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ScienceDirect

Procedia - Social and Behavioral Sciences 155 (2014) 539 – 546

Procedia Social and Behavioral Sciences

The International Conference on Communication and Media 2014 (i-COME'14), 18-20 October 2014, Langkawi, MALAYSIA

Communicating Effectively the Lifelong Blue Print and Its Demands to Improve Open Distance Learning (ODL) Ergonomics

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Abstract

This paper is intended to improve Open Distance Learning (ODL) ergonomics to minimize attrition rate in Malaysia lifelong learning initiatives. The issue confronting learning ergonomics which design characteristics in the learning process and the environment is its influence and impact on learning performance adaptability. Profiling the learners can improve ergonomics in ODL. Communicating such initiatives effectively offers possible improvements in course design, facilitation of meaningful learning experiences, student comfort and productivity; the accumulation of these attributes could reduce learning frustrations in the process of acquiring new knowledge.

Peer-review under responsibility of School of Multimedia Technology & Communication, Universiti Utara Malaysia.

Keywords: Learning support; institutional ergonomics; physical ergonomics; mindset ergonomics; open distance learning.

1. Introduction

Literature seems to suggest that although we have greatly improved and championed the establishment of ODL as an enabler to education, to democratise education for all citizens making primary, secondary, tertiary and continuous learning more accessible and flexible today compared to 30 years ago. We have not done enough to support students' learning in ODL (Dzakiria, 2006; Mannan, 2007; Serwatka, 2005; Sweet, 1986). Perhaps, it is timely to consider the human factors, conditions and all the processes affecting open distance learners (students) in order to

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Peer-review under responsibility of School of Multimedia Technology & Communication, Universiti Utara Malaysia.
doi:10.1016/j.sbspro.2014.10.336

improve the ergonomics for a better and more effective ODL experience. With ergonomics, human interactions will be improved and overall system performance of delivery systems in ODL will be optimised and efficient as well as effective.

Despite extensive improvements and developments in Open and Distance Learning (ODL), student dropout or attrition rates in ODL around the world continue to be very high reported to be in the range of 30% - 45%. Various reasons and factors have been associated with the attrition rate in ODL but the strongest ones are linked to the learner demography (i.e., age factors; digital divide, etc.) which may very likely attribute to the statistics (Harold & Russum, 2000; Dzakiria, 2006; Hara & Kling, 2001; Hughes, 2004; Kember, 1989; Mannan, 2007; Wickersham & Dooley, 2001). Human factors, synonymous to ergonomic principles and techniques deployed, have achieved proven success in improved performance, productivity, competitiveness and learning in many public and private sector organisations (Dzakiria, 2004; Dzakiria et.al. 2006; Smith, 2007; Haslam, 2002; Korkmaz & Sommerich, 2009). Unfortunately, the ongoing and alarming dropout rates in ODL seem to suggest that the benefits accruing from the application of human factors/ergonomic science vis-a-vis the performance of students in ODL have yet to be established. The relevance of human factors or ergonomic principles and approaches to evaluating and upgrading ODL students' learning performance has received little attention (Berliner and Biddle, 1995; Dzakiria et.al, 2006; Wilson and Daviss, 1995) and has not sufficiently addressed the attrition rate phenomenon in ODL.A possible reason for such situation has been put forth by Smith and Smith (1966, p. 1). They suggested that "factors of human design long have been ignored in experimental psychology. It has been believed that learning could be studied as a general process". This should be interpreted as different from other tangible physical ergonomics like the chair that we sit on to work, the keyboard that we type on or the designs of car seats, etc., all which require continuous ergonomics improvements to promote human performance.

Although a large body of evidence regarding context specificity in performance and learning can be cited to contradict a generalised learning theory (Smith, 1994; Smith et.al, 1994), it is likely that the latter viewpoint still plays an influential role in educational policy development and decision making. The authors feel the former perspective is irrelevant. The failure to support students and satisfy their needs in learning may increase the number of non-completion rates and a push factor to the respective institution.

Innate learning attributes contribute to educational human performance. However, some research on ergonomics also suggest that design factors have an equally important contribution to learning performance. Improvement in learning requires improvement in teaching and learning deliverables. The integration of nine events of instruction (Gagne, 1967, Gagne et al, 2005& Smith and Ragan, 2006) in ODL delivery system can further enhance the satisfaction of learners in acquiring knowledge as well as diploma, degree or higher level of degree. The integration of the events of instruction can help increase the interactions between instructors and students (learners). The design of ICT-related projects to increase ODL completion success depends very much on how human interactions can provide learning guidance to students as ODL learners as cognitive ergonomics also play an important role in ODL (IEA, 2000). This is vital element to consider as distance learning is becoming one of the fastest growing educational modalities since the era of computers or technology in the beginning of 1990s. Through effective ergonomics, ODL would certainly prepare learners to be digitally literate in the ICT-rich environment with lots of satisfaction and success in their career-building efforts based on ODL environments.

2. Defining learning ergonomics

Enhancing learning (human) ergonomics for a given group of students, classes or particular institutions may significantly improve the students' learning performance and educational experience. Improving certain or specific design factors as ergonomic interventions could benefit education and ODL experiences. Therefore, learning ergonomics is concerned with how and why the design characteristics of educational processes and systems influence the performance of students. Besides physical ergonomics, cognitive ergonomics through the integration of 9 events of instruction into the ODL system of deliverable may be useful in enhance the retention and transfer of learning in ODL classrooms. The new and advance development of technology (delivering the online nuggets of knowledge) should further enhance the delivery system of ODL. The use of traditional learning and modern learning (technology-based) could certainly improve the performance of ODL learners through systematic design of instruction (Dick and Carey, 1996) and appropriate consideration of learning ergonomics.

The scope of learning ergonomics in open distance education encompasses all modes (modalities) and levels of performance-design-interaction that may occur in a particular educational environment and system of a respective ODL institution. The "design" of the learning process refers to the physical design of instructional materials, environments and technologies (e.g., ICT, classroom implements and equipment, textbooks, audiovisual materials and systems, work stations, computer hardware and software, school classrooms and buildings), to institutional designs of different skills, tasks, classes of knowledge and curricula targeted for learning, to the social and interpersonal design of the interactions of participants in the system with one another (e.g., student-tutor-staff-management relationships) and to the design, management and administration of jobs, supervisory relationships, organisations, policies and programmes of educational systems, as well as to the designs of communities in which the learning occurs.

From the perspective of performance-design-interactions, learning ergonomics has scientific origins which suggest that much of the variability in cognitive performance is attributable neither to innate ability nor to learning ability, but to specific design features (physical ergonomics) of the learning environment. These may include the various logistical supports that may be provided to serve the learners based on their demography and profiles. Seemingly, an adult learner who has left school for many years and is not familiar with technology will need some training on the use of technology to learn and library skills coaching would become essential. Besides physical ergonomics, cognitive ergonomics that considers memory and acquisition of knowledge in ODL should not be ignored or set aside.

3. Communicating ergonomics for open distance learning (ODL) effectively

Ergonomics in ODL is about searching for the "best fit" of the learning conditions that promote and facilitate effective learning. These may include the fit between learners, the things they do, the learning materials they use, the ODL environments that are attached, the institutional policies that govern their enrolment and learning activities, the various support systems and so forth. Logically, if a good fit is achieved, the stress and pressure felt by the learners can be significantly reduced. When learning conditions are more conducive and more inviting to learning, the learners can learn more effectively and improve their performance greatly. However, a "best fit" in ODL does not mean a single ergonomic solution that is best for all ODL students, environments and institutions. It would be close to impossible to design this, given the broad and wide scope of ODL students' demography worldwide as iterated earlier on in this article. Learners come into classrooms with a variety of learning styles that make it difficult for ODL providers and lecturers to cater for all students equally but with ergonomics, all students can be guided through systematic implementation of instruction with or without technology as long as the benefits such as convenience, efficiency, flexibility, cost-effectiveness and instructional effectiveness and support knowledge management are incorporated in ODL (Gagne et al, 2005). With ergonomics, ODL experience can be customised and individualised and student-centred (Golas, 2000). However, ODL ergonomics is also not just a physical fit, but one that includes other factors like the learners' educational background, working experiences, educational exposures, psychological state, personalities, personal interests, strengths and weaknesses, etc., which help to build the "mindset" and expectations for the learners working towards their completion of the programmes enrolled.

The authors believe that to improve students' performance and provide a worthy educational experience in ODL, one must develop better learning ergonomics, physical and cognitive ergonomics are to be considered in providing better services to these learners. This is done by profiling the students' lives which if done properly, provides meaningful and rich information of respective students, groups and cohorts. Such endeavour seemingly would provide an opportunity to continuously improve ODL experiences among learners and minimize the attrition rates among them. It involves theoretical principles, data and methods to optimise learner well-being and overall learning performance. As such, understanding the need to create better learning ergonomics in ODL is crucial and surpasses the importance of other components and processes. Tutors, curriculum designers, administrators, educational technologists and all relevant practitioners in ODL must be sensitive to student learning ergonomics, be ergonomists themselves and respond to ergonomic concerns in the process of helping learners to actively develop and create their own learning. The learners through the proper consideration of ergonomics, they can certainly relate to the real-world problems (Siegel & Kirkley, 1997). ODL ergonomic must contribute to the planning, design and evaluation of

the various ODL tasks, jobs, products, organisations, environments and systems in order to provide the learners with educational products that are compatible with their needs, resources, abilities and interests. Practising ergonomists in ODL must have a broad understanding of the disciplines, taking into account the physical, institutional, mindset, social, organisational, environmental and other relevant factors that can help increase motivation for learners to stay learning through distance learning modality (Keller & Burkman, 1993). This application domain is not mutually exclusive and it must evolve constantly. New ones are created; old ones take on new perspectives and with the advancement of technology and new ODL systems, we have to learn, re-learn and re-engineer/redesign the way we teach and provide learning opportunities (Dzakiria, 2004) for future improvement.

4. Understanding the types of ergonomics in ODL

Ergonomics in ODL can be broken down into various components that are important to learning and performance. For the purpose of this article, we have categorised three types of ergonomics. They include *physical, mindset* and *institutional* ergonomics which are fundamental to support and enhance ODL deliverables and promote better learning conditions for students.

4.1. Physical ergonomics in open distance learning

Physical ergonomics is concerned with how the physical environment of ODL, learning centres and learning conditions affect students' performance. "Physical" here refers to the various physical logistics and conditions that ODL tutors, practitioners and institutions provide to support learning, i.e., the video conferencing facilities, the resource room; library facility; online resources; the learning space, the learning centres, the audio systems, lighting, heat, light, noise control and so on. For example, there are students who value and enjoy teleconferencing or video conferencing as part of their learning and interaction activities. However, there are others who dislike and even oppose such methodology. In summary, physical ergonomics entails the understanding of the effects of these environmental aspects to learners and how ODL providers should try to increase maximise learning by improving ergonomics physically.

4.2. Institutional ergonomics

Institutional ergonomics in ODL is concerned with the optimisation of the ODL technical systems. These include individual institutional structures, policies and processes. ODL offerings and support at Universiti Utara Malaysia (UUM) may be similar or largely different with those at Open University Malaysia (OUM), Asia e-University (AeU) and other ODL institutions. The fact remains that ODL institutions may be similar or greatly different one from the other. The relevant topics in organisational ergonomics include ODL structures. models, ODL policies, institutional support mechanisms, communication, ODL work designs, learning times, teamwork, participatory designs, community ergonomics, cooperative work, new work paradigms, organisational cultures, virtual organisations, telework and quality management. This type of ergonomics helps in the organisation of learners and effective learning and tutors have an important role to play. The aim here is to ensure that the learners are able to learn and perform effectively by fully adapting the ergonomics institutionally.

4.3. Mindset ergonomics

Having the "correct mindset" while pursuing an ODL programme is fundamental to learning success (Eisner, 1988; Goodyear, 2000). In ODL, mindset ergonomics is concerned with the mental processes that are involved within the ODL career that a student is engaged in. These include actual learning, thinking, analysing, perception, memory, reasoning and motor response, as they affect the learning within the tutor-learner-content interactions. Just as in conventional education, ODL requires students to think, share, comment, make decisions, interact, persuade, argue and take part in other cognitive activities as these may relate to the human-system design. An ODL student would normally be given learning tools at the beginning of the course registration or semester. These may include a

list of courses, course synopses, the LMS system, course assignments, information on tutors, notes, etc. that provide the learners with information which has to be understood in order for them to commence learning.

5. Profiling the learners

Learners can be largely homogeneous and heterogeneous in many ways. The use of a narrative or profile inquiry and the development of case stories offer multiple perspectives in understanding open distance learners (Bruner, 1987,1990;1994; Connelly & Clandinin, 1990). This method of investigation gives meaning to the learners' own lives. Each contextualised narrative unfolds the self-presentation of the learners. Murray (1986) refers to this as "life construction" (p. 277) where the story may not represent "truth" or reality but is an attempt at information reduction, in which the large variety of life events is reduced to a set of narratives based on the conventions of the learners' experience in ODL. The stories of the distance learners are not works of art; rather, they reflect "a kind of life story" which enables us to study "how humans make meaning of experience by endlessly telling and retelling stories about themselves" (Connelly & Clandinin, 1990, p.14).. Such profiling gives a shape to individual stories and allows for a more penetrating analysis in relation to the objectives of the research. The profile taps a metacognitive response in those who tell the story and those who hear it (Davey, 1983; Rumelhart, 1980). The story serves as a tool and provides a meaningful way of organising thinking. It is certainly useful for creating and improving learners' ODL experiences. It provides an opportunity to improve the learning ergonomics for a particular group of learners or cohorts within an ODL programme and will be unique to the institution or ODL programme. This paper describes a qualitative study conducted at Universiti Utara Malaysia as a point of reference to profiling the learners which would provide the unique information and knowledge to various stakeholders in ODL to develop and enhance the physical, institutional and mindset ergonomics of learning within this ODL environment. The results of profiling potentially offer benefits to ALL stakeholders.

6. Research input on developing learning ergonomics in distance education

The study seeks knowledge to generate insights into how, why, when and where learners undertake their learning in particular ways. This research is a single case study focused on a small number of Malaysian distance learners in the northern state of Kedah and Perlis. Eighteen learners were involved and selected on the basis of voluntary participation and their ability to share their distance learning experience and perspective with much openness. Different research techniques were used with the interview remains as the primary technique for data collection, supplemented by students' journals and photographs. The information needed for this study was individual, detailed and contextual. Finding out about the conducive circumstances under which the learners study, the practicalities of studying and getting into the mind frame of learners were important elements of this study. The following were the research questions developed for this study: How do the learners perceive their ODL programmes and courses and what are their experiences like?What is the meaning of ODL for the learners? What are the contributing factors that facilitate or deter learning? And How do the learners cope with the challenges?

This study offers research potential to improve learning ergonomics in distance education. The challenge, however, is to ensure that the learning support in ODL is sufficiently addressed so that a better distance learning experience can be provided. Various findings and conclusions can be drawn from the study. Some of these include:

Teaching and learning in ODL must be student-centred to increase students' success in ODL; Transition is a challenge particularly when a learner moves from a face-to-face teaching environment to an ODL environment; The learners are heterogeneous – they have various backgrounds and experiences which may have been marginalized; Learners value learning interactions and support in their learning process; Effective learning interaction is still considered insufficient by ODL learners; The learners value timely feedback from their teachers regarding course assignments, examination schedules, projects and other inquiries; Learners come from a culturally-induced passive learning environment. In the past, they went through an education system which was largely teacher-centred, hence conditioning them to be "passive" in learning interaction, etc.; The learners' dependence on

assistance and advice from their tutors and this weakness is clearly evident from the data; and the northern states may be lacking in ICT infrastructure and support: availability of Wi-Fi services, internet-intranet, cyber-cafes, etc., compared to the facilities found in bigger cities in Peninsular Malaysia.

Such illustration focuses on the learners' antecedent learning experiences and the relationship between these experiences, current experience as a learner in distance learning programmes and future intentions. The interview data from the individual learners were thematically analysed and presented as a "case story" offering multiple perspectives in meaningfully trying to understand the distance learning experiences exemplified within the ODL programmes at the institution.

The profiling process provides meaningful and critical insights into the following: (1) The patterns of learners' self-identities, their cultures, communities and any transformations that took place over time are telescoped and reflected by the learners in the telling of their stories. The challenges of the ODL programmes may enrich, enhance or affect them in ways that may not be obvious to the outside world but may be incorporated within each individual's story. It brings their challenges and problems to be considered as ODL is not there to deter their learning and progress; (2) Comparison between story cases can be used to get closer to the learners and to understand how the learners are affected by the communities within which they interact. No single story provides a full understanding of the journey toward literacy but each provides "pieces for a 'mosaic' or total picture of a concept" (Marshall & Rossman, 1995, p. 88). Repeated patterns of behaviours and repeated storylines are important in understanding the total concept of literacy and can shed light on the learner's cultural consciousness and on "the interrelationships between collective and individual experience and behaviour" (Fredman, 1990, p. 185); and (3) Reflecting on what took place during their tenure as learners, their schools and family lives, their current learning practices, the community of distance learners, and predicting what the future might hold for them would be enriching experience to be scrutinised in giving better services to them. A narrative is developed or constructed in the telling of their stories. The narrative taps both their experiences and their potentialities. The process becomes "in part a shared narrative construction and reconstruction through the inquiry" (Connelly & Clandinin, 1990, p. 5). The latter would then provide value and meaningful as well as insightful information to improve ODL ergonomics, making learning much more meaningful, manageable and effective as well as increasing their motivation to continue learning and successfully completing their tasks at hands as learners.

7. Profiling input into open distance learning ergonomics

The case findings of the above research provide descriptive knowledge which must be understood in context. The quintessential characteristics of this case study is that it strives towards a holistic understanding of cultural systems of action (Feagin, Orum, & Sjoberg, 1990; Mishler, 1986; Merriam, 1988) within the research setting and context of the case, Universiti Utara Malaysia. The research findings provided an opportunity to analyse the learners' experience in words and their past, present and potential literacy experiences into something meaningful (MacKercher, 1996). The approach relied on three dimensions: time, personal and empirical. The time was outlined as past, present and future, the personal ranged along a continuum from disorder and confusion to organisation and clarity and the empirical was situated in the self, family, community, schooling and work. With particular reference to the above research, for example, four possible suggestions could be made to improve the learning ergonomics at Universiti Utara Malaysia. These include:

7.1. Clear and achievable expectations from participation in ODL programmes and courses

Any ergonomic improvement to learning must be based on objectives that are well defined and achievable as this generates the correct mindset ergonomics. Such ergonomics helps the learners to prepare themselves readily for learning to occur. Students must familarise themselves with the ODL system and learning as soon as they enrol in programmes. This is particularly important especially in the case of ODL students who are from countries where the mainstream education has always been teacher-centred. Students of ODL must be accustomed to the absence of the

teacher most of the time and must have reasonably good library and research skill abilities to function and learn effectively such in an environment.

7.2. Strengthening personal support

In addition, ODL institutions and providers must be prompt in understanding their students' needs and requirements. Such sensitivity must be sustained throughout the continuous offerings of the ODL programmes and courses. For example, if there is a digital immigrant (new to ICT) group or cohort that is lacking in IT skills and knowledge due to the age and digital divide, the ODL stakeholders must plan and execute fundamental training to help these students to reach the level that enables them to function effectively as ODL learners. IT, ICT, e-learning and the LMS are essential tools and enablers to learning in ODL as they are the physical ergonomics that are essential for learning.

7.3. Maintaining students' motivation and enhancing their staying power

Learners require motivation and persistence to stay on their ODL success as a career building opportunity. In fact, students' motivation and persistence have been identified as important factors that could affect student completion rates. Students must in principle understand that their ODL experience will be quite different from any conventional programmes (full-time campus-based programmes) and offers different educational experiences and expectations while maintaining similar quality standards and contents. ODL students must be able to take full responsibility for their learning. They need to be more independent and be able to organise their learning within their busy life as working adults who may have families, children and chores to undertake besides the ODL programme that they have registered in. Scholarships, awards and appreciation letters can be provided to deserving students who perform well in their studies. A small reward could potentially lead to continuous learning and improve overall motivation. Rewarding study credits for relevant working experiences could also improve motivation. This in turn could also be made into an institutional strategy to promote lifelong learning. Such an effort could save the adult learners time, money and other resources that help them to complete their programmes.

7.4. Removing unnecessary hurdles

Undoubtedly, adult learners have more learning barriers and responsibilities compared to younger learners. If we could support their learning by minimising cost, time and specifically, time away from family due to travelling, which would even be better as it helps to minimise unnecessary hurdles. For example, offering ODL courses via face-to-face meetings (f2f) at the students' workplace with a minimum number of students enrolled in a particular programme would certainly provide support to them. Institutions offering various ODL programmes and training should without fail assist their students by increasing the effectiveness and efficiency of ODL systems and by sustaining the motivation among learners throughout the programmes.

8. Conclusion

Profiling the students in the ODL environment and using learners' stories and experiences as a text present a useful approach and potentially provides all participants (individual, group or cohort) with a deep and multi-layered understanding. The deeply personal responses from learners can be described as implicit and subtle. The learners' narratives can certainly reflect a process of self-discovery. In this study, the narrative qualitative approach promotes the development of the learners' voice and self through the critical reflection on their life experiences and the circumstances of their life as distance learners at Universiti Utara Malaysia. But most important of all, the learners' profile and such narratives are apt to improve the learning experiences that would support study completion.

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