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Media-based instructional innovations: opportunities, practices and challenges at Hossana College of Teacher Education

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ABSTRACT
The frequently used phrase 'the medium is the message' in teacher education refers to both successful teacher preparation and the creation of a common language for teaching. For the purpose of analyzing opportunities, practices and challenges related to media-based instructional innovations at Hossana College of Teacher Education, 42 teacher educators using availability sampling and 278 third-year pre-service teachers (145 linear and 133 specialists) using stratified random sampling were selected. We used five-point Likert-type items, open-ended questions and unstructured interviews. In addition to the descriptive analysis, the Mann–Whitney test and Pearson correlation methods were used. The findings demonstrated that, except a few concerns rose by college administrators, there are not enough opportunities and then there are persisting challenges related with the relevant stakeholders for the practice of media-based instructional innovations. Suggestions for the college to create and execute a better organized system of instructional media were also provided.

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1. Introduction

A number of studies have found that meaningful learning environments, which link what students are learning with real-world problems through the use of effective communication tools (media), improve academic performance, lower absenteeism, boost motivation, foster cooperation and develop critical thinking (Moeller & Reitzes, 2011). Particularly in the context of teacher education, media usage is linked to symbolic meanings associated with the adage 'the medium is the message' (Korthagen Fred, 2016; Struyven et al., 2010), ie teacher educators have to do practically what they expect their student – teachers to do in their learning to teach. In addition, learning skills are developed faster if students are taught explicitly and meaningfully along with the content (Cuenca-Lopez & Martin-Caceres, 2010; Feiman-Nemser, 2014, as cited in Loughran, 2006; Mekonnen, 2008). Moreover, since prospective teachers model and learn to teach what their teacher educators and school teachers act to what they teach as content, teacher educators should demonstrate exemplary pedagogical behavior in selection and use of media-based instructional innovations.

Therefore, teacher educators should exhibit excellent pedagogical behavior in the choice and use of media-based instructional innovations since prospective – teachers model and learn to teach what their teacher educators and school teachers act to teach.

Studies assert that learners in this century, especially adult learners, are becoming dissatisfied with and have a limited attention span for our traditional methods of teaching and learning. Traditional methods of teaching and learning lost their appeal for students as they are defined by the 'stand-and-deliver' method of education, which sets stringent rules for attendance times, learning locations and modes of involvement (Fullan & Langworthy, 2015). In the meantime, people in this century are expected to have multiple career paths and engage in re-skilling at different stages of their lives, with the driving forces of the availability of internet connections, lifelong learning and flexible working hours. On the basis of

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that and as a result of the constant social mobility and diversification of life trajectories, the concept of learning occurring in a singular physical location is becoming less and less relevant in the connected world we now live in. As we have all experienced, the COVID-19 pandemic changed learning in many unprecedented ways in that students had to not just move to schools but also keep a social distance from their friends and family and miss the in-person interaction with their teachers. This is also indications of that mode of teaching and learning demand alternative means of delivery rather than sticking to a single approach. Moreover, successfully preparing all learners in response to the policy of the nation and for the needs of 21st Century learning skills-global awareness, creativity, collaborative problem-solving and self-directed learning (Prensky, 2010)-through the growing availability of digital technologies are considerable forcing factors to revisit the curriculum implementation and the way to approach learning. It has been suggested that pedagogical approaches to teacher education must be explicitly taken into account because student teachers learn skills more quickly when the material is explicitly taught alongside them. In order to create a foundation for high-quality pedagogy in terms of the application of these innovations, these are driving forces to examine the opportunities, practices and challenges of media-based instructional innovations (MBIIs) at Hossana College of Teacher Education in Ethiopia.

Learning, in essence, is a communication process that includes active participation in the function of instructional media. Constructivist learning approach with this respect advocates that students learn in an environment that promotes active learning and provides opportunities for students to meaningfully talk and listen, write, read and reflect on the contents, ideas, issues and concerns of an academic subject (Leu & Price-Rom, 2006). Such a teaching and learning can help them derive meaning from what they have learned and the meaning they make can help them perceive and understand the world at large. To this purpose, learners in the teacher education need facilities of effective communication and innovation. Considering whether our curricula and pedagogical approaches, in terms of innovative instructional media, are congruent with the innovative learning styles of the current student society helps to prepare and excel each individual for successful life-long learning. To address issues with educational quality, relevance and equity in Ethiopia in general and at Hossana College of Teacher Education in particular, MBIIs must keep up with and prepare for the changing world in this era of rapid change in information and communication technology and with the interests of the learners (Kedir Assefa, 2007; Lemlem, 2010; Mekonnen, 2008; Semela, 2014). As John Dewey put it, if we continue to teach today as we taught yesterday, we will deprive them of the future (Dewey, 1916).

To this end, examining the potential and present practices of media-based instructional innovations (MBIIs) as well as the challenges that Hossana College of Teacher Education (HCTE) teachers face in putting them into practice became imperative. The study, thus, aims to respond to the following research queries for this purpose:

1. What opportunities for MBIIs do the teacher educators of HCTE have?
2. What MBIIs do the teacher educators use?
3. Is there a statistically significant difference in instructors' implementation of MBIIs in specialist and linear classes?
4. What challenge(s) prohibit the teacher educators from using MBIIs in the college?

The findings of this study serve college instructors and student teachers primarily in order to improve their existing teaching and learning methods, beyond its role in creating a comprehensive 21st century learning environment and a need for future pedagogy. It signifies the college communities to use alternative means of communication, connection, teamwork, mobility and access methods. Additionally, it aids teacher educators by providing them with real-time diagnostic data, tools and resources to evaluate student learning progress or gaps and to make instructional decisions by identifying the most effective teaching and assessment interventions, particularly in challenging subjects like English and mathematics. Instructors could also use media-based instructional innovations (MBIIs) to enhance traditional media and create effective online or hybrid instructional media (Carchidi, 2002). Furthermore, the result of this study offers ease, flexibility and remote access to the classroom in the student's own time. Because student teachers primarily model their teacher educators' pedagogical practices, methods and approaches, it empowers them to equip themselves with professional learning.

2. Background of the study

Media-based instructional innovative has been reviewed in the context of Media Richness Theory (Draft & Lengel, 1986; Draft et al., 1987), which contends that effective communication reduces uncertainty levels by achieving a good match between media and the level of equivocality in a message. This claim was supported in studies rooted in cognitive and social constructivist learning principles that have been acknowledged for supporting the acquisition of productive knowledge (Fulk & Collins-Jarvis, 2001). These guidelines show directions to establish instructional design principles for developing constructivist; student-centered learning environments-such as open-ended learning, authentic learning and inquiry-based learning-intersect with new perspectives on cognition and knowledge creation in learning. Accordingly, the attributes of instructional media were analyzed in terms of attracting attention, developing interest, adjusting the learning environment and promoting the acceptance of an idea. Moreover, innovative instructional media (technology) are becoming a crucial component of education as the classroom of the future becomes more individualized, student-centered and collaborative (Andersen, 2011; Bell, 2010; Lenz, 2013). This is because it allows students to access the higher-order competencies that are commonly referred to as '21st century skills'.

There is much disagreement over the definition and application of the word innovation. Here, there is an ongoing debate among academics about 'what is new, how new, and new to whom'. It is bringing something new into the socioeconomic system, according to those who believe it to be a change or modification of the natural environment in order to meet alleged human requirements. Others see it as a synthesis of new and old concepts, skills and resources; existing knowledge is applied in novel settings, which creates new opportunities. Accordingly, an invention is one that is developed from scratch, modified from an existing idea, or imported from somewhere else (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2004). More specifically, educational innovation is defined as the introduction or promotion of fresh concepts and approaches developed in reaction to a specific issue that exists in the system and has a significant impact on the group's pre-existing behavioral patterns (UNESCO, 2009). Innovation and technology are inextricably linked, as technology is the innovation, change, or modification of the natural environment in order to satisfy perceived human wants and needs. In this line, a few small improvements in a process or application can combine to lead to big changes. Based on this, first-order innovations are prevalent in many technology-rich learning environments or virtual learning environments (VLE) and are implemented by tools such as laptops, notebooks, tablet PCs, interactive whiteboards, Web apps, digital cameras and so on. Whereas those grouped under the second order are innovations like augmented reality (AR), simulations, digital games, remote-response systems, mobile/handheld computing, programming applications and electronic books (Groff, 2013).

Commonly, in teaching and learning, media are all means of communication (idea, practice, or material artifact) for transmitting or delivering content (whatever its format is) to the learners, to ensure effective instruction. To these researchers, instructional media encompasses all the materials and physical means an instructor might use to implement instruction and facilitate students' achievement of instructional objectives. Researchers studying media-based instructional innovations (MBIIs) focus on the use of technologies plus concepts and contexts that advance and accelerate students learning (Flew, 2009; Skylar, 2007; Thornburg, 2014). To mention some: (a) *video conferencing (VC)*: that brings learners together over distance so that they can communicate (debates, role play, exhibitions, performances, etc.) in a common language and share cultural experiences through virtual experiences. (b) *Digital game-based learning (DGBL):* increase learners' engagement since such learning encompasses text, audio, video and animation. (c) *Computer-assisted learning (CAL):* if handled carefully, it enables repetitive learning activities that provide instantaneous feedback to the user. (d) *Mobile technologies:* uses for teaching in situations where practitioners move between different locations and where learning occurs in isolated contexts (Clark, 1994). (e) *Social software:* facilitate participation, communication, personalization and improvement of project abilities and productivity (Redecker et al., 2010; Seechaliao, 2014). (f) *Web 2.0/Multimedia:* allow a user to find and display multimedia documents (a combination of text, photographs, graphics, audio and video). It thrives on the concept of collective intelligence, or 'wisdom of the crowds' (Surowiecki, 2004), which acknowledges that when working cooperatively and sharing ideas, communities can be significantly more productive than individuals working in isolation. (g) *Pedagogy 2.0:* advocates learners' choice and self-direction as well as engagement in flexible, relevant learning tasks and strategies (O'Reilly, 2005).

Blended learning, which combines in-person discussions in the classroom with online course lectures, gives students the chance to benefit from the best of both environments. Students who can collaborate directly with other students and share knowledge in this mixed-mode pedagogy model benefit from a richer learning environment. The best learning occurs when it is a part of a carefully planned system that includes strong curriculum and instruction, continuing professional development, reliable assessments and a culture that values each individual's capacity for learning. As noted earlier, instruction that features real-world contexts facilitates the transfer of learning from school to life (Bell, 2010; Hampson et al., 2011; Lenz, 2013). In line with this, learning management systems (LMS) have gained prominence in the discussion. It can be defined as a web-based software platform or an online learning environment that provides organized learning and assessment experiences in a package (Turnbull et al., 2022). Beyond its role in the delivery and reporting of educational content and learning outcomes in educational organizations, blended learning helps to automate institutional administration. Lessons, training modules, instructional videos, presentation slides, worksheets, online quizzes, e-books, takeaway notes and other learning experiences are all centralized in one location, and it keeps track of student involvement, evaluates their performance and grades their learning progress. Students will have opportunities to use interactive features such as negotiated discussions, video conferencing and discussion forums to develop skills and acquire new knowledge virtually anytime and anywhere via the different channels and content formats made possible by digital technology.

Learning management systems (LMS) have evolved over time to incorporate a wide range of features from technologies, whether proprietary or open-source, that vendors have catered to the general market or to specific segments, such as K–12 learning, higher education and corporate training. These features include cloud and mobile technology. The most popular ones are Google Classroom, which uses cloud technology, web apps, workflow simplification and seamless communication between students and instructors. Canvas Network is also an end-to-end cloud-based service adopted for K–12 and higher education learning. Similarly, Modular Object-Oriented Dynamic Learning Environment (Moodle), a free and open-source learning solution for distance learning, workplace training, flipped classrooms and other pedagogical methods, is also incorporated. As a fully functional LMS, Moodle enables instructors to build online courses, submit files and lessons, set up forums, designate classes for students, hold chat sessions, create online tests and exams, store learning materials and manage assessments online. In a similar manner, students can access the course materials, participate in forums, follow the lessons and chat sessions and submit their assignments and quizzes. In order to establish a personalized learning environment, it is also intended to offer educators, administrators and students a singular, powerful, secure and integrated system. The package includes a universal calendar, effective file management software, automatic notification software, multimedia integration and a progress monitoring utility. Hence, learning management systems have the key importance of: delivering timely relevant course material; collecting and storing assessable tasks and feedback for each learner; tracking learners' progress; generating aggregate reporting information such as class grades, item score analysis and at-risk student information; being used as a multimedia communication tool (synchronously or asynchronously); providing social connectivity (a social learning environment includes discussion forums, live chats and videoconference tools) and providing security and privacy (Kalay & Chen, 2002).

3. Methods and materials

3.1. Research design and sampling

To understand and elucidate the issue of the research in a better way by reducing the limitations of either approach alone, descriptive survey of mixed methods design was used. Mixed methods designs in research combining both quantitative and qualitative methods and help (Ary et al., 2010; Creswell, 2012).

Table 1. Participants.

	Linear (1)		Specialist (2)		Total	
	Population	Sample	Population	Sample	Population	Sample
Teacher educators	140	25	140	17	140	42
Student teachers	489	145	355	133	844	278
Total	629	170	495	150	984	320

The data was collected from third-year regular student teachers in the specialist and linear programs and from teacher educators who deliver courses concurrently in these programs. These groups of student teachers as well as teacher educators were preferred to those in other years of entry because they had theoretical (from courses they have taken) and practical awareness (from their practicum sessions in primary schools) of analyzing the existing opportunities, practices, as well as challenges of media-based instructional innovations in the college. Besides, due to their stay in the college for about six semesters, they were expected to have reliable information regarding the topic of study.

Teacher educators who served as sources of data were selected based on the principles of availability sampling, whereas, the student teachers were selected using simple random sampling, as displayed in the following table. The assumption for using this sampling technique was derived from the researcher's belief in the similarity of the population from the point of view of the subject of this study (Table 1).

3.2. Data gathering instruments

This study employed questionnaires of both closed-ended (Likert-scale) and open-ended questions as the main instrument, while interview results were used to substantiate the findings. The rationale behind employing such a variety of methods of data collection is to produce a more accurate, comprehensive and objective representation of the data (Ary et al., 2010). Accordingly, two sets of questionnaires, one for teacher educators and the other for student teachers, were prepared by the researchers based on their personal experiences and reviews of the literature. The questionnaire administered to teacher educators, along with its composition of 29 closed-ended questions developed in the form of Likert-type scales and 4 open-ended questions. Similar to this, the closed-ended questionnaire given to student teachers is divided into two sections: one part covers background information, and the second section includes a list of opportunities, practices and challenges with ratings on a five-point scale. There were also four open-ended questions for which student teachers had to provide their opinions on the subject topics.

Unstructured interviews were also used to collect qualitative data from members of the teacher educators who deliver courses in both specialist and linear programs and from the owner of the curriculum materials and technology infrastructure of the college, targeting reliable data on the study topic. The interview had six heading questions on the opportunities, practices and challenges of media-based instructional innovations in the college. The developed tools, after they were self-evaluated, commented on and revised, were distributed in person to teacher educators and student teachers who responded. The reliability coefficient of the scales of the questionnaire was computed using Cronbach's alpha and found to be 0.756 and 0.78 for both teacher educators and student teachers, respectively, which verify the reliability of the instruments. It helps to determine the reliability as it measures the internal consistency of a set of items comprising a scale (Joseph & Rosemary, 2003).

3.3. Methods of data analysis

Items were analyzed with the aid of computer software known as the Statistical Package for Social Sciences (SPSS). Mean, median and ranges were used to measure the spread of the values around the center for the closed-ended item responses. After carrying out the Shapiro–Wilk test of normality on the summarized data and checking the model-fitting information using goodness-of-fit, the Mann–Whitney test was used to check for the existence of differences in the practice of media-based instructional innovations between the linear and specialist categories of the participants. Pearson Correlation was carried out to analyze the correlations between the three categories of challenges. Data collected from the open-ended questions and the interviews was analyzed descriptively to see the views teacher educators and student teachers gave on the opportunities, practices and challenges they faced while utilizing innovative instructional media. Discussions were then conducted based on the information obtained from both qualitative and quantitative analysis, which led to the drawing of conclusions and identifying implications.

4. Results and discussion

4.1. Results

4.1.1. Opportunities

Opportunities trigger practices to deliberately design activities, which included mechanisms to minimize any challenges that may face during the process of teaching. An important part of this study involved analyzing the opportunities that exist in the study area while using media-based instructional innovations (MBII). Participants were asked to rate their level of agreement or disagreement with various statements about the opportunities that enable the use of MBII. The findings were summarized in Table 2.

The percentage of participants (41%) were not in agreement, while 18% undecided and only 41% agreed on average on the presence of opportunities to practice MBII in the college. The presence of increased emphasis to ICT by the college administrators (73%) and increased availability of internet access (71%), however, were not refuted by teacher educators and student teachers. On the other hands participants were disagreed on the presence of increased use of technology resources (45%), advancement in technologies (64%), emphasis given to teacher educators professional development related with MBII (49%), suitability of classrooms to practice MBII (44%) as well as a learning management system (LMS) (57%). Professional development activities such as use of advanced technology resources to differentiate instruction, practicing learning management systems (LMS), delivering report of educational content and learning outcomes through an online learning and automating the administrative activities were the major indicators of absence of opportunities to practice MBIIs in the college. Moreover, the value 2 of interquartile range also shows that half of the participants disagreed on the existence of opportunity to utilize MBII in the college.

One of the interview participants had to explain the significance of MBIIs for today's learning and the opportunities prevailing to implement them in the college as follows:

> As education becomes more individualized and location- and time-independent, its importance is growing. Creating awareness is a necessary tactic if one wants to avoid falling behind in today's society. We are starting to establish some concerns in our college in addition to the policy considerations that highlight technology. This could involve ICT infrastructures such as servers, data centers, increases in internet bandwidth (27 to 150 MB), and website development.

From this quotation, it is clear that the college must improve internally in order to provide enough opportunities to employ MBII, beyond the development of some basic ICT infrastructure. One of the participants provided the following response to this sentence in response to the open-ended question:

Table 2. Opportunities for MBII by frequency.

Statement	SD		D		ND		A		SA		Total (%)		
In your college there is:-	F	%	F	%	F	%	F	%	F	%	F	%	IQR
increased emphasis to ICT by the college administrators	19	5	25	8	32	10	141	44	108	33	323	100	1
increased availability of internet access	16	5	40	13	36	11	120	38	105	33	317	100	2
increased use of technology resources	45	14	100	31	72	22	54	17	52	16	323	100	2
advancement in technologies	90	28	114	36	60	19	30	9	24	7	318	100	2
emphasis given to teacher educators professional development related with MBII	61	19	97	30	73	23	67	21	24	7	322	100	2
suitability of classrooms to practice MBII	73	23	68	21	49	15	77	24	53	17	320	100	2
learning management system (LMS)	83	26	97	31	80	25	44	14	10	32	314	100	2
Total	387	17	541	24	402	18	533	23.8	376	17	2237	100	13
Mean	55		77		57		76		54		320		2

Note: SD, D, ND, A and SA stand for strongly disagree, disagree, not decided, agree and strongly agree, respectively.

'The options available at the college are inadequate. That is just getting started'. The other participant's remark, which added, 'The opportunities that exist in the college are really poor and quite late in this respect', is supportive of this as well. All of these could lead to the conclusion that MBII are not adequately conceptualized yet to bring them to the ground or to reality.

4.1.2. Teacher educators' MBII usage

The following table summarizes the degree of agreement or disagreement among participants with regard to various claims made about the MBII's practices (Table 3).

Participants were asked to evaluate how often they practiced the five MBII questions and 37.4% rated 'never', 20% rated 'rarely', 17% rated 'some-times', 14% rated 'often' and 11% rated 'always'. Similarly, overwhelming participants (M = 120) labeled that they never used MBII, where 64.4 for rarely, 55 for sometimes, 45.6 for often and 36.4 for always. This suggests that there aren't many MBII practices in the institution, including blended learning, which combines offline (face-to-face) and online learning. Other MBII practices include mobile technologies, social software, Web 2.0 and multimedia. The interquartile range (2.5) demonstrates that MBII is not commonly used. This is consistent with the above discussion on question 1: the scarcity of opportunities to practice MBII in the college.

The interviewee also pointed out that obviously ICT plays a crucial part in both our daily lives and our educational pursuits. Although we are aware of the advantages and uses of innovative instructional technology in the classroom, a number of personal and organizational issues appear to be impeding its adoption.

4.1.3. Difference in instructors' implementation of MBII

Using a Likert scaled questionnaire, teacher educators and student teachers evaluated the level of MBII application in the college. The differences in practices between the two independent groups were calculated using the Mann–Whitney (M-W) U test of differences, and the results are shown in the following table. The respondents' responses were categorized based on their current teaching or learning programs (either linear or specialist).

Table 4 shows the mean rank, sum of the ranks and significance between linear and specialist teaching programs regarding the practices of MBII in the college. Consequently, the mean rank of the linear group (22.64) is higher than that of the specialist group (19.82), though the difference between the groups is not statistically significant (*p* (.464)>.05). In SPSS ranking, in contrast to the typical ranking procedure, a high mean rank indicates a higher score for the group. And based on that, the practice of MBII in the linear group (22.64) was considerably higher than that of the specialist group (19.82).

Table 3. Frequencies of practices of MBII.

	N		R		S		O		A		Total (%)		
How frequently you use:	F	%	F	%	F	%	F	%	F	%	F	%	IQR
Video conferencing (VC)	179	55	55	17	38	12	27	8	25	8	324	100	2
Digital game-based learning	159	50	59	18	38	12	34	11	31	10	321	100	2
Computer assisted learning (CAL)	90	28	63	20	53	17	64	20	52	16	322	100	3
Mobile technologies	84	26	53	16	48	15	56	17	82	25	323	100	4
Social soft wares	110	34	79	25	67	21	45	14	18	6	319	100	2
Web 2.0 or Multimedia	125	39	53	16	50	16	46	14	49	15	323	100	3
Pedagogy 2.0	102	32	80	25	70	22	51	16	13	4	316	100	2
A combination of offline and online learning	111	34	73	23	75	23	42	13	21	7	322	100	2
Total	960	37.4	515	20	439	17	365	14	291	11	2570	100	2.5
Mean	120		64.4		55		45.6		36.4		321		

Note: N, R, S, O and A stand for never, rarely, some-times, often and always, respectively.

Table 4. Mann–Whitney (M-W) U Test of differences on practices of MBII between groups.

		Ranks			
	Current teaching programs	N	Mean rank	Sum of ranks	Sig
Practice	Linear	25	22.64	566.00	0.464
	Specialist	17	19.82	337.00	
	Total	42			

4.1.4. Challenges

To find out the challenges that teacher educators have, the participants were asked to indicate their level of agreement or disagreement with different statements on the challenges that exist. We categorized the responses into three subtopics, namely, administrative-related, teacher-related and student-teacher-related.

As shown in the accompanying table; 52% agreed, 34% disagreed and 14% were unsure. After that, they were asked to rate how much they agreed with various hypothesized challenges. Table 5 provided a summary of the results.

According to these results, the main obstacles for teacher educators in using media-based instructional innovations to design teaching activities were: Lack of classroom facilities (30.3%); Lack of or insufficient provision of instructional resources, such as computers, multi-media, projectors and fast internet connection (30%); Lack of physical infrastructure and necessary environment (28.6%); inadequate teacher educators' professional development, which includes: refreshment trainings on MBII (28.3%); Low expertise, training and development (28.2%) and Teacher educators' heavy work load (25.9%).

Similarly, majority of the respondents indicated that they faced challenges related to teacher educators in using MBII in the college. 30% disagreed, 20% undecided and 50% agreed. Their level of agreement with different suggested statements on possible challenges was summarized in Table 6.

The findings in Table 6 show that the execution of MBII has been hampered by all teacher educator-related challenges. Accordingly, teacher educators' knowledge and skills (35.9%), readiness (31%), perception (29.7%), interest (25.9%), attitude (24.9%) and belief toward the use of MBII (22.6%) were rated as teacher educator-related challenges in their descending order that prohibit using MBII in the college.

With regard to the challenges related with student teachers in using MBII in the college, 32% disagreed, 19% were unsure and 49% were in agreement, as illustrated in the following table (Table 7).

Student teachers' limited background knowledge to use media-based instructional innovations received the highest rating (28.4%), among the four deducted questions. Other issues include students' inability to comprehend when instructed using MBII (28%), lack of interest in learning through media-based instructional innovations (26.3%) and students' unwillingness to learn through such innovations (25.8%). Our condensed discussion of the three types of challenges (the above table: Tables 5, 6 and 7) revealed that administrative-related challenges were much more common than the other two (although, there is no statistically significant difference among the three categories). This may be due to the fact that

Table 5. Administrative related challenges.

	SD		D		ND		A		SA		Total (%)	
Statement	F	%	F	%	F	%	F	%	F	%	F	%
Lack of physical infrastructure and necessary environment	54	16.8	70	21.7	36	11.2	92	28.6	70	21.7	322	100
Low expertise, training and development	56	17.7	60	19.0	39	12.3	89	28.2	72	22.8	316	100
Inadequate teacher educators professional development including refreshment trainings on MBII	43	13.5	47	14.8	51	16.0	90	28.3	87	27.4	318	100
Non- availability or inadequate provision of instructional resources such as computers, multi-media, projectors and fast internet connection	48	15.1	56	17.6	53	16.7	95	29.9	66	20.8	318	100
Teacher educators' heavy work load	57	17.8	61	19.1	47	14.7	83	25.9	72	22.5	320	100
Class rooms are not facilitated	51	16.5	40	12.9	33	10.6	94	30.3	92	29.7	310	100
Total 1	309	16.2	334	18	259	14	543	26	459	26	1904	100

Note: SD, D, ND, A and SA stand for strongly disagree, disagree, not decided, agree and strongly agree, respectively.

Table 6. Teacher educators related challenges.

	SD		D		ND		A		SA		Total (%)	
Statement	F	%	F	%	F	%	F	%	F	%	F	%
Teacher educators' knowledge and skills	17	5.6	27	8.8	44	14.4	108	35.3	110	35.9	306	100
Teacher educators' negative attitude and belief toward the use of instructional resources	69	21.7	62	19.5	62	19.5	72	22.6	53	16.7	318	100
Lack of interest among teacher educators	65	20.5	59	18.6	54	17.0	82	25.9	57	18.0	317	100
Teacher educators' perception	31	9.8	54	17.1	56	17.7	94	29.7	81	25.6	316	100
Teacher educators' readiness	41	13.1	45	14.4	50	16.0	97	31.1	79	25.3	312	100
Total 2	223	10	247	20	266	20	453	30	380	20	1569	

Note: SD, D, ND, A and SA stand for strongly disagree, disagree, not decided, agree and strongly agree, respectively.

Table 7. Student teachers related challenges.

Statement	SD F	SD %	D F	D %	ND F	ND %	A F	A %	SA F	SA %	Total (%) F	Total (%) %
Students' limited background knowledge	37	11.8	53	16.9	63	20.1	89	28.4	71	22.7	313	100
Students' lack of interest to learn using media-based instructional innovations	54	17.1	47	14.9	70	22.2	83	26.3	61	19.4	315	100
Inability of learners to understand when they taught through MBII	41	13.1	65	20.7	54	17.2	88	28.0	66	21.0	314	100
Unwillingness of students to learn through media-based instructional innovations	58	18.2	50	15.7	54	17.0	82	25.8	74	23.3	318	100
Total 3	190	15	215	17	241	19	342	27	272	22	1260	100

Note: SD, D, ND, A and SA stand for strongly disagree, disagree, not decided, agree and strongly agree, respectively.

Table 8. Pearson correlation between challenges.

	1	2	3
Administrative related (1)	–		
Teacher educator related (2)	.565**	–	
Student teachers related (3)	.533**	.593**	–

**Correlation is significant at the .01 level (two-tailed).

administrative difficulties are crucial to ensuring the standard of education (Organisation for Economic Co-operation and Development [OECD], 2012; Semela, 2014). Through the open-ended questions, teacher educators have made it clear that in addition to the difficulties mentioned above, the MBII's effective implementation was hampered by the lack of the following administrative issues: funding for MBII in the college, a well-equipped ICT infrastructure, cooperative and committed instructional leadership, relevant planning and motivation and positive attitude as well as resource and facilities. Besides that, student teachers background knowledge and teacher educators' attitudes toward the use of MBII have been identified as the determining factors that challenge its implementation.

The perspective of teaching and learning held in teacher educators and student teachers minds could be one possible challenge. The meaning we attach to teaching and learning should be properly understood (conceptualized) and challenged first. Furthermore, let's test the assumptions we held behind our actions.

Discussing further, the study identifies correlations between the three factors of the challenges as follows:

As portrayed in Table 8, the administrative related challenges were found significantly related with the remaining two factors. Teacher educator-related challenges were also found significantly related with student teachers related challenges. Stated otherwise, teacher educator-related challenges and student teachers-related challenges could be predicted from administrative related challenges. The highest magnitude of correlation coefficient was, however, obtained between teacher educators-related and student teachers-related challenges.

4.2. Discussion

The purpose of this study was to examine the opportunities, practices and challenges of media-based instructional innovations at Hossana College of Teacher Education. Both the booming accessibility of technology tools and the inclusion of technology as the basis for the mastery of 21st century skills as one criterion in the curriculum for teacher education have been identified as opportunities for teacher educators to use innovative media-based strategies. This inclusion of MBIIs in coursework guarantees the learning of today's students since, rewarding stimuli is that has an effect on a person's life. Instruction that features real world contexts facilitates the transfer of learning from school to life and digital communications make it possible to bring in wisdom and lived experience of people in the community.

4.2.1. Factors enabling teacher educators to use MBII

However, based on the results of the study, the percentage of the participants who agreed on the presence of opportunities to practice MBIIs in the college was approximately equal to that of the participants who did not agree (40.8% and 41%, respectively), while 18% were unsure. However, although there are some concerns to increase ICT (73%) and to increase the availability of internet access (71%), the participants disagreed on the presence of increased use of technology resources (45%), advancements in technologies (64%), emphasis given to teacher educators professional development related to MBII (49%), suitability of classrooms to practice MBII (44%) and a learning management system (LMS) (57%). This is concurrent with the interview results, which could be represented by one of the responses quoted as 'the opportunities available at the college are at the starting stage in terms of proper conceptualization and provision of supportive environments for MBII'. As studies support, these are essentially necessary inputs for using MBIIs, as each student will learn according to his or her individual learning requirements, styles and pace (Michael, 2006). The best learning occurs when it is a part of a carefully planned system (learning management systems-LMS) that includes strong curriculum and instruction, continuing professional development, reliable assessments and a culture that values each individual's capacity for learning. As noted earlier, instruction that features real-world contexts facilitates the transfer of learning from school to life (Bell, 2010; Hampson et al., 2011; Lenz, 2013).

4.2.2. Teacher educators' usage of MBII

From the participants' response of five questions about the practice of MBIIs, 37.4% rated 'never', 20% rated 'rarely', 17% rated 'some-times', 14% rated 'often' and 11% rated 'always'. Similarly, in the computed mean, overwhelming participants (M = 120) labeled that they never used MBIIs, where 64.4 for rarely, 55 for sometimes, 45.6 for often and 36.4 for always. The interquartile range (2.5) demonstrates that MBII is not commonly used. These suggest that the practice of MBIIs in the institution, including Video conferencing (VC), Digital, game-based learning (DGBL), Computer assisted learning (CAL), Mobile technologies, a combination of offline (face-to-face) and online learning, Web 2.0 or Multimedia, Pedagogy 2.0 and Social soft wares is very low. In addition, the interviewees noted that despite our awareness of the critical role that ICT plays in both our everyday lives and our academic endeavors, a number of personal and organizational issues seem to be preventing its adoption. According to one of the participant's response of the interview, aside from teacher presentation (lecture style of teaching), the teacher educators didn't use any more MBII in their instruction. Other responses to the open-ended question were summarized similarly in that the college doesn't use MBII and the learners aren't getting a good enough education there.

4.2.3. How differ instructors in implementation of MBII?

Likewise, there is no statistically significant difference at practice of MBIIs between the special and linear groups (p (.464)>.05), but the mean rank of the linear group is greater than that of the specialist group (22.64 vs. 19.82). Naturally, it is extremely difficult to apply the MBIIs effectively in environments where the prerequisites are not upheld because there are no opportunities like established learning management systems (LMS), technology resources, or advanced technologies. Therefore, it is abundantly clear that teacher educators at the college do not use media-based instructional innovations because the establishment of MBII has not yet set up. This is also consistent with the above discussion on question 1, the scarcity of opportunities in the college to practice MBIIs.

4.2.4. Constraints

From the above tables (Tables 5, 6 and 7), it was determined that 52% of respondents agreed, 14% were unsure and 34% disagreed with the existence of challenges related to the administrators in the college. Similarly, it was analyzed that 50% of respondents agreed, 20% were unsure and 30% disagreed with the existence of challenges related to the teacher educators in the college. In the same way, 49% of respondents agreed, 19% were unsure and 32% participants disagreed with the existence of challenges related to the student-teachers in the college. These show that not only majority of the participants agreed on the prevalence of the challenges in the college, but also the administrative related challenges outweigh the other remaining categories of challenges such as teacher-educators-related and student-teachers-related challenges. This is supported by the Pearson Correlation Test, which revealed that administrative-related challenges were much more common and found significantly related with (although, there is no statistically significant difference among the three categories) the other two. Or administrative-related challenges were found favorably correlated with teacher educator-related challenges (r = .565*) and student-teacher related challenges (r = .533*). The highest magnitude of correlation coefficient was, however, obtained between teacher educators related and student teachers related challenges. Stated otherwise, teacher educator-related challenges and student teachers-related challenges could be predicted from administrative related challenges. The findings are equivalent to the studies that assert administrative difficulties are the most decisive determinants to ensuring the standard of education (OECD, 2012; Semela, 2014). To others, effective educational leadership enhances learning and out of all the school-related elements that affect what students learns, leadership comes in second only to classroom instruction (Leithwood et al., 2014).

Through the responses of the open-ended questions, teacher educators have made it clear that difficulties related with funding, ICT infrastructure, cooperative leadership, relevant planning and motivation, attitude as well as resource and facilities were found the profound challenges. They also discussed that when adopting MBIIs in the college, teacher educators ran into administrative challenges, such as obstructed classrooms, inadequate teaching resources, inadequate physical infrastructure, stagnant professional development and low expertise. Concurrently, according to studies, teachers and institutions face challenges when integrating technology, such as issues with accessibility, availability and reliability of the technology; the need for ongoing teacher and learner training; varying levels of tech-savvy among teachers and students; the time and resources required to create technology-integrated courses and the need for new ways of managing classes where technology is used. Additionally, it will face difficulties with planning, personnel, resources and ethical concerns that could compromise the success of media-based instructional innovations (Felix, 2005; Krajka, 2006).

The use of interviews by the participants also revealed that MBIIs are still not even completely conceptualized to bring them to the reality of practices. As discussed by one of the interviewees, the perspective of teaching and learning (the dominance of the traditional lecture method of teaching) held in teacher educators and student teachers minds could also be the other challenge. He exposed further, the meaning we attach to teaching and learning should be properly understood (conceptualized) and must challenge it first. His nice saying is quoted as, 'Let's test the assumptions we held behind our actions'. This further demonstrates the presence of deficiency of professional development among the staff. Parallel to this, beyond the social and culture status of the countries, the user perception and readiness as well as the concern from the government is the major determinant factor for the integration of technology in the developing nations.

Likewise, adherence to traditional lecture methods of teaching and a lack of commitment on the part of teacher educators were analyzed as significantly affecting challenges of implementing MBIIs, based on the data from open-ended questions. The knowledge and skills gap, readiness, perception, interest and attitude as well as belief toward the use of MBII among the teacher-educators as well as among student teachers were also found significantly affecting challenges. Studies confirm that when meaningful learning environment is facilitated learners connect their learning with real world issues and such teaching reduces absenteeism, rises their motivation, fosters cooperation and communication, builds critical thinking skills and boosts academic performance (Moeller & Reitzes, 2011). Thus, creating an environment that facilitates innovative thinking through experiential learning can dramatically help individuals understand the innovation process and develop the valuable mindset and skill set of an experimental innovator. Consequently, leaders have to give focus on the academic affairs (becoming instructional leader) to strengthen the process of bringing the learners' increased learning outcomes in terms of the expected knowledge, skill and attitude. These in turn, need dedication and concern of the government to the up-gradation of learning and teaching process through the implementation MBIIs in institution.

Ethiopia has made many steps backward in terms of innovation and competitiveness (Adam, 2012). Of course, Ethiopia may confront issues like a lack of infrastructure, qualified teachers, funding, government policies and general readiness, just like all developing nations do. However, there should be strategies to maintain MBIIs. Having a clearly stated policy as the first step in the technology planning process, teacher educators and college administrative bodies should believe that they cannot afford not to incorporate technology into their classes because technology plays such an integral part in their lives as well as in the lives of their student-teachers. They require digital literacy to interact across cultural divides and to develop into independent learners capable of keeping up with the demanding demands of the working world. Finally, as studies insist, failing to use digital technologies to their full potential deprives the next generation of the critical importance of 21st century learning skills like global awareness, creativity, collaborative problem-solving and self-directed learning, in addition to streamlining and facilitating the teaching and learning process. Moreover, as John Dewey articulated, if we continue to educate people the same way we did in the past; we will rob them of their future (Dewey, 1916).

5. Conclusion and implications

5.1. Conclusion

Undisputably, some possibilities including limited internet access and a desire to develop ICT infrastructures arose in the college as a result of the government's policy directives. However, it needs more provision of opportunities prerequisite to the practice of MBIIs in Hossana College of Teacher Education. These include establishing of learning management systems (LMS) and pertinent professional development programs capable to infuse practice of advanced technologies that are essential to the successful implementation of teaching and learning processes in the college. In addition, creating supportive environments in terms of proper conceptualization of MBIIs, provision and management of technology resources required for the effective practice of MBII.

There are no remarkable differences in practice of MBIIs between the linear and specialist groups in the institution because they are not used there. Despite this, MBIIs could have been utilized, at the very least, in a blended learning setting, to open the door for complete technology use in the teaching and learning process. Lack of physical infrastructure, low expertise, lack of training and development, inadequate teacher educators' professional development and inadequate provision of instructional resources remain administrative-related challenges for the college.

Teacher educators' knowledge and skills, readiness, perception, interest and attitude, as well as their beliefs toward the use of MBII, were significantly affecting challenges. The adherence to the traditional lecture methods and the lack of commitment of teacher educators to implement MBII were also found to be considerable challenges. Student teachers' limited background knowledge, inability to understand and lack of interest were found significant challenges.

Thus, facilitating the college with MBII and maintaining the working environment advanced needs proper conceptualization, management and development strategies, this brings to the reality of practices of the MBII.

5.2. Implications

As technology is an integral part of accessing the higher-order competencies often referred to as 21st Century Skills, which are necessary to be productive in today's society, effectively preparing all teachers in accordance with national policy and for the requirements of the above skills, the education college should go further to guarantee the quality of education of the society. The following recommendations have been made for the Hossana College of Teacher Education under the general heading of this issue.

- In order to offer teacher educators access and opportunities to the MBIIs' practice, the college must do more. The college can begin creating pertinent professional development programs and learning management systems (LMS) by making it easier to afford technology tools and facilities.
- To excel in the teaching and learning process, practice of MBIIs must be ensured, starting with a blending learning strategy to pave the way for complete technology usage.
- To make MBIIs' practices a reality, appropriate conceptualization about them and skillful development of strategies must be used.

- The college must work to lessen difficulties faced by its administrators such as: a lack of physical infrastructure and innovative instructional resources, a lack of professional development and training as well as lack of expertise and commitment. Challenges related to the teacher educators and student teachers, such as lack of readiness, perceptions, attitudes and commitments regarding the usage of MBII are also to be mitigated by the college.
- The college's responsibility also goes to working to lessen the negative effects of the adherence of the teacher educators to the traditional lecture methods and to promote their conception of pedagogy to the progressive approach that require MBII implementation.
- Finally, the college must work on teacher educators' professionalism through institutional learning to ensure its comprehensive vision.

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About the author

Abayneh Ergogo, PhD, is an Assistant Professor of Curriculum and Instruction. He has been working as a teacher educator, researcher and advisor at Hossana College of Education and published a number of scholarly articles in international peer-reviewed journals. He offers insightful analysis and forward-thinking solutions to longstanding teacher education problems. Because integrating technology into instruction improves student-teachers' ability to learn how to teach, this research in particular is both timely and extremely relevant. As systems attempt to modernize and customize instructional preparation, the topic at hand is therefore a critical one in teacher education today.

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