

TECHNOLOGY AIDED PEDAGOGY AND CONTENT IN HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

Technology in higher education is believed to have positive effects in improving teaching -learning practices for achieving the quality education. Focusing on technology aided pedagogy and content (TPC) in its preparation, organized delivery and its effects, the present study attempted to gather information about the instructors' beliefs and perceptions in its contribution, and advantages. It also considered technology gadgets used in the local context and needed to bridge the gap between theory and practice along with TPC based teaching -learning future vision in higher education institutions. This information may help in the application of TPC as the best practice approach in those institutions to bring desired educational changes in the direction of quality achievement.

KEYWORDS: *TPC Adoption, ICT Integration, Technology Gadgets, Classroom Interaction, Knowledge Construction, Equipped Classroom, Challenges*

INTRODUCTION

It is a universal fact that every society is in need of quality social life, which depends on quality education that is the basic component of development in the productive direction with immediate and long-term outcomes. Today's education focuses on establishing a harmonious relationship between theoretical and practical knowledge with interdisciplinary approaches in teaching - learning activities at all levels of education in general and higher education institutions in particular in the 21st century (Andoh, 2012; AACTE, 2010). The rapid growth in technology aided pedagogy and content (TPC) has brought glamorous changes in the field of education as per the growing needs and demands of modern societies. In this present era, TPC is becoming increasingly important in our education system to transfer objective based knowledge and skills from its sources to ultimate users for clear understanding, new knowledge construction, reflection, and remediation. It is facilitated by creating a stimulating classroom environment for participation, interaction with the feedback system, storage, and retrieval of knowledge to handle the problems in personal and professional life situations.

As referred by AACTE (2010), Technological Pedagogical Content Knowledge (TPCK) is a framework to understand and describe the kinds of knowledge needed by a teacher for effective integration of technology in all content areas. The TPCK framework argues that effective technology integration for teaching specific content or subject matter

requires understanding and negotiating the relationships between these three components: technology, pedagogy, and content for effective educational outcomes. Classroom teachers are at the forefront of synergistically integrating these three (Rogers, 2003; Earle, 2002).

Keeping view of it, today's higher education institutions have been trying to restructure their educational curricula and classroom facilities to adopt TPC in order to bridge the gap between theory and practice to promote meaningful and outcome based learning as well as enhance professional productivity (Tomei, 2005). This work, therefore, has been designed to study the common beliefs and perceptions of TPC by the instructors of higher education institutions of one of the developing countries, i.e. Eritrea (N.E.Africa). The study findings may help to adopt TPC integration into daily teaching - learning process in higher education for visible educational outcomes considering its far-sighted vision. Although huge investments on infrastructure, equipment and professional development are claimed to improve education in many countries (Andoh, 2012; Gulbahar, 2007; Norton et al, 2000), investment in TPC is an investment for the better future of children.

MATERIAL AND METHODS

This study was undertaken to gather information about the beliefs and perceptions of instructors on technology aided pedagogy and content in higher education institutions. It included 60 instructors as study sample from the three colleges of the Eritrea Institute of Technology, Eritrea (N.E.Africa) by using the convenience sampling technique. The first-hand information was gathered and recorded in predesigned and pretested 5-point scale questionnaire (1 = strongly disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly agree) (Chandradas&Gogai, 1999). Information was analyzed to see the meaning at a glance and then interpreted considering the local context. The study related literatures were used in discussion gaining insights.

RESULTS AND DISCUSSIONS

Table 1: Perception in contribution of TPC in Higher Education Institutions

S. No.	Statement	5-Point Scale					Mean Rating
		1	2	3	4	5	
		%	%	%	%	%	
1	TPC would help in stimulating and creating readiness of mind to learn	-	2	2	21	75	4.7
2	TPC would enhance the transmission of knowledge and skills to students	-	2	3	25	70	4.63
3	TPC would promote social interaction and participation in classroom activities.	2	3	17	36	42	4.13
4	TPC would enhance knowledge construction by learners	-	5	7	33	55	4.38
5	TPC would help creating an environment for storing information	-	-	7	36	57	4.5
6	TPC would facilitate the retrieval of information	-	3	9	35	53	4.38

The perception of respondents on the contribution of TPC in promoting readiness of mind to learn and enhancing knowledge transmission to students is very good with an average rating of above 4.5. The promotion of social interaction & participation in the classroom and enhancing knowledge creation, storage and retrieval by use of TPC has been also perceived well with an average rating of above 4.1. In support of these findings, AACTE (2010) also mentions - academic

content mastery and skills such as critical thinking, communication, technology literacy, and collaboration are required for success in college, life, and career. They also refer to these assets as the indispensable currency for participation, achievement, and competitiveness in our global community.

Table 2: Perceptions in Advantages of Technology in Higher Education Institutions

Ser. No.	Statement	5-Point Scale					Mean Rating
		1	2	3	4	5	
		%	%	%	%	%	
1	Technology would facilitate teaching endeavors	-	5	16	37	42	4.15
2	Technology would transform teaching - learning process into a new approach	-	2	8	40	50	4.38
3	Technology would save resources	5	-	5	32	58	4.38
4	Technology would help the achievement of instructional objectives & goals	-	-	7	45	48	4.42

The perception of respondents on the use of technology in facilitating teaching endeavors, transforming teaching-learning process, saving resources, and achieving instructional objectives & goals was very good with average ratings of above 4.1, but less than 4.5. In support of the findings, Project Tomorrow (2010) also mentions that, as a result of using technology in the classroom, students are more motivated to learn (51%), apply their knowledge to practical problems (30%) and take ownership of their learning (23%). Moreover, students are developing key 21st-century skills including creativity (39%), collaboration (30%) and problem-solving and critical-thinking skills (27%); thus effectively preparing them for future success in the workplace as opined by their concerned teachers. This presentation by the referred author also shows that technology application alone will have less effect in its impact on teaching-learning, while consolidated application of pedagogy & appropriate content along with would do the more positive effect in the process.

Table 3: Technology Gadgets Used & Needed in Higher Education Classrooms

Ser.No.	Gadgets Used by Respondents in Teaching	Count	%
1	Fixed gadgets (Desktop PC)	48	80
2	Portable gadgets (Laptop/Tablet/Ipad)	41	68.3
3	Presentation gadgets (LCD Projector)	23	38.3
Ser.No.	Gadgets Needed by Respondents for Teaching	Count	%
1	In-classroom gadgets	46	76.7
2	Net-based systems	51	85
3	Others (Online discussion forums)	1	1.7

The respondents have access to fixed gadgets like desktop PCs (80%), while 68% have access to portable gadgets and 38% use presentation gadgets like LCD projectors in their teaching - learning activities. In need of further technology aid, 85% of respondents showed the need to have network-based systems such as course management systems. 77% required in-classroom gadgets such as the multimedia screen, smart boards, and smartphones, Projectors etc. to enhance the effectiveness in the teaching-learning process in a stimulating and interactive environment.

In some literature, it is mentioned that technology is the live wire and teachers need to cater to the learning style of children by developing inquisitive minds, discovery learning, and sharing learning experiences by engaging them in a meaningful and productive way (Anderson, 2007).

Table 4: TPC Based Teaching-Learning Future Vision & Challenges

Ser.No.	TPC Based Teaching-Learning Future Vision	No.	%
1	TPC based curriculum	3	5
2	e-education facility	34	56.7
3	Access to research seminars & publications	3	5
4	Strong Internet connection	4	6.7
5	Well equipped classroom	9	15
Ser.No.	Challenges in Adopting TPC	No.	%
1	Lack of resource center	47	78.3
2	Lack of electricity	7	11.7
3	Lack of classroom facility & safety	10	16.7
4	Lack of Internet	9	15
5	Lack of training & experience	9	15
6	Lack of enough financing	21	35

Projecting TPC based teaching -learning future vision, more than half of the respondents have foreseen the application of e-education facility in their teaching -learning endeavors (57%). Approximately 22% respondents have envisioned the need to have a well equipped classroom and a strong internet connection for better teaching-learning activities with updated material prepared in advance and then organized delivery of the same in the class with confidence can bring that desired educational outcomes. Moreover, equal numbers of respondents have expected the need for introducing TPC based curriculum and exposure to research activities (5% each).

In some other studies, it is mentioned that the application of technology is to support more robust instructional methods and understanding the relationship between content, pedagogy, and technology through the dissemination of Technological Pedagogical Content Knowledge (TPCK) theory and research (US Department of Education, 2010; AACTE, 2008). Perception of looking at technology as a tool for transforming educational vision into reality is focused on four pillars of pedagogy: curriculum, learning environment, teaching strategies and assessments. Again, it has been noticed in the present study regarding contextualized challenges in adopting TPC, 78% respondents have mentioned that the lack of resource center is the most hindering factor in the teaching-learning process and its effective outcomes. The lacks of training and experience, as well as meager Internet connectivity mainly during working hours of the institution, are other challenging factors(15% each). In fact, training and experience of teachers engage them to learn and use the technological tools better for high-performance improvement. About 12% respondents have mentioned that shortage of electricity also poses a challenge in the same direction. Inadequate financing for adoption of TPC has also been raised as one of the main challenges (35%). These findings have been supported by Sife et. al., (2007). Also, it has been stated that teacher-level, school-level and system-level factors stand as barriers preventing teachers from ICT use (Andoh, (2012); Chen, 2008; Clausen, 2007). As Farrel (1999) points that training and workshops are needed not only to improve the skills of instructors, but also as a means of getting both teachers and students involved in the process of implementing and integrating ICTs in a better teaching – learning process. Further, he recommends staff training to be a continuous process for regular updates with the development of ICTs.

CONCLUSIONS

Technology-aided pedagogy and content in higher education institutions is highly demanding as an effective teaching practice approach. The present study witnesses that TPC helps in content preparation and its organized delivery in transmitting knowledge and skills (95%), achieving instructional objectives and goals (93%), resource saving (90%) and knowledge construction by learners through interaction and creativity (88%). Moreover, e-education facility, as well as well equipped classroom infrastructure, is envisioned for better teaching - learning outcomes. It is, therefore, crucial to appreciate that every instructor needs to be professionally trained to select appropriate TPC and use it in a right time and right way in the teaching-learning environment to yield results par excellence in education.

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