Maximizing the Potentials of ICT in Business Education through the Application of TAM and VARK

By

IDORENYIN IDORENYIN THOMAS UKUT
Department of Business Education,
College of Education,
Afaha Nsit,
Akwa Ibom State.

Abstract
In order to enjoy the maximum benefits of ICT in business education, this paper proposed the application of TAM in business education with reference to the VARK learning style preference. There are several scales that can be used to measure the learning style preferences. This paper is focused on VARK since it is most relevant and applicable in ICT. When applied alone, TAM may not be able to explain well the usage and integration of ICT because there are issues like learning style preference that may tamper with the applicability of such findings. Learning styles are personal qualities that influence the way students interact with the learning environment, peers, and teachers. The intervening variables that influence the attitude, subjective norms or perception of students on preferred usefulness, preferred ease of use of ICT as proposed by TAM should be identified and controlled in order to maximise the potentials of ICT in business education. Several studies based on TAM has identified such variables to include gender, age, experience, voluntariness of use, etc. This paper has identified numerous benefits which can be maximised in business education through ICT. Recommendations were made on how to use TAM and VARK in the classroom in order to maximise the benefits of ICT in business education. The paper concluded that TAM should be combined with VARK in the teaching / learning situation for best results.

Technology Acceptance Model (TAM) has been used in several empirical studies to explain the acceptance, usage and integration of ICT in the society. TAM as
a model explains why people use information technology. This model was suggested in 1985 by Fred Davis. TAM examines the mediating role of perceived ease of use and perceived usefulness in their relation to external variables and other intrinsic variables like attitude toward ICT, behavioural intention to use and the actual system use. (Legris, P., Ingham, J. and Collerette, P., 2003). TAM has been modified into different versions and used in several studies. Each modification is an extension of the original TAM model to include other variables.

This paper proposed the application of TAM in business education with reference to the VARK learning preference for maximum benefits of ICT to be achieved. When applied alone, TAM may not be able to explain well the usage and integration of ICT because there are issues like learning preference that may tamper with the applicability of such findings. Learning styles are personal qualities that influence the way students interact with the learning environment, peers, and teachers. (Alkhasaweh, I. M., Mrayyan, M. T., Docherty, C., Alashram, S., and Yosef, H., 2008).

VARK explains the preferred medium for learning to include:

V = Visual. Visual learning strategies include gestures, pictures, videos, posters, slides, textbooks with diagrams and pictures, graphs, symbols, white space, underlining different colours, highlighting, etc.

A = Aural. Aural learning strategies include hearing. People in this group attend classes, discussions, tutorials, explain new ideas to other people, use a tape recorder, tell interesting stories, joke, leave space in notes for later recalling and filling, etc.

R = Read/Write. People who prefer this learning strategy prefer to list, make headings, use dictionaries, text books, manuals, etc.

K = Kinaesthetic. Kinaesthetic learning strategy uses all senses – sight, touch, taste, smell, and hearing. Such people prefer laboratories, field trips, tours, collections, exhibitions, samples, photographs, etc.

The learning preference of individuals based on VARK can be bi-modal, tri-modal, or multi-modal. This means that some people may prefer more than one learning style.

Learning is a change in behaviour and perception as a result of the knowledge, information, skills acquired / received. Teaching, on the other hand, is the process by which a person transfers knowledge, information, skills, etc. to others. There are several learning styles just as there are several teaching styles. The relevance of students’ learning style to teaching style is in the need to match appropriate teaching style based on the students’ learning style. Teachers should therefore, try to understand the learning style of students and then try to match appropriate teaching style with the identified learning style.
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There are several scales that can be used to measure the learning style. These include Grasha-Riechman student learning style scales, Barbara Bree Fischer and Louis Fischer’s styles in teaching and learning, Kolb learning assessment test, etc. This paper is focused on VARK since it is most relevant and applicable in ICT.

The provision of ICT in the classroom is not a guarantee for effectiveness and improved student performance. There are other factors that should be considered. One of such other factors is the learning style preferences of students. In order to effectively choose the appropriate ICT materials that will be suitable in learning, the learning style preferences of students in such class should be analysed. VARK test has proved to be a very useful tool when analysing learning style preferences. When ICT task is given based on the identified learning style preferences, the benefits of ICT will be maximised. Students learn at different rates and have individual needs, training should be flexible to cater for the individual needs. (Holden, H., Ozok, A. and Rada, R., 2008).

Different learning styles are noticed in different learning environment. The learning style varies depending on the individuals that make up the group. The implication of this for maximization of ICT potentials is that learning task in ICT should reflect the learning preference of the individual given the task to perform. Students perform better when they are given their preferred task to perform. Some students may prefer to read and summarise materials (R - Read / Write) while others may prefer to design materials (K – Kinaesthetic group). On the other hand, some students may prefer to watch certain visual materials (V – Visual group), while others may simply want to listen (A- Aural group). (Katsioloudis and Fantz, 2012).

There are other considerations that affect the classroom setting and learning style preferences. These include ethnicity, gender, age, nationality, cultural background, etc. These divergent attributes when considered in terms of TAM, leads to differences in terms of preferred usefulness, preferred ease of use, attitude towards ICT, behaviour towards ICT adoption and the actual ICT adoption.

VARK as a Diagnostic Instrument

VARK is usually employed as a diagnostic questionnaire to determine to what extent and what percentage of the students’ preferred style is visual, aural, read/write, or kinaesthetic. It was developed in 1987 by Neil Fleming of Lincoln University, New Zealand. It is consultative in nature and has an additional fourth category, read/write when compared to other learning style diagnostic materials. (Fleming, 2006).

Mismatch is often noticed to be one of the problems that create disparity between teaching and learning styles. This mismatch comes as a result of differences between the teaching style and the students’ preferred learning style. In most cases, students are visual learners, whereas most teaching is delivered orally. In order to bridge the gap that often result from mismatch, it is necessary to match teaching style with students’ preferred learning style. This can be achieved by using VARK.
questionnaire at the beginning of each course class in order to identify the prevalent learning style in the class. This information will guide the choice of teaching style that will best suit the class. (Ernest and Clark, 2008). **Available Technology Acceptance Models that Could be used in Business Education** 

There are several models that explains technology acceptance. These include the following:

1. TAM = Technology Acceptance Model
2. UTAUT = Unified Theory of Acceptance and use of Technology
3. IDT = Innovation Diffusion Theory
4. TRA = Theory of Reasoned Action
5. TPB = Theory of Planned Behaviour
6. The combined TAM and TPB
7. MPCU = Model of PC Utilization
8. TPACK = Technology Pedagogical Content Knowledge (Koh, 2014).

**TAM as a diagnostic tool**

This paper is focused on TAM as it can be used in combination with VARK to help in the maximization of ICT potentials in business education. A key purpose of TAM is to provide a basis for tracing the impact of external variables on internal beliefs, attitudes and intentions. It suggests that perceived ease of use (PEOU) and perceived usefulness (PU) are the two most important factors in explaining system use. TAM was proposed by Fred Davis and Richard Bagozzi in 1985 (LeGris et al, 2003). TAM was adopted from the Theory of Reasoned Action (TRA) which was proposed by Fischbein and Ajzen to explain and predict the behaviours of people in a specific situation. TRA and TAM propose that external variables interfere indirectly, influencing attitude, subjective norms or their weights.

Fig. 1. Theory of Reasoned Action (TRA).
The intervening variables that influence the attitude, subjective norms or perception of students on preferred usefulness, preferred ease of use of ICT should be identified and controlled in order to maximise the potentials of ICT in business education. Several studies based on TAM has identified such variables to include gender, age, experience, voluntariness of use, etc.
Potentials of ICT in Business Education Teaching and Learning

The combination of TAM and VARK will enable the following potentials of ICT to be maximised in business education teaching and learning:

- ICT is invincible for personalization of instruction, interactivity, versatility, ability to present concepts graphically which cannot be shown easily.
- ICT is a way to grab students’ attention and help them learn faster.
- It adds variety to reach more types of students.
- It provides diversity in presentation and dynamism in class attitude.
- ICT might be more interesting / fun for students.
- Using ICT in learning helps students to fit into the society on graduation since they will be using ICT every day after they graduate. It guarantees the future.
- ICT caters for the need of overactive students by making their lessons equally overactive to focus and keep their attention.
- It saves time. Virtual activities will allow less preparations for the teacher. (Holden et al, 2008).
- It helps in monitoring attendance.
- It facilitates distributing grades. (Shi & Bichelmeyer, 2007).
- It can be used in creating materials for instruction.
- It facilitates communication with colleagues and students. (Pinnock, 2006).
- ICT can be used in academic record keeping.
- It is very useful in drill and practice games.
- It helps in making teaching and learning more rewarding.
- It ensures the future of every discipline through the creation of data bases for future reference.
- Using ICT offers the greatest support to learners from disadvantaged background.
- Using ICT can result in improved learning.
- ICT impacts the society that the learners are in.
- ICT can be used for organization of information for use.
- It facilitates capacity building.
- It is very useful in school management information system.
- Digital libraries are very useful for both students and teachers.
- ICT facilitates resource sharing.
- Expands access to education
- Guarantees uniform quality
- Leaves room for diversity of results
- Transforms the learning process. (Haddad & Draxler, 2002).
- Flexibility of learning
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- Ensures broad viability & availability of educational opportunities
- Accessibility of learning materials irrespective of time and space. (Mac-Ikemenjima, 2005).
- Encourages self-discovery and personalized learning opportunities.
- Enhances learning and development, interactions, communication, and collaboration.
- ICT helps in documentation and assessment
- Strengthens home-school connections.
- Technology has brought closer the student, teacher and parents. (Kaushik, 2014).
- Managing and collecting data and facilitating online networks of EAR researchers. (Tacchi, Foth & Hearn, 2009).
- ICT enhances the extent of communication among teachers.
- Enhancement of training teachers and using seminars for the purpose.
- ICT encourages the improvement of teaching methods and lesson contents.
- ICT leads to the alleviation of duties other than classes.
- It helps in shortening work hours for teachers.
- The use of ICT helps inactivation of communication between teacher and student.
- It encourages academic development for students.
- It leads to the improvement of students’ attitude.
- ICT encourages improvement of students’ attendance rate.
- It enhances improvement of students’ skills for utilization of ICT.
- Through ICT activation of communication between teachers and students’ parents is enabled, hence effective monitoring of academic progress by parents.
- It leads to improvement of information sharing between teachers and parents.
- It leads to the activation of exchange with other schools.
- It quickens the process of dispatch of information.

Conclusion

In order to maximise the benefits of ICT in business education, this paper concludes that TAM should be combined with VARK in the teaching / learning situation for best results. The intervening variables that influence the attitude, subjective norms or perception of students on preferred usefulness, preferred ease of use of ICT as proposed by TAM should be identified and controlled in order to maximise the potentials of ICT in business education. It is necessary to match teaching
style with students’ preferred learning style for maximum benefits of ICT in business education.

**Recommendations**

In order to enjoy the maximum benefits of ICT in business education, the following recommendations will be useful if they are applied:

- TAM should be applied with reference to the VARK learning style preference identified in the class. VARK is usually employed as a diagnostic questionnaire to determine to what extent and what percentage of, the students’ preferred style is visual, aural, read/write, or kinaesthetic. This questionnaire can be downloaded from the Internet.

- The intervening variables that influence the attitude, subjective norms or perception of students on preferred usefulness, preferred ease of use of ICT as proposed by TAM should be identified and controlled in order to maximise the potentials of ICT in business education.

- Students perform better when they are given their preferred task to perform. Students should therefore, be given ICT tasks to perform based on their preferred learning style.

- In order to bridge the gap that often result from mismatch, it is necessary to match teaching style with students’ preferred learning style. This can be achieved by using VARK questionnaire at the beginning of each course class in order to identify the prevalent learning style in the class. This information will guide the choice of teaching style that will best suit the class.

**References**


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