Utilizing Social Constructivism to cultivate teacher educators' and trainees' digital competence: energizing learner-centered approach

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ABSTRACT	Published Online: November 09, 2022

This article examines the perspective of teacher educators and teacher trainees in an academic teacher education program regarding the application of social constructivist approach in cultivating ICT integration in teacher training, in order to have teachers fit for the 21st Century Education. This article provides an overview of social constructivism and its implications for ICT integration in classroom practices. Objectives of the study were to establish how social processes cultivate teacher educators' and trainees' technology knowledge and also to establish how social processes cultivate teacher educators' and trainees' technology skills. Participants were teacher trainers and trainees from School of Education, Makerere University and data were collected using focus group discussions. Data were analysed qualitatively by transcription. It was found out that; social interactions indeed cultivate a number of technology knowledge, but participants exhibited low levels of judgment and negotiation, low levels of data management, problem solving and critical thinking skills. It was concluded that; content analysis through team work is a basic technique for developing teacher educators' and trainees' technology knowledge and also, the digital skills require continuous active practice and they cannot be attained in isolation of technology knowledge.

Keywords:
Social constructivistism, teacher educator, teacher trainees, digital competence

INTRODUCTION

In spite the seemingly great expansion in ICT usage many Sub Saharan Africa (SSA) higher institutions of learning still face a lot of challenges both in access and effective pedagogical utilization of Information technology. Salient among the major causes of this, its alleged is a constrained ICT environment for most teacher education higher institutions of learning (Guma, Faruque, & Khushi, 2013). The most critical factor in the successful integration of ICTs into teacher education is the extent to which the teacher educators have the knowledge and skills for using ICTs in teaching. So, teacher training requires a shift in teachers' roles, understanding the learning process and a transition from traditional teaching style to a social-constructivist approach (Postholm, 2006).

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This study using Makerere University as a case study, pivoted on Utilizing a Social Constructivist approach to cultivate Teacher-educators' and trainees' digital competence in order to harness the pedagogical novelty in ICT. The study viewed social constructivism as social processes that are geared towards learning through social interactions whereas digital competence was perceived as technology skills and knowledge.

OBJECTIVES

- Establish how social processes cultivate teacher educators' and trainees' technology knowledge.
- Establish how social processes cultivate teacher educators' and trainees' technology skills.

LITERATURE REVIEW

The emphasis of social constructivist learning is to transform traditional learning beyond educator-centred learning to achieve learner-centred, problem-based and collaborative learning environments (Alexander, 2008). As such, this form of learning focuses on understanding

learners' views and feelings and creating conducive environments towards problem solving other than just imparting knowledge to learners; involvement of the students in everything going on during the lesson. Social Constructivism as a learning theory posits learners construct knowledge and meaning through the process of sharing their ideas and opinions with others and in turn reviewing the ideas and opinions being shared (Orlando, 2013). According to Bahufite (2017) the social constructivist approach, ICT comes in as a common factor to provide a rich environment, capable of helping learners gain new experiences and enhance collaboration, discovery and social interaction.

Social processes cultivate teacher educators' and trainees' technology knowledge

Social processes include: information sharing, active participation, negotiation and modification, these are part of the major components of the social constructivist theory which promote deep learning through the use of ICT tools. So it is anticipated that, these social processes promote technology knowledge to support teacher trainers' teaching practices if well utilized. Unlike in developing countries, Plowman et al. (2010) found out that, almost all children in UK aged three and four are growing up in homes which have a range of different technologies. They found that 98% of their survey respondents' children were living in a household with access to a mobile phone (p. 308). Such children posses adequate technology knowledge and even at schools they found it easier to do their academic activities using technology, which seems to be an inverse relationship when it comes to the Ugandan context. It does not imply children in Uganda do not completely have access to technology tools, but rather children need support from their teachers to properly use these devices in their learning, although most of their teachers are technology migrants who cannot easily integrate ICT into teaching. Ideally if teacher trainers and trainees can realize the benefits of ICT in teaching, then technology empowerment will become a smooth process. As mentioned by Jaiswal (2011) that, a teacher education system empowered by ICT-knowledge can have a great opportunity of academic excellence, quality instruction and leadership in a knowledge-based society. Vajargah, Jahani and Azadmanesh (2010) also revealed that, technology knowledge can be used to support teaching and learning.

However, Shuva (2010) indicates that, the challenge with technology integration in teaching is how to transform the curriculum and teaching-learning process to provide students with the requisite knowledge to function effectively in a dynamically and continuously changing technology environment. To meet these challenges, teacher training institutions and schools must incorporate the new technology approaches in the curriculum. Further, according to Cennamo, Ross and Ertmer (2010, p.10), to achieve technology integration that targets student learning, lecturers need particular technology knowledge that enables them to: identify which particular technological tools are needed to support specific curricular goals; specify how the tools will be used to help students meet and demonstrate those goals; enable students to use appropriate technologies in all phases of the learning including exploration, analysis and production.

Social processes cultivate teacher educators' and trainees' technology skills

By technology skill here, we are talking about the "do", "action", it is the ability to do something well, so skill here is an active word, teacher trainer's and trainee's ability to perform a task practically using any form of ICT. Social constructivism focuses on social processes which indicate that, to develop a skill, the individuals need to see the need for sharing information, why and how active participation is facilitated, and role of negotiations or discussions in teaching and learning and also the purpose information modification. Whereas there is now great need of shifting from "Learning to use ICT" to "Using ICT to Learn or teach", teacher educators especially in teacher training institutions in developing countries have not taken lead in this; they have not engaged learners with digital technologies for learning purposes. Jegede (2009) indicates that, it is unfortunate where computer aided instruction happens to be one of the most required skills for a classroom practitioner but instead it is the least possessed by teachers. Ajayi, Salawu & Adeoye (2008) made a strong warning to such teachers without ICT skills, that they stand a very big risk to continue existing in a technologically demanding world; any classroom teacher with adequate and professional skills in ICT utilization will definitely have his or her students perform better as a result of continuous information sharing, active participation, negotiations and knowledge modification.

Also, (Agyei and Voogt, 2011; Inan and Lowther, 2010) indicated that technology skills are the strongest predictor of technology integration in the classroom. Other researchers like; (Cavas et al., 2009; Tezci, 2009; Drent and Meelisen, 2008) have continued to show that there are significant positive relationships between teachers' ICT skills and frequency of ICT use. However, Laurillard (2013) indicates that, even if teachers and students use technology, this does not necessarily mean that they can teach or learn with it. Because using technology to learn does not come naturally to everyone, digital skills should not be treated as independent of context (Young, 2012), but both teachers and students should be exposed to technology skills applicable across the curriculum (Collin & Karsenti, 2013). Tondeur, Forkosh, Prestridge, & Edirisinghe (2016), specified that among the most critical technology skills required for integration are: communication and problem solving.

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METHODOLOGY

Research design

The researcher used a case study research design and employed a qualitative research methodology, thus it was based on interpretive paradigm.

Participants

The researcher targeted teacher trainers and trainees in the School of Education, College of Education and External studies, Makerere University, Kampala and a total of ten participants were selected using both purposive and convenient sampling techniques.

Data collection instruments

The researcher used focus group discussion guide and observation checklist to collect data from participants.

Data analysis

The researcher applied qualitative data analysis method adopting Miles & Huberman's (1994) model of "transcendental realism" which involves three stages of analysis: *data reduction*, *display* and *conclusion*. At the data reduction stage, the researcher summarized data transcripts from the Focus Group Discussion and observations while discarding irrelevant data; at the display stage, the researcher presented the data in form of tables, paragraphs using key themes, highlighting some key statements and at the conclusion stage, the researcher verified data, made interpretations and drew conclusions.

Study Results

ICT knowledge acquired from social learning interactions

There is no doubt that Information and Communication Technology (ICT) expands access to education and through ICT, learning can occur anytime and anywhere. And so, the following technology knowledge areas were experienced during our online social interactions with both the teacher trainers and trainees.

Table 1: ICT knowledge levels acquired from social learning interactions

Competence level	Technology knowledge	Analysis
Lowly (*limited understanding of concepts related to ICT knowledge*)	*Judgmental*	Participants could not establish authenticity of most of the information used.
	Negotiation	Limited knowledge of complex tasks management such as upgrading or installing programs.
Moderately (*Basic understanding and ability to apply basic ICT knowledge*)	*Collective intelligence*	Participants somehow made comparisons of the collected texts/content.
	Media literacy	Participants fairly utilized most of the Google classroom features.
	Civic literacy	Participants tried to be responsible users of the platform.
	Content analysis	Participants fairly understood the appropriateness of content.
Highly (*High level of understanding and ability to interpret how and when to apply technology knowledge*)	*Research*	Participants exhibited high competence level of research technology knowledge.
	Distributed cognition	Since participants were guided, they carefully and reasonably attended to the various academic activities.

Judgemental knowledge was lacking due to the fact that internet itself is a temptation in such a way that, it makes sharing of information much faster, so you find that, people will share anything minus establishing the authenticity of the matter. *Negotiation* knowledge was also rated lowly, this concerns the ability to reason out on complex tasks such as switching from one program version, but it could be attributed to the fact that, today many learners want to get all answers from the internet, so availability of internet however good it might be, it has created gaps in individual reasoning, simply because we do assume, all answers are online. Participants were rated moderately competent on:

Collective intelligence, media literacy, civic literacy and *content analysis* whereas *research* and *distributed cognition* were rated as highly competent. Items like research, participants were obviously expected to be competent because, this is something ongoing in any teaching/learning process even without internet.

ICT skills gained from social learning interactions

This test item was aimed at establishing the different ICT skills which participants attained from the interactive process, so presented first in a table which gives the basic analysis of the way participants exhibited technology knowledge after the social interactions in terms of level of competence.

Table 2: ICT skills level gained from social learning interactions

Competence level	Technology skills	Analysis
Lowly (*limited understanding of concepts related to ICT skills*)	*Data management*	File management was so complicated for participants.
	Problem solving	Conventional and innovative ways of handing complex matters was a major problem to many participants.
	Critical thinking	Ability to analyze information objectively was thus challenging.
Moderately (*Basic understanding and ability to apply basic ICT skills*)	*Creativity*	Participants exhibited new techniques in handling some technical tasks, although not with a lot of ease.
	Multitasking	Participants had moderate potential to manipulate a number of tasks at ago.
	Information presentation	Learners exhibited high level of presenting information to an extent that some would use professional programs like Microsoft power point.
Highly (*High level of understanding and ability to interpret how and when to apply technology skills*)	*Self-direction*	Self-investigation was mastered; learners were able to get answers on their own.
	Collaborative	As a result of team or group interactions, participants ably worked effectively and respectfully with diverse other members.
	Appropriation	Participants had a lot of ability to construct meaningful content

Data management, problem solving and *critical thinking* were technology skills where participants showed limited level (*lowly*) of understanding, however all these skills relate to the technology knowledge in which participants exhibited low levels of understanding (*judgement* and *negotiation*), so many learners today have resorted to receiving all answers to complex tasks from the internet, whereas at times these answers also are so complicated to follow. This has limited learners' analytical approach to work. *Creativity, multitasking* and *information presentation skills* were fairly reasonable, participants would show some level of creativity in their work, they tried to perform a number of tasks at go which could also be attributed to the fact that, since learning these skills was interactive, definitely social interactions force users to attend to a number a bigger audience and like each participant may raise a different questions which requires attention, in the end a learner handles variety of questions or tasks concurrently. Participants were highly competent on other skills like: *Self-direction, collaborative* and *appropriation,* however it is reasonably clear that during social interactions, individuals gradually gain self-management skills, no one is forced to give feedback over a given topic, but it is just self-consciousness and similarly in

the due course participants gain collaborative skills since interactions involve exchange of information.

DISCUSSION

Social processes and teacher educators' and trainees' technology knowledge

Information Technology tools and programs require knowledge from the users which can be gained through social interactions on a customized learning management system such or any other free online platform such as Google classroom. The study findings revealed that social interactions promote: personalized learning, curiosity, motivation, and other aspects. But to the greatest advantage, when teacher and learners socially interact through information technology, then this promotes; *discourse analysis*, *collaborative learning, Internet efficacy, personality traits.* In such an environment ICT triggers constructivist innovation in the classroom thus leading to the realization of meaningful authentic, active-reflective and problem-based learning, a method that challenges students to "learn how to learn", students seek solutions to real world problems. In the same line, Ghasemi and Hashemi (2011) found out that, learner interactions can easily be promoted by using Information technology, because ICT promotes;

information access, allows the learner to select and interpret information, review and modify their work to improve the quality through computer programs. Plowman et al. (2010) found out that, in the UK, almost all children aged three and four are growing up in homes which have a wide range of technologies which they use to interact with one another. Then, Zaidieh (2012) also agrees that learning platforms have particular features which promote social interactions and thus learners construct their own knowledge through collaborations. However, Abao, Dayagbil, & Boholano (2015) warn teachers that, much as social interactions may promote ones' ICT knowledge, but then ICT does not automatically improve teaching and learning, it is the role of teachers to do something to motivate learners. Despite the fact that, a particular ICT may have a lot of good features; but it is the role of teachers to make meaningful use. For that matter, Cennamo, Ross and Ertmer (2010, p.10) advised that, to achieve technology integration that targets student learning, lecturers need particular technology knowledge that enables them to: identify which particular technological tools are needed to support specific curricular goals.

Social processes and teacher educators' and trainees' technology skills

Study findings indicated that, when learners use ICT to interact in groups with their teacher as a guide, they gain digital skills like; *digital networking skills, data management skills, Internet skills, communication skills, self-direction skills which is to do with* self-investigation, *creativity, collaborative skills, problem solving skills, information literacy skills* and *multitasking*. These findings also revealed that, to gain technology skills, there is need to embed the required ICT skills in the curriculum, in that adoption of ICT skills are not context-free. In the same perspective, Voogt & Pelgrum (2005) indicated that, ICT skills are complex, and therefore must be taught in a context integrated into the curriculum and as part of complex skills such as information handling, collaboration and communication and were embedded in an authentic context. Researchers like; Redecker, Leendertse, Gijsbers, Punie, Kirschner, Stoyanov, & Hoogveld (2010) entirely agree that, technology skills inspire teachers' pedagogical collaboration and functions as a catalyst of change since many educational settings in which ICT is used become cross-disciplinary, teachers become team members instead of independent workers. On the other hand, the study results continued to indicate that, teachers who use technology frequently to support learning in their classrooms report greater benefits to student learning. Richard (2010) in the same line reveals that, learners who use ICT in learning tend to be more competent even in other areas of life because of their various engagements with technologies. Study findings indicated that, when learners use some of these digital skills in other areas of self-management, take an example of communication skills, this cuts across disciplines, problem

solving, it does not only apply to ICT tools, internet skills, to access information today, this has become almost a compulsory skill.

CONCLUSIONS

From the discussion, the following conclusions were drawn as per each objective:

1. It was concluded that; content analysis through team work is a basic technique for developing teacher educators' and trainees' technology knowledge.

2. There is no doubt that social interactions can promote ICT integration skills, but these digital skills require continuous active practice and they cannot be attained in isolation of technology knowledge.

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