

Application of Instructional Technology in promoting KAP in a new learning paradigm in Eritrean Higher Education

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Abstract

Today, education is work-centered having harmonious relation between theory and practice based on well prepared and organized delivery of educational content supported by appropriate instructional technology focusing on integration of learner's knowledge, attitude and practice (KAP). Technology is connecting people across the globe, opening new vision of learning opportunities with organizations adopting technology aided education. The present study attempts to focus on contribution of instructional technology in Eritrean higher education that brings effective outcomes in terms of KAP in a new learning paradigm. It also tries to find the engagement of in-class instructional technologies for on-task classroom productivity using Presentation tools, online demos, simulators, graphic tools, interactive applications, educational software such as Moodle and enabling classroom computing hardware etc. being participatory and collaborative to deal with the real world. As per the findings of this study, in-classroom instructional technologies stimulated learners' readiness of mind to learn (mean rating = 4.70 in a 5 point scale) that helped in participation & knowledge construction (4.38), retrieval of acquired knowledge (4.5) made into practice (4.38). These have synergistic effect on achieving instructional objectives and goals of the lesson with mean rating of 4.42.

Key Words: Instructional technologies, new learning paradigm, participatory learning,

KAP Integration, on-task classroom productivity.

Introduction

In this age of science and technology, the glamour of instructional technology is adopted as an essential as well as powerful tool in teacher's hand in the classroom to bring the desirable behavioral changes by integrating knowledge, attitude and practice (KAP) of learner to deal with the real world challenges. It is one of the crucial aims of education. There is underlying fact that every society is in need of quality life through quality education that is one of the basic components of development in productive direction. Today's education is focused with due emphasis on establishing a harmonious relationship between theory and practice. Also, there is interdisciplinary approach to teaching in well-equipped classroom. Simultaneously, teacher must be well prepared with appropriate instructional technology, keeping in mind its guiding principles, i.e. instructional communication process with modern technologies (Andoh, 2012; Yi et al., 2006), ways of gaining experiences (wong & Li, 2008) with psychological and behavioral perspectives, etc. Instructional technology consisting of hardware approach (Audio Visual aids), software approach (facilitating applications, Psychology, principles of learning, behavioral management strategies) and system approach (coordination of hardware and software approaches) influences the educative process in versatile ways for effective outcomes. (Mohanty, 2008; Rengarajan, 2001; Dwyer et al., 1997)

It is wise that every learner must be an active member of 3Hs club i.e. Head, Heart and Hands, means he/she should acquire right information with valid reasons by using his/her head, then accepts the same being good enough by heart and at last, puts it into action and practice by using hands. These above features can be synonymously reflected on learner's KAP and come into working form with synergism in eclectic manner. Also, it is required that every teacher should be equipped with necessary skills and competencies in relation to technological, pedagogical and content knowledge (TPACK) with proper communication skills and response to feedback system to deal with teaching learning situation effectively. As per the needed skills and content mastery, instructional technology is crucial and giving fuel to transform the education vision into reality.

Significance of the study

Use of instructional technologies in present teaching-learning process being tightly integrated with pedagogy and content promote more efficient accumulation of knowledge, broadening attitude and practical implementation of the wealth gained. This in turn,

promotes the engagement of more and wider ranges of supporting technologies in the process. In the local context in the institutions of higher education of Eritrea there has been an upsurge of provision of technologies in the learning environment such as computers, projectors, smart phones, tablets, interactive online learning technologies, web-based course management systems, although most of them are at the early stage of development. As new technology connects people across the globe and opens new vision of learning research opportunities that supports largely the developing, accumulating and sharing of new body of knowledge. With appropriate use of these instructional technologies, learners could also be motivated to widen their horizon and open up their attitude towards using the accumulated knowledge in practice. As per the need, use of appropriate instructional technologies in higher education learning environment is wise for productive quality education by overcoming the local context challenges. In Africa, the introduction of computers in primary and secondary schools is a recent phenomenon. For Africa to compete in the global economic environment, a highly skilled and educated workforce with aptitudes and skills in the application of ICT is essential. It is important that all education sectors from primary to higher education understand the benefits of investing in ICT infrastructure required for introducing ICT-enabled education (Mndzebele, 2013). There are very limited studies on instructional technologies in higher education in Africa. It is our daring attempt to adopt new approach of promoting the use of instructional technologies in higher education teaching-learning processes being motivated by some studies (Rogers 2003, Earle 2002) with far-sighted vision in order to bridge the gap between theory and practice (Andoh, 2012) to promote meaningful and outcome-based learning knowledge, attitude and skills fit to practical problem-solving (AACTE, 2010; Project Tomorrow, 2010) as well as professional productivity and development (Tomei, 2005) in the direction of educational change. Moreover, education being a public good needs to be disseminated to all levels of schools and higher education with restructured curriculum, pedagogy incorporating instructional technology infused education in a new learning paradigm in transformative perspective for quality education (Nut, 2010; Johnson, 2009). In relation to the Eritrean context, this calls for the government policy on ICT integrated education in the country with necessary investments, arrangements and initiatives. Ministry of Education of the State of Eritrea focuses that human capacity development is essential to support the planned ICT infrastructure and the new pedagogical practices. It is required for the technology supported new national curriculum to be used in formal and non-formal education system (MOE, 2005).

Problem Statement

The wide spread of rigid structure of education system with restrictive curricula, resistance to educational change, limited access to ICT, lack of teachers' technology training and others to this Eritrean context are the root causal factors not to adopt a new technology based paradigm in both schools and higher education learning environments. As a result, the use of instructional technologies to leverage the construction, accumulation and sharing of knowledge has been hampered by the prevailing facts on ground.

The present study has been designed with far-sighted vision to help set a guideline to introduce appropriate instructional technologies that would promote knowledge construction and accumulation, and its well versed attitude to share it in practice and gaining new experience as cultural wealth. This would stimulate the introduction of needful changes in curriculum to include technology-based approaches applied from school levels to higher education.

Research Questions

- How do instructional technologies promote KAP integration in a new learning paradigm?

Objectives

- To investigate how instructional technologies promote learner's knowledge, attitude, and practice

Material and Methods

This study was undertaken to gather information about the beliefs and perceptions of instructors on the use of instructional technologies to promote KAP in a new learning paradigm in Eritrean higher education. It included 60 instructors as study sample from the three colleges,

i.e. the College of Education, College of Engineering & Technology and the College of Science of the Eritrea Institute of Technology, Eritrea (N. E. Africa) by using convenience sampling technique. A questionnaire instrument was developed by the researchers by compiling learner centered ideologies, experiences and observations in technology supported environment keeping in mind the central objective of the study. There was 5-point scale in the questionnaire (1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 =

Agree, 5 = Strongly agree) (Chandradas & Gogai, 1999). It was examined by the experts in both disciplines of education and technology. Then it was subjected for pilot study and finally shaped questionnaire was made ready for use. Twenty participants were selected from each college representing the whole institute and the questionnaire was used to gather first-hand information in three different sessions in an easy and comfortable environment with prior information about the study and its purpose. The participants' consent was obtained in written form. Confidentiality of their responses was ensured to be maintained as per the research ethics. Information were analyzed to find the meaning at a glance and then interpreted considering the local context. The study related literatures were used in discussion gaining insights. Further references were consulted that strengthen the aim of the study.

Results and Discussion

Table-01: On-Task Classroom Instructional Technologies used		
<i>Instructional technologies used by respondents in teaching</i>		<i>%</i>
1	In-classroom Hardware (Laptop/Tablet/LCD Projector/Multimedia Screen)	76.7
2	Presentation applications (PowerPoint / Demo / Interactive Simulators etc.)	80.0
3	Net-based systems - Presentation contents (simulators, graphic tools, Online contents and other educational software such as Moodle)	85.0

It shows that widely used in-classroom instructional technologies in higher education classes such as enabling in-classroom hardware (77%), in-classroom presentation applications (80%), and net-based presentation contents (85%) etc. facilitate teaching-learning process for collaborative participation of both teacher and learners in an open-dialogued environment. It makes the class interactive being engaged in on-task productivity (Anderson, 2007) with in- depth understanding and internalization of the facts in the lesson taught. Instructional technologies create a new learning paradigm where learning is easier and better by creating learner's participatory interest and inquisitive mind involving multi-sensory organs. Learning becomes meaningful, concrete and inspirational (Levin & Wadmany, 2008; Yi et al., 2006). Teaching & learning also becomes more interesting and enjoyable.

Table-02: Contributions of Instructional Technologies in Higher Education Institutions							
<i>Ser. No.</i>	<i>Statement</i>	<i>5-Point Scale</i>					<i>Mean Rating</i>
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	
		<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	
1	Technology facilitates teaching endeavors	-	5	16	37	42	4.15
2	Technology transforms teaching - learning process into a new approach	-	2	8	40	50	4.38
3	Technology saves resources	5	-	5	32	58	4.38
4	Technology helps the achievement of instructional objectives & goals	-	-	7	45	48	4.42

Source: Lever-Duffer, et al., 2003; Heinich, et al., 1999 (for general concept of the table design)

Instructional technologies contribute in diverse ways being a new classroom approach in a well-equipped classroom, benefit to the teacher by facilitating teaching endeavors (mean rate 4.15/5.0) that enhance its effectiveness with content delivery in an organized manner to achieve instructional objectives and goals (mean rate 4.42). It saves time and energy (mean rate 4.38) of the teacher and learner though with long lasting one-time investment. It also reduces verbalism in instruction, stimulates the environment and motivates the learners for maximum learning being question-posed and reflective throughout the lesson. It supports the learner centered interactive pedagogy in higher education classes facilitated by technology enabled instructor with positive attitude (Andoh, 2012) being trained with technology aided pedagogy and content knowledge theory and research (US Department of Education, 2010; AACTE, 2008). Teacher becomes able to deal with learning dynamics, attracts learners' attention, enjoys class discipline, identifies weak learners and uses scaffolding approach to meet their needs and differences. As a whole, it becomes lively classroom and conducive for teaching-learning activities (Wozney et al., 2006; Christensen & Knezek, 2006).

Table-03: Contribution of instructional technologies to create knowledge and develop attitude to share it in practice							
Ser. No.	Statement	5-Point Scale					Mean Rating
		1	2	3	4	5	
		%	%	%	%	%	
1	Technology helps in stimulating positive attitude and readiness of mind to learn	-	2	2	21	75	4.70
2	Technology enhances knowledge construction by learners	-	5	7	33	55	4.38
3	Technology provides easier means to store the acquired knowledge	-	-	7	36	57	4.50
4	Technology facilitates the retrieval of accumulated knowledge and its implementation into practice	-	3	9	35	53	4.38
5	Technology promotes social interaction and participation in classroom activities.	2	3	17	36	42	4.13

Source: Lever-Duffy, et al., 2003; Heinich, et al., 1999 (for general concept of the table design)

The contribution of in-class instructional technologies is highly focused on learner's gain, i.e. developing positive attitude and readiness of mind to learn (4.70/5.0), acquiring knowledge, easy way of constructing new knowledge (mean rate 4.38) based on in-depth understanding of the concept, procedure and facts, increases the retention of information (mean rate 4.50) in the memory storage. Besides, it facilitates retrieving / recalling of accumulated knowledge into practice when and wherever to be used. It accompanies social interaction and sharing, critical thinking, reasoning, imagination, assimilation and creativeness to handle problematic situations. This is the ultimate aim of education that gained-information and both hard and soft skills are to be used for the success of personal and professional life (AACTE, 2010; Anglin, 1995). The present study findings are matched with the Chinese proverb: "If we hear, we may forget; if we see, we may remember; if we do, we understand and know".

Conclusion

KAP in the domain of education refers to what we understand and know through teaching-learning technologies, how we perceive them and how readily we adopt them to use in our life system for easy-going and quality living. The present study has brought to the light those instructional technologies as a new approach create a new learning environment for better learning outcomes such as knowledge construction, accumulation, retrieval and its implementation in practice along with favorable attitude and readiness of mind as per the need. Their interest developed, desire aroused, deep understanding and trust created and outcome oriented satisfaction ensured and both teacher and learner actively engage themselves in dialogue process, interaction and collaboration for maximum productivity that remains long lasting for future application.

Therefore, the teachers' community should appropriately select and use these advanced instructional technologies considering the present and future need-based requirements, especially focusing on learners' KAP integration. This is the driving force for their holistic development. Also, it needs to restructure the curriculum, pedagogy transformation, leadership and initiative roles for instructional technology supported education in schools and higher education in Eritrea.

This study brings a new understanding with regard to the integration of KAP in education that it requires coordinated approach to boost the whole education environment including, technology embedded curriculum, transformative pedagogy, community awareness to educational technology and its implementation, promoting learners' involvement to adopt new methods and so on in a time-need new learning paradigm.

Recommendation

As per this research study findings, appropriate synergy between KAPs supported by enabling instructional technologies in the classroom environment is the core drive behind educational excellence in the new teaching-learning paradigm. What makes the choice appropriate is, therefore, partly the readiness of the parties involved to adopt and progress on the real ground. The following considerations deserve appropriate attention in order to achieve the said goal:

- Promoting tech savvy society (teachers, students, parents and the general public) through technology literacy campaign.
- Special training focused teachers' capacity building enabling them to integrate

technology into classroom practices with competence.

- The trained teacher shall be able to take those skills to the classroom and engage students to build their awareness, thereby influencing the society.
- The basic ground work to succeed in such transformation is to educate the public at large and update the mindset of those involved in education and decision making positions.

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