

Effective Management and Application of ICT towards the Accessibility to Learning for Development in Distance, Collaborative and E-learning Among Working Adult Learners in Tertiary Education in the Malaysian Public Universities

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Abstract

Purpose – This research is attempts to examine the effectiveness of the management and application of ICT facilities for working adult learners accessing the distance and collaborative teaching and learning opportunities for development by attending the off-campus diploma and degree programs offered in the Malaysian public universities. Effective management of the state of the art ICT and e-learning platform plays an important part in the successful implementation of distance, collaborative and e learning for the working adult learners. Andragogical approaches in the teaching and learning process with the application of ICT culture would create intelligence, academic excellence and quality work life of working adult learners. The working adult learners' demographic factors, such as age, gender, academic, professional achievement and working experiences are also taken into consideration.

Design/ methodology/ approach – Six dimensions of distance, collaborative and e learning andragogical approaches in the teaching and learning (ICT accessibility and e-learning management domain, demographic domain, adult learners' learning culture, environment, external domain and learners' efficacy) were examined to determine the effective management and application of ICT towards the accessibility to learning for development in distance, collaborative and e-learning for working adult learners.

Finding - In general, there is a significant difference among factors stated above with effective management and application of ICT in distance, collaborative and e learning among the working adult learners. The andragogical approaches in teaching and learning are also closely related to the managerial skills in distance, collaborative and e learning of working adult learners. In addition, the course tutors and instructions are another two essential factors found to be the strong fundamentals of successful implementation of distance, collaborative and e learning for the working adult learners in Malaysia.

Research limitations/ implications – This study represents an addition to the extant literature on management and application of ICT platform in distance, collaborative and e-learning for working adult learners in Malaysian tertiary education and working adult learners' efficacy in the usage of ICT in creating intelligence and academic excellence.

Practical implications – The tutors' effective management in the application of ICT and e-learning platform is important to inculcate the working adult learners' teaching and learning environment for academic excellence and achievement couple with the accessibility to learning will spur further the successful implementation of total e learning perspective.

Originality/ value – This study provides further groundwork to assist existing and would-be tutors, academia and education managers to improve ICT and e learning platform and accessibility for learning, their work quality and quality of life among the teaching staffs and

working adult learners to achieve high standard of civil obligations by maximizing intelligence and academic excellence among working adult learners.

Keywords: management, distance, collaborative and e-learning, efficacy, adult learners, tertiary education, accessibility.

Paper type: Research paper (Distance Education Management)

Introduction

The inception and accessibility to learning in distance, collaborative and e-learning among working adult learners in Malaysia has contributed to the development of human capital for the country's advancement and development. Qualified adult working individuals registered for the programs and attended weekend classes and workshops in various territorial learning centers established in the strategic vicinity of each state in Malaysia.

The introduction of tele-conferencing in 1980's as a new innovational tool that benefited many during that period. However the education setting now is totally different as the Internet and the www has most of the infrastructure and computer is becoming the universal technology combining text, sound and image.

It evolved from off-campus studies organized by Universiti Sains Malaysia, followed by SPACE of Universiti Teknologi Malaysia, e-PJJ and i-Learn of Universiti Teknologi MARA, and off-campus part-time weekend classes of Universiti Malaya, Universiti Putra Malaysia and Universiti Kebangsaan Malaysia.

As A.Gunasekaran, Ronald D.Mcneil and Dennis Shaul (2002) suggested that the emergence of digital technologies has increased the interest in the computerized delivery of higher education, which led to e learning through electronic mail, internet, World Wide Web and multimedia.

1990s saw the most advanced technology innovation in the Malaysian educational system namely the uses of Internet; these tools enabled the successful implementation and accessibility of distance, collaborative and e learning throughout the country. Today's education scenario in Malaysia is totally different. The usage of computer with LAN and WAN and techno-enabled facilities, government and private vendors sponsoring e-learning portal and platforms enable working adult learners to access and acquire knowledge and this formed the foundation of life-long learning in Malaysia. The late 1990s saw the advancement of information technology such as virtual reality and multimedia, according to Tiffin and Rajasingham (1995), it would allow fully immersed, interactive real-time communication through audio, textual video and even touch and smell. This development would create a communication environment where all functions of a conventional classroom can take place.

Related Literature

Researchers have been done on distance, collaborative and e learning but rarely any researches done on the management and application of ICT perspective which enable accessibility to distance education for development. This is the utmost important aspect in the process of accessing to knowledge and education because e learning environment can be used widely either for educational or training purposes (Shirley, 2001, Alstete, 2001) but the problem which still exists is the effective management and application of the contents and its effectiveness in accessibility by the users.

Other questions that may seem difficult to answer are working adult learners learning process with weekend face-to-face instructions in the campus or learning centers with the aid of internet at home through the e-learning platform provider. Therefore as Koatas M., Psarras, J. and Stefanos P.(2002) stated, academic community is addressing more and more on the rise of on-line community that will be instrumental in the realization of advanced learning society.

Even to some extent, certain quarters would prefer to combine both the electronic-enabled learning system and traditional one. Young (2001) suggested that e- learning works best within a blended training solution which incorporates traditional methods and technology-led learning. One method is to utilize it as a method of providing a consistent level of skills within a team of delegates prior to them participating in an instructor-led session so they can get the most out of the training and the instructors' time and knowledge. Eisinger (2000) also mentioned that by combining traditional learning characteristics with the unique environment available on-line, elements that emerge would differentiate excellent e learning, namely the sharing of knowledge.

The suitability of courses offered will have some impact towards the students' learning process, as Young (2001) suggested that within the web-enabled environment, learners can access courses, individual topics and performance support resources any time, from the office, at home or while traveling. Standard web browsers offer a consistent and seamless user interface across a wide variety of workstation platforms and networks. One might also ask for the fulfillment and requirements of the curriculum as well as the content relevancy because most of the courses followed, as Morris (1996) quoted, distance and collaborative interactive project. The production of teaching materials could be enjoyed nationwide by academic staff participation, irrespective of their location. New ideas and materials would become immediately available for discussions and trials after dispatch by e-mail to a central server.

Fry (2001) noted a series of benchmarks for ensuring distance, collaborative and e-learning quality. Evaluating program effectiveness includes a documented technology plan, with password protection, encryptions, back-up system and reliable delivery, established standards for course development, design and delivery, good facilitation of interactive and feed back and the application of specific standard for evaluation.

On the other hand, Lalita Rajasingham (1996) also noted that effective, cost-efficient instruction that can match the needs for skills related to technological change, delivered

interactively, at the convenience of the learners. Koubek, and Jandl, (2000) listed out 4 choices of media for the specific support depends on the needs of the individual learners. The evaluation is based on the fact that there is no best medium for a specific area or learning institution.

Effectiveness in the management of distance, collaborative and e-learning platform needs to have certain quality. As Ian Roffe (2002) proposed, elements of quality control and assurance system in distance learning should produce learning materials and monitoring correspondence learning activities. However, Lewis (1989) suggested that e-learning is still too new for most learners to identify on-line learning as a preference. Thus the sheer newness of e-learning for many individuals and groups brings pressure on evaluation to yield information about its effectiveness and efficiency as a learning solution.

Research Objective

The objective of this study is to determine ways to achieve an effective managerial and application of ICT perspective and the accessibility to learning for development through distance, collaborative and e-learning for working adult learners in the Malaysian tertiary education.

With the findings, it is hoped that the Malaysian public universities could gain insights into how to achieve excellence in the management of ICT and e-learning platform in delivering quality life-long education to everyone on the street. Further more techno-education is revolutionizing. This is due to the fact that education is for all, the purpose of achieving quality of life for every Malaysian and the realization of Malaysia as a developed country by the year 2020. There are other factors that determine the managerial effectiveness such as the process of technology enhancement and edu-platform accessibility, as well as andragogical approaches in teaching and learning

Research Framework

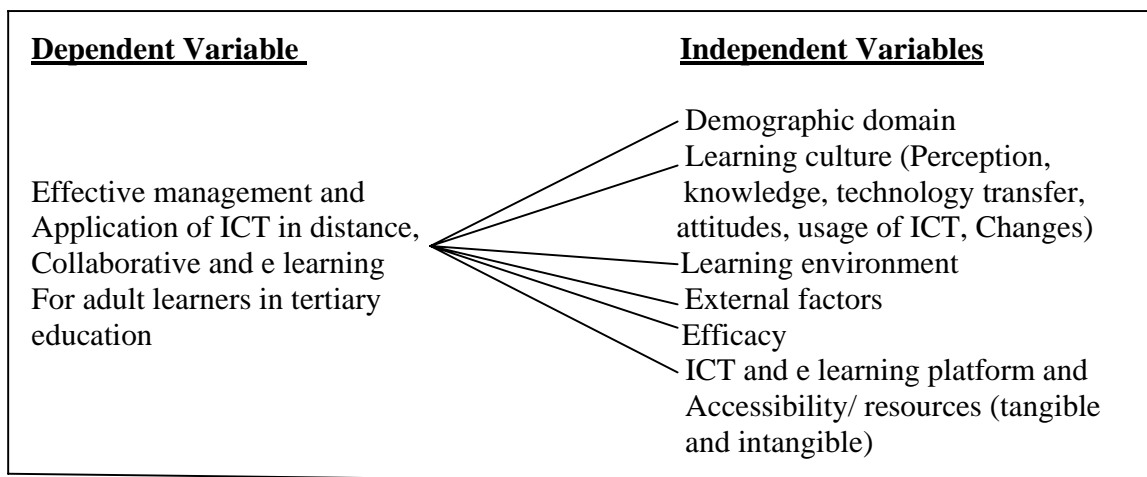


Figure 1: Theoretical Framework

Research Methodology

A set of questionnaire was given to a total of 100 respondents from four randomly selected public universities in Malaysia. (25 adult learners from each selected public university) The questionnaire consists of Part 1 that includes questions on the respondents' demographical data and Part 2 that includes the dependent and independent variables. Non-parametric and parametric statistical tests were used to analyze the data.

The information on the four public universities was obtained from secondary data. This was to determine the existing universities' distance, collaborative and e-learning management practices.

Results

Reliability of instruments:

Cronbach Alpha statistic is found to be **0.936**. Therefore the reliability of the questionnaire is acceptable.

Descriptive Statistics

Table 1: Summary of Respondents' Characteristics

SUBJECT	FREQUENCY	PERCENTAGE (%)
1. GENDER		
Male	25	25
Female	75	75
2. RACE		
Malay	60	60
Chinese	25	25
Indian	15	15
3. Academic Achievement		
First degree	27	27
SPM/STPM	73	73
4. Professional Qualification		
Diploma in Education.	36	36
Engineering	27	27
Others	37	37
5. Working Experience		
0-5 years	30	30
6-15 years	35	35
>16 years	35	35
6. Experience in using ICT and		

Internet			
1-3 years	5	5	
4-6 years	77	77	
>7 years	18	18	

Table 1.1 and 1.2 summarize the respondents' characteristics. There are 25 male (25%) and 75 female (75%) adult learners from the four public universities attending distance-learning classes. Table 1.3 shows that 27% of the adult learners only possess basic diploma in education and 73% only possess basic secondary school certificate. Among them are 60 Malays (60%), 25 Chinese (25%) and 15 Indians (15%). Table 1.4 shows that only 27% of the adult learners possess high professional qualification. Table 1.5 shows that all respondents have at least 5 years working experience. Table 1.6 shows the percentage of adult learners who have experience using ICT and Internet in their learning process.

Inferential Statistics and Discussion

Table 2: The results of Pearson Correlation tests

Correlation test between	r	p value	N
1. Working adult learners' academic level & ICT and e-learning facility provided	0.646	< 0.001	100
2. Lecturers' commitment and the learning course content provided	0.795	<0.001	100
3. Learning institutions and providers' effectiveness of the distance, collaborative and e-learning programs	0.639	<0.001	100

Note: $\alpha = 0.01$; r = correlation coefficient; N= Total respondents

Table 2.1 shows that there is strong positive relationship between adult learners' academic level and the ICT and e-learning facility provided by the universities. Each university is proving some form of e-learning facility to their adult learners. Adult learners are encouraged to use the facility like networking with their respective lecturers or via learning portal provided by the university, example i-Learn portal from UiTM.

Table 2.2 shows that there is strong relationship between lecturers' commitment and the learning course content provided. Lecturers are committed in proving and maintaining the learning contents in the portal and it is always ready for the learners to access from time to time and maintain their portal. They must follow the guidelines formulated by the portal provider, for example i-Learn Portal of UiTM.

Table 2.3 shows that there is strong relationship between the learning institution and providers' effectiveness. The e- learning portal providers' commitment must be cost effective and fully utilized not only by the lecturers and students but also the whole staff in the institution in order to function well as a learning organization. The effectiveness of e-learning programs depends on the level of priority given to the program. If the ICT and e- learning portal facility is insufficient to cater for the needs of the users, responsible administrators must make an effort to raise funds to fulfill the needs.

Discussion

The six factors that contribute to effective management and application of ICT in collaborative and e-learning are demographic, culture, environment, external factors, learners' technological efficacy, ICT and e-learning platforms. Each one of them is equally important. Futrell and Geisert (1984) stated that administrators are entrusted with duties and responsibilities. Administrators not only manage the organization as a whole but also other unit in that organization.

Therefore, the university administrators' challenges are to choose the best management model to manage the ICT and e-learning application for the incorporation in the teaching and learning process, not only for the in-campus full-time students but more for the adult learners as means to acquire life-long learning. So, administrators could choose the departmental approach as 'Top-Down' organization method is based upon the grouping of various activities because an organization is a large machine that develops laws and principles which govern the machine's activities (Terry Lucey, 1995).

Table 3: Summary of one-way ANOVA : Significant difference between distance, collaborative and e-learning administrators and the effectiveness in the management and application of ICT in the Malaysian public universities

E-Learning Administrator	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.951	1	.951	18.447	.000
Within Groups	1.444	28	.052		
Total	2.396	29			

Note: Value of F Prob. = .000 which is smaller than α level of 0.05

Table 3 above shows that there is a significant difference between e-learning administrators from the surveyed universities It may due to the unavailability of general guidelines provided by the universities in managing the appropriate procedures to be practiced. So, the effectiveness in the management and application of ICT depends much on the administrator's experience and management knowledge.

A committed administrator will yield the success of the implementation of ICT and e-learning application for the adult learners or otherwise. Successful implementation need to be compelling to the audience it targets by offering the learner a resource that seems to be appealing, valuable and productive to their goals and aspirations (Henri, 2001).

Leaders will help everybody in the organization, including gaining more insightful views of current reality and this is in-line with a popular emerging view of leaders as coaches, guides or facilitators. (Terry Lucey, 1995).

Table 4: Summary of one-way ANOVA : Significant difference between the tangible resources in ICT and e-learning platform and the effectiveness in the management and application of ICT in collaborative and e-learning for adult learners

Resources (Tangible)	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.235	1	2.235	10.538	.003
Within Groups	5.938	28	.212		
Total	8.173	29			

Note: value of F Prob. = .003, which is smaller than α level of 0.05

Table 4 above shows that there is a significant difference between the tangible resources such as e-learning platforms and the infrastructures, accessibility, its networking facilities and all the software for classes and administrators' effective management of ICT.

The significant difference between the tangible resources of ICT in the universities surveyed may be due to the administrators' managerial effort towards the increase of the ICT infrastructure. The administrators' duty is to oversee adequate ICT infrastructure and its effective utilization. So the significant difference may be accounted for the administrator's lack of effort to equip the universities with extra ICT infrastructures from any proposed initiatives and other means. Universiti Teknologi MARA has set a good initiative by being equipped with the latest e-learning platform called i-Learn Portal to facilitate its student population of above 200,000 by the year 2010 in preparing the country with the needed future human capital.

Table 5: Summary of one-way ANOVA : Significant difference between intangible ICT resources and the effectiveness in the management and application of ICT in the public universities

Resources (Intangible)	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.211	4	.303	9.194	.000
Within Groups	.824	25	.033		
Total	2.035	29			

Note: Value of F Prob. = .000, which is smaller than α level of 0.05

Table 5 above shows that there is a significant difference between intangible ICT resources such as the ICT application and the e-learning training, ICT literacy, maintenance courses and basic programming for the lecturers from the surveyed higher learning institutions. If human factors are involved in designating the intangible ICT resources in those institutions unless proven otherwise, it will show the significant difference among the administrators in managing the ICT infrastructure.

The cost, sources, time frame, infrastructures, management process, curriculum and andragogical approaches are of significant contributing factors for the management and implementation of ICT and e-learning application in the distance, collaborative and e-learning environments. Individual university itself plays a pivotal role in terms of cost and sources, infrastructure and curriculum. The supply and commission of the basic ICT infrastructures and e-learning platforms, some total enrolment of students amounting to thousands, are currently enjoying the facilities. Therefore, the tangible and intangible resources are utmost important to the administrators' effort in the effective management and application of ICT in distance, collaborative and e-learning. One has to be competence in managing the whole process and it has been postulated that competency in delivering effective instruction is a function of teaching staff's knowledge and skills (Sahari Nordin, 2000).

Learning portal administrators and lecturers who have to carry out the implementation stages in the distance, collaborative and e-learning system must fully utilize the technology offering innovative programs (A Gunasekaran; Ronald McNeil and Dennis Shaul, 2002). The support of the education process are all in the way with key elements of provision of learning materials, providing facilities for practical work or simulations, enabling questions and discussions, assessments and provision of student support services (Alexander and McKenzie, 1998).

Table 7: Summary of one-way ANOVA : Significant difference between school culture and effective management of ICT in schools

Learning culture	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.484	1	.484	7.091	.013
Within Groups	1.912	28	.068		
Total	2.396	29			

Note: Value of F Prob. = .013, which is smaller than α level of 0.05

Table 7 above shows that there is a significant difference between the learning culture of using ICT in the learning and teaching process. The difference may be due to the users' background, attitude and prior knowledge of ICT application.

ICT is the core of education for future citizen and the kinds of changes designed in each organization, how the changes modified the organizational culture and the changes that happened in the way lecturers actually used ICT and e-learning in their teaching and learning process (Azinian, H 2001). To rid off the existing conventional teaching and learning culture, lecturers are the agent for change. The conceptual framework for staff development calls for an integrated approach to the problems that is the various forms for training and continuing support are combined with activities aimed at influencing the system in which the teaching staff work on daily. (Nikolave. I, 2001).

Teaching staff must use the advancement of the ICT and e-learning facilities to up-grade themselves in the teaching and learning process. This can be done by life-long learning concepts and practices. It is important because a total of 97% of college students today use Internet for research and 70% of them use the Internet daily (Hamm, 2000). It will bring cultural change to the higher learning institutions.

Changes of learning culture are inevitable. One has to ask the willingness of the organizations to invest in a paradigm shift from knowledge hoarding to knowledge sharing. Organizations that succeed in the knowledge management are likely to view knowledge as an asset and to develop organizational norms and values to support the creation and sharing of knowledge (Devenport et.al, 1998).

Conclusion and Recommendations

The Malaysian adult learners' distance, collaborative and e-learning program is still a model of integrated and guided approach whereby face-to-face lectures and tutorials, chalk and talk in the conventional classroom continue to exist alongside the integration with modern techno-learning platforms. The formulation of the e-learning application curriculum and andragogies will stay for many years to come. Gradually, by inculcating the new techno -education culture, we are able to realize the country's vision.

There are other academic burdens which have to be reduced and dealt with or it will affect the portal administrators' effective management of LMS. The implementation of e-learning application needs to be scrutinized. Special task force or a supervisory panel at ministerial level must be set up to supervise the implementation stages.

Therefore, the setting up of independent distance, collaborative and e-learning center in each public university governed directly by the university with full-time staff and incorporated as an independent faculty with standardize LMS in the accessing and dissemination of knowledge under the patronage of the Ministry of Higher Learning. govern, synchronize and connected to enable a more efficient and cost effective learning system to transform the country's population into learned human capital.

The success also requires a team of skillful, dynamic, experienced, confident and committed e- learning portal administrators and course managers. All in all, the effective management and application of ICT in distance, collaborative and e-learning in the eastern region should follow a constructed model based on religious perspective.

In gearing up for the wholesome human capital for the country, every quarter must sacrifice for the good course. For this matter, the public and private sector employees have to contribute by giving allowances in terms of time off for their staff to concentrate in their learning process as adult learners.. The adult learners are not only assets to the department but also to the nation.

The government must play its part by installing and commissioning the broadband facility and extending the bandwidths throughout the country. Constant supply of

electricity throughout the country is a must to ensure the success of the project. Malaysia has been very successful in this perspective because both the telecommunication and energy divisions are under the charge of one ministry.

The proposition of a Malaysian comprehensive distance, collaborative and e-learning model must be carried out with immediate effect. The main concerns in this model are that the e-learning portals administrators and course managers have to equip themselves not only with the knowledge in writing learning contents but also management science with religious touch, which is vital. However its success depends much on the managerial skills towards the guided distance, collaborative and e-learning should be referred to.

In conclusion, the utmost important element in the success of management and application of ICT in distance, collaborative and e learning in the Malaysian tertiary education in the preparation of high quality human capital and the realization of the country's vision to be a develop country by year 2020 is the accessibility to learning for development of lifelong learning for every individual Malaysian.

Limitation of Study

The sample size for the survey is small. However, it will be increased in the future study.

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