

Framework for Assessing the Role of Modern Instructional Technology in Teaching Agricultural Vocational Courses in Higher Institution

Hauwa Hassan¹, Nor Lisa Binti Sulaiman², Bala Ishiyaku³

^{1,2}Department of Vocational Technology
Faculty of Technical and Vocational Education

Universiti Tun Hussein Onn Malaysia

³Department of Construction and Real Estate Management,
Faculty of Technology Management, Business and Entrepreneurship,

University Tun Hussein Onn Malaysia

hauwahassan79@yahoo.com¹, norlisa@uthm.edu.my², balaishiyaku@yahoo.com³

Keywords: instruction technology, modern instruction technology, instruction technology methods, instruction technology equipments.

Abstract. The paper proposes a framework for assessing the influence of Modern Instructional Technology (MIT) on the teaching of Agric vocational courses in higher institutions. As an on-going Master's research, the study set to identify the MIT methods and equipment used in teaching Agric vocational courses in a study area, assess the influence of MIT methods on teaching Agric vocational subjects in the study areas and propose a framework for improving teaching of Agric vocational courses using MIT in the study areas. Literature revealed how much attention is given to the influence of Information and Communication Technology (ICT) equipment on education with little attention given to the changes in Instruction Technology. The development of MIT poses a challenge to the instructors to improve educational quality to meet the current need of education of the 21 century digital students. As a multi-disciplinary study, theoretical and conceptual frameworks are important and study approach is considered a quantitative method. As the study moves toward pragmatists' school of thought about what constitute knowledge, exploratory survey and case study were recommended. The population of the study comprises of the students of Agric education offering core Agric education subjects in a study area. Data collected will be analysed using descriptive statistics and parametric inferential statistics. The study can provide ideas on how the use of MIT stimulates teaching of Agric vocational courses in the study area. It will indicate how to encourage young individuals to embark on vocational skills and will prove that use of MIT leads to critical thinking that leads to new innovations.

Background of the Study

Modern Instruction Technology (MIT) refers both to the new methods and equipment use to make teaching better. There is evidence in literature that new technologies provide range of opportunities that can transform teaching and offer improved possibilities for learning [1]. This terminology is used widely in different fields of education to refer to emerging technologies that are used in instruction and learning processes [2]. However, MIT methods are advanced teaching methods concerned with improving the efficiency and effectiveness of learning. For a long time in the past, teaching and instruction were used synonymously to mean utilising all personal attributes and training in order to provide the student with the required levels of knowledge, skills and attitudes a lesson is designed to achieve [3].

MIT has become an increasingly important aspect of the high institutions' vocational education content delivery method. Agric education as a vocational course is not exempted. Consequentially, Agric education is forging ahead at a startling pace with the adoption of MIT [4]. Professional development and continuing education for agricultural teachers is therefore vital for the future of best practice in agricultural education [5]. The ability of an Agric education department or institution to adapt MIT will be influenced by factors such as a) availability of high

quality facilities, equipment, technical support, and training in MIT used in teaching Agric vocational courses, b) knowledge, skills, attitude and abilities of its staff to apply MIT methods in teaching Agric vocational courses, and c) strategic framework for improving teaching of Agric vocational courses using MIT. Therefore, continuous research to identify and improve MIT in Agric education is important to accommodate students' dynamic learning needs and styles through a variety of MIT methods.

Statement of Problem

Despite the rapid development in the advent and use of MIT equipments in teaching [6] inability of teachers and students to operate at improving levels toward MIT methods was observed [8]. There is a problem of integration of MIT methods and provision of appropriate MIT equipment and facilities in High education institutions. Hence, Vocational courses in the universities find it difficult to realize their true potentials in terms of knowledge engineering, promoting and widening participation in the use of MIT [7]. In the same vein, the failure to provide MIT equipment in the high Institutions of learning as well as effective use of MIT methods in the Institutions lead to graduation of student that cannot generate creative ideas, cannot compete favourably and cannot be employed. Therefore, this paper propose a framework to identify the extent of the use of MIT in developing countries, in terms of availability of MIT equipment, teacher's intention to use, usage behaviour from the teachers and students' perspectives. Hence, the study to assess the role of modern instructional technology in teaching agricultural vocational courses in higher institution stem from literature reviewed which pointed to the insufficient studies on use of MIT methods in Agric education courses. The MIT equipments (such as projectors, electronic whiteboards, audio visual equipments, computers, etc.) which may influence teaching and learning ability of students in Agricultural vocational courses depending on subject area, intention to use and usage behaviour of both the teachers and students in the class.

Scope of the Study

The focus of a study to assessing the role of modern instructional technology in teaching agricultural vocational courses in higher institution can be an examination of the relevant MIT methods and equipment used in teaching Agric education in the study area. The study can also measures the extent to which MIT stimulates teaching and learning in the study area and to examine the influence of MIT in teaching and learning of Agric education in the study area. Meanwhile, the expected respondents to the instruments of data collection for such study are Agric education teachers and students in the study area.

Literature Review

MIT are most recent instruction method and equipment use in teaching and learning process. These equipment's include computers, mobile devices (handset, iPhone, iPad) projector etc, while the methods are Problem Based and Inquiry Learning, Cooperative Learning, Simulation Games and Competition, Brainstorming, Simulations, Collaborative Learning, Case Studies, Colloquia, Controversial Issues, Cooperative Learning, Individualized Instruction, Mixed-mode instruction, On-Line Instruction and Learning and Programmed or Automated Instruction. Integrating technology into classroom instruction and learning has been an important issue in the last few decades. Several meta-analyses have been conducted to examine specific modes of instruction or educational practices that promote student learning and teaching with technology. [8] for example, examined the effects of small group versus individual instruction with technology and found that small-group learning had more positive effects than individual learning. Therefore, to design an effective direct instruction nowadays, there is need for using the knowledge of MIT methods and equipment as well as knowledge of contents knowledge of the subject area. [9] cited the work of Robert Marzano (*What Works in the Classroom*) where he added an interesting component to basic lesson design sequence for Direct Instruction, established by Madeline Hunter (Fig. 1). Initially, the model consists of 6 fundamental steps: Anticipatory Set, Objective & Purpose, Input & Modelling, Checking for Understanding, Guided Practice and Independent Practice. Then the kinds of knowledge teachers would ideally use to design modern instruction were integrated in the model, which are pedagogical knowledge, content knowledge, and technological knowledge. These are

presented as MIT methods knowledge, agric education knowledge and MIT equipment knowledge. More importantly, however, are the areas of overlap included in the triple Venn diagram (Fig. 1) that mark where these knowledge and expertise domains converge.

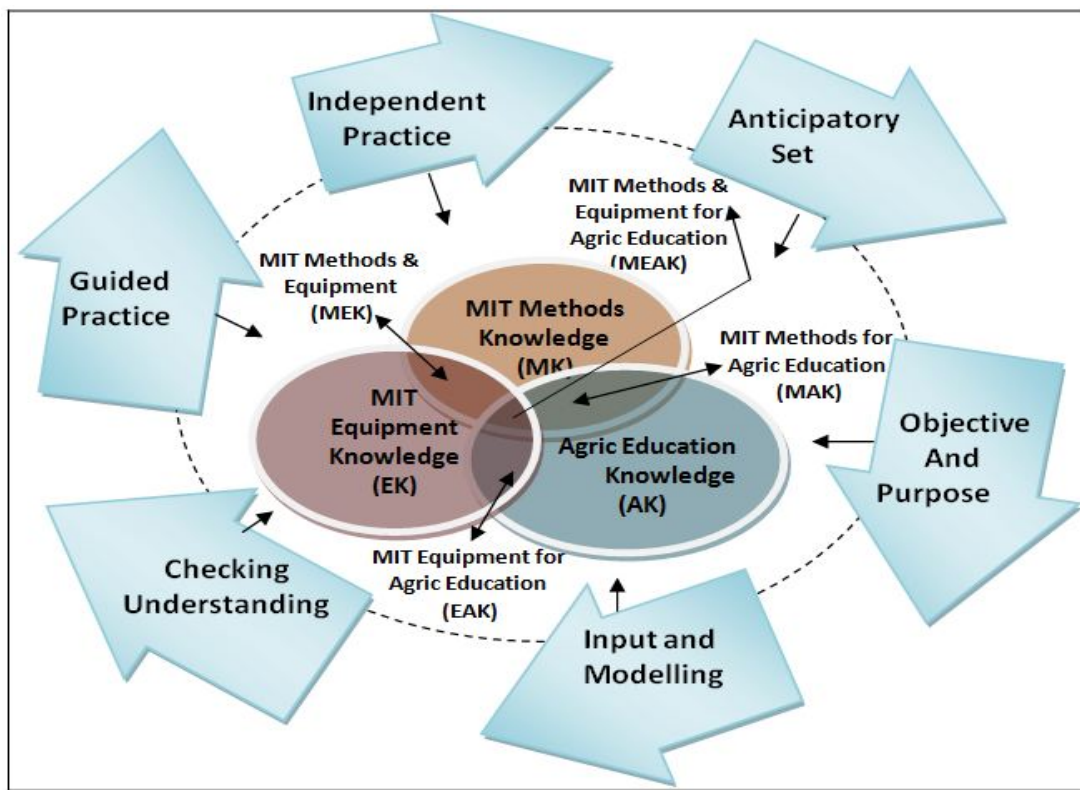


Figure 2.1 Modern Instruction Design Model Adapted from [9]

[10] stressed that modern instruction innovation is needed in the teaching and learning of Agriculture to increase the quality of the knowledge acquired. This innovation process can be done by understanding and improving instructional methods in High education institutions which can assist students in improving their problem-solving abilities and concept mastery so that they can apply the acquired knowledge in a practical situation. [11] pointed that an additional benefit of this environment is its flexibility, and students can learn to apply their knowledge in either individual or collaborative settings, thereby gaining in introductory agriculture courses require instructional methods that combine the theoretical emphasis and structure of lectures and the practical relevance and flexibility of multimedia instruction methods. Such a combination of instructional methods is more likely to lead to the accomplishment of the agriculture learning outcomes than using other methods alone. This is equally important to the effectiveness of teacher to communicate with the present digital students.

Research Methodology

The study to assess the role of modern instructional technology in teaching agricultural vocational courses in higher institution can use a quantitative methods design, which is a procedure for collecting, analysing and presenting data in numerical form [12]. The study can identify the MIT methods and equipment usage variables and causally relates them to determine the nature of their relationships. The population of the study may comprises of the students of Agric education offering core Agric education subjects in the two study areas (excluding special problems, special topics, laboratory courses, and the school computer applications course). The sample of the study can be drawn from the population by random selection from official students' list to be collected from the Department offices. Systematic random sampling can be used for this research. As the students list is normally arranged in order of their registration numbers, the sample students can be selected by random start, using random numbers generated online from stattrek.com. As a survey study, questionnaire is to be used as instrument for data collection. A pilot survey may be carry out

before the main survey, to ensure the validity of the instrument. The instrument is to be personally administered and collected for the statistical analyse. The data collected will then be coded and insert to SPSS software for the analysis. The reliability of the measurement can be analysed by finding Cronbach's alpha at not less than 0.7. Descriptive and correlation analysis can be carried out to determine the relationship between MIT equipment availability and MIT methods usage. Data analysed in this quantitative research can be presented in tables, charts and graphs with popular vocabularies like variables, population and results used. This is illustrated in Fig. 2 below;

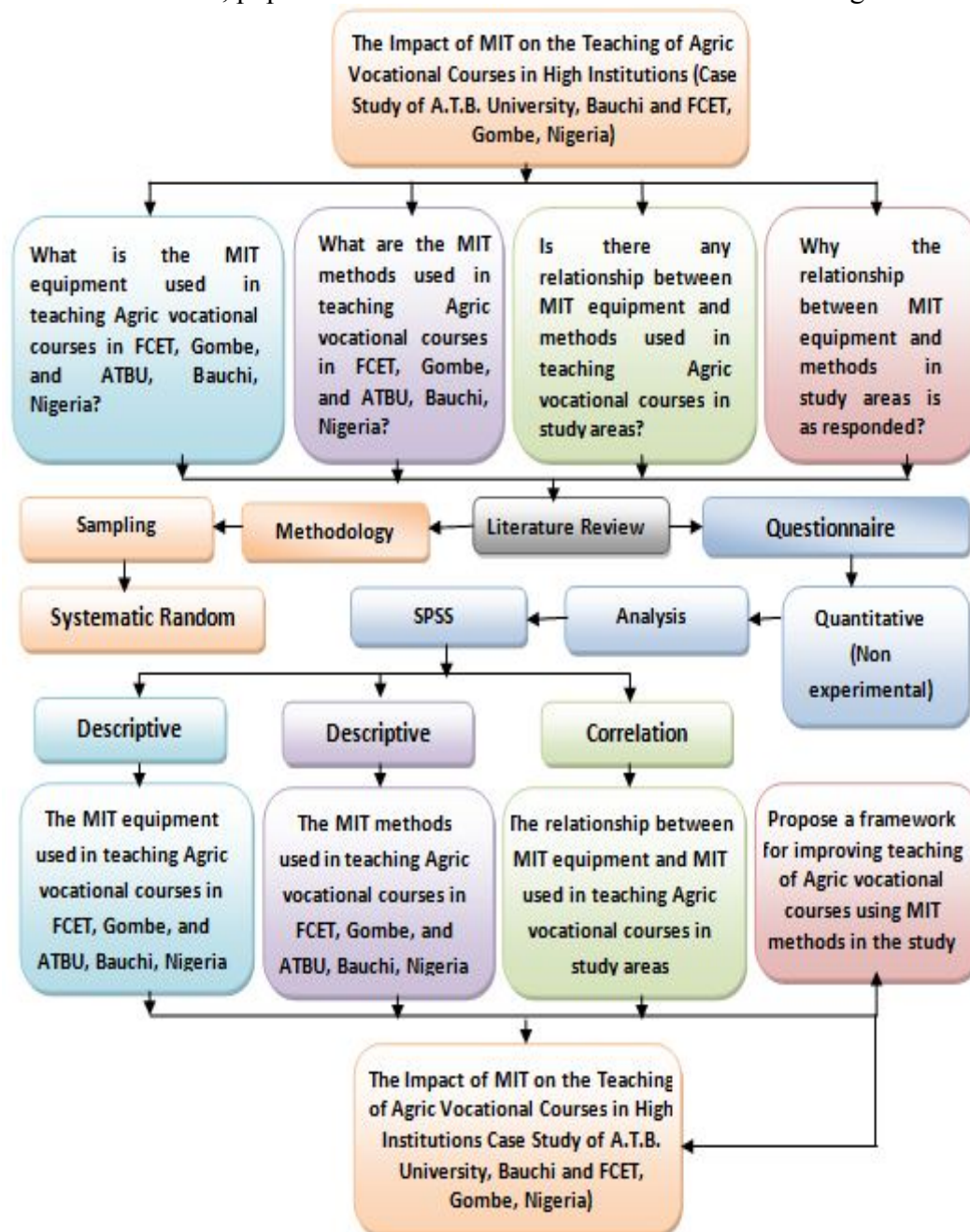


Figure 2: Framework for assessment of the impact of MIT on teaching of Agric vocational courses
Expected outcomes

The students and staff responds on availability of the MIT equipments can provide information on what types of equipments are available and how adequate and functional they are. The Usage behaviour can provide information on which MIT methods are used by the teachers, how are the teachers and students use them and why. The personal information of staff and students, together with the available MIT equipments can further explained why the nature of the usage behaviour is as responded. The study can provide ideas on how the use of MIT stimulates teaching of Agric vocational courses in the study area. It will indicate how to encourage young generation to embark

on vocational skills and will prove that use of MIT leads to critical thinking that leads to new innovations.

Conclusion

Therefore the framework model developed is sufficient to assess the impact of MIT, of both method and equipment used in the teaching of Agric vocational courses in developing countries.

References

1. L. Harasim, Online education. Computer networking and scholarly communication in the twenty-first-century university. (1996) 203-214.
2. Q. Wang, A generic model for guiding the integration of ICT into teaching and learning. *Innovations in Education and Teaching International*, 45. 4 (2008) 411–419.
3. J.S. Bruner, *Toward a Theory of Instruction*. The Belknap Press, MA. (1966).
4. V. Kostoglou, M. Vassilakopoulos, & C. Koilias, Higher technological education specialties and graduates' vocational status and prospects. *Education Training*, 55.6 (2013) 520-537.
5. R. J. Birkenholz, & B. R. Stewart, The use of instructional technologies in agricultural education. *Journal of Agricultural Education*, 32.2 (1991) 40-48.
6. S. Zhang, S. Zhang, X. Chen, & X. Huo, Cloud computing research and development trend. *In Future Networks*, (2010) 93-97.
7. M. O. Aburime, & J. O. Uhomobhi, Impact of technology and culture on home economics and nutrition science education in developing countries. *Multicultural Education & Technology Journal*, 4.1 (2010). 4–16.
8. Y. Lou, P. C. Abrami, & S. d'Apollonia, Small group and individual learning with technology: A meta-analysis. *Review of educational research*, 71.3 (2001) 449-521.
9. T. Heck, Merging Basic Lesson Design with Technological Pedagogical Knowledge, TeachThought, posted on 06/20/2013, retrieved from <http://www.teachthought.com/learning/merging-basic-lesson-design-with-technological-pedagogical-knowledge>. retrieved on 12/11/2013.
10. W. Syafii, & R. M. Yasin, Problem Solving Skills and Learning Achievements through Problem-Based Module in teaching and learning Biology in High School. *Asian Social Science*, 9.12 (2013) 220.
11. J. L. Pridmore, R. V. Bradley, & N. Mehta, Methods of Instruction and Learning Outcomes: A Theoretical Analysis of Two Approaches in an Introductory Information Technology Course. *Decision Sciences Journal of Innovative Education*, 8.2 (2010) 289–311.
12. J. W. Creswell, *Educational research: Planning, conducting, and evaluating quantitative and qualitative approaches to research*. Upper Saddle River, NJ: Merrill/Pearson Education (2002).