

**41ST INTERNATIONAL ASSOCIATION FOR EDUCATION ASSESSMENT (IAEA)
CONFERENCE**

**THEME:
"VALIDITY", "VALIDITY",
"VALIDITY"**

SUBTHEME:

**USING TECHNOLOGY TO IMPROVE
VALIDITY**

**An evaluation of information and communication technology in improving validity of
assessment items in test development**

BY:

PETERSON W. KABUGI

SENIOR ICT OFFICER

THE KENYA NATIONAL EXAMINATIONS COUNCIL

Mobile:(+254)-726 155 404

EMAIL: pkabugi@knec.ac.ke

Contents

- 1. INTRODUCTION..... 4
- 2. REVIEW OF LITERATURE..... 4
- 3. PROBLEM STATEMENT..... 5
- 4. RESEARCH QUESTIONS..... 5
- 5. OBJECTIVES 6
- 6. METHODOLOGY 6
- 7. RESULTS AND DISCUSSION..... 7
- 8. REFERENCES 8

Abstract

It is no exaggeration to use the word “revolution” when talking about how our lives have changed over the past few decades. Today we rely on information and communication technologies and devices that hadn’t even been imagined in the 1980’s. Moreover, emerging technology skills has also been on upward trend compared to the recent past. People with less computer skills are now comfortably using these technologies and devices such tablets and smart phones which give hands-on technologist enough motivation to innovate endless facilities to match these ever growing skills . Generally speaking, the way we live and do our work has changed profoundly. Over the years, the process of developing assessments has been evolving from traditionally known process of paper and pen ,which was occasioned by repetitive work of reading books and syllabuses which were prone to uncertainty and typographic errors, to more recent ways that uses softcopies and e-learning materials. This has tremendously improved on content validity of set items. However, in more critical analysis, there is need for more innovations to match these diverse and dynamic trend of information technologies to enhance validity, accessibility and inclusiveness in test development. In all these emerging technologies, internet is the most obvious tool which cannot be ignored. It provides much needed and liberated resources that can enhance innovations to improve validity in assessment. This paper will highlight on online item writing system that was developed in purpose of enabling teachers in Kenya to create objective questions based on primary education syllabuses and, post them in a centralized database server. On the other hand, subject officers access these items and based on their test development knowledge, they can validate these items to determine quality and relevancy. In addition, moderators validate these items before they are pretested and stored in the item bank.

Keywords: Online Items Writing, item writing, internet, database, server

1. INTRODUCTION

Kenya National Examinations Council (KNEC), a national examinations body in Kenya that administer examinations in Kenya, has developed as web enabled system called Online Item Writer System (OIWS) that allows registered teachers write, validate and post the items to centralized database server. The system also allow the subject officers to oversee these items and may accept or reject based on various preset test development conditions. The system consist the four interlinked modules; registration, induction, item writing and moderation.

The Online Item Writer System is innovation that geared on ensuring various stakeholders participate in delivering quality assessment items that can be pre-tested and store in item banking for future use in administering examinations.

In addition, the system also improve validity in item writing processes as it enables an item writer or test setter for a particular subject to choose topic through subtopic, content area, objective and cognitive level. The system allows the posted items (just created) to be in real time moderate by subject matter experts (SMEs) to ensure they are correct and most importantly the measure what they are supposed to measure, and content validity is guaranteed.

2. REVIEW OF LITERATURE

The rapid expansion of technology in people's everyday life led the educators to integrate technology into education for instructional and assessment purposes (Nazlı,2015). Nazlı argues, peoples' technological know-how lead the assessors to integrate technology for assessment purpose. The trends of the computer skills in the society should aligned mode of the assessment and therefore paper and pen is being driven away. The current use emails as best alternative for communication, social networks such as facebook and twitter and online payments are just an indicator that the world has changes to Internet of Everything. It is up to all of us to get involved to ensure that the internet, as Internet of Everything (IoE) unfolds, Continues to be a powerful force for improving people's lives (Michelle et al,2013).

Furthermore, trends in technology—the dramatic increase in and the reduced cost of processing power, storage, and bandwidth; the rapid growth of cloud, social media, and mobile computing; the ability to analyze Big Data and turn it into actionable information; and an improved ability to combine technologies (both hardware and software) in powerful ways—are making it possible to realize more value from connectedness (Michelle et al,2013). It is estimated that number of devices which are connected the internet in the world exceeds the total number of people living the world. The shows that future is connectedness. IoE will connect people in more relevant ways, delivering the right information to the right person or machine, efficiently and effectively. Moreover, if open

standards are developed and adopted, IoE will enable better interpretation and use of the data being collected.

Evidently, the model of measurement could be more valid, reliable and relevant if modern technologies such internet could be maximally exploited at any moment in time, providing ongoing, targeted, and personalized feedback on what assessors must do to improve users' experience.

Finally, the assessor can invite subject matter experts (SMEs) from far end of the world to their test development process and these experts could present a professional discussion or argument through web conferencing or online chat that can be greater use to improve validity test items.

3. PROBLEM STATEMENT

The process of collecting and moderating quality items in Kenya National Examinations Council rely mostly in small number of assessment setters and moderators. The assessment setters develop items in closed rooms and provide the items to subject officers who in turn convene a meeting to discuss on the quality, validity, relevance and reliability of these items. The demand of these assessments items is increasing due increase in candidatures in primary, secondary and middle-level institutions in Kenya. Since year 2002, the candidatures are increasing by an average rate of 4.34% and 8.45% yearly in primary and secondary school respectively. It is now evident that small number of assessment setters and moderators will be constrained to meet these demand in future if the equivalent trend continue. Validity of the set items on the other had cannot be compromised and ignore. In addition, the teachers who are selected to set assessment are small subset of wider fraternity of teaching staffs employed by Teachers Service Commission (TSC) in Kenya thereby raising the question of inclusiveness.

The main objective of these paper is evaluate how online item writer system can provide much needed volume of assessment items, improved validity and inclusiveness of setting assessment items in test development.

4. RESEARCH QUESTIONS

Prior to the development of the online tool, the following research questions where strongly discussed;

- a) To what extent can modern technology be used to improve validity of items in test development in Kenya?
- b) Which is the best modern way of collecting large numbers of quality items in Kenya?

- c) How can we use information and communication technology to increase the accessibility and inclusiveness in test development in teaching fraternity in Kenya?

5. OBJECTIVES

The main objective of these paper is evaluate how online item writer system can provide much needed volume of assessment items, improved validity and inclusiveness of setting assessment items in test development.

- a) To evaluate the extent at which the modern technology can be used to improve validity of items in test development
- b) To determine if modern technology can be used to facilitate collection quality items from teaching fraternity in Kenya.
- c) To create and consolidate database of items by use of information and communication technology.

6. METHODOLOGY

The method that was adopted was survey. The target population comprised of all registered teachers and test development staff in Kenya National Examinations Council. Due to time constrain, the study adopted random sampling which involved seven (7) subject officers in the Kenya National Examinations Council and five hundred registered teachers from larger teaching fraternity in Teacher Service Commission (TSC) in Kenya. The sampling was conducted in five geopolitical regions referred to as county in Kenya. The data collected was analyzed using Structured Query Language (SQL) in Relation Database Model(RDM).

The secondary data was extracted from Kenya National Examinations Council archive result for the purpose of analysis only.

The system design adopted the Rapid Application Development (RAD) . The planning of the application was interleaved with writing the application itself. The lack of extensive pre-planning allowed the application to be written much faster.

7. RESULTS AND DISCUSSION

The study findings were based on the outcome of the system collected assessment items.

Table 1.0: Summary of data submitted through the online item writing

Region	Total Number	Online Participants	Quality Item	Percentage of Quality Items
Machakos	600	121	87	72%
Nairobi	278	74	45	61%
Nyeri	774	134	56	42%
Kisumu	345	100	89	89%
Eldoret	297	67	89	51%
Total	2,294	496	311	

The table 1.0 shows summary data submitted by teachers in various geopolitical regions in Kenya and how they participated in creating assessment items. The process was generally successful in regards of following considerations;

- a) The online item writing system was newly introduced to normal item writing exercise to teachers who have scant computer skills.
- b) The system presented a completely new model of assessment setting which was "click click" and write a stem and responses.

Evidently, that percentage of quality items collected during the exercise was high than anticipated which is positive feedback on how the modern technologies can be embedded to ensure improved validity.

As regard to what extent the new technology can be used to improve the validity of the items, the system brought an innovative way to guide the registered teachers on various steps such as induction, selection of topics, subtopics, content area, objectives, and cognitive level for a stem item writing, to ensure validity is achieved.

The table also shows that it is also possible to use online systems to create a large database of assessment items to match the candidature increase rate in Kenya.

As to how the assessors such as KNEC can improve inclusiveness, the system proved this possibility due to the fact that the internet is accessible across various technological devices such as smart phones, pad and tablets.

8. REFERENCES

1. Nazlı. "Assessing ELT Pre-Service Teachers via Web 2.0 Tools: Perceptions toward Traditional, Online and Alternative Assessment". *The Turkish Online Journal of Educational Technology* – July 2015, volume 14 issue 3 Pg 1
2. Michelle et al. "Education and the Internet of Everything" *Cisco Consulting Services and Cisco EMEAR Education Team October, 2013*. Pg 4-5