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# The NTeQ ISD Model: A Tech-Driven Model for Digital Natives (DNs).

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**Abstract:**

Integrating Technology for enquiry (NTeQ) instructional development model (ISD), is believed to be a technology-driven model. The authors x-rayed the ten-step model to reaffirm the ICT knowledge demand of the learner and the educator; hence computer-based activities at various stages of the model are core elements. The model also is conscious of the digital age we are, thus the learner has to be tech savvy, a netizen, and the educator on the other hand has to be a digital native equally to be able to explore the gains of the model. It is only in this manner that the rich gains of the model can be tapped in an era that technology has revolutionized the teaching/learning process.

**Key words:** Problem definition, discovery, computer use, authentic assessment.

**Introduction:** The NTeQ model by Morrison and Lowther (2010) is the main focus of this discourse. The choice of the model is informed by several factors; the emphasis on learner's activities by using the computer especially in a digital age that is ICT-driven. This is what makes the model an ICT model; hence it demands that both the educator and the learner have to be computer literate, ICT savvy or fluent to be able to tap into the rich potentials of the model. The model can be described as an ICT integration-proponent model which goes beyond mere advocacy. Hence if our school system should be able to meet to the ICT demands on the system, it behooves on all, both the teacher and the taught to be abreast of trends and issues that bother on ICT usage in our schools. The reasoning is that we can not be lagging behind in basic ICT competencies in an era that ICT itself has revolutionized the world and her operations. Educators on this part of the globe must rise to the challenges occasioned by this innovation as there is heavy presence of computers in our schools but yet without deserved integration (Etiubon & Etiubon, 2013; Ofoegbu & Ikedichukwu, 2013).

In the design of instructional development models, whether classroom, product, or system (Gustarson & Branch, 2002), one thing is common, that is, the pursuit for attainment of instructional objectives with ease, less time and energy, or inshort maximization of instructional schedule. This is the essence of instructional effectiveness or the most recent, instructional efficiency. In the bid to making learning more pleasurable, yet meaningful, several instructional models adorn available literatures. The learner and concurrent development activities model (Gerlach & Ely, 1990); the analysis, state objectives, select media, utilize media, require performs and evaluation model (Heinch, Molenda & Russell 1999); the plan, implementation and evaluation model (Newby, Stepich, lahman & Russell, 2000); the contextual learners' instructional development model (Williams, 2005); the dynamic instructional design model (lever-Duffy & McDonalds, 2011); and the integrating technology for in enquiry model (Morrison, & Lowther, 2010) are just a tip of the ice berg in this regard. These models and others, share certain characteristics in common. The models are; student-centred and goal oriented; focus on meaningful performance, measurement of outcome in reliable and valid ways, interactive, self-correcting and advocate a team effort (Branch & Merrill, 2012).

**The NTeQ model and salient features**

**Objectives specifications:** This forms the first element of the model. The emphasis on objectives specification or statement is reinforced by its presence in all instructional models across literature. At this stage, lesson's objectives have to be stated in clear and concise terms whether in the cognitive, affective or psychomotor (Bloom, Engelhart, Furst, Hill & Krathwohl, 1956). Emphasis here is that objectives should focus on higher objectives that will involve the learner's mental reasoning, promoting meaningful and deep learning. Objectives

specification should also employ the ABCD acronym approach. The objectives should be exact on who the audience (A) is; the behavior (B) required of the audience as evidence of learning, the condition (C) under which the audience should be expected to perform and the degree (D) or minimum level of acceptance of required behaviour confirming satisfactory learning. The use of adjectives that can be defined, confirmed and verifiable is also a focus of such objective speciation. This is the basis for non-inclusion of ambiguous verbs while stating instructional objectives. Borich (2011) would add that the step in preparing behavioural objectives should include: specifying the learning outcomes; identifying the conditions; stating criterion levels and keeping objectives simple. In all, the computer should have a place in its attainment.

**Matching objectives to computer function.** The model is very clear on the would-be-role of the computer in supporting the attainment of the stated learning outcome above. This component demands that both the and the learner and the educator have been computer literature by virtue of the age we are today, a digital aged. Both of them should be models in computer usage in facilitating learning, not mere proponents of computer integration. They should be seen referring to relevant sites, utilizing relevant and related applications and interactive software that would support or match lesson objectives. This however can only be attained where the needed ICT competencies can be guaranteed on the part of both the learner and the educator. Because it is obvious that most of our learners are either ICT savvy, literate or natives, the onus lies on our educators who should be able to acclimatize to the digital natives' environment, hence personal development, ownership of personal computers amongst others are sure measures that would guarantee needed ICT competencies (Anekwe & Williams, 2013; Williams, 2014).

**Problem Specification:** This is the underlining element that makes the model as enquiry one and also a learner-centred one. The reasoning is that a problem statement creates a curiosity in a learner on how to confront such problem and in the cause of doing that it is obvious that lots of consultations and explorations via the net have to be made. This is the premise why it is said that in problem-based learning approach which addresses problem specified, that learners on their own seek out necessary information needed to overcoming a given problem (Savery & Duffy, 1995; Savery, 2006).

**Research and analysis:** Research is a major contributor to knowledge when conducted based on basic tenets of research. The background of the problem, problem statement, questions and hypotheses, instrumentation, its validity and reliability and analysis are some of such tenets. Once research moved from authority or tradition, to experience, deductive or inductive and the most current which is scientific, it had relied heavily on data analysis for meaningful results. The conduct of research is an individual thing by the learner, the educator however proving guidance, the analysis of data however is done by the researcher him/herself, utilizing available technological tools. Data analysis, whether it is summarizing a simple set of scores, examining differences between groups, variables, constructing tests and analyzing questionnaire (Fitz – Gibbon & Morris, 1987), these activities are carried out by the learner, reinforcing not only the vital place of technology in research but also making this phase replete with learner-centred activities.

**Results presentation:** When a research is conducted and analysis and interpretation of data accomplished, provision should be made for the presentation of the results by the learner-researcher. Written or oral presentations are viable options. The PowerPoint application software can be a good resource in these instance learners should be encouraged on how to create and design slides and make their presentation before their peers, with the educator on the background. A good presentation can be enriched where such basic principles as; multimedia, contiguity, modality, redundancy, coherent, segmentation and personalized are brought to bear and in the right manner (Clark & Mayer, 2008, Williams, 2015).

**Computer-based activities:** This is a three-in-one approach of the three-steps as contained in the referred model (Morrison & Lowther, 2010). These activities should be in three stages; during, before and after computer use, so that a lesson is replete with students' performance activities (SPA), however that are computer-based. Before computer usage, the activities that should pre-occupy the students and that are tied to the objectives have to be spelt out. In the same vein their activities while using the computer have to be defined so that they are well guided on what could be achieved by using the system. Thirdly, student activities do not end with the second

phase, so activities after computer usage also need to be considered. The activities should be linked and related, reinforcing, succeeding or preceding ones, whether during, before or after computer usage. These three-in-one computer-based activities corroborate the position that the NTeQ model as a tech-driven model for digital natives (DNs). The model insists that all users have to be computer literate, savvy and net generations, digital natives or residents net generations, (Prensky, 2001; Jones & Shao, 2011 White & Cornu, 2011 & Williams, 2014).

**Supporting activities:** This element forms the ninth ingredient of the referred model. Supporting activities consist of those activities that ordinarily would support attainment of objective but however are computer independent (Morrison & Lowther, 2010). So, while there is ample room for the three-in-one phase activities above, there should also be the incorporation of this phase, as ordinarily all activities cannot be computer base. Students' performance activities are in variants; drill and practice, consultation that are not e-bound, experimentation, group activities and others, are typical examples. The cybercafé, ICT and computer laboratories can be described as supporting systems in ICT integration, the same way consultation devoid of e-sources could be classified as an activity prior to computer-based activity in developing and validating of an academic paper, for instance (Williams, 2015). The way the support staff of a project cannot be underestimated in attainment of organizational goals, so also supporting activities cannot be under rated while considering computer-based activities in attainment of instructional objectives.

**Assessment:** The last element in the model as in other models is very key in confirming the status of specified objectives (Gerlach & Lly, 1990; Heinch et al., 1999; Newby et al; 2000; Williams, 2005; lever-Duffy & McDonald 2011). However, assessment to be meaningful has to be tied to stated objectives and has to go beyond paper and pencil type, emphasizing authenticity in the form of portfolio and rubies. A portfolio showcases overt evidence of knowledge acquired because it can be seen and felt. In the same way, a rubric provides criteria for measuring outcome and feedback generation. The essence of assessment in this model should be the authentic type that does not encourage rote and memorization and perhaps guess work. The positions of Spandel (2006), Yoshina and Harada (2007), Borich (2011) on the place of authentic assessment lend credence to this segment.

**Conclusion:** The NTeQ model is a technology-driven model as such the users of the model have to be computer literate, so it can be adjudged as promoting ICT integration in our school system. The model is a timely one considering the digital age of today. Therefore, our learners and educators have to tap into the rich potentials of technology as to gain maximally from the immeasurable benefits of the referred model. ICT has revolutionized education and teaching/learning, and so we cannot afford to be lagging behind among comity of nations in technology integration in our school, especially for developing nations.

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