to them: "What kinds of problems/challenges did you face when you started your business?". The following table 3 presents the summary of the problems or challenges they faced.

From the table abobe, it can be observed that micro-entrepreneurs in Dar es Salaam, Tanzania are facing different problems in starting their business. The findings indicate that the majority of them face the problem of business skills and insufficient capital. The problem the majority of customers identified was lack of capital 45 (95.7%).

Information needs

Highly needed: Information to get license, Information on getting capital, Information on procedures to get business license/permits, Information on places to get equipment/materials/goods, Getting premises for business, Information on markets for my products/services, Information on how to handle business records/transactions.

Needed: Information on how to create a company/ business profile, Information to identify business partners, Information on how to write a business proposal, Business standards and regulations, Use of social media to market products, Where and how to get official information, Information on how to brand my product/services, How to advertise and promote my product/ services, Information on effective product marketing strategies, How to produce high-quality products/services, how to manage and improve my working environment.

Sources of information

Another area which is part of forming a baseline data is to determine sources of information used by micro-entrepreneurs before the IRIS project. Respondents were asked to identify sources they use to obtain and disseminate information or

Problems in starting a Business	F	%
Lack of business skills	35	74.5
Insufficient capital	45	95.7
Absence of reliable electricity	30	63.8
Awareness of opportunities	32	68.0
Designing procedures	23	48.9
Government revenues	35	74.5
Business places to start	35	74.5
Designing business	34	72.3
Identify potential customers	24	51.1
Capital creation	23	48.9
Confidence	23	48.9
Family matters	21	44.7
Sources of raw materials	20	42.5
Security of the products	19	40.4
Sewing equipment	17	36.1
Revenue collection	10	21.2
License budget	8	17.0

Table 3. Problems in starting a business (Field data 2018).

use for their business. The following are sources of information identified as part of the findings. The identified sources were categorized into three levels, and the first was about getting to know which sources were very frequently used. These were personal experience, friends and relatives, customers, television and radio. The second level was to identify which sources were frequently used; the results are newspapers, Internet, library and social media. The last level aimed at identifying sources which were seldom used; the responses were government websites, trade fairs like Saba Saba, brochures, commercial banks, and electronic databases.

The study has shown the information needs of micro-entrepreneurs in different levels. Significantly, the majority of their needs is on how to get capital, markets and improving the business environment. Through the project there is a need of addressing their needs by providing the access to relevant information identified by students. It is high time for students to be involved with different projects in order to help micro-entrepreneurs in their businesses. The teaching approach, not only at TUDARCo, is supposed to change by adopting the FinTan model where active learning is adopted and in turn, community needs are addressed.

Linking micro-entrepreneurs and active pedagogy

Practically, many of universities in Africa operate traditionally with academics and research being the core activities of the institution. The institutions are detached from the needs of the industry and are struggling to catch up with rapid change of technological innovations. There is a huge need to transform the university from its current status to include more innovation and entrepreneurship program to facilitate students' graduation with more than just basic theory, i.e. rather with practical experience and skills needed by the industry – third generation universities. Currently in Africa, and Tanzania in particular, innovation spaces and hubs play a crucial role in equipping youths with needed industry skills required for them to be employable or start their own ventures. There is less collaboration of industries with academic institutions, which limits their potential on creating further impact by reaching a larger group of beneficiaries and improving their process through learning and documentation, a role that can be played by academic and research institutions. Faculty members' (academic staff) rigidity, traditionally, is another issue; it is not common to a university professor to be told what and how to teach. Since the work-based teaching will

be adopted in the university curricula, it is expected that in the process some academic staff will be against it. The IRIS project managed to orient instructors through innovative pedagogy training. Students are involved to address micro-entrepreneurs' needs identified by providing solutions.

Initially, micro-entrepreneurs were asked whether they have connections of any forms with higher education institutions. The majority, 96%, pointed out that they do not have formal connections directly related to their teaching and learning practices. During the interview, other micro-entrepreneurs commented that the network they have with students is just established in a friendly or relatively bases. Graduates, and some of them are still students, help relatives' or friends' different ideas in running their business. Some activities are conducted by students to address the needs identified. One of the activities done by students for micro-entrepreneurs is the creation of a Facebook page for the entrepreneurs.

Paulig research

The IRIS project has been an excellent way to develop students' research skills, entrepreneurship skills, critical thinking, problem-based learning and creativity. Learning to study with the new pedagogical method felt difficult at the beginning, but soon the students had the chance to see the advantage of the new methods in practice. Students had to participate in identifying community needs. One of these was finding out challenges facing coffee farmers in the Kilimanjaro region. Instead of attending a lecture and listening to the teacher, the students now have an opportunity to question what they learn, discuss and share their ideas with other students and their teachers. For students the project works as a base to start their own enterprise, since during the project they learn to see a problem, solve it, sell services to customers and connect with entrepreneurs. Solving community problems directly is efficient and motivates the students to take the next step in changing their mind set and start with their own innovations.

Conclusion

The improvement of entrepreneurial skills among higher education and strengthening the learning outcome by learning by doing has been addressed. The outcome aimed at bridging the gap between industry and higher education institutions in Tanzania. The attention was paid to the needs of female micro-entrepreneurs who are one important stakeholder group. In Tanzania, the full potential of the micro-entrepreneurs' sector has yet to be tapped due to the existence of several constraints hampering the development of the sector. These constraints, to mention a few, are unfavorable legal and regulatory framework, undeveloped infrastructure, limited access to information, poor business development services, and limited access of micro-entrepreneurs to finance, ineffective and poorly coordinated institutional support framework etc. It is for this reason that the IRIS project was developed to address the constraints and to tap the full potential of the sector by involving HEIs. The emerged needs of micro-entrepreneurs were the seeds which were cultivated by student teams in continuous communication with TUDARCo members and entrepreneurs. The activities supported directly the learning programs.

In order to engage the community, the first activity was to map out and find the micro-entrepreneurs' communities. The activity included several sub activities. The students were able to manage the data collection and analysis as a part of their research skills studies. The students made a selection, together with their supervising lecturers, about the micro-entrepreneurs meeting the IRIS criteria and being selected. The selection criteria included characteristics as size, gender, development needs and local of the informal company. Learning by doing, students conducted a research in Kilimanjaro contracted by Paulig Company, were able to develop an online cake shop and create Facebook accounts. Above all, students were connected with the community and they managed to have their own real projects. Generally, micro-entrepreneurship as a sector has a huge potential for creating employment, generating income, contributing to foreign exchange earnings and overall economic development and poverty alleviation. It is through this project that students and the community work together to increase productivity, and in turn, an industrial–university linkage established and enhanced a café of SMEs.

Picture 4. Second year students in data collection practices

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Micro-Entrepreneurs' Access to Official Information in Tanzania

Enhancement of Micro-Entrepreneurs' Access to Official Information in Tanzania

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Background to micro-entrepreneurs' access to official information

In today's world, information is considered as one of the most important resources in such that its accessibility is mentioned as a constitutional right in many countries' constitutions. Information is this much emphasized, because it is of paramount importance as a driver of nearly everything in life. In Tanzania, access to information is mentioned in Article 18 (1) and 18 (2) of the constitution which states that:

> *Without prejudice to expression the laws of the land, every person has the right to freedom of opinion and expression, and to seek, receive and impart or disseminate information and ideas through any media regardless of national frontiers, and also has the right of freedom from interference with his communications. Every citizen has the right to be informed at all times of various events in the country and in the world at large which are of importance to the lives and activities of the people and also of issues of importance to society (URT 1998).*

Internationally, access to information is recognized in article 19 of the Universal Declaration of Human Rights of 1948 as a basic human right (https://www.un.org/en/universal-declaration-human-rights/). Similarly, access to information is enshrined as a human right in article 19 of the International Covenant on Civil and Political Rights of 1966, which states that:

> *"Everyone shall have the right to hold opinions without interference and everyone shall have the right to freedom of expression, this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers either orally, in writing or in print in the form of art, or through any other reduce of his choice."(ICCPR, 1966)*

Tanzania recognizes the role and importance of access to information and other human rights and has demonstrated this by being a signatory to these international human rights instruments. However, there is still significant discrepancy between theory and practice as the reality on ground is different, since many people are still facing big challenges in accessing information of different kinds.

Generally, there have been several problems affecting citizens' access to information, such as lack of awareness of sources of information, ignorance of the importance of information, reluctance of some government offices to provide information and lack of funds, which are some of the barriers affecting information accessibility. This situation has to a great extent affected human development processes in many ways including business endeavors.

In a study about the information need of women in small scale business in Dar es Salaam, Ndenje (2004) ascertains that access to business information is receiving little attention, to such an extent that there is a vacuum of studies that focus on the subject. On such grounds, understanding of entrepreneurs' information needs and the problems they face when seeking and using information is critically impaired. This implies that the majority of entrepreneurs are operating without appropriate information that would equip them with power to access the right information at the right time from the right source and consequently decide in an informed manner. The IRIS project, through one of its objectives, intended to find out the status of micro-entrepreneurs' access to official information, identified the gap and made an intervention through designing a service.

Design thinking framework

The design thinking framework was adopted to guide the service designing process. This is an integrative approach where the process of problem solving is considered together with its framework condition. Analysis of a problem and solution development are considered systematically and holistically in a form of a process. It basically focuses on thorough customer understanding and customers' needs and problems. The design thinking process includes understanding, observing, point of view (define the problem), ideating (finding and selecting idea), prototyping (developing prototype) and testing the idea (Mueller-Roterberg 2018). The framework allows designers to have a clear and deeper understanding of the problems and enables them to reframe in a more human-centric way, as it focuses on thinking and reasoning outside the box in a more creative and innovative way.

Mapping of information services for micro-entrepreneurs

In order to address a problem, it is important to have a clear understanding of its nature and extent. Mapping of information services for entrepreneurs was of critical importance as it formed the basis for effective understanding of the nature and extent of micro-entrepreneurs' access to official information and how it subsequently influences their business growth. Through mapping, information services of various types and subjects were identified, located, analyzed and eventually matched against entrepreneurs' needs, perceptions and preferences. In so doing, the gaps were identified, and new services designed in collaboration with potential customers to cover the identified gaps.
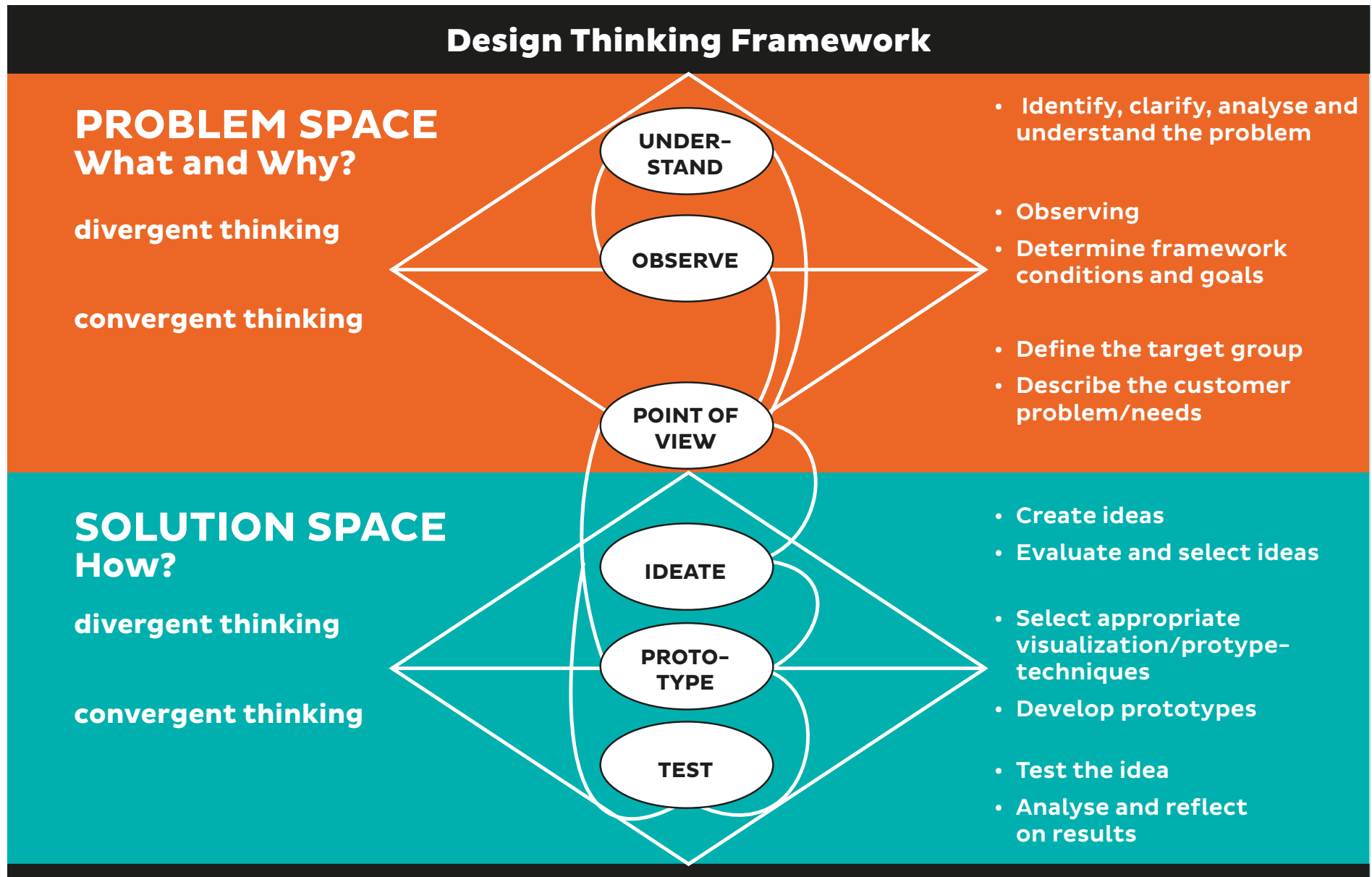
Figure 1. Design Thinking Framework (Mueller-Design Roterberg 2018)

Mapping approach

A standardized questionnaire with both open and close-ended questions for data collection was collaboratively developed by 15 students and two facilitators. The whole process started by a seminar whereby a presentation regarding the concept of information for micro-entrepreneurs was given and thereafter the students set in groups of five for discussion that ended in setting up questions for data collection. Later the questionnaire was tested and refined accordingly. Coverage of the questions included information about organization type and status of micro-entrepreneurs' information provision and information services designated for micro-entrepreneurs.

In order to get a sample, the students identified broad key areas where official business information can be obtained. The identified areas included government offices and Non-Governmental Organizations (NGO) providing micro-entrepreneurs information, libraries and business centers, academic institutions, research institutions, financial institutions and business incubators. From these broad areas, specific organizations were listed and considered as samples for mapping business information services for micro-entrepreneurs.

The three teams of five students each administered the questionnaire to the identified organizations from March to April 2018 by visiting the organizations. These students were randomly allocated to the organization to collect data. However, prior to commencement of data collection, permission had to be solicited from office of the Directorate of Postgraduate Research and Consultancy. The data collected were compiled and analyzed to derive conclusions.

Nature and types of the service provision

The specific objectives of mapping business information services for micro-entrepreneurs were to identify organizations providing business-oriented information services, their location, nature of the service and type of business information they provide. The ultimate goal was to establish business information services which would eventually be linked with the identified information need.

A total of 25 organizations were surveyed. Most of the organizations surveyed, 14 (60.8%), were government-owned organizations. This was deliberately done because official information and documentations are mostly channeled through government institutions. However, it was also important to include some Non-Governmental organizations because most of them support the government initiatives and are therefore considered as a formal channel for official information.

The nature and type of information resources in most of the surveyed organizations indicates that 17 (74%) organizations falls under the category of information centers, because the type of materials they provide specializes in one field or related fields as opposed to libraries which provide material to many subjects. A few organizations 3(13%) do not even have a room which can be referred as an information center; instead they have information or customer service desks where general customers' inquiries are attended to by the designated officers. Examples of such organizations are Districts and Municipal councils. The other 3 (17%) in the list of the surveyed organizations are libraries that provide generic type of business information to members in their respective communities. These include Tanzania Library Services Board (TLSB), College of Business Education Library (CBE) and Dar es Salaam University School of Business (UDBS).

Nature and type of users of information services

Almost all information centers in the above listed organizations serves insiders rather than outside customers. That is to say, information centers are mostly used by staff of the respective organizations for references than they are used by entrepreneurs. Most of the entrepreneurs' queries are handled by the customer service department and they are hardly referred to the information centers. In the information centers visited, it was difficult to find more than five readers. The interview findings show that entrepreneurs in most cases want quick answers for solving instantaneous problems. There are very few who engage themselves into in-depth searching and understanding the problems and challenges they encounter. That being the case, the most preferred materials are fliers and brochures because they are brief and straight to the point. Since these materials are found

at the customer service desk, one sees no need to go to the library/information center. In cases where users need technical know-how of doing or performing various things, they prefer trainings over studying by themselves. SIDO is the most popular organization in the country in the provision of trainings to micro-entrepreneurs. It is an organization with a countrywide network operating incubation services.

The missing link between information services and the demand/needs

Most of the surveyed information centers use the conventional information services such as reference, selective dissemination of information, current awareness, reader services, indexing and abstracting, just to mention a few. Nearly all the services in these information centers are non-outreach services and therefore serve only users who regularly visit the centers. The survey found out that the outreach services available in these organizations are organized and conducted by technical people with the support of public relations and marketing officers. Information officers are hardly involved. A librarian in one of the information centers said:

> *"In the next financial year, we will start doing outreach services alongside with the technical and other staff because our budget for that was eventually approved. This is after many years of waiting."*

Since information officers rarely engage themselves in outreach services and users do not come to libraries/information centers to seek for information, it implies that the services in information centers are inadequately used, because there are just few users physically visiting the centers. The following gaps were identified:

1. Lack of one stop center for accessing micro-entrepreneurs' information.

Each organization responsible for entrepreneurship welfare is working independently and as a result, entrepreneurs must move from one office to another seeking for basic working information for their business. Unlike macro-entrepreneurs who have a one-stop center for accessing information, which is Tanzania Investment Centre (TIC), micro-entrepreneurs have none. This calls for a countrywide network of such services to ensure micro-entrepreneurs' accessibility to the right information from the right source. This counter-acts the existing trends of relying on peers for information that would have been accessed through the official channels.

2. Information centers are hardly used by micro-entrepreneurs.

Even though many of the government institutions have information focal points or centers, the fact is they are rarely used by outsiders. According to the interviews, most micro-entrepreneurs are looking for quick responses to their queries which are mostly handled by the customer care departments. As noted earlier, this is because most micro-entrepreneurs are not interested in searching in-depth knowledge about their business such that they end up getting satisfied with mere handout and fliers.

3. Micro-Entrepreneurs are not used to using library services.

A trend in the use of libraries in Tanzania just like in many other African countries is low (Muneja 2013). This is affecting many aspects of life, including developments in business, because most micro-entrepreneurs are not used to using libraries where they could get a lot of business information necessary for opportunities and development their business.

Picture 1. Service design co-creation workshop.

Service Designing

Service design is an activity that involves planning and organizing resources such as people, infrastructure and other materials of a service for the purpose of improving quality of the service and the interaction between the service provider and customer. It may involve slight changes in the existing service or new creation of an entire service. The process involves an analysis of the existing services to find out how well they meet user needs and streamline them accordingly so that they do. To ensure that entrepreneurs and other stakeholders improve their access to official information as one of the IRIS project objectives, service design was considered as an important approach.

According to Fritsche (2010), service design addresses services from the perspective of the user and it must ensure that the service interfaces are useful, usable and desirable for client's point of view and effective and distinctive from the supplier's point of view.

Co-creation of the service

The service design of library services was collaboratively done by different stakeholders and it went through several stages. It started with a co-creation workshop. This was an important stakeholders' workshop which intended to analyze micro-entrepreneurs' situation, needs, wants and challenges and propose solutions. Over 50

participants of different cadres from government and non-government organizations that provide information and other services to micro-entrepreneurs in Tanzania participated. Such organizations are, for example, Tanzania Library Services Board (TLSB), Tanzania Food and Drugs Authority (TFDA), Tanzania Bureau of Standards (TBS), School of Library, Archives and Documentation Studies (SLADS), Economic and Social Research Foundation (ESRF), Research on Poverty Alleviation (REPOA), College of Business Education (CBE), Mzumbe University and Tumaini University Dar es Salaam College (TUDARCo). These stakeholders were identified during the mapping of library and information services which took place prior to the workshop.

As noted earlier, the purpose of the workshop was to gain an in-depth understanding of the micro-entrepreneurs in Dar es Salaam, Tanzania and their operating environment. Understanding customers included knowing their situation, needs, problems/challenges and wishes in as far as accessing information related to their business is concerned. Based on the analysis of the information gathered from stakeholders who work closely with micro-entrepreneurs and the micro-entrepreneurs themselves, the following were identified as the situation of most micro-entrepreneurs in the city of Dar es Salaam, Tanzania.

» They mostly rely on their peers as sources of information

» They have limited information on how to best operate their business

» Some of them are not registered (i.e. they are not formal)

» They lack innovation and because of that you may find a large group doing the same business in the same area

» Their business is on and off or does not grow mostly because they lack adequate capital

» Some of them are mobile. These are famously known as "Machinga"

» They dodge paying tax

» Some of them do not have fixed places for their business as official places for business are limited.

This kind of information formed the basis for a shared understanding of the micro-entrepreneurs' situation which was an important step in designing the service that would effectively interface between service provider and customer. On top of that, micro-entrepreneurs were further analyzed by identifying their needs and wants. This also was done to share understand of what is known about micro-entrepreneurs needs and wants as input to the service design. The following needs and wants were identified:

» Markets for their products and services

» Marketing support

» Business management support

» Quality and standards of products and services

» Information on how to access a loan from a financial institution for boosting their business capital

» Knowledge on how to manage finances

» Getting places for conducting their business

» Business networking

» Knowledge on how to process/manufacture and packaging goods.

The process continued by outlining challenges faced by micro-entrepreneurs when doing their business. This was also targeted to enrich the understanding of environment in which micro-entrepreneurs are working. The challenges identified are listed here under:

» Lack of enough capital

» Lack of adequate information about markets for their products and services

» Limited knowledge on how to best operate their business

» Lack of innovation in their business as most of them are doing the same business in the same area

» They are less networked.

After analysis of the situation, needs and challenges and/or problems of micro-entrepreneurs, the time came to devise workable solutions. The proposed solutions are summarized below:

» Analyzing their need to ensure that the provision of information face their information needs

» Repackage information according to their needs

» Improve their skills on designing and branding their products

» Improve communication network system of information to facilitate effective reach of the information

» Networking to allow them to support each other

» Improve their marketing skills particularly through social media (i.e. help them to effectively use social media such Facebook and Twitter to market their products and services)

» Provide them with spaces for business (e.g. market places, incubators and industrial packs)

» Train them on how to process, manufacture and package their products

» Improve library services to attract micro-entrepreneurs to visit libraries and read books and other sources of information related to their business

» Link micro-entrepreneurs with organizations which are ready to support them

» Create a one stop center for accessing business information for micro-entrepreneurs

All these findings from micro-entrepreneurs (i.e. Customer) had to be evaluated and checked against the available services. So, there was a need to survey the available services with a view of finding out the way they perform in relation to the findings above.

Service Safari

Service safari was an organized trip made to visit information centers for a purpose of observing or experiencing the service provision in genuine context. Unlike the previous sections where all ideas and views were generated in a workshop, in this section the comments and views are findings of the observations and interviews made during the visits. From the available list of organizations, a random sampling was made to get three organizations to be surveyed. The safari included interviews and observations on the services provided and the general customer attendance and use of the services available. General observation from the service safari are noted below.

» The visited information centers were noted to have very low number of users at the particular time of the visit. One of the centers was actually locked and there was not even a single user.

» Most of the materials are not friendly to illiterate users (i.e. most of them are in text format and some cases big books). Few audio-visual materials were observed.

» Some of them are not visible (i.e. located in hidden places with no or invisible directions; in one of the centers there was not even a sign to identify the place).

» It was noted that centers have few staff, which can be an impediment when the demand for service is high.

» It was also observed that centers are well equipped with facilities; for example, at one of the centers, there were many computers but there was nobody to use them.

Regarding the interviews, the following were noted as key issues featured in the discussions.

» Overlapping of roles and responsibilities between information officers, marketing officers, communication officers and public relations officers.

» Limited budget affects implement programs and services designed to meet user needs.

- Poor reading habit hinders effective utilization of the available services, because most of them are text-based and thus requires reading skills.

- The value of information centers is undermined because of the negative perceptions of some staff caused by lack of knowledge regarding contribution of information developments of the core functions of organizations.

- Poor marketing of the available services. Only few people are aware of the existence of information centers which are attached to these organizations. In some cases, you may find even some of the staff are not aware of what these centers are doing.

- Users are interested with training that involves more action/hands-on than theory. They like to be told rather than reading by themselves.

Design Drivers and Goals of Service Design

Design drivers are summaries and definitions of the identified design goals based on customer insights. This was done to build a bridge between understanding the customer situation, needs and challenges and solution ideation. Key issues gathered from micro-entrepreneurs' situation, needs and challenges are listed below:

- They need access to information on issues such as where and how to access low interest loans, where to find a market for their products, how to market/advertise their products, how to effectively conduct business, how to manage finances, access prices and tax issues, raw materials etc.

- They need technical knowledge on how process/manufacture and package their products.

- They need to be incubated and thereafter hosted in industrial packs for market purposes, networking and ease assistance or support.

- They need to have a legal and regulatory policy framework for smooth running of their business activities.

Picture 2: Interview in one of the visited information centers

- The service design goals were developed based on key issues number 1 and 2 as follows:

- To design a service that consolidates various micro-entrepreneurs' official information and makes them accessible under one roof

- To design a service that provides for acquisition of skills required by Micro-Entrepreneurs in production of goods and services and management of their business

- To design a service that reaches out to micro-entrepreneurs as they are not used to visiting libraries/information centers

Solution ideation and testing

This chapter deals with ideation of a new solution based on the acquired knowledge and insights. It is basically a process which deals with idea generation with regard to what will work best as a solution to the identified problems. Ideation is in fact a basis for building a prototype and getting the innovative solutions to users.

Ideation workshop

An ideation workshop brought together stakeholders from organizations dealing with micro-entrepreneurs, municipal council staff and academicians for co-creation of the solution. Organizations such as SIDO, TFDA, BRELA, TWCC, TBS and KMC participated. The target was to brainstorm about the previously identified problems and challenges regarding micro-entrepreneurs' access to official information and other related issues and finally suggested ideas for possible solutions. Several ideas were proposed, and they were all matched against a list of criteria such as ease of access, ease of use, affordability, inclusiveness, resources available and sustainability. Evaluation of the proposed ideas was done and the idea for consolidated micro-entrepreneurs' information help desk was accepted as the idea to be prototyped and tested.

Prototyping and testing of the help desk

The ecology of the micro-entrepreneurs' help desk was set in the co-creation workshop. The setup took into consideration the criteria identified at the ideation level and it includes a network of organizations providing information services to micro-entrepreneurs, a network of entrepreneurs' technical support institutions, Tanzania Library Services Board, Lecturers and students and Tumaini University Dar es Salaam College Library as a host. According to the setup, organizations dealing with micro-entrepreneurs have the role of supplying information to the centralized portal (i.e. the help desk). This was purposely designed to restrain the current practice that requires micro-entrepreneurs to move from one organization to another seeking for information. Based on the findings, it was also necessary to include technical support for micro-entrepreneurs since most of the micro-entrepreneurs seemed to prefer hands-on training rather than theories from literature. In addition, the trend shows that reading culture is low, thus hands-on activities can work better to fill the gap. Most of the activities of the help desk are designed to be run by students under supervision of their lecturers. This is the reason why lecturers and students are forming part of the ecology of the help desk. For prospects of scaling up the service, Tanzania Library Services Board (TLSB) was opted to be part of the service. The idea behind this is that the countrywide network of TLSB can be appropriate for making the help desk accessible to as many people as possible in the country.

As noted earlier, the service is hosted in the library of Tumaini University Dar es Salaam College. The materials acquired for the micro-entrepreneurs are displayed in a designated place within the library and there is a library attendant to attend queries from users of the service. Repackaging of the information is done when there is a need. The launching of the service was attended by micro-entrepreneurs, students, academic staff and other stakeholders like SIDO.

Interviews made about the suitability of the service revealed that most of those who used the service accepted the idea and the services. However, most of them recommended outreach services as many needy people do not have a tendency of going to the library for information searching. One of the outreach services recommended is the mobile micro-entrepreneurs' information help desk. According to this recommendation, the help desk can have wider access if it will go out and meet micro-entrepreneurs in their workplaces and have live conversations on various matters of their concern. On the other hand, there were views that other means of communication that reach many people easily and widely, such as radio and television, may be deployed to get the intended impact. Others recommended that the service should be mainstreamed in the government through district or municipal councils where focal points for micro-entrepreneurs to access information will be developed and funded by the government. All the recommendations made suggest that there is a critical problem in terms of access to official information, but also tells that the majority of the people are not proactive in terms of information.

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IRIS

Effective Communication in the Project IRIS

IRIS

Effective Communication in the Project IRIS

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Introduction

All organizations whether large or small, commercial, government, charities, educational and other not-for-profit organizations have the responsibility to communicate with a range of stakeholders (Ihlen 2013). Traditionally, there are five communication tools: advertising, sales promotion, personal selling, public relations and direct marketing (Smith & Zook, 2011). Increasingly, digital media and the Internet in particular, are used to communicate with stakeholders.

The objective of the project Introducing Reverse Innovation in Higher Education Institutes in Tanzania (IRIS) is to develop active pedagogy and create new cooperation in the HEI context, introduce new partnerships and disseminate the pedagogy model widely to a variety of stakeholders. Therefore, the IRIS project emphasizes the importance of effective communications in increasing awareness and engagement to its stakeholders.

IRIS communications objectives

Communication is an essential activity and indicator in the IRIS project. In addition, communication is one of the key activities ensuring the project sustainability, rooting and general dissemination in the Tanzanian higher education context. The main objective of IRIS communications is to reach new working life partners for co-operation, disseminate and root the IRIS project results and inspire the community to co-operate with universities enabling co-creation processes.

One of the main goals of IRIS is to increase **active dialogue and concrete collaboration between different sectors in society.** There are several beneficiaries and stakeholders connected to the project in its different stages. The three main stakeholders are micro-entrepreneurs from the local community, Higher Education Institutions (HEI)

and library and information professionals. The cooperation of the three main stakeholders creates the core of the IRIS project objective. In addition, main beneficiaries are students, other working life representatives, NGOs, libraries, government authorities, innovation hubs and many more. Active communications with this variety of stakeholders is crucial for the project success.

IRIS utilized a mix of active communication methods to engage with its stakeholders. Different channels and methods were chosen according to the target audience to maximize the dissemination impact to each stakeholder group. Considering the ease of use, reliability, convenience, and the ability of the channel to document communications were all taken into consideration (Snyder & Eng Lee-Partridge 2013). Strategies were determined as internal and external, with a main event for the project, Tanzanian Innovation Pedagogy Event (TIPE) and a final publication.

Internal communication has been traditionally considered as the only channel for management decisions, but instead it should be seen as mechanism for faster change, more flexibility and innovation, better quality decisions, better knowledge sharing and a more motivated workforce (Quirke, 2017). The main internal communication methods were face-to-face meetings and workshops, video conference, phone, WhatsApp and email. The project team also shared a co-working space online, where documents and reports could be developed and shared in real time. As IRIS partners were located in different countries, each partner organization had their additional internal communication activities. These included regular face-to-face meetings, phone, Skype for Business and WhatsApp.

The aim of the internal communication activities was to maintain the project progressing effectively and to ensure team members were involved, informed and included. The selection of suitable channels kept all project team members up to date of activities, involved in planning processes, shared information and enabled effective decision making.
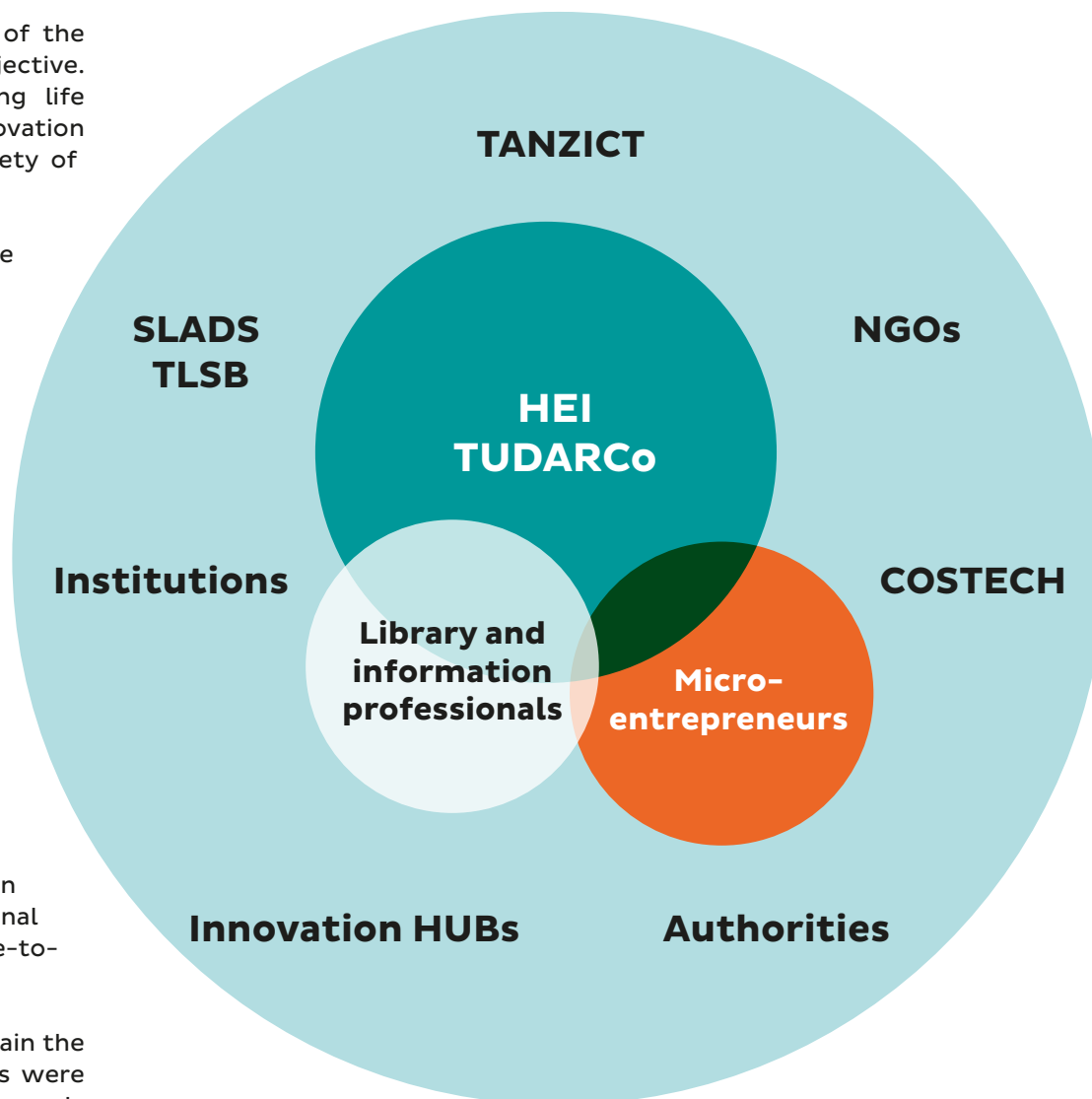

Figure 1. IRIS project stakeholder map (IRIS project application, 2017)

External communications strategies included more channels and activities to ensure the involvement and reach of several stakeholder groups. It has been stated that multimedia features like photos and videos contribute to the success of communication (Hofmann et al., 2013). Therefore, IRIS' main digital communication channels were a public website and Facebook page, to maximize the appealing elements. The IRIS website included a blog, news, partners' and team members' introductions and an event calendar. The aim of these channels was to reach the wide audience, co-operative partners, authorities and other HEIs.

In addition, the IRIS project had an Instagram page that was mainly targeted at students to share their moments and experiences in the IRIS project. Instagram was a good channel to share picture material from a wider audience. Participants, the IRIS team members, students and staff were often encouraged to share photos on their social media networks by using the IRIS or funder's hashtags or alternatively sharing pictures and greetings to persons responsible for TUAS and TUDARCo communications to take forward. The steady encouragement to communicate actively has led to active communication channels and to an increase in engagement and involvement with the audiences.

External communication also included different stand-up presentations, presences. Also separately, regular communication was done towards funder authorities in Finland. A major external communications effort was a major event on the second year of the project under the name TIPE (TUDARCo Innovation Pedagogy Event).

The history of the TIPE name is that TUDARCo and TUAS, in collaboration through the IRIS Project, designed the innovation pedagogy model to the Tanzanian context. The idea of innovation pedagogy of TUDARCo is to activate Higher Education Institutions to collaborate with local communities, companies, private and public sector, NGOs and government authorities. The basis of the idea is active learning and teaching methods where real working life is connected to the higher education studies, enabling collaboration across sectors already during the student's studies. This collaboration enables the generation of young students and innovators to meet the local actors' needs and ensures local development, employability and tighter connections between communities in Tanzania.

The TIBE objective was to showcase the IRIS project's learning outcomes and experiences that have been gained from the project collaborations as well as to develop networks and identify possible areas of new, future collaboration. The main organizers of the TIBE event were the IRIS team members and students from both project partner universities, TUAS and TUDARCo.

The TIPE event was designed to take place on two separate occasions, the first one as an independent side event and the second one as a collaboration event together with Dar es Salaam Innovation Week 2019.

The TIPE event collaborated with the biggest innovation event taking place in Tanzania annually. TIPE had an opportunity to network with other creative and innovative companies and entities that are improving the lives of many Tanzanians in the area of education and entrepreneurship. In March 2019, TIPE hosted its first event in collaboration with Human Development Innovation Fund (HDIF) during the INNOVATION WEEK 2019 (IW2019). IW2019 is a series of events, curated by the Human Development Innovation Fund (HDIF) and the Commission for Science and Technology (COSTECH) with support from UKaid that brings together players in the Tanzania innovation ecosystem to share their insights on social innovation with stakeholders from across Tanzania. Moreover, Innovation Week provides a platform for innovators to showcase their work, identify areas of collaboration, and meet potential partners. The event takes place yearly at Tanzania Commission for Science and Technology (COSTECH), an organization that coordinates and promotes research and technology development activities in the country. IW2019 took place from 25th March to 29th March 2019 under the theme Scaling and Sustaining Innovation for Human Development.

More than 100 companies and institutions applied to participate as partners and only 50 organizations were selected to participate as exhibitioners or partners. The event partners were individuals and organizations from various sectors, who volunteer to share insights

on innovation in their field of expertise to audiences and collaborators from across sectors. The IRIS Project applied and presented its innovation pedagogy through the sub-theme of "Scaling and Sustaining Innovations in Education".

The second session of TIPE was its independent side event, which was organized independently by the IRIS team and both TUAS and TUDARCo students. The side event was held at Tanzania Library Board Services (TLBS), Dar es Salaam. The event was targeted mainly at academic institutions, researchers, policy makers, government authorities and NGOs. In addition, some companies and startups also participated in the event. Up to 60 people from different sectors attended the TIPE side event.

In the event, IRIS presented three papers focusing on the three main areas of the project i.e. Entrepreneurship, Active Innovation Pedagogy and Library and Information Services. The presentations highlighted the benefits of the project to the micro-entrepreneurs, the importance of libraries as important centres of information for micro-entrepreneurs and the benefit of the active pedagogy to high learning institutions. People from other academic institutions were invited to join the panel discussions and share their insight on the TUDARCo Innovation Pedagogy Model. Students from TUDARCo and other academic institutions were also invited to share their learning experiences. Overall, the audience was highly inspired by the IRIS project's results. During discussions the audiences suggested concrete and realistic solutions that will increase interaction and collaboration between communities and higher education institutes. One example was the active use of social media platforms to inform and connect with the local community members.

IRIS used broadcast and print media occasionally, especially during kick off meetings, launching events and the main event TIPE. These media have been integrated with digital media communications with an objective to reach even wider and different segments of audience. Additionally, the IRIS results have been communicated actively through TUDARCo promotional campaigns.

Tipe results and experiences

The Innovation Week 2019 event offered a great platform to present IRIS results. More than 2000 people from different sectors attended the event. The
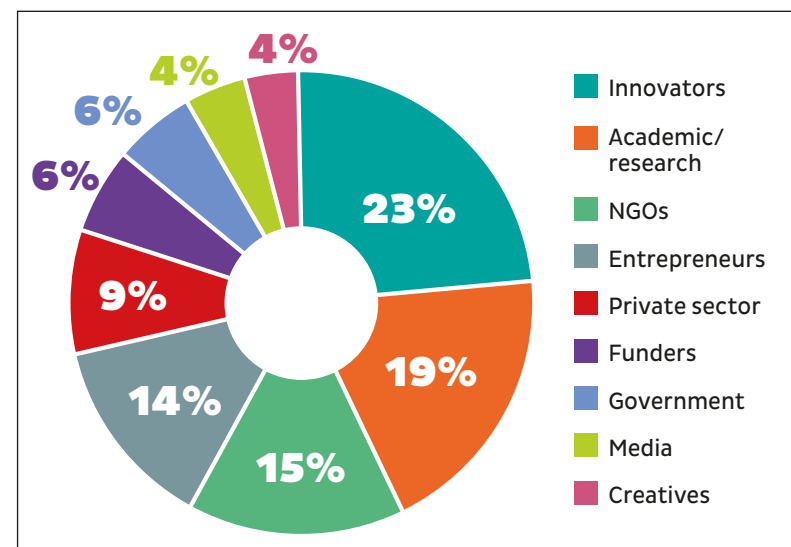
Figure 2. Breakdown of Innovation Week participant profiles (HDIF 2019)
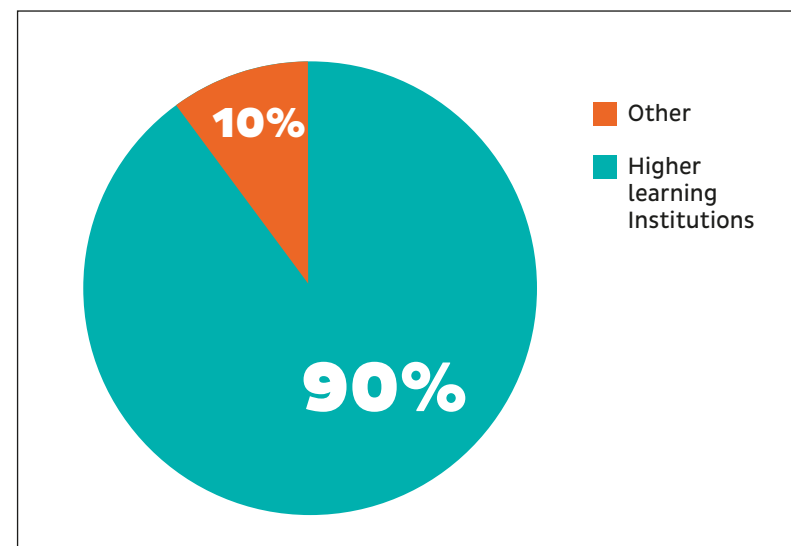
Figure 3. TIPE Side Event attendees.

Picture 1. IRIS Kick off on Channel 10 (IRIS, Kick off meeting 2017).)

IRIS team had an opportunity to be present in two different ways during the Innovation Week 2019. One was a presentation at the event and the other one was an exhibition stand. Up to 30 TUDARCo students played a key role to showcase and share the true experience of the model to more than 200 people who visited the stand in the very central place in the COSTECH venue. Some of the results showcased during the event were an information service desk, micro-entrepreneurs' videos representing results and benefits of collaboration and involvement of micro-entrepreneurs and the active pedagogy. All visitors who visited the IRIS stand were impressed with the IRIS project outcome, according to the verbal feedback received. The innovation week was a unique opportunity for IRIS to encounter so many different people, and to introduce and collect responses of TUDARCo's innovation pedagogy model. Besides the audience, media and some institutions were very interested in the new pedagogy model and invited the project representatives to participate in various conferences, seminars and other events.

During Innovation Week, the HDIF invited the IRIS team to participate in a hub tour with their innovation partners who were interested to see the IRIS project in action. IRIS had an opportunity to pitch their innovation idea to representatives from the Swedish embassy, the Swiss embassy, European Union delegation, United Nation Development Programme and World Food Programme.

Moreover, the week was an active learning platform not only for the project team members but also for TUDARCo's students who played a key role in the exhibition.

IRIS had an opportunity to meet different companies who were participating in the Innovation Week and were interested in the active pedagogy model and as a result, new collaborations were formed. One example is ESS CREATIVE AND LEGAL FOUNDATION which invited TUDARCo students to promote their insurance services. Another example is Sahara Ventures, a company that promotes innovation ecosystems and acts as a startup incubator in Tanzania. The CEO of Sahara Ventures, Mr. Jumanne Mtambalike, was one of the keynote speakers during the TIPE side event. Mtambalike is an expert in innovation hubs management. Since the event, the IRIS team has been working very closely with Mr. Mtambalike to develop a concept on how to start up an innovation hub at TUDARCo.

TIPE had an opportunity to be one of the 77 partners to host an event as part of Innovation Week 2019. The event was covered by reputable media houses and it was communicated all over social media platforms. Being part of the official partners enabled the IRIS project communications also to reach a new level of media coverage.

IRIS received a lot of inputs from both events and today the elements of the active pedagogy are successfully incorporated in the TUDARCo curriculum. One of the IRIS project's key achievements is that the curriculum was accredited in May 2019 by the regulators of higher learning institutions. The accreditation process is not easy or common, but the IRIS project achieved something special thanks to the amazing team, great activities, results and successful communication activities.

SOCIAL MEDIA

411
@HDIFtz
new Twitter
followers

364
@HDIFtz
Twitter
mentions

2.3k
@HDIFtz
Twitter
impressions

229
Number of new
people who have liked
@HDIFTanzania
Facebook page

586.1k
Unique users engaged with
@HDIFTanzania Facebook page

10
Videos
made

2:54
Average
video length

237
Total
individual
video views

455
Total
minutes
watched
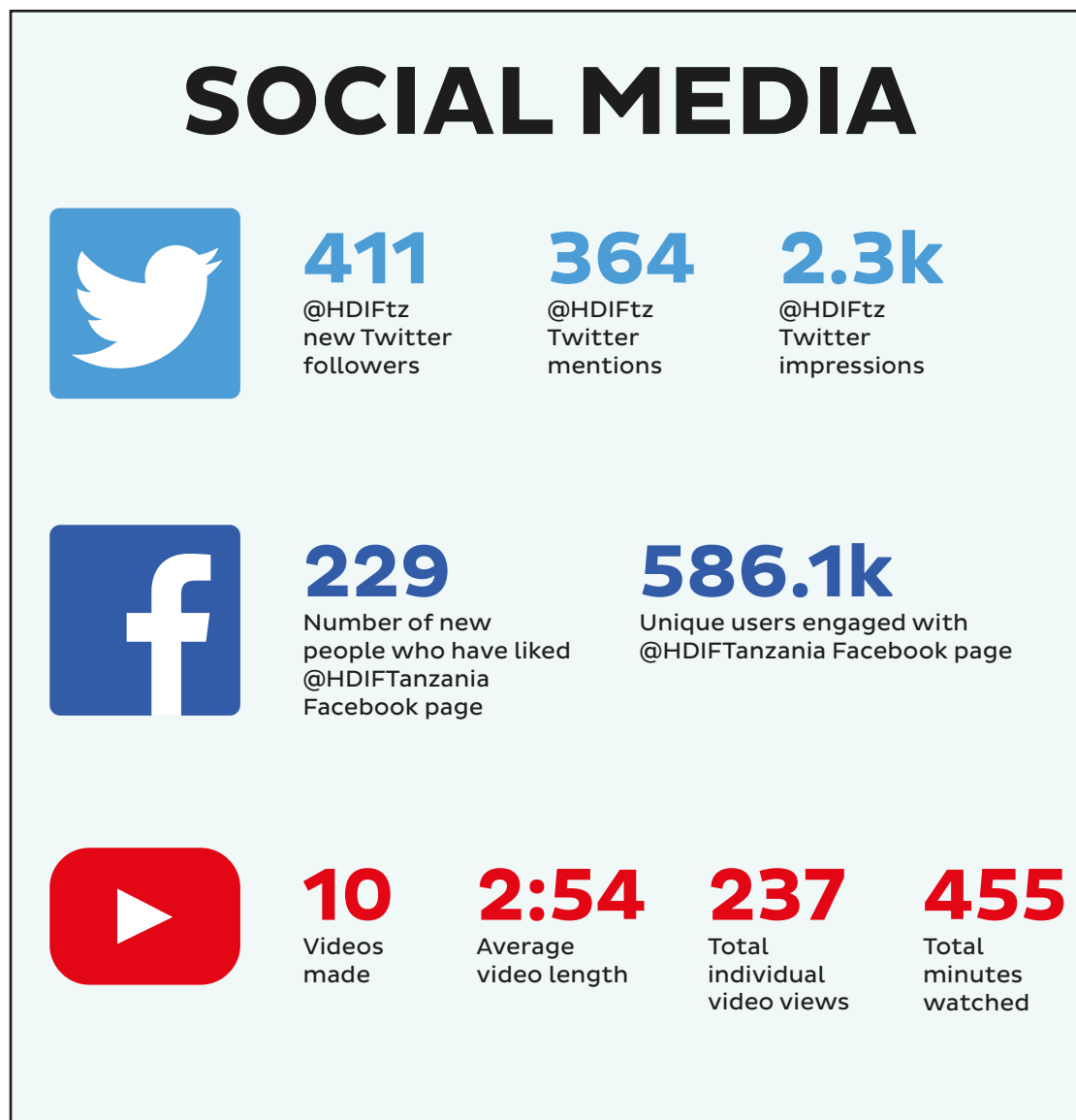
Figure 5. Social media coverage (HDIF 2019)

MEDIA

18
Media houses

45
Journalists

13
TV stories

32
Newspaper
stories

16
Radio
Stories

210 million TZZ
Advertising Value Equivalency (AVE)
Source: Ortus, 2019

Figure 6. Innovation week media coverage (HDIF 2019)

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Endeavour to Innovate – Learning Experiences from the IRIS Project

IRIS

Endeavour to Innovate – Learning Experiences from the IRIS Project

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The IRIS project aims to increase the reverse and bottom-up problem solving of entrepreneurs and cooperation of HEIs with the surrounding community. This is an important endeavour because the success of most start-ups or micro-entrepreneurs (Micro Es) has been found to depend heavily on factors beyond the control of the business itself. These factors constitute an entrepreneur ecosystem (Fuerlinger, Fandl, & Funke 2015). Isenberg (2011) has identified six domains of this ecosystem (see Figure 1): "*a conducive culture, enabling policies and leadership, availability of appropriate finance, quality human capital, venture-friendly markets for products, and a range of institutional and infrastructural supports*" .

HEIs play an important role in the domain of high-quality human and social capital development. It is widely agreed in the related literature that the sustainability of an entrepreneurship ecosystem in a specific geographic region is determined by its innovation capacity, which in turn depends on the interactions among different kinds of actors and technology policies (Freeman 1978; Lundvall 1988). These factors also support Tanzania's development goals. The Tanzania Development Vision 2025 underscores that good education and lifelong learning (LLL) are the driving forces for the realization of the vision and for the active transformation of the mindset and culture to promote attitudes of self-development, community development, and commitment to face development challenges and exploit every opportunity for an improvement in the quality of livelihood. This implies that education should be treated as a strategic agent for mindset transformation and for the creation of a well-educated nation that is sufficiently equipped with the knowledge needed to competently and competitively solve the development challenges that face the nation. The IRIS project supports this by supporting micro-entrepreneurs to access official information, supporting TUDARCo to improve its pedagogy innovation and links to the industry through reverse innovation.

Knowledge exchanges between entrepreneurs and the academic community are important here. Wilson (2012) argues that one of the most important prerequisites for innovation in a geographical area is the cooperation of four sectors: government, business, civil society, and academia.
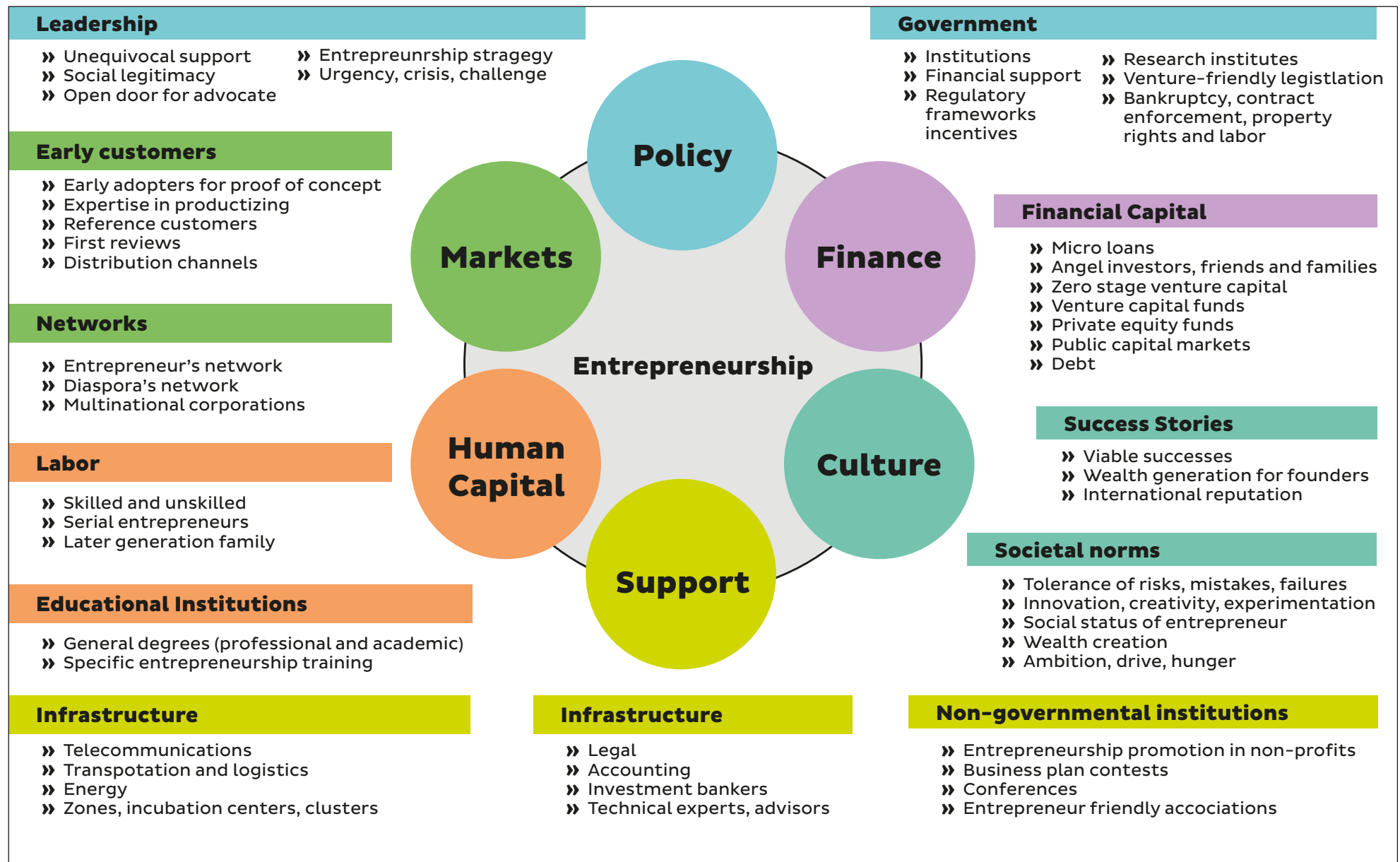
Leadership

» Unequivocal support
» Social legitimacy
» Open door for advocate
» Entrepreunrship stragegy
» Urgency, crisis, challenge

Early customers

» Early adopters for proof of concept
» Expertise in productizing
» Reference customers
» First reviews
» Distribution channels

Networks

» Entrepreneur's network
» Diaspora's network
» Multinational corporations

Labor

» Skilled and unskilled
» Serial entrepreneurs
» Later generation family

Educational Institutions

» General degrees (professional and academic)
» Specific entrepreneurship training

Infrastructure

» Telecommunications
» Transpotation and logistics
» Energy
» Zones, incubation centers, clusters

Government

» Institutions
» Financial support
» Regulatory frameworks incentives
» Research institutes
» Venture-friendly legistlation
» Bankruptcy, contract enforcement, property rights and labor

Financial Capital

» Micro loans
» Angel investors, friends and families
» Zero stage venture capital
» Venture capital funds
» Private equity funds
» Public capital markets
» Debt

Success Stories

» Viable successes
» Wealth generation for founders
» International reputation

Societal norms

» Tolerance of risks, mistakes, failures
» Innovation, creativity, experimentation
» Social status of entrepreneur
» Wealth creation
» Ambition, drive, hunger

Infrastructure

» Legal
» Accounting
» Investment bankers
» Technical experts, advisors

Non-governmental institutions

» Entrepreneurship promotion in non-profits
» Business plan contests
» Conferences
» Entrepreneur friendly accociations

Policy · **Finance** · **Markets** · **Culture** · **Human Capital** · **Support** — Entrepreneurship

Figure 1. Isenberg's Model of the Entrepreneurship Ecosystem (Isenberg 2011).

In Isenberg's model, the role of HEIs is confined mainly to the training of the human capital necessary to sustain an entrepreneurship ecosystem. In the model of an innovative ecosystem, higher education institutions are central because of their ability to recruit and train a skilled talent pool and because of their ability to provide ideas and technological support for the acceleration of any new ventures underpinning the development of start-ups. These start-ups grow into innovation-based companies, which then become R&D partners to the higher education institutions, as well as mentors and network members. The framework is helpful in focusing on the importance of the institutional capacity of stakeholders, especially higher education institutions, within an innovative ecosystem.

Higher education institutions operate within two overlapping ecosystems, one focused on generating start-ups and the other focusing on supporting innovation among established firms. Start-up ecosystems encourage the formation of new firms. These ecosystems typically involve incubators, accelerators, angel investors/capital networks, and mentoring initiatives. Innovation ecosystems focus on accelerating the supply of resources to existing firms to promote more productive innovation. Dynamic regions need both start-up and innovation ecosystems. Often, these ecosystems are anchored by HEIs because these institutions provide a continuous flow of new ideas and brainpower that can be converted into wealth by new and expanding businesses. In the model, higher education institutions are the major source of talent needed to power these ecosystems.

The IRIS project could be seen as a learning platform where systemic change results from constant interaction and the "collision" of various actors operating in the ecosystem (Uusikylä, 2019). Given the fluid nature of these changes, it is sometimes difficult to predict these patterns a priori. This section aims to evaluate the learning of the IRIS project through a systemic learning approach.

Peter Senge (1990; 1996) defines five components of a learning organization that distinguish the learning organization from other organizations. These include systems thinking, self-management, mental models, shared vision, and team learning. Systems thinking acts as an integrator of all aspects; it is the cornerstone of how a learning organization sees the world (Senge 1990, 69). Systems thinking is about changing mindsets: one should see entities and interrelationships rather than mere causal relationships and should see change processes rather than individual situational representations. Mental models are the assumptions, generalizations, and images of ourselves, other people, and institutions. They influence how we understand the world and how we act and behave. Vision is the image of the future that the organization seeks. In a learning organization, all members of the organization must be involved in creating a vision that produces a vision based on the goals of the organization to which people commit and the goals they set. Building a shared vision promotes commitment, learning, community, risk-taking, and experimentation and gives direction to learning, helping people thrive.

The IRIS project is coming to an end in autumn 2019. During the project, Finnish and Tanzanian partners have managed to find a good working relationship and have been able to agree on the implementation of common goals. This in and of itself already provides a good starting point for action. The conditions for cooperation will be further enhanced by the fact that both higher education institutions have been very committed to continuing the collaboration under the forthcoming new project. Joint visits to both higher education institutions have opened the window to the reality of innovative teaching and learning practices. Understanding each other's teaching and development practices has given rise to a common understanding and common goals. According to Gregory Bateson (1972), knowledge in social systems is not passively transferred. Learning takes place by attributing meanings to those signals and transforming some of them into information. The latter is a "difference, which makes a difference" for the receiver of that information, and learning is the process for marking these differences. Chris Argyris and Donald Schön (Argyris & Schön 1978) develop these ideas further and apply them to learning that takes place beyond the level of individuals. Their model has been widely used in the organizational development and management literature. Figure 4 presents the broader learning framework to understand how innovative practices can evolve from single-loop (action) learning toward double-loop (structures) and triple-loop learning patterns.
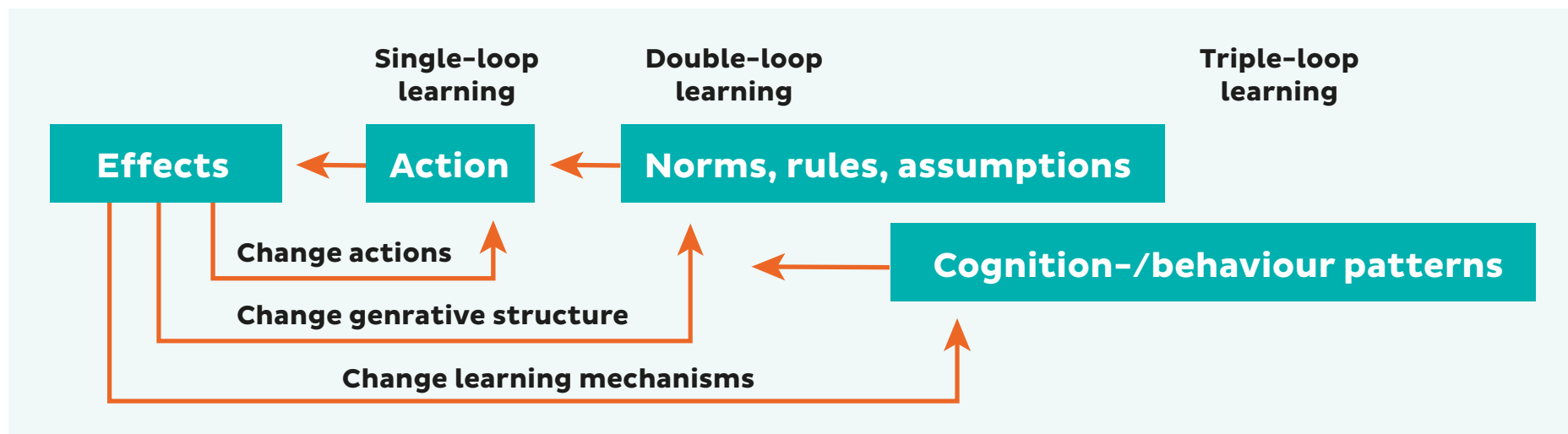
Figure 2. Types of Learning in the IRIS Project (Hummelbrunner 2015, 20).

For organizations, the more traditional "single-loop learning" solution is learning from feedback, that is, it merely fixes what is wrong. In the double feedback loop (double-loop leaning) that is typical of a learning organization, corrective actions are directed at operating instructions and norms rather than at what is wrong. Continuous questioning and error analyses contribute to a common awareness and thus lay the foundation for future action. Some authors have conceived of a further type of organizational learning, for which the most prominent term is triple-loop learning. Typically, this is described as additional to the primary and secondary forms of learning and is often referred to as meta-learning or "learning to learn," which aims at improving the processes of single- or double-loop learning (Tosey et al. 2012). However, what is central to the learning organization is a joint reflection from different perspectives. In action learning, a group of people with different backgrounds work together to solve a real problem by gaining the information they need and finally sharing their results with the rest of the organization. In the following, the learning experiences of the IRIS project are outlined through discussions in two learning workshops. The workshops were held in Dar es Salaam (August 22nd) and Turku (September 5th) as part of the developmental evaluation. In the workshops, the learning experiences of the IRIS project were outlined on the one hand through the learning model described above and on the other hand through reflection at the individual, organizational, and societal levels.

The Dar Es Salaam learning workshop on August 22, 2019

The learning workshop was held at Dar es Salaam's TUDARCO campus on August 22, 2019. There were five key implementers of the IRIS project in Tanzania. All participants were involved in the project from the very beginning. Petri Uusikylä, the project evaluator, opened the event through Skype and presented the objectives of the day, the implementation model, and the practical arrangements. The workshop was facilitated by Adam Foy and Petri Uusikylä.

Individual-level learning experience

The discussion in the workshop was open, enthusiastic, and constructive. The most significant part of the individual-level learning experiences was the adoption of new practices, thinking models, and operating culture. Some interviewers stated that they did not know much about what to expect before the project started. Still, the way the project was carried out exceeded their expectations. It was surprising, for example, how a small budget could make a big difference.

The project brought teachers and students together in a new way. Alongside traditional teaching, it introduced a new method of coaching that activates and motivates both students and teachers. The new dynamics gave rise to experiments that could not even be dreamed up before the project. The inclusion of companies in the curriculum was unprecedented. It positively surprised many TUDARCo teachers. This provided both teachers and students with practical experience and understanding of the everyday life and needs of Micro Es. This, in turn, is important when developing a new curriculum.

Toward the end of the project, the IRIS project participated in Tanzania's Innovation Week. Teachers had reservations about what the innovation week could bring to the university and its students. The results were very positive. Both teachers and students were motivated, contacted by on-site donors, companies, and partners. The result was useful contacts that could be utilized in the future.

Teamwork and flexible practices were also key learning outcomes. This will allow us to further define our common vision and strategic goals. This has also changed the way we communicate and think "outside the box."

Organizational-level learning experience

At the organizational level, the initial situation at TUDARCo was challenging. Many of the teachers involved in the project did not have a clear idea of what the IRIS project was trying to achieve. In addition, their own role in the implementation of the project was somewhat unclear. Against this background, for those who attended the Dar es Salaam workshop, the organizational learning outcomes can be considered excellent.

The project has transformed teaching practices (from classroom to project), opened interfaces to local businesses and the printing industry, and taught the model and delivery of innovative pedagogy. However, the lessons have largely been remembered by the teachers who participated in the project. It was hoped that the other departments of the university and the administration would also extend the practices developed in the IRIS project. This is a prerequisite for changing the operating culture at the Tumaini/TUDARCo level.

The project approach was summarized in a workshop on "*Determining first – Rewards will come later*." This illustrates the model of systemic learning well, where incentives and rewards are determined by emerging phenomena, not in advance. The excellent results of the project encourage us to continue to innovate.

The newest curriculum for innovative pedagogy turned out to be the most critical and permanent approach. Its wider implementation would allow the model to spread to other units and other higher education institutions in Tanzania. This was the subject of a lively discussion in the workshop.

Societal-level learning experience

The discussion on social change, or profound transformation, was somewhat less in the Dar Es Salaam Learning Workshop. There are certainly cultural reasons behind this, as well as the widespread practice that there is no open criticism or questioning at the school level of the broader system of university governance.

Nonetheless, the Tanzanian partners of the IRIS project showed interest in participating in the new follow-up project, thereby disseminating the innovative practices adopted by the IRIS project. At the same time, a follow-up project would allow for greater networking and a search for new partners. Here, too, the IRIS project has produced many positive results, the wider social impact of which can only be seen in the years to come.

The Turku Workshop on September 5, 2019

The Turku Learning Workshop was held at Turku University of Applied Sciences on September 5th, 2019. There was a core project team (four people, three of whom had been involved in the project from the beginning and one who had replaced a colleague who left the project). The participants reflected on their learning experiences, and this was based on the facilitation and instructions given by the evaluator. The participants first discussed their individual-level learning experiences. Thereafter, organizational and societal learning experiences were talked about. The discussion was conducted in two-person groups, and the groups reported on their discussions using post-it notes and a flip chart. After that, others had the opportunity to comment on the findings.

Individual-level learning experience

At the individual level, emphasis was placed on the importance of one's own attitude and approach from the start of the project. It was noted that the approach to Tanzanian students and colleagues is a key factor in creating a climate of trust and a collaborative culture. An example was a report on how Tanzanian students quickly realized that they also had the opportunity to provide critical feedback to project staff. This created a culture of open discussion. In general, TUDARCo's students had excellent language and learning abilities. The students were highly motivated and eager to learn new things.

Initially, understanding the social context and culture made it difficult. Similarly, local colleagues were reluctant to interpret and analyze societal structures, education and innovation policies, and other factors that had a direct link to action. The project partners from Turku had to obtain this information elsewhere (e.g., from the Embassy of Finland or other contacts).

Several discussions emphasized the importance of flexibility and adaptability. In the final year of the project, the IRIS project was prominent in Tanzania's Innovation Week (April 2019). The attendance had been carefully prepared. Still, the Turku team was surprised at how unfinished everything was when they arrived in Dar es Salaam the week before the event. However, after a small "crisis meeting" with the local partners, urgent implementation of the missing preparations began, and everything was completed on time. Otherwise, the visibility of the IRIS project, student activity, and motivation made Tanzania's Innovation Week one of the project's most successful individual events.

Creating a common approach requires constant communication. It was stated at the Turku seminar that only continuous interaction allows for a common interpretation and the creation of common meanings. According to the group, short, weekly Skype meetings should be held in the future. This way, the right "frequency" can be maintained throughout the project. During the project, one participant stated that she longed to be involved in TUDARCo's teachers' daily routines, which led to a better understanding of the content of the work. There were such opportunities, but there could have been even more.

The biggest positive surprise was the activity, enthusiasm, and willingness of Micro Es to participate in joint development. This was considered a significant risk before the start of the project. According to micro-companies, the output was, according to one project worker, a "valve" that opened many other development paths.

Another participant said how important it is to get personal feedback during the project. This is emphasized in both single-loop and double-loop learning situations when it comes to doing the right things. The second comment stated that it would be important to get feedback, especially from your own university. As an example, he mentioned his conditioned reaction when a representative of the university administration called. The immediate reaction usually is, "What have I forgotten or failed to report this time?" Sometimes, just a thank you or open interest in projects can be very rewarding.

Organizational-level learning experience

Organizational learning is particularly important in projects such as the IRIS project, where the geographical, social, and cultural context

of the partner organizations is very different. The difficulties of understanding the cultural context have already been referred to above. Nevertheless, Turku University of Applied Sciences and Tumaini University quickly found a common approach and realized that good practices cannot be mechanistically transferred from one institution to another, but their implementation rather requires an understanding of the underlying mechanisms of action and their cultural specificities.

It was pointed out at the Turku Learning Workshop that at both HEIs, the project was implemented in a rather isolated way and could not be integrated in the best possible way with the other activities of the university (except the curriculum). In TUDARCo, the university's management and administration did not participate much in the project activities and were thus far removed. Similarly, Turku University of Applied Sciences should be more interested in development projects (especially those in developing countries). The threat is that only one of the 300 projects that the University of Applied Sciences will carry out will remain. In this way, the content innovations and doctrines of the project do not spread within the UAS. Dissemination within one unit, though is a bit easier because there are only 30–40 projects.

The workshop participants were concerned about the financial and administrative discourse of Turku University of Applied Sciences. The IRIS project is talked about outside the project mainly in terms of cost, reporting, and administrative procedures. In this way, the accumulation of knowledge slows down or, at worst, stops altogether. One solution is the project life cycle assessment implemented at Turku University of Applied Sciences. At its best, this can increase the visibility of project results, thus increasing organization-level learning.

Societal-level learning experience

When implementing innovation projects in a diverse and challenging environment, it is important to understand the broader political, administrative, economic, socio-economic, and cultural context in which the projects are implemented.

The workshop stated that Turku University of Applied Sciences has no strategy regarding projects in developing countries. In this case, knowledge of Africa and know-how had been created through the unit's previous projects and personal experiences. The workshop commended the Ministry of Foreign Affairs for organizing the Africa Seminar, which gave IRIS promoters a broader understanding of the continent's economic and political situation. The seminar also highlighted the enormous potential for Finnish companies in sub-Saharan Africa.

The experience, contacts, and understanding of the Tanzanian context in the IRIS project were very important experiences and views on projects within HEI-ICI, thereby increasing learning from not only projects, but also the wider societal aspects of projects.

Both learning workshops (Dar es Salaam and Turku) emphasized the importance of openness and trust as the starting points for successful project cooperation. When confidence is strong, cultural or functional differences do not pose great challenges to the project. On the other hand, if there is a lack of confidence, even minor problems and conflicts can escalate very quickly.

Discussions at both workshops also highlighted the importance of systemic understanding, as well as the links and overlaps between different levels of governance (individual, organization, and society). Figure 5, which is based on the discussions in the workshops, highlights the critical success factors at different levels and their impact on the success of a project.

The individual-level factors strongly emphasized the importance of motivation and competence as a kind of orientation factor. At best, motivation and enthusiasm can compensate for a lot of knowledge and skill deficiencies. Another key strength at the individual level is openness and open-mindedness. Both workshops were given as concrete examples of how after suspicion and concern, things went well when the parties were confident that their good ideas could thrive (e.g., the brilliant results of the 2019 Tanzanian Innovation Week). The

Figure 3. Critical Success Factors of the Nested Components of the IRIS Project (source: The Author).

third key factor at the individual level was the importance of getting feedback. This has also been found in many psychological tests to be a central starting point for learning.

Individual-level learning cannot be very effective unless it is transformed into organizational-level learning. At the organizational level, the learning workshops have emphasized the importance of commitment, communication, and collaboration. Of particular concern was the lack of interest and commitment of the training organization as a whole (as applies to TUAS as to TUDARCo). The institution's way of talking about the project emphasizes administrative and financial discourse rather than genuine interest.

A reflective work culture is a prerequisite for learning at the organizational level. It requires openness, clear feedback (positive and negative), and the ability to communicate in a way where everyone can understand the message clearly. Adaptivity is also part of the way an organization learns to operate. You have to dare to change the decisions you make if you find that things are not going the way you want or if there is a sudden change in your operating environment. Networks are also central to the organization's operations. Skilful networking can produce remarkable results, even with small resources. In the organizational literature, this is called network effects.

At best, organizational learning outcomes and reforms can have major systemic effects, especially when they happen to be in the right phase of a systemic change (e.g., higher education reform) or hit the so-called leverage point, which takes the system to a new level. The top level of the systems changes and is formed by the broader context (landscape) of society and societal development, which can only be affected to a very limited extent by the different actors in society. The middle level (the so-called regime level) reflects the prevailing socio-political system, which is made up of the interacting elements of society (e.g., politics, administration, science, and technology). The third level consists of innovative experiments taking place outside the current system that, together with the changes to the system of internal opportunities and changes to the operating environment, can lead to a wider social transformation. Transitions are thus processes of structural change in the prevailing systems (and their subsystems). Under the appropriate conditions, structures can change rapidly, but often, a wider social transition can take decades (Geels 2002; Geels & Schot 2007). Research has explored learning-oriented experiments as the key elements of systemic change. Radically new operating models often originate from the integration of such experiments into other ongoing development processes (Elzen, Geels, & Green, 2004; Geels, 2004).

The system will not change unless the results are also distributed vertically. In practice, this means that the results of the project must also be communicated to innovation and higher education policy makers, such as ministries, technology agencies, and the donor community. In the IRIS project, advocacy work was carried out wherever possible throughout the project. However, even more active communication with the above-mentioned parties would probably have increased the project's impact even more. On the other hand, this is an opportunity for the forthcoming new project.

Picture: The journey continues.

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