Context matters: Human factors are important when designing technology-enhanced learning (TEL) - lessons from working with partners in Uganda and Ethiopia

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Cover photos show librarians in Kenya interacting with colleagues online.

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1 Executive summary

Over recent years, there has been an increased awareness and use of technology-enhanced learning (TEL) approaches to improve the reach and scale of capacity development interventions to support research and higher education. These approaches have come to the fore in 2020 with the COVID-19 pandemic preventing travel or physical classes.

In 2019 we undertook a study that included a review of learner feedback from INASP's own TEL work alongside published literature on the learner context in Ethiopia and Uganda. Our goals were to review learner feedback from a perspective of country context in order to help us to tailor our TEL initiatives to specific learners and make learning even more effective.

We looked for answers to the following questions:

- What are the expectations and priorities in terms of learning outcomes and skills development in higher education?
- What role does social interaction play and how should it be supported to facilitate learning?
- What are motivational factors for learning?
- What are conducive factors and impediments to gender equity in the research and higher education environment?

Reviewing learner feedback from INASP's own courses in conjunction with looking at wider evidence from within specific countries helps us to understand the local context better. Some action points came out of this study:

- Besides running our MOOCs for researchers on a global platform, we now provide private spaces for certain user groups from one country and are assessing how this helps to attract learners who appreciate a more protected space.
- We are also exploring ideas for how course facilitators can address user needs in a more tailored way in such learning spaces.
- As an organisation that promotes sharing, using and producing research and knowledge, we have broadened the audience of our TEL initiatives over recent years. In addition to researchers, INASP is now supporting higher education lecturers and students. We developed an online course for students that introduces critical thinking and released a version for early-career researchers in 2020 (a self-taught tutorial and a facilitated course).
- We recognise that we need to understand the situation of different user groups better when designing our TEL approaches, in order to support the learners even more effectively. We have developed a scoping and design tool that helps to ensure that we ask the right questions before we design or adjust TEL approaches, including scoping questions around equitable and sustainable access, and barriers to learning. The insight that we gain from the scoping activity will help us to make the right design decisions as we develop courses tailored to specific learner context in the future.

2 Introduction

Over recent years, technology-enhanced learning (TEL) approaches have become more and more popular in supporting capacity development in research and higher education. These approaches have come to the fore in 2020 with the COVID-19 pandemic preventing travel or physical classes.

INASP has been delivering and facilitating online courses, communities of practice, mentoring and other online approaches to support teaching and learning and capacity development for Southern researchers, students and professionals across the research and knowledge system for over 10 years. Recently, in particular in light of the COVID-19 pandemic, we have been sharing some things that we can do to tailor learning to learners' needs and influence success of our TEL approaches (Wild, 2019).

But what wider factors can affect the learners' acceptance of e-learning systems?

Through our work in partnerships with African higher education institutions, we are aware of how much context matters when developing and rolling out learning approaches.

Country context and cultural norms and values can influence many aspects of TEL (Zhang et al 2013), but studies that include African learners are still limited. For example, only six of the 107 studies included in a literature review on TEL acceptance (Abdullah & Ward 2016) had collected data in African countries.

In 2019 we undertook a study that included a review of learner feedback from two major INASP projects alongside published literature on the learner context in Ethiopia and Uganda. Our goals were to review learner feedback from a perspective of country context in order to help us to tailor our TEL initiatives to specific learners and make learning even more effective.

This paper summarises the findings of this analysis of learner feedback and wider literature. Some of the findings were also presented at the eLearning Africa conference in 2019.

3 Analysing learner feedback from our work

During our Strengthening Research and Knowledge Systems (SRKS) project (which ran from 2013 to 2018), we gained significant experience in rolling out massive open online courses (MOOCs) and other smaller scale online courses and blended approaches in African countries (references: A. Nobes & R. Murugesan 2017; R. Murugesan et al. 2017; V. Schaeffler 2017; J. Wild & V. Schaeffler 2016). The main audience were (early-career) researchers and librarians. The topics were diverse, covering research writing, copyright and licensing and monitoring & evaluation of e-literature use.

At the end of the SRKS programme we analysed the learner feedback we had received across the project's activities, in order to identify the key themes from our learner's TEL experiences – the "learners' journey". Depending on the learning approach, participants reported that the INASP online and blended learning opportunities support the learners with:

- Meeting their personal learning objectives, gaining understanding and improving skills
- Being more confident in the area covered by the course
- Applying their learning, sometimes already during the course
- Starting new activities after the course
- Transferring their learning to other areas
- Changing behaviour to be more successful in their work and life.

Using feedback data from a learning initiative for librarians, we were able to compare two modes of delivery - a purely face-to-face training, delivered through three-day workshops, and a blended learning approach, which consisted of an online course complemented by face-to-face study groups.

In summary, we found evidence that online learning is generally perceived as useful by the participants and we can reach far more interested learners than through purely face-to-face training.

However, how learners experience their learning journey depends on learners' characteristics such as gender or job role – and this can influence their learning outcomes.

We also recognised that we still face some challenges such as addressing gender inequalities and making our courses more accessible. Therefore, we wanted to learn more about human factors that affect the learning experience and need to be taken into account when designing TEL approaches.

4 Identifying further questions

Within INASP's Strong and equitable research and knowledge systems in the Global South (SERKS) programme (April 2018-March 2019), we had the opportunity to ask further questions about the needs of the African learners who we want to support with our TEL initiatives. Our dilemma was that we had only very limited budget and time for filling the gap in our understanding that we had gained so far from our previous online and blended learning approaches. Therefore, we turned to existing source material such as study reports, congress outputs, interview notes and national strategic plans that we had collected in Ethiopia and Uganda, two of our partner countries.

We looked for answers to the following questions:

- What are the expectations and priorities in terms of learning outcomes and skills development in higher education?
- What role does social interaction play and how should it be supported to facilitate learning?
- What are motivational factors for learning?
- What are conducive factors and impediments to gender equity in the research and higher education environment?

Using Nvivo, a data analysis tool for qualitative research, we extracted country-specific answers to these questions from the source material. In this way, we could complement our experience from previous TEL initiatives with these country contexts.

In the following section we summarise the responses to these questions from the literature review in these two countries and consider within the context of INASP's learner feedback.

5 Key themes

5.1 What are society's expectations and priorities in terms of learning outcomes and skills development?

Learning about country expectations and priorities helps us to shape our programme work and conversations with partners. In both Ethiopia and Uganda, higher education is expected to support the learning of life and work-related skills and also build the attitudes and mindset that are demanded in the workplace. We discuss the two countries' approaches here.

Ethiopia

The literature in and about Ethiopia points to the following learning outcomes that need to be addressed:

- Critical thinking skills as intellectual capacity to think clearly and independently – to collate, interpret, analyse, evaluate and integrate information from various sources and to articulate and communicate it in the form of concepts, ideas and arguments
- Problem-solving skills to understand problems in their entirety
- Practical skills, including computer skills
- Communication skills
- Attitudes such as industrial work ethic and willingness to learn

Dr Tesfaye Teshome, Director Higher Education Relevance and Quality Assurance Agency 2015, on skills development needed in Ethiopia:
"Let me take you to my experience at 'TanaBeles.' I was fascinated by the engineering work being done there. We saw the Dam and the engineer said, "We need some critical amount of water here to start the generator." When I looked around, I saw a chain of mountains with no single vegetation. I asked the engineer if they wouldn't have a problem getting a critical mass of water with that kind of situation and how they would manage that. He said that was for the forestry and environment specialists to worry about. That was the response I expected to get and that is where we fail. We should train our students in an integrated fashion in a way they can understand a problem in its entirety. That is why I say inter-disciplinary, multi-disciplinary and competence-based curricula are needed, focusing on problem solving."
REENVISIONING HIGHER EDUCATION AND RESEARCH IN ETHIOPIA - PROCEEDINGS OF THE SECOND SCIENCE CONGRESS 2015

However, the sources also note that there are open questions about what learning outcomes are expected by the Ethiopian society and how well higher education institutions address these needs. The question "What is the purpose of higher education?" needs to be better addressed, whether in policy documents, academic interchanges or conferences.

Uganda

Literature from and about Uganda points to the following learning outcomes that need to be addressed were mentioned by the sources:

- Knowledge and skills but also moral values that help to promote sustainable national development and sustainable lifestyles of the citizens, e.g. related to human rights; gender equality; a culture of peace and non-violence; global citizenship and appreciation of cultural diversity
- Critical thinking skills
- Practical skills required in the job market, e.g. ICT skills

In Uganda, the role and value of research and knowledge for national development is recognised in policy and national plans, including modern science and traditional knowledge. As a result, higher education should also prioritise scientific literacy, including communicating research and knowledge, proposal writing and skills on how to obtain patents for innovation.

Critical thinking and INASP

INASP is addressing critical thinking skills in several of the projects we are involved in.

The Transforming Employability for Social Change in East Africa (TESCEA) partnership is supporting universities in Tanzania and Uganda to embed approaches to support development of critical thinking and problem solving skills into university courses. The end goal is to develop tools to help scale up the approaches from this work across East Africa.

A sister partnership, Assuring Quality Higher Education in Sierra Leone (AQHEd-SL), is working to improve quality and consistency of higher education teaching across Sierra Leone. INASP's role within that partnership is to support the development of critical thinking skills within redesigned curricula.

As a result of current travel restrictions, both of these projects are looking more to TEL approaches. In AQHEd-SL, elements of an INASP online critical thinking course are currently being adapted to be accessible to users who are most reliably reached by WhatsApp. Versions of the Moodle-based INASP critical thinking course are also available as a self-taught tutorial and, from 16 June 2020, as a four-week facilitated course.

5.2 What role does social interaction play and how should it be supported to facilitate learning?

We know from running our online courses that the social component of a learning initiative is an important influence on learner completion rates. We offer social interaction through discussion forums that support peer-to-peer interaction and learning from each other. Our MOOC impact study (INASP 2017) revealed that 63% of participants agreed that they learnt new things from peers on the forums; 45% thought that the forums were one of the most useful elements of the course; 54% planned to stay in touch with other participants after the course; and 19% reported that they had already started discussions with other participants about possible research collaboration, showing the strong social connections that had been established.

Online learning is considered a social phenomenon in its own right that includes relationship building, peer-to-peer learning and the forming of communities of learners (see e.g. Stefan Hrastinski 2009; Raven M. Wallace 2010; J. Wild 2019).

We were interested to learn more about social interaction and its challenges, especially regarding equity, in the two country contexts in this review.

Our analysis suggests that participants in *Ethiopia* may face challenges such as language problems when attending learning events. There are also some gender-related learning impediments such as:

- Lack of self-confidence among female students in higher education
- Negative influence from male fellow students and male teachers
- Sexual harassment
- Female students with non-urban backgrounds may not get along with female fellow students from urban areas

In Uganda the analysis highlights persons with disabilities as a group with special support needs. They face accessibility barriers in education due to negative societal attitudes and discrimination in the society, among other things.

Extract from the situation analysis in Uganda's SECOND NATIONAL DEVELOPMENT PLAN (NDPII)
2015/16 – 2019/20:
"The Uganda National Household Survey of 2009/10 indicated that Persons with Disabilities were at 16 percent of the population translating to approximately 5.5 million persons with disabilities using the recently concluded Uganda National Population and Housing Census provisional results. Persons with Disabilities face various forms of barriers ranging from negative societal attitudes; discrimination, inaccessible physical environment, information and communication technology to those resulting from insensitive disability friendly regulatory frameworks. These result into unequal access to services in the area of education, employment, healthcare, transportation political participation and justice in communities by persons with disabilities."
[SECOND NATIONAL DEVELOPMENT PLAN (NDPII) 2015/16 – 2019/20]

We conclude that social interaction not only plays a role – whether supportive or impeditive – *during* group learning initiatives but also in learners' likelihood of *accessing* these initiatives, in the first place. Some learners such as female students and persons with disabilities can be put off joining a learning initiative because of adverse social interaction as well as other barriers.

The following points provide further insight on what conditions need to be created so that learners in our partner countries perceive online learning as a protective space that facilitates access to group learning and supportive social interaction.

5.3 What are the motivational factors for learning?

Participant feedback from our online courses revealed that learners were motivated by the experiences they gain, the possibility to apply their learning in academic and non-academic life, improving their CV and standing out from others, and being awarded a certificate.

Demotivating factors were learning disruptions, in particular due to power and/or internet failure and other work and private commitments, as well as the pressure of not being able to meet short deadlines. However, most of the feedback we receive is from course completers, which may produce an incomplete picture of factors that may demotivate participants to such an extent that they drop out of the course.

Our analysis of partner country context enhances our understanding of motivational factors. It reveals the following motivating factors for undertaking and completing a learning initiative:

- Increased employability and perspective of higher income-earning jobs
- Learning from African scholars and about content that are relevant for the own country

For higher education students, the following specific factors can increase the students' motivation:

- Learning opportunities outside the formal classroom teaching inspire passion
- Active engagement in their own learning and intellectual development
- Reality check through learning-by-doing and work placements
- Building relationships and learning from role models

This latter aspect may result in differences in the learning journey of male and female students since female learners experience a lack of female role models in many fields, as discussed in this paper from Ethiopia:

Tesfaye Semela, Assistant Professor, Department of Rural Development and Family Science, Awassa College of Agriculture, Debub University, Ethiopia:
"There is abundant theoretical and empirical support regarding the positive effect of women role models on young female students to follow in their foot steps in all spheres including succeeding in tertiary institutions. Thus, there is a consensus at all levels that more women should be employed in higher education institutions. But the reality on the ground tells a different story. For instance, in 2002/03 academic year the proportion of women faculty in Ethiopian universities stands at 7% (MoE-EMIS, 2003; Habtamu, 2003). Debub University is no exception in this regard. A close scrutiny of faculty gender composition in the university reveals that women constitute about 10% (Academic Program Office, 2004/05), most of whom in fact are in typical „feminine" fields such as: HomeScience and Technology, Nursing, Language, and Humanities. This picture has to change and more women should be encouraged to join higher education as faculty members. This is not simply to bring about equality, but also due to its significant exemplary role to same-sex students that success in higher education is not contrary to women's role in society."
Tesfaye Semela 2006

INASP's online learning opportunities tend to have a good balance of female and male completers and we build mixed-gender teams of guest facilitators. So, they may offer an opportunity of getting in touch with same-gender role models to aid learning success.

The literature studied also mentions motivational barriers:

- In Ethiopia, higher education students are often assigned to departments; meaning they do not have their own choice of study subject and may end up studying a subject they are not interested in. Students are generally influenced by their peers, classmates and parents in choosing their areas of interest. Instead of focusing on what they want, they focus on what the market demands.
- For Ugandan academic staff, there is a tension between their role as teacher and their own learning needs. Parents see universities as teaching institutions for their children to get education as an enabler of employment. If a graduate does not get a job, the university is often blamed for the failure. For parents therefore, research and knowledge production are not part of their understanding of what a university is. For them, a university is merely a continuation – and the end - of the academic ladder for students. Staff in many of Uganda's universities are employed, and evaluated, for teaching. Research and the related need of learning is a distant obligation for most staff.
- Negative attitudes are factors in both countries, for example, the attitude of assessing usefulness on the basis of (monetary) gain or a general "negative attitude towards work".

We believe online learning opportunities can offer a window to other perspectives on learning. A broad exchange about learning benefits is possible since the learners can connect with a great diversity of people and their areas of interest. Of course, the challenge of finding time for learning still exists for academics who need to juggle their lecturer and researcher role. Early involvement of supervisors and university authorities, when offering TEL opportunities, may help to ease the problem.

5.4 What are the conducive factors and impediments to gender equity in the research and higher education environment?

We found some evidence from our previous online courses that there is a gender difference in how participants learn. In the AuthorAID MOOCs, we see that women are more likely to use mobile devices – between 10 and 20% of women participants. Men and women also tend to work different hours. In some countries the completion rate of male participants is higher, while in others a higher proportion of female participants completed. That suggests the country context needs to be considered when designing learning initiatives that contribute to gender equity.

In Ethiopia, affirmative actions have been set up to tackle gender inequality in the higher education and research environment. However, a widespread belief exists that female students who are admitted to the degree programmes with affirmative action are unlikely to succeed in their studies and this has negative implications in terms of self-esteem and academic self-concept, which, in turn, can have a negative effect on their learning success (T. Semela 2006).

Sources mention academic weakness and a high attrition rate of female students in higher education. According to a study conducted by Bahir Dar University in 2013, intrinsic factors such as lack of self-confidence, homesickness, addictions to drinking or other harmful behaviour and lack of interest for learning were most often mentioned as impediments.

In addition, extrinsic factors contributed to the low academic performance of female students. Some of these are: Lack of proper reading place, lack of availability of computers, and deficiencies in reading materials due to financial problems.

Intrinsic and extrinsic factors seem to be equally relevant for face-to-face and online learning, and the learning design is influenced by them. However, we believe online learning can have some advantages when tackling the above-mentioned barriers that, in particular, female students face. For example, the flexibility of online learning helps avoid homesickness; freely available online material can ease financial constraints; and online course versions for mobile phones may help female students who are less likely to have access to computers.

6 How we put our learning from this study into practice

Reviewing learner feedback from INASP's own courses in conjunction with looking at wider evidence from within specific countries helps us to understand the local context better. That matters when we develop TEL approaches to support capacity building. Some action points came out of this study.

Besides running our MOOCs for researchers on a global platform, we now provide private spaces for certain user groups from one country (R. Murugesan 2020), and are assessing how this helps to attract learners who appreciate a more protected space. We are also exploring ideas for how course facilitators can address user needs in a more tailored way in such learning spaces.

Both countries in this study consider critical thinking skills as an essential learning outcome within higher education. Graduates need critical thinking skills in their workplace and further academic career but also in their daily life as responsible citizens. As an organisation that promotes sharing, using and producing research and knowledge, we have broadened the audience of our TEL initiatives over recent years (see previous section on Critical thinking and INASP). In addition to researchers, INASP is now supporting higher education lecturers and students (J. Harle 2017). We developed an online course for students that introduces critical thinking (V. Schaeffler 2018) and released a version for early-career researchers in 2020 (a self-taught tutorial and a facilitated course).

We recognise that we need to understand the situation of different user groups better when designing our TEL approaches, in order to support the learners even more effectively. We have developed a scoping and design tool that helps to ensure that we ask the right questions before we design or adjust TEL approaches, including scoping questions around equitable and sustainable access, and barriers to learning. The insight that we gain from the scoping activity will help us to make the right design decisions as we develop courses tailored to specific learner context in the future.

Veronika Schaeffler is a Programme Specialist at INASP. Results of INASP's study on this topic were also presented at the eLearning Africa 2019 conference by INASP Programme Specialist Andy Nobes.

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