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THE EFFECT OF UNDERSTANDING OF INFORMATION AND
COMMUNICATION TECHNOLOGY ON STUDENT'S
ACHIEVEMENT MOTIVATION: LITERATURE
REVIEW AND PROPOSITIONS

SYUHADA BT KHALIDI

GRADUATE BUSINESS SCHOOL
UNIVERSITI KEBANGSAAN MALAYSIA
BANGI
2010

HAK MILIK
PERPUSTAKAAN
IBU PEJABAT MARA

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Control No:	000485
Accession No.:	400495
LC No.:	TS .S982 2010

UNIVERSITI KEBANGSAAN MALAYSIA

2010

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation and gratitude to my supervisor, Dr. Nik Mohd Hazrul B. Nik Hashim for his professional expertise, invaluable guidance, persistent encouragement, patience, enthusiasm and generous contribution of his valuable time and knowledge in supervising this project. Above all, I express sincere gratitude to my friends who faithfully gave me encouraging support throughout the duration of my writing. Finally, I wish to thank my husband, Mohd Rizahuddin b. Misdi and the rest of the family, for their unwavering encouragement, patience, consistent guidance, great assistance and inspiration in the development of my project paper.

Hak Milik MARA

Abstract

This study pertains to the conceptual analysis of the understanding of Information and Communication Technology (ICT) among students and how will it effect their own achievement motivation in terms of self confidence and competitiveness. This study also considers two moderating factors in this relationship namely lecturer's support and college ICT facilities it selves. The study will first identify the need for ICT research that ventures into the student's acceptance in terms of learning in a technological environment. It will highlight the lack of research in terms of ICT towards student's achievement motivation. After generating the need for this conceptual research, this paper has proposed the conceptual model to have the overview of what the issues in question. This will be supported with five propositions that will link the concepts together. Finally, this study will suggest on future research directions in terms of having a more focused approach to the effect of ICT on student's overall self confidence and individual competitiveness in relation to their achievement motivation.

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1.0 INTRODUCTION

Since year 2003, a wide range of Information and Communication Technology (ICT) such as laptop, LCD projectors, trolley with speaker and UBS system, as well as software like power point, flash and interactive courseware have been used to support teaching and learning of subjects throughout schools and colleges in Malaysia. In fact, extra effort has been made to provide additional facilities like computer laboratories, wireless internet connection and local area network to assist lecturers in their teaching and professional tasks. Ideally, lecturers should be very receptive toward the adoption and implementation of ICT in education. Effective use of ICT with multimedia and graphics for example, enriches teaching and enhance interactivity in learning. With a large investment in the ICT infrastructure, and increased emphasis on the use of ICT in teaching, lecturers are expected to be competent and effective in utilizing these tools. In general, lecturers held a reasonably positive attitude towards ICT adoption in colleges, and those who received either prior to and on the job training recorded a higher competency in ICT.

Malaysia, as a fast developing nation, is moving towards realizing her vision to be a progressive and fully developed country by the year 2020. One of the challenges of Vision 2020 is “to establish a scientific and progressive society, a society that is innovative and forward-looking, one that is not only a consumer of technology but also a contributor to the scientific and technological civilization of the future” (Information Department of Malaysia, 1997). The emphasis on science and technology has introduced multimedia as one of the delivery systems in schools. With the advent of the knowledge-economy (k-economy) and globalization, an effective instructional design is pivotal. Kumar and Helgeson (2000) noted that science education reform emphasized the need for integrating computer technology into learning, teaching and assessing.

In view of this, this paper will look at the relationship between understanding of ICT and how it affects student's achievement motivation in terms of increasing their self confidence and individual competitiveness. This relationship will be looked upon two moderating factors from within classroom variables and external classroom variables. The moderating factors are college facilities and lecturer support.

The application of computers is now infiltrating all levels and areas of education worldwide. Computers, as the technology in the multimedia stream, have long been introduced to Malaysian educational institutions but students use these computers as a tool. Many schools and colleges use computers for documentation purposes only but in this age of information technology, the usage of computers as an instructional medium is more imperative due to the huge volume of information that is changing rapidly. Thus, most schools and colleges are equipped with computer laboratories (in terms of college facilities) but they are hardly used as instructional mediums (maybe due to lack of lecturer support). Lecturers and educators should integrate computers as an instructional medium to facilitate the teaching and learning process. Multimedia instruction is possible since many schools are now equipped with computer laboratories. Students are not only encouraged to be computer literate but are also allowed to surf the Internet to gather more information to construct their own knowledge. Lecturers are needed to facilitate students' construction of knowledge in a very exciting, presentable and practical method.

It is hoped that by understanding ICT, with the appropriate ICT facilities in Colleges and continuous support from the lecturers, students' motivation to learn and excel will increase thus eventually will increase their self confidence and individual competitiveness.

2.0 RESEARCH OBJECTIVE

While previous studies have examined various issues related to the integration of ICT in teacher education namely challenges and prospects, access and accessibility, little evidence has been provided in terms of the relationship between exploitation of ICT skills and student's achievement motivation. Table 1 below presents a few examples of the researches done about ICT in the context of education.

Table 1 : Past empirical studies reflecting the use of ICT in the context of education.

NO	AUTHORS	METHODOLOGY	OVERVIEW OF STUDY	MAJOR FINDINGS
1	Richard Andrew, Alison Robinson, Carole Torgesen	A two part systematic review from 2001 to 2003. To determine the impact of ICT on Literacy learning on 5-16 years old.	Focuses on issues about literacy learning in English as government worldwide are investing heavily in computer hardware and software.	The use of computer to students are mostly confined to individual work.
2	CP Lim, CS Chai, Computer and Education	A study done in 2 primary schools in Singapore. Method of analysis include face to face interview, observation of ICT based learning activity and focus group discussion with students	Researches into teaching and learning activities that supported their learner autonomy in ICT based lesson.	identifies and describes five categories of orienting activities: introductory sessions to ICT tools, instructional objectives, worksheets and checklists, dialogues among participants, and post-instructional reflection.
3	Liz Taylor, 2004	Examine 44 students teachers who enrolled for certificate in education at a university in UK from 2000-2001 existing understanding of ICT in education	Examine students teacher's existing understanding of ICT and the way it changes as they learn to teach.	understanding of ICT became more sophisticated over the year in three stages, which involved processes of personalization, growth of pedagogical sensitivity and the development of contingent thinking
4	J. Tondeur, J Van Braak, Martin Valke, 2006	survey was conducted among 570 respondents in a stratified sample of 53 primary schools	To examine whether teachers using ICT in accordance with the competencies propose by the authority.	Results show that teachers mainly focus on the development of technical ICT skills, while the ICT curriculum on the integrated use of ICT within the teaching and learning process.

NO	AUTHORS	METHODOLOGY	OVERVIEW OF STUDY	MAJOR FINDINGS
5	Bee Theng Lan, Chia Hue Sim	Questionnaires were distributed to 250 secondary schools teachers of Mathematics and Science. Items were measured on a five-point, Likert scale, and open-ended questions. Data were analysed using SPSS version 15.	Examine to what extent teachers utilizing ICT in schools and how they perceived their competency.	Elderly teachers were eager to adopt ICT in schools. They were receptive to ICT and reported a high extent of ICT use in teaching and professional job. In general, teachers held a reasonably positive attitude towards ICT adoption in school
6	Pramela Krish, Noraza Ahmad Zabidi, UKM, 2007.	In service teachers from TESL program were interviewed	Look into the changes teacher's experiences in new ICT learning environment and implications to their pedagogy practices.	Identified level of technical support needed and how to address them is crucial. Need infrastructure support and also on-going technical support
7	V Chandra, M Lloyd - British Journal of Educational , 2008	Maps the achievements in Year 10 Science of two cohorts of students over two years where students in the first year studied in a traditional environment while students in the second took part in a blended or e-learning environment.	Methodological research to investigate the use of ICT will increase student's performance	ICT, through an e-learning intervention, did improve student performance in terms of test scores.

From table 1 above, we can see that most ICT centered research done worldwide in this information age. But we can see from previous research, only a handful would link ICT with student's performance. More research was done on how ICT change the teaching style of teachers in stead of student's acceptance and learning style. In view of this gap, this paper would propose to look into the conceptual review of the understanding of ICT, focusing on student's psychological impact in terms of student's achievement motivation. Two moderators will be looked into, namely lecturer's support and college facilities. Student's achievement motivation is represented by their self confidence and individual competitiveness.

Therefore, the purpose of the present study is to develop a conceptual model and present several propositions in view of using ICT in student teachers' everyday learning practice in relation to their achievement motivation. This study also will discuss the future research for this issue.

The objectives of this study are :

- (i) To research the literature review to gain better understanding of the study in question.
- (ii) To generate a theoretical framework of the concept of student's achievement motivation to fill the gap in ICT research.
- (iii) To come up with a conceptual model.
- (iv) To generate several proposition.

3.0 LITERATURE REVIEW

3.1 UNDERSTANDING OF ICT

3.1.1 A focus on new technologies (ICT)

There is a broad optimism that ICT can and does support the kind of learning appropriate to the information age. For example, the ease of the technology frees up time for higher-order learning opportunities (Brown, 1994), it supports meaningful learning (Jonassen, 2000) and student autonomy (McLoughlin, 2000), at risk students are more likely to engage in literacy tasks (O'Rourke, 2001), it promotes active learning (Meredyth, Russell, Blackwood, Thomas, & Wise, 1999) and will enable the user to do new things rather than just old things better (Snyder, 1999). Furthermore, it is argued that computing technologies appropriately coupled with other educational innovations can increase the efficacy, efficiency, and extent of student's self-regulated learning (Winne & Hadwin, 1998: 108).

Internationally, college lecturers are under increasing pressure to respond to patterns of globalization, and changes in local labor markets. This is most apparent in relation to the capacity for information and communication technologies (ICTs) to change the way education is delivered. As educational institutions strive towards greater accessibility and social inclusiveness, enabling practitioners to make informed assessments of appropriate ICT application will be essential in providing meaningful learning environments for students.

The introduction of ICT does not, however, guarantee better learning for *all* students and not all researchers agree that educational technology is a must. Access to computers and the Internet does not mean new learning methods suddenly emerge. As Schacter (1999) points out, "we should not accept the rhetoric that technology makes learning easier and more efficient because ease and efficiency are not prerequisite conditions for deep and meaningful learning" (p 331). If the inclusion of ICT is to be utilized effectively to

engage students, it should be expected to provide a better option to the practices it is to replace. This study also stop short of researching on whether students would feel more motivated to learn if ICT integration into the learning process is used.

The situation in relation to integrating ICTs into teaching and learning is even more important. This study suggests a general need to develop support for lecturing staff developing the use of ICTs in their teaching and learning. (Sue Clegg, John Konrad, Dr Jon E.C. Tan, 2000)

Advocates for the inclusion of ICT in pedagogical practice argue that it has the potential to encourage critical and reflective thinking for individuals to attain personal goals. In a supportive (constructivist) environment, the use of ICT promotes student autonomy whilst also providing opportunities to work collaboratively with others, that is, practices that promote deeper cognitive opportunities and engage the learner in intellectual activities with some control over learning. This includes learning attributes described by Meredyth et al (1999) as “capacities such as self-regulation, self-discipline, collaborative learning and creative thinking” (p 228). Approaches where ICT is used to support learning has been found to benefit the affective learning domains (attributes such as motivation, perseverance, etc.) by improving student engagement to tasks (Jacobsen, 2001), improving motivation and enthusiasm (Mandinach & Cline, 1996), and improving attitudes to learning (Ryser, Beeler, & McKenzie, 1995). While it is difficult to assess the direct impact of the affective domain on student learning outcomes, it is widely recognized as an important correlate of effective learning. Research on the impact of ICT consistently reports that students who have regular access to and use ICT demonstrate considerable improvements in these affective areas (Ainley, Bourke, Chatfield, Hillman, & Watkins, 2000; Calnin, 1998; Cuttance, 2001; Schacter & Fagnano, 1999). Table 2 below is the summarization of the impact of ICT usage in the teaching process to student’s learning attributes.

Table 2: Research on the impact of ICT to students learning attributes.

No	Author	Learning attributes
1	Meredyth et al (1999)	self-regulation, self-discipline, collaborative learning and creative thinking
2	Jacobsen, 2001	motivation, perseverance
3	Mandinach & Cline, 1996	improving motivation and enthusiasm
4	Ryser, Beeler, & McKenzie, 1995	improving attitudes to learning

Along with the gains in the affective domains, research is consistent about improvements in the learning environment. The learning environment is not a factor that can be directly related to achievement gains, but like the affective domain, remains an important correlate in student achievement. When ICT is used in the classroom it creates more opportunities for individualized and differentiated curriculum (Calnin, 1998), there is increased student collaboration (Thompson, 2004), it increases self-management and self-regulation as learners (Cuttance, 2001), and relationships between teachers and students are more interactive and guiding, rather than one of transferring information from teacher to student (Shears, 1995). The critical factor in supporting effective learning with ICT is to focus on the way it is integrated into classrooms.

When using ICT the hope was that it would be a tool capable of changing the characteristics of problems and learning tasks, and hence be a mediator of higher cognitive skills: synthesis and analysis, critical thinking, evaluating, hypothesizing, questioning, observing patterns, making generalizations and problem-solving strategies. Authors such as Cuttance (2001) and Schacter (1999) conclude that ICT will yield positive gains in student achievement, and Scardamalia & Bereiter (1996) report effective ICT use can support depth of understanding and reflection. Large scale British research provides data that shows students in an ICT environment demonstrate domain-specific attainment gains (British Educational Computing and Technology Agency, 2004). Advances in technology will not make current teaching methodologies redundant. Rather,

ICT should be grasped and applied in imaginative and creative ways to enhance cognitive learning for students (Gilliver, Randall, & Pok, 1999). The teacher's awareness of the way an individual student will benefit from different learning experiences contributes to enhancing the learning process. The effects of the teacher and instructional styles constantly impact on students as they consciously and unconsciously gain new skills and knowledge.

A review of 219 studies on the use of technology in education consistently found that students in technology rich environments experienced positive effects on performance in all subject areas (Look, 2005). In particular, Becta (2003) pointed out that ICT provide fast and accurate feedback to students, and speed up computations and graphing, thus freeing students to focus on strategies and interpretation. Further, use of interactive multimedia software, for example, motivates students and leads to improved performance. In fact, studies showed that more students finished high school and many more consider attending college where they routinely learned and studied with technology (Becta, 2003). Barak (2004) pointed further revealed that the use of ICTs in education would promote deep learning, and allows schools to respond better to the varying needs of the students.

Findings from a research by Betty Collis & Marijk van der Wende, 2002 states that dominant theme in the responses from their survey is that ICT use, in terms of e-mail, word processing, PowerPoint, and the Web, has become standard as part of the teaching and learning process. But this has not radically affected the nature of this process; rather, ICT has become part of the blend of on-campus delivery. Overall it seems that higher education institutions do not expect revolutionary change as a result from or related to the use of ICT. In general, there is not really a concern about being forced to change by external forces or developments. Rather, a "business as usual" approach is taken, without anticipating any real dramatic changes in mission, profile or market position. Nevertheless, institutions are gradually "stretching the mould"; they change their procedures and models as a process of change from within. These changes, however, are

gradual and usually slow and may comply with the slight changes in needs and demands as perceived by the institutions.

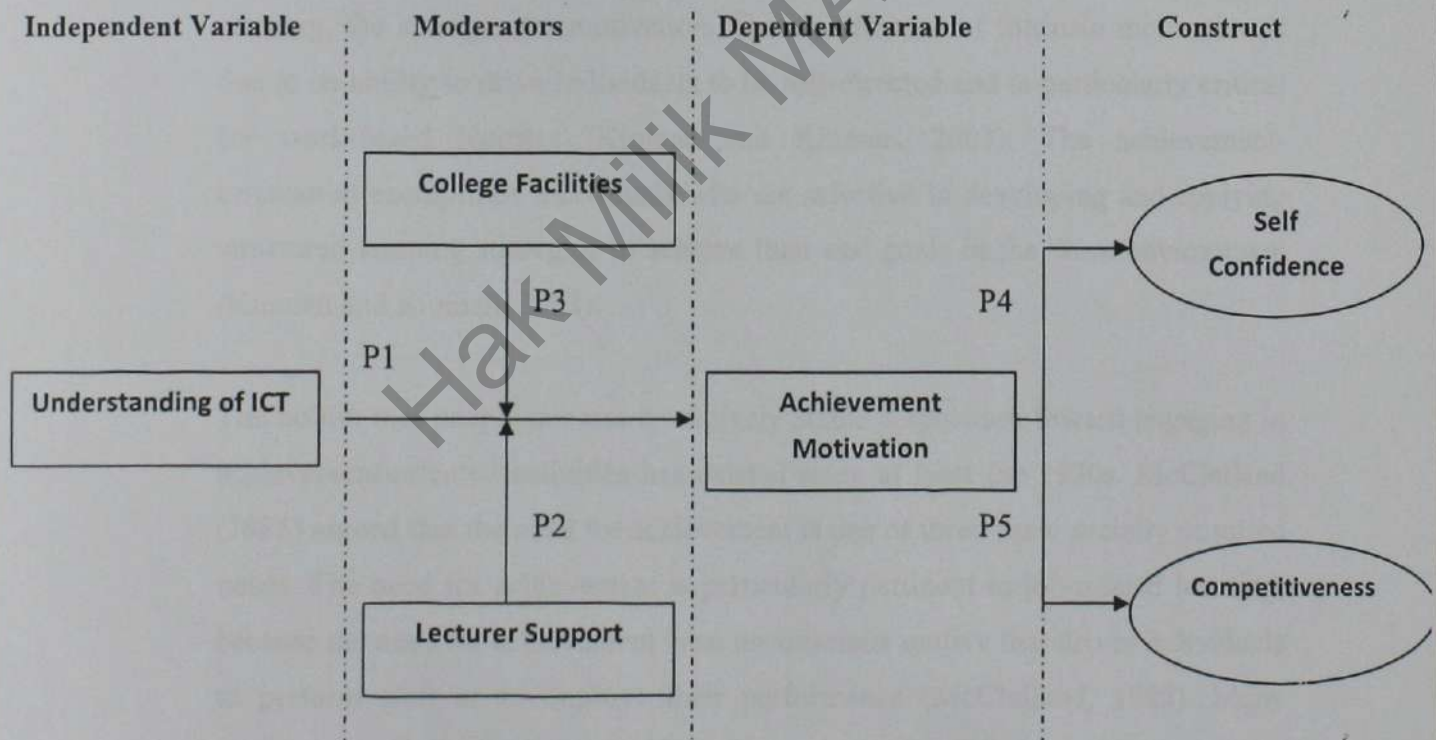
From Lina Macchiusi and Suzanne Trinidad, Curtin University 2001 study indicates that they are an increased adoption of ICT in teaching and learning with academic professionalism. An important outcome of the study shows that the number of respondents using Web based materials in their teaching and learning had dramatically increased. Over the 12 month period the majority of the case study sample indicated that they used electronic communication extensively with their students (communication, email lists, bulletin board, internal email system, acceptance and marking of assignments).

The study also revealed that existing work practices of teaching staff in university were definitely changing to meet the needs of the university. With this changing face of academic life certain professional attributes came to the forefront. One of the attributes emphasis on requiring a variety support needs, from educators and management. All of the case study respondents, regardless of their level of integration acknowledged the importance of ICT support, what differed were the degree of support and the type of support they required to effectively adopt or continue utilizing ICT. In view of this, two moderating factors will be suggested, namely lecturer's support and college ICT facilities.

4.0 THEORETICAL FRAMEWORK

The problem colleges face today and in the future will not just be about creating strategies to encourage the adoption of ICTs in order to achieve 'critical mass,' the challenge will be how to keep up with the demands these changes place on the overall system. Another important issue to address is how will colleges provide the appropriate infrastructure and ICT college facilities as well as support from academic staff to continue effectively integrating ICT in their teaching and learning. We wanted to investigate how these two variables moderate the effect of using ICT to increase student's achievement motivation. Two main construct for achievement motivation is in terms of student's self confidence and competitiveness. The proposed study wanted to know the impact of understanding ICT to their self confidence and will it help in terms of individual competitiveness.

From the discussion above, the conceptual model suggested are as below;



4.1 ACHIEVEMENT MOTIVATION

Defined as the need to perform well or the striving for success, and evidenced by persistence and effort in the face of difficulties, achievement motivation is regarded as a central human motivation. Achievement motivation as defined by McClelland et al (1953) is the positive and negative effects aroused in situations involving competition with certain standards of excellence where performance in such situations can be assessed as success or failure.

4.1.1 The need for achievement

The examination of motivational factors as an antecedent of learning is important as it has been argued that it is stronger than one's cognitive ability to learn (Carbery and Garavan, 2005). The more importance an individual places on learning, the stronger the motivation. The significance of intrinsic motivation is due to its ability to drive individuals to be self-directed and is particularly critical for work-based learners (Kinman and Kinman, 2003). The achievement-orientation exemplifies individuals who are selective in developing and applying structured learning strategies to achieve their end goals in the work environment (Kinman and Kinman, 2003).

The notion that people possess a relatively stable disposition toward engaging in achievement-oriented activities has existed since at least the 1930s. McClelland (1985) argued that the need for achievement is one of three basic socially acquired needs. The need for achievement is particularly pertinent to job-related learning, because the need for achievement is an unconscious motive that drives individuals to perform well or to improve their performance (McClelland, 1985). Many studies (e.g. Hollenbeck *et al.*, 1989, Slocum *et al.*, 2002) have found a strong positive correlation between need for achievement and goal attainment. From

McClelland, 1985 the need for achievement is relatively stable and subsequently is part of an individual's personality .

Numerous factors affect the development of need for achievement:

- birth order of siblings (Lindgren *et al.*, 1976);
- intactness of the home (McClelland, 1961);
- parents' educational level, especially the father's (McClelland, 1985); and
- the early experience of success at tasks (Argyle and Robinson, 1962).

Furthermore, the need for achievement is a function of expectations, which are based on personal standards of excellence. One's performance is compared to one's expectations such that meeting or exceeding these expectations produces positive affect, whereas not meeting these expectations produces negative affect (McClelland, 1985).

Individuals with a high need for achievement have a propensity to demonstrate their ability in overcoming difficult tasks whilst maintaining consistently high standards (McClelland and Watson, 1973; Slocum *et al.*, 2002). Such individuals consistently seek feedback on their performance in order to learn from their mistakes and prefer quantitative feedback (Boyatzis and Kolb, 1995). One reason why individuals with a high need for achievement seek objective feedback is that their motivation is intrinsic more so than extrinsic and therefore they prefer objective appraisal rather than approval or acceptance based on the subjective appraisals of others (Boyatzis and Kolb, 1995).

In the research focused on the development of objective measures of achievement motivation, there is a general consensus that motivation is made up of multiple dimensions, but there is not a general agreement regarding the specific makeup of those dimensions. In general, there is a support for the idea that achievement motivation is the product of interdependent variables such as the locus of control

(Duke & Nowicki, 1974), the need for affiliation, impulsiveness, planfulness (Friis & Knox, 1972), personal achievement, social achievement, academic achievement (Piedmont, 1989), mastery, work orientation, competitiveness and personal unconcern (Helmreich & Spence, 1978). It is assumed that these factors may vary according to individuals' experiences and characteristics (Helmreich & Spence, 1978; Piedmont, 1989; Reid & Boothroyd, 1973). Therefore, it has been recommended that consideration of individual characteristics such as gender and social roles be included when analyzing various dimensions of achievement motivation (Alper, T. G., 1974; Helmreich & Spence, 1978; Piedmont, 1989; Reid & Boothroyd, 1973).

It has been suggested that students' perceptions of the college experience have both negative and positive effects on student attrition and persistence (Hatcher, Kryter, Prus & Fitzgerald, 1992; Klein, 1990; Lamport, 1993). Specifically, it has been theoretically argued that student satisfaction is necessary for continued motivation (Klein, 1990). Furthermore, Bean and Bradley (1986, p. 403) demonstrated that "satisfaction had a greater influence on performance than performance had on satisfaction" indicating that satisfaction with college can be a predictor of academic success. Also, Edwards and Waters (1982) tested freshmen college students and upon a two-year follow-up found that first quarter grade point average and general satisfaction with college combined to predict attrition.

4.1.2 Motivation and Engagement

Motivation is generally seen as the process of reaching the goal and maintains it. Motivation provided an important basic on planning, organizing, making decision, learning and evaluating activities of perceived behavior (Pintrich & Schunk, 1996). Atkinson and Feather (1966) stated achievement motivation is combined two personality : tendency to approach success and tendency to avoid failure.

Research indicates that declining attitudes and motivation toward learning among middle-years students is a serious issue (Anderman & Maehr, 1994; Dweck, 1996; Russell, 2001). Student recollections of their learning experience uncover intrinsic and extrinsic motives that have an impact on their engagement to learning. The focus, however, is on intrinsic motivation as an essential precondition of more effective learning. Intrinsic motivation is based on the "satisfaction derived solely from the qualities of the activity or its consequences" (Carter et al., 1996: 155).

A primary intrinsic motivator is when students are interested (as a characteristic of the person or of the learning environment) as this increases their willingness to learn. Interest increases students' attention to task, and they show greater concentration and enthusiasm (Ainley, 2001). One of the consistent messages from research (Braggett, 1997; Cormack, 1996; Cumming, 1996; Earl, 2000; Hill & Russell, 1999; Lee & Smith, 1993) has been the problems associated with student alienation and disengagement within the middle-years of schooling. Developing classroom strategies which activate the intrinsic motivation of middle-years' students has become an important goal in education. Student-centered classrooms that promote authentic learning tasks, provide active learning opportunities and incorporate ICT are strategies that have been developed. A review of student voices highlights classroom practices that represent some of the attempts to intrinsically motivate and engage them in learning.

The evidence from the students supports activities such as project work, group work, problem-solving, and reflective thought (Ravitz, Becker, & Wong, 2000) that are key parts of student-centered learning. For these students there is genuine interest in learning. Often, middle-years students are encouraged to learn for extrinsic motivational reasons such as exams or tests which provide a powerful incentive to work (Gipps & Stobart, 1993).

From this evidence, the final product continues to be seen by many students as the most important part of the learning process. However, research indicates that the use of ICT can develop new forms of learning and ICT into schools has helped to create environments that are more relevant to our information economy (Department of Education Training and Youth Affairs, 2001): aspects of student-centered learning.

The fact that virtually all students believe computers enable hands-on opportunities because they physically push buttons, control a mouse, move the cursor, use different software applications, explore the Internet by following prompts, and comprehend (or not) what's moving on the screen (as opposed to the still text of a book), can change cognitive skills. The computer gives the students a sense of ownership of the task at hand. For some students, the hands-on experience with a computer is an intrinsic motive that is sufficient to engage them in learning tasks. However, it must be realized that the use of ICT as a preferred learning approach does not suit all learners. In view of this, lecturers must identify the different learning style of the students and adopt the teaching method that would maximize the student's potential in learning.

The use of technology creates a different learning approach, resulting in different attitudes to learning, levels of motivation and engagement, and therefore different attainment levels. Cuttance (2001), Schater (1999), Calnin (1998) and British Educational Computing and Technology Agency (2004) conclude that the use of ICT will result in positive gains in student achievement. However, one of the key difficulties in determining shifts in thinking and problem-solving is that they are difficult to measure.

Motivational variables may play a key role in predicting both kinds of success in college. For example, a large body of literature indicates that self-efficacy is related to academic performance (Bandura, 1986; Schunk, 1981; Zimmerman, 1989). Researchers have also had some success in predicting academic

performance with global, trait measures of achievement motivation (Covington & Omelich, 1979; Dunham, 1973; Raynor, 1970; Spence & Helmreich, 1983). Moreover, there is some evidence that the relationship between achievement motivation and grades may be obtained even with aptitude variables controlled.

More recently, theorists have focused on achievement goals, conceptualized as situationally specific measures of motivational orientation, and argued that they may be stronger predictors of academic success (Pintrich & Schunk, 1996). Achievement goals reflect the purpose of achievement behavior in a particular setting (Dweck & Leggett, 1988; Nicholls, 1984). When pursuing mastery goals in a learning situation, a student's purpose is to develop competence by acquiring new knowledge and skills. When pursuing performance goals, a student's purpose is to demonstrate competence relative to others (thus the individual competitiveness construct). Not all students are positively oriented toward competence, however, and some adopt work avoidance goals that focus on effort minimization (Brophy, 1983; Nicholls, 1989).

It is easy to believe that ICT has a positive influence on learning and many parents and teachers are convinced ICT offers better learning opportunities than 'traditional' approaches. The large financial commitment in schools and homes is evidence of the positive thinking about ICT and its potential to improve student attainment. For many students the novelty of the equipment is a motivational factor in their learning. The attention should, however, be focused on whether the ICT is engaging the student and enhancing the learning by way of support from the lecturers and college management and does ICT give the students the competitive advantage.

Another important component of student motivation concerns their general achievement goals, or their goals for academic learning and in classroom contexts. The general distinction between mastery and performance goals contrasts students who are mastery-oriented and focused on learning and understanding (similar in

some ways to intrinsic motivation) and those students who are performance-oriented and focused on doing better than others in terms of grades or other outcomes that invite interpersonal comparisons (Pintrich, 2000a, b). There is a need to examine the role of these goals with the context of various classroom environments. Many mathematics and science classrooms, especially those at the secondary and post-secondary levels, use competitive grading systems and it may be adaptive in these contexts for students to adopt performance goals. As schools and teachers make changes to improve instruction, these grading systems may change, and the goals may function differently.

4.1.3 Self Confidence

Confidence in one's abilities generally enhances motivation, making it a valuable asset for individuals with imperfect willpower. This demand for self-serving beliefs (which can also arise from hedonic or signaling motives) must be weighed against the risks of overconfidence. (R Bénabou, J Tirole - Quarterly Journal of Economics, 2002)

From the study, it specifies that the first premise of the motivation theory is that people have imperfect knowledge of their own abilities, or more generally of the eventual costs and payoffs of their actions.¹ The second one is that ability and effort interact in determining performance; in most instances they are complements, so that *a higher self-confidence enhances the motivation to act*. As demonstrated by the opening quote from James [1890], this complementarity's has long been familiar in psychology. It is also consistent with the standard observation that morale plays a key role in difficult endeavors; conversely, when people expect to fail, they fail quite effectively, and failure leads to failure more readily for individuals characterized with low self-esteem [Salancik 1977].

The fact that higher self-confidence enhances the individual's motivation gives anyone with a vested interest in his performance an incentive to build up and maintain his self-esteem. First, the manipulator could be another person (parent, teacher, spouse, friend, colleague, manager) who is eager to see him "get his act together," or otherwise apply himself to the task at hand. Such *interpersonal* strategies are studied in Bénabou and Tirole [2001]. Second, for an individual suffering from time inconsistency (e.g., hyperbolic discounting), the current self has a vested interest in the self-confidence of future selves, as it helps counter their natural tendency to quit too easily. It is in this context, which builds on Carrillo and Mariotti [2000], that we shall investigate a variety of *intrapersonal* strategies of self-esteem maintenance. We shall thus see how and when people may choose to remain ignorant about their own abilities, and why they sometimes deliberately impair their own performance or choose overambitious tasks in which they are sure to fail (self-handicapping).

In most societies, self-confidence is widely regarded as a valuable individual asset. Going back at least to William James, an important strand in psychology has advocated "believing in oneself" as a key to personal success. Today, an enormous "selfhelp" industry nourishes, a sizable part of which purports to help people improve their self-esteem, shed "learned helplessness" and reap the benefits of "learned optimism." American schools place such a strong emphasis on building children with self-confidence ("doing a great job!") that they are often criticized for giving it preeminence over the transmission of actual knowledge.

4.1.4 Competitiveness

Some individuals eagerly approach competitive challenges, others strive for noncompetitive personal goals, and others shy away from all types of sport achievement. Investigations of general personality characteristics have been of little value in explaining such individual differences, and even the work on widely researched, theoretically based achievement motivation constructs has yielded

little insight into sport achievement behavior. (Dzewaltowski, D.A. & Deeter, T.E. 1988).

The current findings from this research also confirm the value of a multidimensional measure as the separate dimensions of competitiveness, win, and goal orientation demonstrated differing relationships to general achievement choices.

4.2 MODERATING FACTORS

4.2.1 Lecturer support

The central role of the ICT coordinator in encouraging the classroom use of IT is well documented (Paul, 1994). However, the existence of a specialist ICT coordinator is not of itself a sufficient or necessary condition. The coordinator in this instance succeeded in encouraging dense use of ICT in teaching and learning mainly at a personal cost in terms of the time and energy he or she put into it. Nevertheless, the activities of a supportive management who were evolving strategies to support the lecturers' efforts (such as requiring all departments to integrate ICT into schemes of work at the rate of one course per year), and who were public in their appreciation of the lecturers' work, helped to push forward integration. For example, In an integrative institution, the ICT coordinator was established as the equivalent of a head of department and was given a great deal of freedom to plan ICT activities and plan hardware development and training, which enabled lecturers to support the introduction of ICT in a systematic and realistic fashion. The result was that targeted lecturers were given the time and skills to integrate ICT into their lessons and to plan how they might go in the future, with guaranteed access to connectivity. In another example of support of lecturers, the role of project coordinator was deliberately given to a curriculum

expert rather than the lecturer as IT coordinator, to emphasize the learning rather than the technical dimension.

Where ICT meets their own teaching needs and the learning needs of their students, where there are consistent systems of support and training, where enough time is set aside for lecturers and teachers to begin to integrate ICT into their curriculum activities and where management are publicly committed to the deployment of ICT in an integrated way, the traditional culture of lecturers and teachers can be changed. Where the appropriate systems of support are in place, then ICT can be experienced as a 'transformative technology' both for staff and for students (Comber & Lawson, 1998).

What is crucial is that the delivery of lecturers ICT development courses should be clearly focused and applied. One recurring theme voiced by participants in year 2000 study by Sue Clegg, John Konrad, Dr Jon E.C. Tan, was the need for them to gain the necessary skills that enables them to develop on-line learning and course delivery. While this had been one of the course's aims, its ability to do so was seriously limited by the varied backgrounds and levels of previous ICT experience amongst group members. The rather broad entry criteria for the course may be considered to be a major contributing factor in such limitations.

This study suggests that participants need to have some common baseline of experience that enables them to convey what their specific requirements are before engaging with further development of ICT application. The use of a clearer threshold of previous experience would have established this commonality, and would have greatly enhanced the communication of needs and the levels of peer group networking. Providers of professional development in ICT should therefore

think carefully about course recruitment parameters if they are to provide valued and applicable learning experiences.

4.2.2 College facilities

Having the right infrastructure and technical know how are important factors in training lecturers in ICT era. The use of ICT in the education system requires different levels of technical support. For example, the first line of technical support is based within the college, whereby lecturers are required to have fully supported the idea of using ICT as a means of teaching and learning.. After that, further technical support in terms of facilities of ICT and contracts with local technicians and companies must be considered. For example in some colleges, senior management were planning to extend video conferencing and email facilities and to use them for administrative and recruitment purposes. The most developed integrative institutions had very ambitious plans for ICT and their future. For example, the development of a lifelong learning centre, sponsored by commercial firms, developing a cybercafé for use by parents and others beyond as well as in the school day. Thus, in a climate of innovation in which senior management strongly supported ICT initiatives, there were incentives for staff to become heavily committed to innovative practice using ICT. Waggoner (1994) argued that 'certainly, the investment of time to investigate the potential of technology can be sizeable; if the institutional reward structure is not supportive, it is unlikely that many (staff) will risk such an undertaking' (p. 183).

The research studies focusing on the barriers to use ICT reveal that the insufficiency or lack of ICT facilities appears as significant barriers (Beggs, 2000; Bussey et al., 2000; Lee, 2000; Braak, 2001; Butler & Sellbom, 2002; Mumcu & Usluel, 2004; Usluel & Seferoğlu, 2004).

In year 2000 research by Sue Clegg, John Konrad, Dr Jon E.C. Tan, their respondents encountered problems of technological/ software failure and

unavailability. The majority of these problems were, at this stage, concerned with accessibility rather than specific software use-related difficulties. In their course assessments, these frustrations shows significantly, some using descriptors such as 'poor' and 'average'. In this sense, there was a clear fracture between what was being delivered on a theoretical level, and the need to be able to explore the technology in practical terms. As one client responded when asked about the problems they had encountered:

'Availability of resources. Things we have learnt about are not widely available'

(Respondant 1)

Thus, while the course attempted to provide an overview of the application of ICTs and the ways in which they might be utilized as innovative and accessible teaching methods, participants were faced with the frustrations of not being able to see this in practice. While some of these frustrations were directed at the course itself, others recognized that some of these problems originated from an overall lack of support from the University infrastructure. As participants responded:

'It has been a useful overview but I think the major problem with the use of ICT is the.... Lack of support in the university as a whole'

(Respondant 2)

Referring to this finding which was done in year 2000, there could be a different view on this matter after 10 years. Taking into consideration the technological advancement the world has experience today and the emphasize on ICT on almost every organization, the need to research matters in terms of support facilities has emerged.

5.0 PROPOSITIONS

P1: The understanding of ICT is related positively to student's achievement motivation.

Researching on whether students would feel more motivated to learn if ICT integration into the learning process is used. Motivation to learn is represented by student's achievement motivation. This proposition will help to fill the gap in existing research that lack investigation regarding the effect of understanding and usage of ICT and how it affects students in terms of their achievement motivation. A primary intrinsic motivator is when students are interested (as a characteristic of the person or of the learning environment) as this increases their willingness to learn. Interest increases students' attention to task, and they show greater concentration and enthusiasm (Ainley, 2001). While all the attributes concerning achievement motivation is derived psychologically, the question of whether non intrinsic motivation such as lecturer support will have any effect to student's achievement motivation is also crucial. Thus the second proposition is derived.

P2: The increase in lecturers' support will strengthen the effect between understanding of ICT and student's achievement motivation.

The attitudes of lecturers are central to the success of ICT integration. Where lecturers were given appropriate training and assistance to explore the learning opportunities of the ICT tools rather than just address the technical skills needed, they could quickly be converted to using it. Positive experiences of using ICT will make it important for the lecturer's to apply it in their everyday lesson. Thus provide the students with proper support it needed to understand the subjects. The crucial factor appeared to be ICT facilities provided by the management. For a lecturer to successfully implement ICT pedagogy in classroom, it must be supported by the management in terms of proving adequate ICT facilities in the college. In developing a more meaningful ICT integration programmes to lecturers, management should consider the inclusion of significant technological training components that give hands-on instruction. This will bring us to the next moderating factors, which are college ICT facilities. To enable the lecturer to

successfully implement lecturer support as moderating factor to ICT usage and achievement motivation, we will investigate the effect of college facilities to this relationship.

P3: The increase in college facilities will strengthen the effect between understanding of ICT and student's achievement motivation.

In colleges, the support of management was vital for the long-term future of ICT. Supportive managements had looked ahead to identify what levels of funding would be required for different levels of facilities needed and had actively explored alternative cheaper service providers. Equally important was the encouragement of management to continue to develop ICT facilities and use and to budget for improvements in the hardware and software needed to maximize potential. Although potential user perceptions are defined in various studies as significant variables to explain ICT usage, ICT usage depends first on whether there are enough ICT facilities. Facilities include hardware and software requirement, accessibility to the World Wide Web and most important, to maintain the status of the college as a technology friendly campus to its students. Finally, the desirable outcome from all this moderating factors are hoped to fulfill the student's achievement in terms of their motivation to learn and thus, increase their self confidence and individual competitiveness, which brings us to proposition 4 and 5.

P4: Achievement motivation will increase student's self confidence

P5: Achievement motivation will increase competitiveness.

The need for achievement is correlated positively to *self confidence*, ambition (Soyer *et al.*, 1999), a genuine appetite for success (Schroth and McCormack, 2000), working hard, *competitiveness* (with self and others), and intrinsic motivation to master tasks (Spence and Helmreich, 1983). Although goal orientation, which reflects a focus on personal standards, seems more closely related to general achievement, it was competitiveness that is regarded as a major determining factor for most achievements.

6.0 ISSUES FOR FUTURE RESEARCH

6.1 Difficulties in the assessment of achievement motivation

Clear behaviour-oriented assessment criteria such as oral communication, dealing with conflicts or influencing behavior can normally be handled well by the researchers. Uncertainties in relation to adequate perception and evaluation are recurrently seen in the case of the requirement of achievement motivation. Many researchers admit to having difficulty in evaluating general achievement motivation on the basis of simple survey or interview sessions. In addition to this, that fact that behavior is always a result of ability and motivation therefore makes it difficult to assess motivation as an isolated criterion.

Nevertheless the assessment of achievement motivation cannot be disregarded. Its general relevance becomes clear, for example, if one follows scientists such as Eckardt & Schuler (1992) who regard achievement motivation – next to cognitive skills – as the second, probably general, professionally relevant factor.

Achievement motivation measurement gives rise to various uncertainties, thus, using a multimethod diagnostics might be useful in order to obtain a more comprehensive and more adequate picture. (Annen & Gutknecht, 2002).

Based on these considerations, achievement motivation has since 2003 been tested in a questionnaire instrument - the achievement motivation inventory (LMI) from Schuler & Prochaska (2001). In addition, each candidate carries out a self-assessment of his achievement motivation at the end of the assessment. This self-assessment is based on the same definition specification as is found in the observation sheets. This is in keeping with the requirement of Höft & Bolz (2004) that self-assessment and other rating should be carried out by an identical procedure.

It is crucial to develop more measures for construct using exploratory analysis as a tool for validity and reliability test.

6.2 Considering more moderators

To have a better understanding and more complete and clearer picture of the relationship between ICT and achievement motivation, it is fair to include more moderators and mediator for future research. For example, whether ICT seminars would help in increasing student's achievement motivation or whether industrial training in ICT organization would give a positive effect on achievement motivation. Student's EQ are also very important in influencing the research findings.

7.0 CONCLUSION

The aim of this study is to come up with a conceptual analysis of the understanding of ICT among students and how will it affect their own achievement motivation in terms of self confidence and competitiveness. After researching literature review on ICT related study, it has come across a void in research pertaining to how ICT affect student's motivation. It also considers two moderating factors in this relationship namely lecturer's support and college ICT facilities. The study will first identify the need for ICT research that ventures into the student's acceptance in terms of learning in a technological environment. After highlighting the lack of research in terms of ICT towards student's achievement motivation, two important construct are also deemed very important to be included as constructs of the achievement motivation . Lecturer support and college facilities are two important construct that are designed in the conceptual model. This will be supported with five propositions that will link the concepts together. Through this research, it is inevitable that an empirical research will follow suit to test the theory that has been put through in this paper.

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