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A Discourse Analysis of Teacher-Trainees' Abstract Conceptualizations of Emerging Technologies in Teaching to Revitalise Luganda Language

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Abstract: While many young learners of the 21st century have grown up with, and generally prefer to learn using Emerging Technologies (ETs), few teachers of Luganda language graduate with learning experiences of integrating ETs in their teaching. One of the most crucial stages of gaining experiences in any subject or object of interest is making Abstract Conceptualizations (ACs) about it (Kolb, 1984). Whereas, scaffolding ACs has potential to expand a teacher's knowledge of integrating ETs in teaching, it is difficult to enact in a pedagogically sound manner. This paper emerges from a Design Based Research in which 68 Luganda language teacher-trainees at Makerere University were enrolled in a semester-long (17 weeks) blended learning course aimed at cultivating their experiences of integrating ETs in teaching. The study was informed by Kolb's (1984) Experiential Learning Theory (ELT) and Reeves' (2006) model of conducting research in authentic e-learning contexts. Six distinct abstract conceptualisations of ETs emerged from trainees' responses. This paper discusses the implications of such abstract conceptualization in the revitalisation of Luganda language.

Keywords: Luganda Language, Emerging Technologies, Abstract Conceptualizations, Teacher-Trainees, Online Learning, Artifacts, Teaching, Discourse Analysis.

Introduction

Luganda language is one of the indigenous languages spoken by people of Uganda. Out of the 45+ indigenous languages of Uganda, Luganda is the most widely spoken, with more than eight million speakers (Namyalo, 2013). Although Luganda is a fairly well documented language, and while it is being taught as a subject of study at some education institutions in Uganda, many young learners of this generation are slowly detaching themselves from its study (Kizza-Mukasa, 2014). The need to address this challenge is urgent. Otherwise, many young learners of this generation will continue to detach themselves from the study of Luganda. When this challenge is not addressed, Luganda language will lose its continuity and be at risk of extinction. The larger study from which this paper emerges aimed at cultivating teacher-trainees' experiences of utilising emerging technologies (ETs) in teaching to revitalize Luganda language.

The Concept of Emerging Technologies

According to Ng'ambi, Gachago, Ivala, and Watters (2012), ETs are often discussed at academic forums, such as conferences, without making any abstract conceptualizations of it. Indeed, existing reviews of seminal studies on the use of ETs in education have not come up with a specific definition of this concept as yet. For instance, instead of providing a specific definition, Siemens and Tittenberger (2009) opted to give examples of ETs, citing Skype, Blogs, Facebook, Wikis, Second Life, and Google Reader, as well as many others. Siemens and Tittenberger (2009) observed that ETs embody philosophies and ideologies that reflect particular world views. Siemens and Tittenberger (2009) also

noted that ETs have several affordances. By this, they meant that the different features of ETs provide much potential for learning. For example, many social networking technologies such as Facebook, Whatsapp, and Viber can provide networked teaching and learning pathways for educators and students. In a related (broader) perspective, Veletsianos (2010) did not define but opted to characterize ETs as context dependent, evolving, dynamic, under researched technological tools, concepts, and innovations with a lot of potential to transform pedagogical practices in higher education. Although many young learners of this generation generally prefer to learn using ET (Prensky, 2001), and while the practice of integrating ETs in teaching is increasingly common in other learning disciplines (Carlson & Gooden,1999; Pope, Hare, & Howard, 2002; Brown & Warschauer, 2006; Koehler, & Mishra, 2009; Muyinda, 2010; Stobaugh & Tassell, 2011; Ottenbreit-Leftwich, Brush, Strycker, Gronseth, Roman, & Abaci, 2012; Global Digital Citizen Foundation, 2015), ETs remain under-utilized in the teaching of Luganda language (Kabugo, Muyinda, Masagazi, Mugagga, & Mulumba, 2015). One of the main reasons why ETs remain under-utilized in the teaching of Luganda language is the fact that many teachers of Luganda language graduate from their teacher-training institutions with little or no learning experience of integrating ETs in their teaching (Kabugo, et al, 2015). The need to cultivate teachers' experience of utilizing ETs in teaching Luganda language to young learners of this generation is critical. Otherwise, many young learners of this generation will continue to detach themselves from the study of Luganda language. When this challenge is not addressed, Luganda language will lose its continuity and be at risk of extinction (Kabugo, 2015).

Theoretical Underpinning

The design of the larger study was informed by Kolb's (1984) Experiential Learning Theory (ELT). Kolb's ELT premises that individuals learn best by gaining experience with their objects or subjects of interest. According to Kolb, experience is attained at four different cyclic stages. Figure 1 below illustrates Kolb's (1984) stages of experiences in form of a cycle.

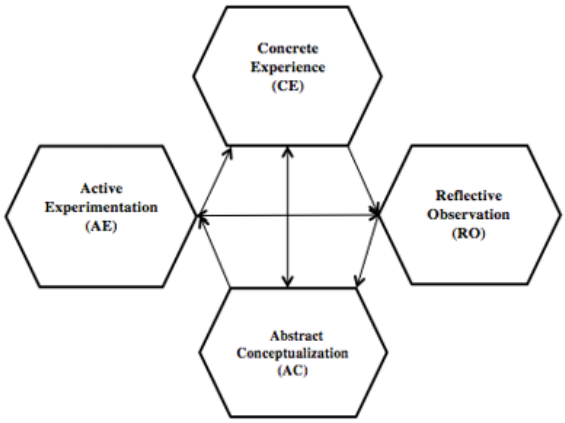

Figure 1: Kolb's (1984) Experiential Learning Cycle (ELC)

Each of these stages are explained below:

Concrete Experience (CE): At this stage, a learner directly engages with his or her subject or object of interest. Much of how learning takes place at this stage is by doing (Kolb, 1984). Teaching tools and

activities that may support learning at this stage include: authentic examples, samples, demonstrations, trigger films, as well as case studies (Mobbs, 2005).

Observational Reflection (OR): At this stage, a learner steps back from doing or directly engaging with the object or subject in question, so as to reflect on what s/he has already experienced (Kolb, 1984). The quality of reflections is usually dependent on the type of observations the learner makes about the objects or subjects s/he has engaged with (Mobbs, 2005). Teaching tools and activities that may support learning at this stage of experiential learning in, especially, e-learning contexts include: blogs, journal entries, and chats rooms (Kabugo, 2015).

Abstract Conceptualization (AC): At this stage of experiential learning, a learner tries to make sense of what s/he has concretely experienced (Kolb, 1984). Sense making happens through interpretation and involves the making of connections, discussion of consequences and implications of the form, structure, operations, and dynamics of the subject or object of engagement (Kolb, 1984). Teaching tools that may support this stage of experiential learning in e-learning contexts include: concept maps, argument maps, debate graphs, analogies, models, frameworks, and theories (Kabugo, 2015).

Active Experimentation (AE): At this stage of experiential learning, a learner tries to test what s/he has already experienced (Kolb, 1984). For technology-related experimentations to be useful, they must be done from authentic e-learning contexts / environments (Herrington, Reeves, & Oliver, 2010). Teaching tools that may support this stage of experiential learning in authentic e-learning contexts include: simulations, project works, laboratory tests, case studies, and field work (Kabugo, 2015).

Although Kolb's (1984) Experiential Learning Cycle (ELC) is frequently used as a pedagogical tool in university settings, and while it has recently found its way into the corporate world with a number of organizations using it as a concept to analyse workplace behaviour and facilitate workplace learning (Hailstone, 2008), it has been criticised for certain reasons.

Smith (2010) argues that Kolb's idea of stages or steps does not sit well with the reality of thinking. Smith's main concern is about Kolb's presentation of experience in terms of sequence. As Dewey (1897) earlier stated with regard to reflection, a number of such "experiential stages" can occur at once, while some of them can be jumped. For that reason, Smith (2010) contends that Kolb's way of presenting experiences in terms of sequential stages is both simplistic and unrealistic. Other experiential learning researchers have criticised Kolb's ELC for paying insufficient attention to the process of reflection, for taking very little account of different cultural experiences/conditions, and for building from such a weak empirical base (Jarvis, 1981).

Whereas some of the criticism against Kolb's ELC may hold, accepting such criticisms in totality is no better than accepting Kolb's ELC in full. This is because, Kolb (1984) has, since the publication of his seminal work, "Experiential Learning: Experience as the source of learning and development", responded quite well to some of his critics. For instance, Kolb has argued that teaching by focusing on particular experiential learning stages may not be so flawed a strategy as teaching to no experiential stage at all (Kolb & Kolb, 2005, 2006). Besides, Kolb has acknowledged the view that experience can begin from any of his proposed four stages (Kolb & Kolb, 2005, 2006). Mindful of Kolb's responses to his critics, this study adapted and utilized Kolb's initial ELC as follows:

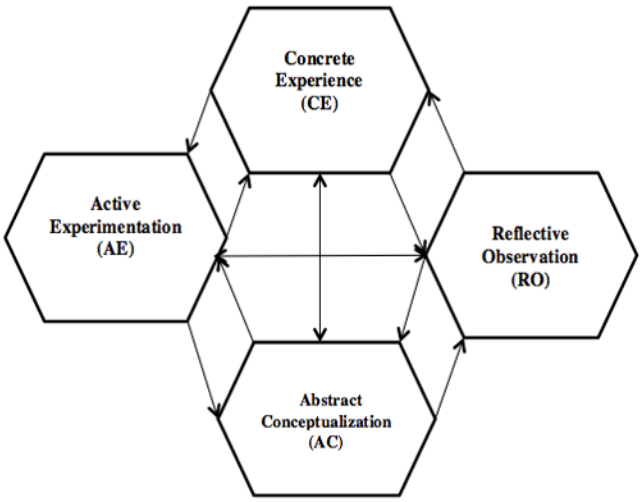

Figure 2: Adapted Version of Kolb's (1984) Experiential Learning Cycle (ELC)

In the modified version of Kolb's (1984) ELC above, the stages of experiential learning have not been numbered so as to capture the view that experience can begin from any stage. Likewise, a second layer of arrows (in an anticlockwise direction) has been added to consider the multidirectional nature of experiential learning. This paper draws on the revised version of Kolb's ELC (Fig. 2) and aims at analysing teacher-trainees' abstract conceptualization of ETs in their teaching of Luganda language.

Objective, Research Question and Approach

This paper aims at analysing teacher-trainees' abstract conceptualisation of ETs in teaching to revitalize Luganda language in the contemporary generation.

The study was guided by the following key question:

- How do teacher-trainees at Makerere University abstractly conceptualize ETs in their teaching to revitalize Luganda language?

The larger study from which this paper emerged followed a Design Based Research (DBR) approach. DBR has its origins in educators' pragmatic desire to improve learning, not in a purely practical sense, but also from an informed theoretical perspective. Herrington et al (2010) put it succinctly:

> [DBR] is grounded in the practical reality of the teacher, from the identification of significant educational problems to the iterative nature of the proposed pedagogical solutions" (Herrington et al, 2010:5).

Figure 3 below illustrates the focus of DBR.

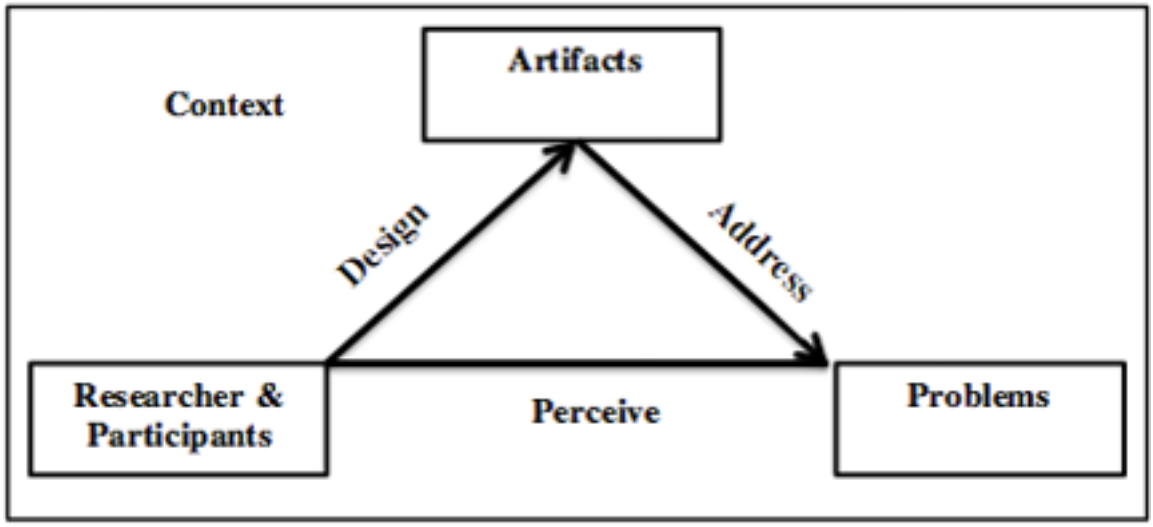

Figure 3: DBR as Researcher & Participants, Artefacts, and Problems (Adapted from Johannesson & Perjons, 2012)

Studies that have followed a DBR approach to explore educational problems in Uganda in general and at Makerere University in particular have yielded transformative results (Muyinda, 2010). While conducting research using a DBR approach can be a lengthy iterative activity (Herrington et al, 2010), this study drew on a precise, four-phase model proposed by Reeves (2006):

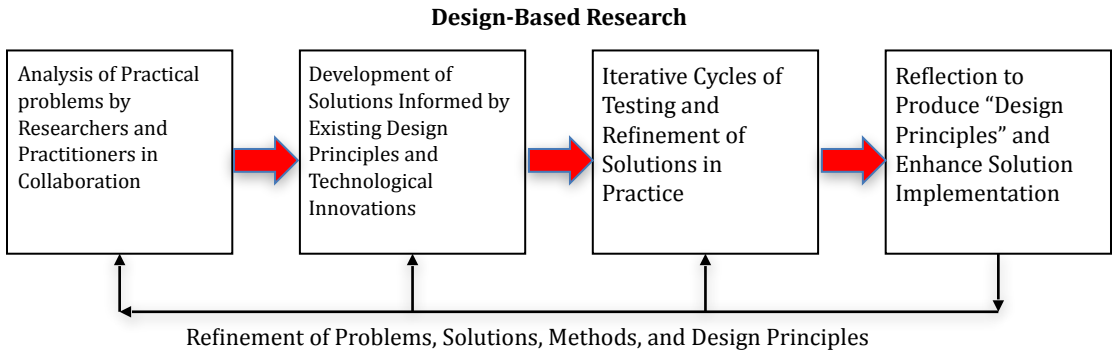

Figure 4: Reeves's (2006) Four-Phase Model for Conducting DBR in Authentic E-learning Contexts

In section two above, the practical problem of this study was illuminated. The other three phases of Reeves' (2006) model are explained in the sections that follow.

Design and Development of Solution

The second phase of DBR, is to design and develop a solution / intervention for addressing the problem identified (Reeves, 2006). In order to design an informative solution, "…literature is consulted to find a relevant theory that can guide the design thinking, as well as to locate existing design principles that may have addressed a similar problem" (Herrington, at. al, 2010:7). In this study, a blended learning course was designed for the purposes of cultivating teacher-trainees'

experiences of using ETs to effectively teach Luganda language to the Net-Generation. There is substantial evidence in the literature to suggest that blended learning courses are an effective approach to cultivating teachers' experiences of using ETs in teaching (Kabugo, 2015; Ertmer & Ottenbreit-Leftwich, 2010; Herrington, et. al, 2010; Koehler & Mishra, 2009; Brown & Warschauer, 2006; Pope, Hare, & Howard, 2002; Carlson & Gooden, 1999). The course was organized as follows:

Call for Participants

At the beginning of the study, a call was made inviting third-year, Bachelor of Education, Luganda Language teacher-trainees at Makerere University to participate in a semester-long (17 weeks) study. The purpose of the study was explained to them: *"To cultivate their experiences of utilizing emerging technologies for effectively teaching Luganda language to the Net-Generation*". Out of the target group of 78 trainees, 68 trainees responded to the call. Following their response to the call, all the 68 applicants were accepted to participate in the intervention. The study was designed as a blended learning course. The online component of the course was designed as a closed course using Edmodo as its platform (Kabugo, 2015). In addition to the online course, face-to-face sessions were organised every Saturday from 10:00 am - 2:00 pm throughout the semester in the School of Education (SOE) computer laboratory. The SOE's computer laboratory was used as a space in which the trainees freely explored and practiced more than 50 educational technologies (Global Digital Citizen Foundation, 2015). These technologies include: web-based documentation tools like Google Docs; Blogging applications like BlogSpot; Wikis such as PbWiki and Wikispaces; Social media tools such as Facebook and Twitter; instant messaging applications such as Whatsapp; Podcasting and Vodcasting tools such as YouTube, Soundcloud and Audioboo; Concept and Argument Mapping tools such as Debate Graph, C-Map and Rationale; Audience Response Systems such as Socrative; Mobile learning application tools such as Winkisite and Mob.is.it, among others. Trainees were guided to utilize a number of the above ETs to innovatively create their own solutions for their pedagogical challenges.

Design of the Online Task

Towards the end of the intervention (thirteenth week), a task was designed to seek trainees' personal experience and understanding of ETs at the level of Abstract Conceptualization (ACs). Trainees were required to make sense of the technologies they had concretely experienced, by interpreting, the making of connections and discussing the consequences and implications of using such technologies in the teaching of Luganda language to digital natives. This was designed as a closed online learning task on Diigo.

As seen in the screenshot (Fig.5), Diigo was used as a discussion forum in the intervention. Different topical themes and assignments were given in the form of threads to which the trainees responded. All the topics, themes, tags, assignments, and responses were made in Luganda language. The first discussion thread on the screen is the online task that was posted to seek trainees' abstract conceptualization of ETs. By 09 March 2015, this task attracted three hundred and sixty seven (367) views from the trainees. The "follow ups" under this discussion thread indicate that all sixty-eight (68) trainees responded to the task by the said date. Trainees' responses to the online task formed the primary data that was tested and analysed in this paper.

Iterative Cycles of Testing

The principle of iteration of testing in DBR maintains that a single test is not sufficient to gather enough evidence about the success or failure of the intervention and its effect on the problem situation

being addressed (Herrington et. al, 2010). For this matter, standard DBR takes a robust approach to testing, where changes are made to the learning design after the first implementation for the purposes of enhancing its capacity to address the problem (Herrington et. al, 2010). This principle aligns with Reeves' suggestion that DBR should primarily be developmental in nature, and that its purpose is to improve and not just to prove situations (Reeves, 1999). In this study, participants were allowed to submit, refine and share as many responses as possible with regard to their abstract conceptualization of ETs, based on their personal experiences in the intervention.

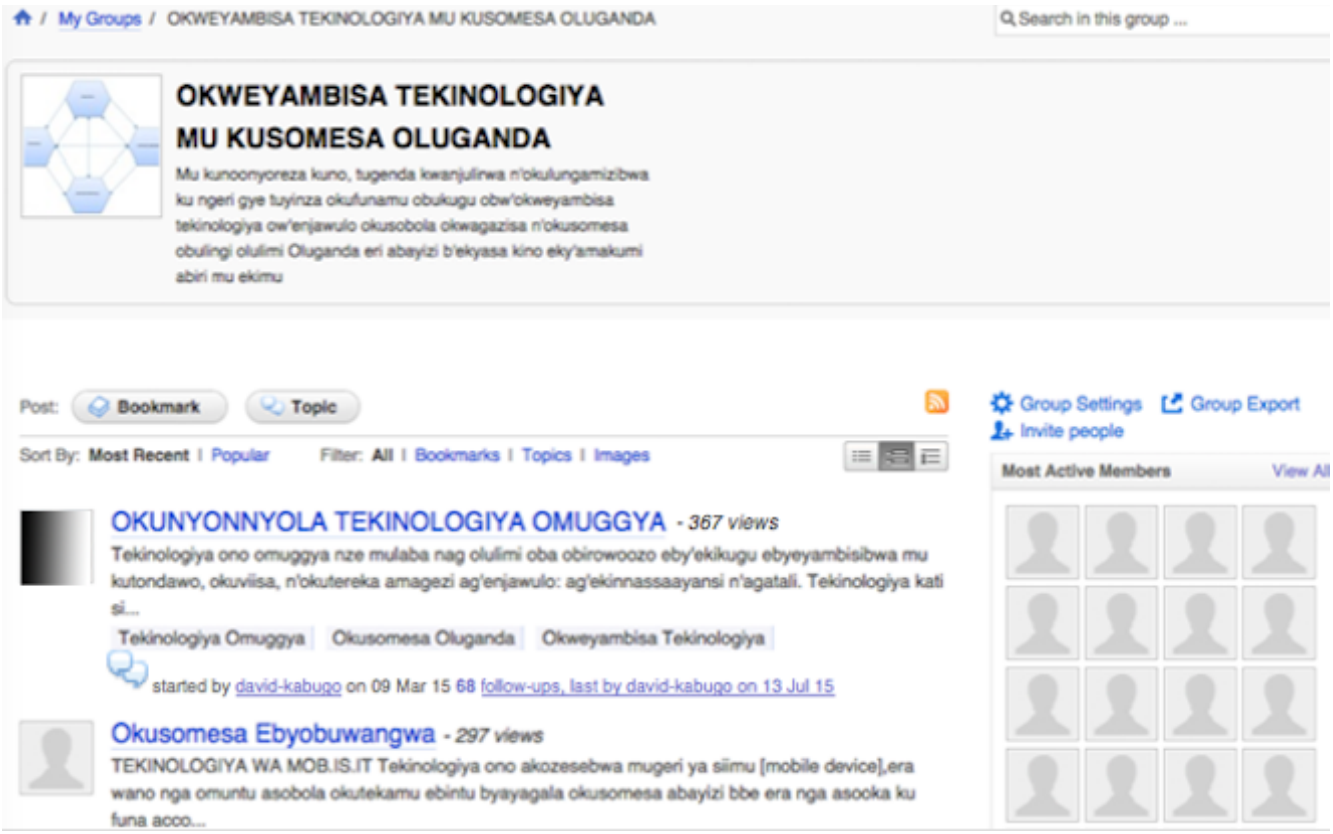

Figure 5: Diigo Screenshot Showing the ETs Abstract Conceptualization Task Given to Trainees

Data Analysis

This study utilized Fairclough's (1992) three-dimensional framework for analyzing discourses as its analytic tool. Discourses refer to dialogues or conversations. Discourse theory holds that dialogues or conversations, including their dimensions, shape and are recursively shaped by their constructors (Fairclough & Wodak, 1997). According to Fairclough (1992), every discourse has three dimensions: a) the micro dimension, which is the spoken or written text (artifact), b) the meso dimension which deals with the processes of interaction, i.e., production and consumption of that text (artifact), and c) the macro dimension, which deals with the context, i.e., larger socio-cultural, political and economic environment of dimensions a) and b). Fairclough (1992) contends that discourses, including their dimensions, can be analysed at three levels, which include: i) description, ii) interpretation and iii) explanation. At the first level, the analyst focuses on a discourse dimension and describes its genre, type, category or quality. At the second level, the analyst directs his or her attention at interpreting

and making meanings and inferences from the genres, types, categories or qualities of a discourse dimension. At the third level, attention is directed at explaining and making connections and understanding implications of a discourse dimension for social practice. Fairclough's (1992) framework for analysing discourses and discourse instances is illustrated in Figure 6.

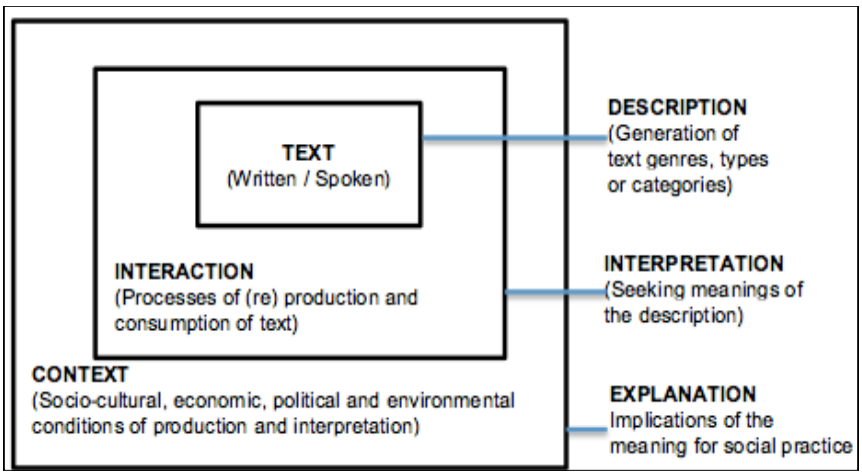

Figure 6: Fairclough's (1992) Three-Dimensional Framework for Analyzing Discourses

Inferring from discourse theory, this study held that trainees' responses (written discourses, including discourse dimensions) to the online task concerning abstract conceptualization of ETs (see Fig. 5), were shaped and recursively shaped by trainees' experiences of utilizing a number of ETs for teaching of Luganda language during the intervention. In this paper, trainees' responses are analyzed from micro dimension at three levels. However, there is usually a subjective judgment in analysing discourses and discourse dimensions from a micro dimension at all levels (Roode, Speight, Pollock, & Webber, 2004). Mindful of such subjectivity in our analysis, we present our findings in a tabular format. As Roode et al, (2004) advise, such a format can help the readers of this paper to construct a comparative or "independent" analysis by easily referring to the source text that precedes the analytic table, the translation of the source text (row 1), and its description, interpretation and explanation (columns; 1, 2 and 3) in the analytic table.

Presentation and Discussion of Findings

In this section, trainees' responses (written discourses) to the online task regarding abstract conceptualization of ETs (see Fig. 5), are analysed in a tabular format. Trainees made their responses in Luganda language. The main text in each screenshot is translated into English for analysis. The first row of the analytic table contains the translated version of the text. The translated version of the text / artifact is analysed from a micro dimension at three levels, namely description, interpretation and explanation. For the purposes of brevity, seven compelling screenshots are selected, translated and analysed.

Table 1: Translation and Analysis of Text / Artifact #1		
I look at emerging technologies as a language or technical thoughts used in creating, manipulating and storing different knowledge: scientific and non-scientific. I no longer look at technology as just machines. For example; Whatsapp and Facebook are not machines. Rather, they are systems of thoughts designed by specific people.		
Description (Text Analysis)	Interpretation	Explanation / Implication
Trainee cites Social Networking Applications as examples of ETs. He also observes that ETs are systems of thoughts, and constitute a certain kind of language.	Systems of thoughts are also known as ideologies or philosophies. Therefore, the allusion being made is that ETs are, and perpetuate certain forms of ideologies / philosophies. In addition, viewing ETs as a certain form of language, where language is to be understood as a socio-cultural and psychological tool that mediates people's interactions, is to argue that ETs are serve same purpose.	Teachers of Luganda and other indigenous languages seeking to utilize ETs in their teaching should be mindful of the explicit and implicit pedagogical ideologies (beliefs) that are embodied therein, and perpetuated by different ETs. They should also utilize ETs in manner that mediates students learning.

Table 2: Translation and Analysis of Text / Artifact #2		
Emerging Technologies vary from one individual to another. What is emerging to me may be old to another individual. For example, although students of other courses - especially Science courses have been using MUELE http://muele.mak.ac.ug for their learning for quite a long time now, this technology is emerging to us as Luganda language students because we have just been introduced to it this semester.		
Description	Interpretation	Explanation / Implication
Trainee illuminates how an institutional Learning Management System<http://muele.mak.ac.ug>(Moodle) is still emerging to him as Luganda language student, but old to other students in Science disciplines.	ETs are not necessarily new technologies. Old technologies may also be emerging depending on who, where, how, and why they are utilized. Thus, ETs are individual, discipline, context and application (methodological)-dependent.	It is important for teachers of Luganda and other indigenous languages to place disciplinary, context and methodological requirements of their teaching before technologies.

Table 3: Text / Artifact #3		
ETs encompass innovative, scientific and technical ways of doing things. The use of intelligent technological devices such as those that communicate with human senses (Sensory Devices) can help explore the needs, and cultivate the potentials of individuals. One of the examples is Google Glass.		
Description	Interpretation	Explanation / Implication
Trainee describes ETs more broadly as technological tools and artifacts that influence and are influenced by people's lives and practices.	Tools and artifacts, including their ways of use and meanings, embody people's socio-cultural practices, collective of which, is technically called discourses (Fairclough, 1992). Here, ETs are viewed as forming or mediating certain forms of discourses.	Luganda language teachers should not use ETs for their own sake. They should utilize ETs in a manner that mediates and transforms students' discourses (lives and practices). They should be able to contribute to the transformation of ETs.

Table 4: Text / Artifact #4		
These ETs keep evolving and developing through different stages. After a while, there arises a new version of a given technology and every version that emerges is usually better than the older one. For example, there are different versions of MS Office applications such as the MS Word 98, 2000, 2011, and 2013 versions.		
Description (Text Analysis)	Interpretation	Explanation / Implication
Trainee describes ETs as evolving and dynamic technology tools or applications that are in a constant state development or refinement.	The evolving and dynamic nature of ETs has potential to increasingly transform pedagogies.	Teachers of Luganda and other indigenous languages ought to update their pedagogical, content and technological knowledge as a function of their engagement with ETs.

Table 5: Text / Artifact #5		
Since these technologies are just emerging, we cannot claim to fully understand them. These technologies keep changing in so many different ways. As such, an individual cannot claim to fully understand them, before undertaking empirical research and trajectories about them.		
Description (Text Analysis)	Interpretation	Explanation / Implication
Trainee submits that ETs are not yet fully understand and not fully researched.	Limited understanding and research about ETs can greatly impact integration in pedagogy.	Teachers of indigenous languages using ETs in teaching should seek full understanding of, and research the use of ETs so as to maximize the potential of such technologies especially in transforming pedagogy.

Table 6: Text / Artifact #6		
ETs can bring transformation into teaching although we have not yet fully exploited their potential. For example, the use of technologies allows a teacher to talk less and to give students opportunities to engage in their learning. In the traditional teaching, the teacher spends over 90% of his/her time talking, while learners are just listening.		
Description (Text Analysis)	Interpretation	Explanation / Implication
Trainee posts on how the potential of ETs to transform pedagogical practices has not yet fully been exploited.	Limited research about ETs impacts its use in, and potential to transform pedagogical practices.	Indigenous language teachers using ETs in teaching should seek full understanding of, and research the use of ETs so as to transform pedagogical practice.

Table 7: Translation and Analysis of Text / Artifact #7		
Most technologies are made from developed countries. These technologies come in foreign languages such as English, Arabic, French and so many others. This gives an upper hand to people who know such languages to quickly understand, utilize and benefit from these technologies compared to people who do not know such languages.		
Description (Text Analysis)	Interpretation	Explanation / Implication
Trainee describes the imbalance that exist between developed and developing worlds in regard to production and consumption of emerging technologies.	ETs are not only connected with technological but also social divides! (Roode, Speight, Pollock, & Webber, 2004).	Teachers of Luganda and other indigenous languages, seeking to understand, utilize, and benefit from ETs should draw on best practices from across the globe.

Conclusion and Reflections

This paper emerged from a larger study, which set out to cultivate teacher-trainees' experiences of integrating emerging technologies in teaching to revitalize Luganda language. The study was undertaken in the School of Education at Makerere University. Sixty-eight third-year Luganda language teacher-trainees were enrolled into a semester-long blended course, in which they experimented with more than 50 different emerging technologies in their teaching. Towards the end of the course, trainees were tasked to share their evolving understanding of the concept of emerging technologies. The task was designed on and completed using Diigo (a learning social and personal knowledge management platform). This paper has analysed trainees' online learning responses using discourse analysis. Six distinct abstract conceptualizations of ETs emerged from trainees' responses: i) ETs perpetuate certain forms teaching and learning ideologies (philosophies), ii) ETs are individual, discipline, context-dependent, iii) ETs form and mediate specific forms of discourses (ways of saying, acting and interacting), iv) ETs are dynamic and have potential to transform teaching and learning practices, v) ETs are not fully understood and are scantily researched at different educational levels, and lastly, vi) ETs can perpetuate a socio-techno divide. This paper comprehends the need to continually reconceptualise and utilise ETs in the teaching of Luganda language. The need for continuation of this activity rests in its potential to revitalise and preserve Luganda language. As evidenced in this study, conducting this activity helped to capture learners' attention and interest in learning Luganda language. When students' interest in learning any subject is captured and sustained, the subject of interest is preserved. Secondly, this activity propelled participants to reengineer and modernise their language as they attempted to incorporate and build new technological expressions and concepts into their language. Lastly, being a pedagogical task, this activity customarily engaged trainees in production, publication and consumption of educational resources for teaching and learning of Luganda language. Production, publication and consumption of educational resources for any language, ensures preservation and revitalization of such a language.

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