

African Journal of Education and Practice (AJEP)

**INFLUENCE OF INFORMATION COMMUNICATION TECHNOLOGY (ICT)
INTEGRATION IN THE CURRICULUM AND TRAINER COMPETENCY SKILLS IN
INFORMATION COMMUNICATION TECHNOLOGY (ICT) ON THE QUALITY OF
EDUCATION IN VOCATIONAL TRAINING CENTERS: A CASE STUDY OF
MURANG'A COUNTY**

Pauline Nelima Wakasiakah. Dr. Thomas Senaji and Dr. Tobias Mwalili

INFLUENCE OF INFORMATION COMMUNICATION TECHNOLOGY (ICT) INTEGRATION IN THE CURRICULUM AND TRAINER COMPETENCY SKILLS IN INFORMATION COMMUNICATION TECHNOLOGY (ICT) ON THE QUALITY OF EDUCATION IN VOCATIONAL TRAINING CENTERS: A CASE STUDY OF MURANG'A COUNTY

^{1*}Pauline Nelima Wakasiakah

¹Post Graduate Student: Jomo Kenyatta University of Agriculture & Technology, Kenya.

*Corresponding Author's Email: wakasiakah@gmail.com

²Dr. Thomas Senaji

Lecturer: Kenya Methodist Univeristy (KEMU)

³Dr. Tobias Mwalili

Lecturer: Jomo Kenyatta University from Agriculture and Technology (JKUAT)

ABSTRACT

Purpose: The purpose of this paper is to assess the influence of Integrating ICTs in the curriculum and the trainer competency skills in ICT have on the quality of training in Vocational Training Centers (VTCs) in Murang'a County, Kenya.

Methodology: The study used a descriptive research design to establish the relationship between ICT integration in the curriculum, Trainer competency skills in ICTs and the quality of education in VTCs. The population was sixty three (63), which was a census of all the VTCs in Murang'a. A questionnaire was administered at the end of the training to capture the pre and post training experience and test the effectiveness of the training. The analysis of the data was conducted through descriptive and inferential statistics.

Results: The findings indicated that VTC trainers lacked ICT skills this was based on them not being proficient in performing basic tasks asked by the researcher and on the integration of ICTs in the curriculum the findings indicated that, VTCs were not using ICTs to deliver the curriculum. Trainers indicated that they used ICTs only for record keeping but not as a tool for training or further research or even for demonstration videos available online.

Unique contribution to theory, practice and policy: It was recommended that Murang'a County should come up with a policy which ensures that all the trainers in the VTCs have proper ICT skills if possible take them for courses on ICTs and how they can be used in their various trades/courses. As for ICTs integration in the curriculum, it was recommended that, the County should partner with Kenya Institute of Curriculum Development (KICD) and other stakeholders, to come up with a curriculum that is inclusive of ICT.

Key words: *Trainer ICT skills competency, Vocational and Technical Education, Vocational Training Centers, ICT integration and vocational and Entrepreneurial training (TVET)*

1.0 INTRODUCTION

1.1 Background of the study

Vocational Training Centers (VTCs) also called Youth Polytechnics (YPs) or Village Polytechnics (VPs) are centers/ institutions of learning that equip trainees with various vocational skills called trades in Kenya, VTCs fall under Technical, Vocational and Entrepreneurial Training (TVET). They hold the key to building of the technical and entrepreneurial workforce by equipping the Kenyan youth with necessary skills in different trade areas of their choice. Integration of Information and Communication Technologies (ICTs) into various fields of education and training has been a topic of discussion by many educational researchers (Rogers, 2002) and organizations such as (UNESCO, 2008), (ADB, 2004) and stakeholders in other sectors of the economy. The VTCs in Kenya offer varied types of vocational courses which are examined by National Industrial Training Authority (NITA) and the level of the graduates is Grade III, II & I. The development and integration of ICTs into TVET have been one of the major area emphasized by UNESCO due to the fact that ICT tools are becoming inexpensive, reachable and interactive in which their application into all levels of education is expected to be imperative in making educational results labor-market oriented, and in the transformation of contents, methodology as well as promoting “information literacy”. Though, studies reiterating the advantages of ICTs in education cannot be exhausted in the dynamic knowledge based society, the literature on the integration of ICTs in TVET is often not comparable to other fields of specializations and has attracted only few researchers or scholars. VTCs furnish skills required to improve productivity, raise income levels and improve access to employment opportunities for people (Kerre, 2009) and also they prepare people for self-employment and to be a medium of evolution for people to the world of work; by making an individual to have a sense of belonging in the community, VTCs are also seen as a way of reducing extreme poverty (Hollander and Mar, 2009) (UNEVOC, 2010).

1.2 Problem Statement

A number of constraints continue to inhibit the effective provision of technical and vocational education training in Kenya. Among these are: lack of qualified instructors and development of curriculum for TVET (Farstad, 2002; Nyerere, 2009; MoE, 2008; Kerre, 2009; UNESCO-UNEVOC, 2010). These challenges have led to low enrolment, poor placement in the job market and high dropout rate of trainees from the VTCs. When it comes to ICTs and Education little or no effort has been put on ICTs and VTCs, people forget that most of modern industry equipment is fitted with ICTs but there is a mentality that vocational education/skills do not require ICTs for training hence little or no effort has been put to ensure VTCs have ICTs or ICTs are being used for training in the centers. This study was timely as it sought to implement strategies relevant for the attainment of Vision 2030. To the Murang'a County Government, this study presented an independent status report on the dynamic capabilities of her VTCs and suggestions of what to do to improve the ICT usage in the curriculum delivery and have trainers who are equipped with ICT skills in the Kenyan VTC institutions in general, the study challenges their strategic mindsets in a new realization of embedding ICTs all round in the day today learning in the

centers. To the specific institutions that were surveyed, the study will help inform their future debates and strategies, particularly leveraging on Trainers' ICT skills and Curriculum capabilities.

2.0 LITERATURE REVIEW

Constructivism Theory

It is a theory is led by ideas of Jean Piaget and his theories of the four childhood stages of development (Piaget, 1955). Constructivism or Constructivist learning is based on students' active participation in problem-solving and critical thinking regarding a learning activity which they find relevant and engaging. They are "constructing" their own knowledge by testing ideas and approaches based on their prior knowledge and experience, applying these to a new situation, and integrating the new knowledge gained with pre-existing intellectual constructs. The term refers to the idea that learners construct knowledge for themselves; each learner individually (and socially) constructs meaning as they learn. Constructivist approach is used in day to day learning activities: We need to use or reflect on the trainees' experiences so that they can construct or build their own understanding also depending on the trade. In this case, different people generates their own 'rules' and 'mental models' which is then use to make sense of their experiences. Therefore, constructivism is simply the process of adjusting our rules/mental models to accommodate new experiences. How is ICT integrated in this theory? The Web is where constructivist learning can take place, it provides access to rich sources of information, encourages meaningful interactions with contents and brings people together to challenge support or respond to each other. Here, the trainer is required to provide guidance or coaching to allow trainees to create their own meaning otherwise it does not guarantee constructivist learning. Constructivism training is suitable for high-ability trainees. It can be used for VTC trainees. Since constructivism training focuses on builds up knowledge based on experiences, therefore, it encourages trainees to learn independently. The effective use of ICT can help in the success of the training. Trainees can use ICT to find extra information and relate it with their prior knowledge before construct a new knowledge.

Behavioral Theory

This is an ICT theory that argues that technology alone cannot be used to explain all the success seen in business today. People and their behavior; skills, activities are more important in explaining business success seen as if it's because of automation; it's actually because of brains behind the automation. People can sabotage or embrace technology. The impact of technology on people is therefore very important. It looks at observable behaviors produced by a learner's response to stimuli e.g after watching a demonstration Video. Responses to stimuli can be reinforced with positive or negative feedback to condition desired behaviors. Ames (1992), who analyzed a number of research studies, developed a theoretical framework for motivation relating to a belief in oneself and the ability of pupils to do better through long -term goals. She considered two types of motivation goals: mastery goals and performance goals, which involve different ways of thin king about one self. Mastery goals relate to the belief that effort and

outcome are interdependent. With such goals there is a motivation to learn by developing new skills, trying to understand the tasks, improving the level of competence and achieving a sense of mastery based on self - referenced standards. Achievement of mastery goals is therefore likely to lead to a longer-term high-quality involvement in learning, compared with achieving performance goals of particular tasks. In the case of ICT this would involve developing competence in performing learning tasks in order to acquire higher skills and more knowledge. Performance goals on the other hand focus on one's ability and sense of self-worth, 'especially important to a performance orientation is public recognition that one has done better than others or performed in a superior manner' in achieving specific goals (Ames, 1992). These goals are directed towards achieving success in relation to the achievements of one's colleagues. Research by Ames (1992) has also shown that 'tasks that involve variety and diversity are more likely to facilitate an interest in learning and mastery orientation. Trainees are more likely to approach and engage in learning in a manner consistent with a mastery goal when they perceive a meaningful reason for engaging in the activity.' This suggests that if trainees perceive that ICT will help them in their long-term future, they are more likely to spend time on the ICT-based activity and related work.

Diffusion Theory

Rogers (2003) in his diffusion of innovation theory argues that media and interpersonal contacts provide information that influences a person's opinion and process, innovation characteristics and adopter characteristics. The innovation-decision process categorizes the steps an individual takes from awareness for innovation, through the formulation of an attitude to the innovation, on to the decision as to whether to implement and finally confirmation of this approach, i.e. knowledge, persuasion, decision, compatibility, complexity, observer bale, relative advantage and attempts have an impact on the likelihood of acceptance and adoption, and also on the rate at which innovation process develops. Finally, (Rogers, 2003) defines the socio-economic characteristics of early adopters under the broad categories of socio-economic characteristics, personality values characteristic, and communication behavior characteristic. According to the theory, the degree of interpersonal influence an early adopter possesses within the innovation decision-process will affect the dissemination of the innovation to others.

Trainer competency skills in ICT

Based on her research (Yu-mei, 2000) summarized that trainers were actually receptive to changes; especially the use of educational technology, and were aware of the fact that technology is here to stay and had a deep concern of somehow 'missing out and that computer related training is advantageous to all trainers. Trainers were also aware of the fast rate of the technological innovations that were taking place (Steel & Hudson, 2001) and increased use of Information and Technology (IT) in training and learning (Wishart & Blease, 1999).

Integration of ICT in the Curriculum

According to the principle of individual differences, humans differ greatly in the way they respond to stimuli. Some of these differences may be related to their genetics, gender or past experiences. By the same token faculty and trainees embrace the use of ICT differently and because the perceptions of the role ICT plays in education may inadvertently influence the extent of use, the latter will also be reviewed and of course there are mixed opinions on whether or not ICT should be used in teaching and learning with some educationists arguing in favor of it and others fronting a more blended approach (Bonk 2012; Breen et al 2001). The VTC curriculum can choose to fully or partially incorporate ICTs. By use of blended implementation, the trainers will use ICTs to plan for lessons, to store trainees' progress records, use display screens for video displays and presentations prepared by trainers, radio for sound tutorials and at the same time face to face learning will be done by the trainer.

Summary of Literature Review

TVET educators have always been early adopters of innovations related to ICT tools, equipment, and system controls. The same is true regarding the use of ICTs for supporting the delivery of TVET programmes, there is a paucity of information on the extent to which ICT-mediated learning is being integrated in TVET, however unlike other TVET institutions, VTCs are lagging behind. While there are pockets of exemplary TVET programmes that have successfully implemented ICT- mediated learning in different parts of the world, Australia, Canada, and the United States appear to have reached a more advanced level of integration more than Kenya. There are many barriers that hinder the integration of ICTs into training and learning in Vocational Training. The most significant being: infrastructure, availability of suitable materials, job threat, appropriateness of the methods, and credibility of programme content/curriculum content. Although there are some anecdotal records of successful attempts regarding the use of ICTs for teaching affective and practical skills, there is no hard evidence in support of these claims. VTC trainers will need to keep up to date in order to maintain their occupational literacy skills. Those involved in the integration of ICT-mediated training need training in the pedagogical applications of ICTs for teaching and learning. Trainees also need a set of ICT literacy skills in order to succeed in ICT-mediated learning environments.

3.0 RESEARCH METHODOLOGY

This study used descriptive survey research design. The target population of the study were Managers and Trainers of the Public VTCs in the eight (8) Sub Counties in Murang'a County . A census was conducted of all the VTCs, which are sixty three (63) in number. This study used primary data whichy was collected through use of structured questionnaires. Data from the questionnaires was analysed using Statistical Packages for Social sciences (SPSS) to derive descriptive results.

4.0 RESEARCH FINDINGS AND DISCUSSION

4.1 Demographic Data

4.1.1 Gender

This study also examined how the gender distribution of leadership in the VTCs is in Murang'a County and the results were as indicated in Figure 2. The figure indicates 46% of the respondents were Female (n= 26) and 54% were Male (n=31) this is an indication the opinion of the findings was from both genders hence not bias.

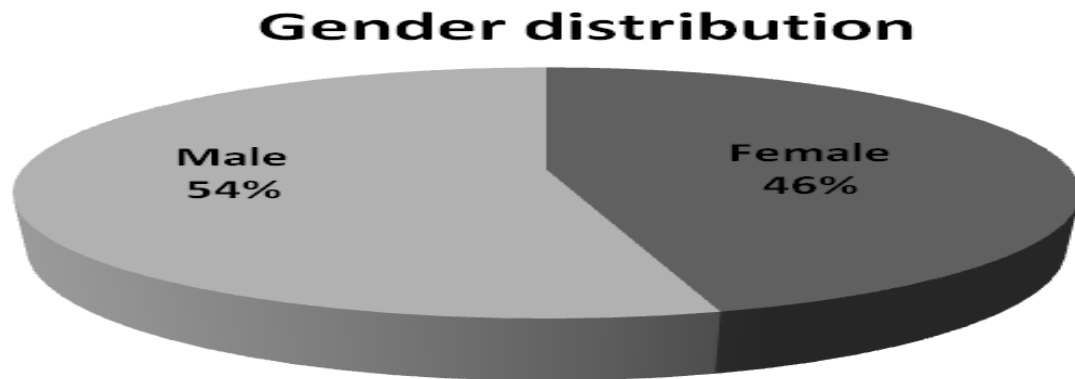


Figure1: Gender distributions of respondents

4.1.2 Highest qualifications

The study examined the distribution of the census of respondents according to their highest professional qualifications. The foregoing was necessitated by the desire to understand the extent to which the Managers or Trainers were qualified to carry out their tasks in the VTCs. The distribution of their qualifications is as shown in Table 4.3. The highest qualification is Diploma at 41.3% (n=26)

Table 1: Distribution of respondents by qualification

S/No	Qualification	Frequency	Percentage
1	Diploma	26	41.3
2	Artisan	13	20.6
3	Higher Diploma	8	12.7
4	Degree	5	7.9
5	Craft	3	4.8
6	National Diploma	1	1.6
7	Certificate	1	1.6
8	Missing	6	9.5
Total		63	100.0

4.1.3 Area of specialization

The study also analyzed the distribution of respondents based on their area of specialization. This was meant to analyze what respondents with different vocational trades/courses felt about ICTs use in their areas of specialization. From the analysis, majority of the respondents were from the Fashion Design & Garment making trade with 25.4% followed by Building Technology (Masonry) trade at 17.5%, Hairdressing & beauty therapy 9.5%, the trade with the least respondents were Business studies, Food processing technology & Plumbing each with 1.6% and Agri business with 2% therefore, it is alright to conclude that the study represented majority of the trades/ courses being taught in the VTCs this means that, with the knowledge each has in their area of specialization, they would know whether or not ICTs is important or not in the a trade/course they represent.

4.2 ICT Competency skills of trainers

4.2.1 Relevance of ICTs in the various trades/ courses offered in the VTCs

From the study, 98% (n=56) cited that, ICTs are very important for the various trades/ courses being offered in the VTCs while 2% (n=1) of the respondents cited that ICTs are not important. Therefore, it is clear that respondents from various trades agree that ICT is important in their trades/courses.

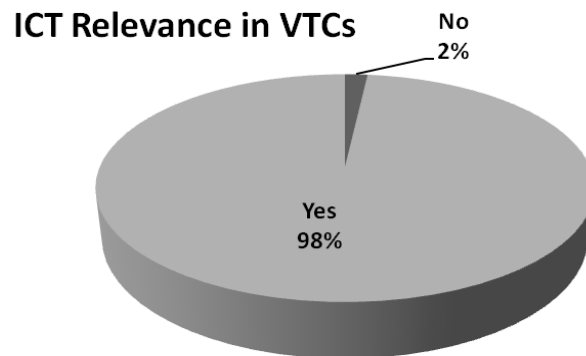


Figure 2: ICT Relevance in VTC trades/courses

4.2.2 Level of ICT training for the trainer

By asking this question, the researcher intended to find out whether or not the VTC trainers have ICTs training or not. The findings were as indicated in Table 3 below:

Table 2: Level of ICT Training

S/No	Level	Frequency	Percentage
1	None	7	12.3
2	Basic	37	64.9
3	Intermediate	8	14.0
4	Advanced	5	8.8
Total		57	100

4.2.3 Trainer ICT skills proficiency

The respondents were asked to respond as to whether they were proficient in the activities indicated by the researcher and findings were as indicated in Table 4.

Table 3: Trainer ICT skills proficiency

S/No	Type of Skill	Not proficient	Somewhat Proficient	Proficient	Very Proficient
1	Use the computer to prepare lesson plan, Schemes of work and keep progress records	14	25	8	10
2	Use of projector and / with computer in class	25	21	6	5
3	Using internet for mail and tutorials	17	17	13	8
4	Operating the computer by using keyboard & mouse	8	14	11	24
5	Switching the computer on/off	6	15	11	25
Total		70	92	49	72

4.3 Integration of ICT in the curriculum

4.3.1 How ICT is taught in the VTC

The aim of this question was to find out ICT is taught in the VTCs and the findings were as indicated in Table 5. where, 41.2% (n=35) cited that ICT is taught as a separate subject, 30.6% (n=26) cited that ICT is integrated in other trades/subjects being taught in the VTC, 10.6% (n=9) were of the opinion that ICT is integrated in the various trades because it is the requirement of the curriculum, 4.7% (n=4) did not see the need of using ICTs in their trade/ subject while 12.9% (n=11) gave other ways which were that, there were not ICT facilities in the VTC and that ICT is taught to all trainees in the VTC despite the trade as a compulsory subject. From the findings it can be concluded that, ICT has not yet been integrated in the VTCs curriculum in the day to day training.

Table 4: How ICT is taught in VTCs

S/No	How is ICT is taught	Responses	Percent
1	ICT is taught as a separate subject	35	41.2%
2	ICT is integrated in different subjects	26	30.6%
3	ICT is integrated in my subject because of curriculum requirements	9	10.6%
4	I don't see the need of using ICT in my subject	4	4.7%
5	Other reasons	11	12.9%
Total		85	100.0%

4.3.2 How ICT is used in the VTC

The aim of this question was to find out how trainers and the management in the VTCs use ICTs in the day to day training activities and the findings were as indicated in Table 6. From the findings it can be concluded that the VTCs do not utilize and enjoy the benefits of ICTs.

Table 5: How ICT is used in VTCs by trainers

S/No	How ICT is used in the VTC	Frequency	Percent
1	Preparing lessons, scheme of works	26	23.0%
2	Class teaching in front of the students	22	19.5%
3	Keep progress record of students	36	31.9%
4	Search for video demonstrations, tutorials and notes on the internet	8	7.1%
5	Use projector, DVD players and cassettes for delivering the curriculum	8	7.1%
6	Other reasons	13	11.5%
Total		85	100.0%

4.4 Inferential Statistics

Pearson's product moment correlation analysis was conducted to assess the relationship between variables and multiple regression analysis was used to determine the relationship between ICT adoption and quality of education in vocational training centers. As indicated in Table 7, data about trainer competency skills in ICT; and integration of ICT in the curriculum. Pearson's correlations analysis was conducted at 95% confidence interval and 5% confidence level 2-tailed. Table 7 shows the correlation matrix between the factors, trainer competency skills in ICT and integration of ICT in the curriculum and quality of Education.

Table 6: Correlation

		QoE	ICTTSC	ICTCurInt
QoE	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	57		
ICTTSC	Pearson Correlation	.061	1	
	Sig. (2-tailed)	.653		
	N	57	57	
ICTCurInt	Pearson Correlation	.191	-.048	1
	Sig. (2-tailed)	.154	.722	
	N	57	57	57

Where: QoE = Quality of education; **ICTTCS** = Trainer Competency Skills in ICT and **ICTCurInt** =Integration of ICT in the curriculum.

As shown in Table7 there is a positive relationship between Quality of Education and trainer competency skills in ICT and Integration of ICT in curriculum of magnitude 0.061 and 0.191 respectively. The significance value of the relationship between the quality of education and trainer competency skills in ICT and with Integration of ICT in the curriculum were 0.653 and 0.154 respectively. This implies that ICT competency skills for trainers are the most significant factor followed by Integration of ICT in the curriculum in determining the quality of education.

5.0 SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of findings

The study findings indicated that trainers in the VTCs agree that ICTs are important in their various trades/courses being offered in the VTCs but they lacked ICT skills meaning they were not competent in using the ICTs in place. The findings also indicated that, ICTs were not integrated in the current curriculum and trainers were not using ICTs to deliver the current curriculum instead, they were using ICTs for record keeping only.

5.2 Conclusion

Based on the findings of this study, this research concluded that information Communication Technology (ICT) influences the quality of education being offered in the Vocational Training Centers (VTCs). There was an inverse relationship between use of ICTs and that of the quality of education being offered in the VTCs. Increase in ICTs use will positively increase quality of education in VTCs. The study also established that, most of the trainers in the VTCs lack ICT skills and this leads to them no knowing how to integrate ICTs in the curriculum. The findings indicated that, trainers in the VTCs agree to ICTs being implemented in the VTCs and they all agreed that, VTCs will improve training and make trainees participate more in the training hence increase enrolment. They also agreed that, ICT use will make the trainees/ VTC graduates more competitive in the job market and have high placements in the job market. They also agreed that ICTs will make training easy since they will be able to scheme, plan, set examinations and keep progress records of trainees in the VTCs.

5.3 Recommendations

On the trainers ICT competency skills, the study recommends that, trainers in VTCs be taken for ICT use training. This will enable them operate ICTs comfortably e.g. switching on and off of ICTs, creating and manipulating documents in the computers, storing information and retrieving it and finally use the projectors to display information. They will also learn how to use the internet to search for tutorials and more information. By training in ICTs, trainers will also know how to create simple knowledge management systems e.g creating DVD tutorials on topics that are hard to understand so that trainees can replay them over and over in the absence of the trainers and also for future use.

As for integration of ICTs in the curriculum, the study recommends that the County revises the curriculum by incorporating all the necessary stake holders like the Kenya Institute of Curriculum Development (KICD) and the Ministry of Education the Vocational training department so that, they come up with an ICT friendly Curriculum. With an ICT rich curriculum, trainees will receive quality training and this will guarantee better performance in examination, better placement at the job market, high completion rate by trainees and be at a better competitive level with the rest of graduates in Kenya. Trainers will also be able to blend ICTs during training and also prepare lesson plans and schemes of work with ICTs. Finally, the research recommends that the County comes up with an ICT policy that is for Vocational Training Centers (VTCs) that will incorporate all the study objectives and any other item that will boost ICTs implementation in the VTCs.

Reference

- Farstad, H. (2002). Integrated entrepreneurship education in Botswana, Kenya and Uganda. Norway: World Bank International Institute of Technology.
- Kerre, B. W., & Hollander, A. (2009). National Qualifications Frameworks in Africa International Handbook of Education for the Changing World of Work. Bonn :UNESCO-UNEVOC
- Miller, T. (2009). Formative computer-based assessment in higher education: The effectiveness of feedback in supporting student learning. *Assessment and Evaluation in Higher Education*, 34(2), pp. 181-192.
- Mugenda, O.M., & Mugenda, B.G. (2009). *Research Methods-Quantitative and Qualitative Approaches*. Nairobi: Acts Press Publishers.
- Nyerere, J. (2009). Technical and Vocational Education and Training (TVET) Sector Mapping in Kenya. Nairobi: Edukans Foundation
- Piaget, J. (1955). *The construction of reality in the child*. London: Routledge.
- Rogers, E.M. (2003). *Diffusion of innovations*. New York: Free Press
- Steel, J., & Hudson, A. (2001). Educational technology in learning and teaching: the perceptions and experiences of teaching staff. *Innovations in Education and Teaching International*, 38(2), 103–111.
- UNESCO-UNEVOC, (2004). Orientating TVET for sustainable development: Retrieved March, 22, 2017 from, <http://www.unevoc.unesco.org/wiki.0.html>
- UNESCO-IBE, (2010). World Data on Education VII ed. Kenya. Geneva: UNESCO-IBE
- Wishart, J. & Blease, D. (1999). Theories underlying perceived changes in teaching and learning after installing a computer network in a secondary school. *British Journal of Educational Technology*, 30(1), 25–41.
- Yu-mei, W. (2000). Training teachers using computers. *The Journal*, 27(10), 1–8. Retrieved March, 22, 2017 from [http:// www.thejournal.com/magazine/vault/A2856.cfm](http://www.thejournal.com/magazine/vault/A2856.cfm).