Promoting Research on Profiling Learners' Lives to Create Better Open Distance Learning (ODL) Ergonomics

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ABSTRACT

This paper deals with fundamental purpose of improving ergonomic design for open distance learning which may impact students' learning performance and reduces dropout rates. Within this paper, learning ergonomics refers to the interdependence of educational performance and educational design for ODL. It is about finding the 'best-fit' that promote and improve learning performance and ability of the learners. The issue confronting learning ergonomics is which design characteristics in the learning environment have the greatest influence on variability in learning performance. Based on the literature review, this paper suggests that through profiling of learners' lives, we can develop better learning ergonomic in ODL. Learner's lives, a narrative impulse, establishes the importance of stories, provides students' voice, an illustrative example of the learner's background to embark on his or her ODL experience. Learners' profile provides possible improvements to course design, enabler to meaningful and inviting learning, student comfort, and productivity and these attributes could offset learning frustrations.

Keywords: *Ergonomics; Profiling Learners' Lives; Open Distance Learning*

INTRODUCTION

In spite of much improvements and development in Open Distance Learning technology and tools, establishments of new ODL institutions and providers, improved programs, progress on Open Educational Resources (OER) and courses, better tutor training, disbursement of scholarships, etc., dropout rates in ODL around the world is still at an alarming rate . It is a known factor that the learners' demography may well be attributes to the statistics. But, what actions, and research have ODL stakeholders pursued to rectify, or improve the situation?

The literature seems to suggest although, we have greatly improve and champion the establishment of ODL as a great alternative to education, making all categories of education from primary, secondary, tertiary, continuous learning much more accessible and flexible today compared to 30 years ago, we have not done enough to support students' learning (Dzakiria, 2006). Perhaps, it is timely to have a second look at human factors and conditions to improve the ergonomics for better and more effective ODL experience.

Human factor which is synonymous to ergonomic principles and techniques has achieved proven success in improving performance, productivity, and competitiveness in many public and private sector organizations (Dzakiria, 2004; 2006; Smith, 2007; Haslam, 2002; Korkmaz & Sommerich, 2009). Unfortunately, the ongoing alarming dropout rates in ODL seems to suggest that the benefits that the application of human factors/ergonomic science might bring to the performance of students in ODL have yet to be widely recognized, although some research has been done documenting performance benefits associated with ergonomic improvements to classrooms and to computer-based educational work stations. The relevance of human factors/ergonomic principles and approaches to evaluating and upgrading ODL students' learning performance receives little attention (Berliner and Biddle, 1995; Dzakiria, 2006; Wilson and Daviss, 1995).

A possible reason for this situation was suggested by K.U. Smith and Smith (1966, p. 1): "Factors of human design long have been ignored in experimental psychology. It has been believed that learning could be studied as a general process." Although a large body of evidence regarding context specificity in performance and learning can be cited to contradict generalized learning theory (T.J. 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.

Innate learning attributes in some ways contribute to educational performance. However, based on various research on ergonomics seems to suggest that design factors have an equally important contribution to learning performance.

Smith (1966) work remains one of the most distinctive efforts to apply a well-defined human factors/ergonomic perspective to education. The team evaluated a broad range of design factors such as *audiovisual techniques, textbook design, training program design, programmed instruction methods* that can be expected to influence learning and

educational performance. Given the publication of this work some three decades ago, it is timely to explore whether the educational process and educational systems of today can benefit from the application of human factors/ergonomic principles as has been the case with many other human systems and areas of human performance. It is particularly important for ODL segment to improve learning as it is becoming an important avenue and strategy to democratize education and making education much more accessible and flexible for learners everywhere in the world.

Defining Learning Ergonomics

Learning ergonomics refers to the interdependence of educational performance and educational design. It is about finding the 'best-fit' that promote and improve learning performance and ability of the learners.

Performance of students and educational systems to a substantial degree is context specific. This is true in traditional education, and it is equally true within Open Distance Learning (ODL). Students, tutors, institutions may be greatly similar, or different between each other. As such, finding one best-fit or solution that would work with any student(s), institutions, and systems may be difficult. There is no one-best fit or practices of ODL that can be implemented by any ODL institutions.

Enhancing learning ergonomics for a given group of students, classes or particular institution may significantly improve the students' learning performance and educational experience. Therefore, improving certain or specific design factors as ergonomic interventions directed at design improvements could benefit education and learning experiences. Therefore, learning ergonomics is concerned with how and why design characteristics of educational process and system influence variability in performance of students in the system and of the system as a whole.

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

'Variability' in human performance not only has a strict scientific meaning, but also a practical meaning related to variable consistency, reliability, or reproducibility in

learning, as well as to errors, accidents, poor quality, inefficiencies, reduced productivity, and/or lack of competitiveness in performance of students and educational systems that may arise as a consequence of poor design.

From the perspective of performance-design interaction, learning ergonomics has its 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 of the learning environment. These may include the various logistic and support that may be provided to the learners based on the demography and learners' profile. Seemingly an adult learner who has left school for many years and not familiar with technology will need some training on the use of technology to learn, and library skills coaching would become essential.

ERGONOMICS AND OPEN DISTANCE LEARNING

Ergonomics in Open Distance Learning is about searching the 'best-fit' for learning conditions that promote effective open distance learning. These may include the fit between learners, the things they do, the materials they use and the ODL environments they work, travel and learn.

If good fit is achieved, the stresses on learners can be greatly reduced. They are more comfortable, become more inviting to learning, condition effective learning, and the learners can learn better and improve their performance greatly. However, 'best-fit' in ODL does not mean a single ergonomic solution that is best for all ODL students, environment and institutions. That would be closed to impossible to design given the broad and wide scope of ODL student demography worldwide.

It is also not just physical fit, but includes other factors like learners' educational background, working experiences, educational exposures, psychological state, personalities, personal interest, strength and weaknesses, etc.

This paper believes to improve students' performance and provide a worthy educational experience in ODL; we can develop better learning ergonomic by profiling the students' lives which if done properly provides meaningful and rich information of respective student or groups. Learners profile provides information on the learners' human factors which preserved well may support learning, and vice versa. Such endeavor seemingly would provide an opportunity to improve ODL experience and minimizes dropout rates among the learners. It would also make good use of that data that is collected almost without fail within every new academic year or enrollment.

ODL learning ergonomics is concerned with the understanding of the interactions among learners and other elements within an ODL system. It involves theoretical principles, data and methods to optimize human well-being and overall student learning performance.

As such, understanding the need to create a better learning ergonomic in ODL is paramount and surpasses other components and processes of ODL. Tutors, curriculum designers, ODL administrators, educational technologists, and all relevant practitioners in ODL must be sensitive to the student learning ergonomics and be ergonomists themselves. There must be continuous improvements to ODL experiences.

Such ergonomics concern must contribute to the planning, design and evaluation of the various ODL tasks, jobs, products, organizations, environments and systems in order to provide the learners with educational products that are compatible with their needs, resources, abilities, and interest. Practicing ergonomists in ODL must have a broad understanding of the discipline, taking into account the physical, cognitive, social, organizational, environmental and other relevant factors.

As practitioners in ODL, we work within an application domain that offer educational training, courses and services to the learners. These application domains are not mutually exclusive and they evolve must constantly. New ones are created; old ones take on new perspectives, and with the advancement of technology and ODL systems, quite often we have to learn, re-learn and re-engineer the way we teach and provide learning opportunity (Dzakiria, 2004).

Types of ODL Ergonomics

ODL ergonomics can be broken down to various components which is important to learning and performance. These include: *Physical*; *Thinking/Learning*; and *Institutional Ergonomics*.

Physical Ergonomics in ODL

Physical ergonomics is concerned with how physical environment of ODL learning centers and learning conditions affect students' performance. 'Physical' here means the various physical conditions that ODL tutors, practitioners, and institutions provide learning i.e. The video-conferencing facilities, the resource room; library facility; online resources; the learning space, the learning centers, the audios, the lighting, heat, light, noise, and so on. For example, there are students who value and enjoy teleconferencing, or video conferencing as part of their learning and interaction activity. But there are those who dislike and oppose such methodology. This provides an ongoing challenge to many ODL tutors and stakeholders because learners in ODL are always homogeneous. However, physical ergonomics is about understanding the effects of these environmental aspects to learners, and in particular, those that do not support learning and performance which will allow us to better design learning environments for learners which support learning.

Thinking/Learning Ergonomics

Thinking or Learning Ergonomics in ODL is concerned with the mental processes that are involved in learning over the ODL career that a student is engaged with. These include actual learning, thinking, analyzing, perception, memory, reasoning, and motor response, as they affect the learning interactions within the tutor-learner-content interactions. Just like conventional education, open distance learning requires students to think, share, comment, make decisions, interact, persuade argue, present, and other cognitive activities as these may relate to human-system design.

An ODL student would normally be given the learning tools at the beginning of the course registration or semester. These may include, listing of courses, course synopsis, LMS system, course assignments, tutors information, notes, etc. that provides the learners with information, which has to be understood, and digested in order to commence learning.

Course writers and designers normally would be looking at this process, and then trying to design the course, courseware, the learning system, and the learning environment around the learners to allow learning to take place effectively. Balancing the learners' background with the optimal learning tasks and requirement in a particular course is pertinent to students' performance. Such ergonomic is also interested in how long it is reasonable to expect learners to work and finish particular task or assignment.

What is crucial here is to understand that ODL learners can be homogeneous and heterogeneous. Ability to learn varies between learners, and this is crucial to designing the learning ergonomics. Different group of learners may require different support and assistance.

Institutional Ergonomics

Institutional ergonomics in ODL is concerned with the optimization of the ODL technical systems. These include individual institutional structures, policies, and processes. ODL offerings and support for Universiti Utara Malaysia (UUM) may be similar, or largely different with Open University Malaysia (OUM), Asia e-University (AeU) and other ODL institutions. The fact remains ODL institutions may be similar or greatly different than others. The relevant topics in organizational ergonomics include *communication, ODL work design, learning times, teamwork, participatory design, community ergonomics, cooperative work, new work paradigms, organizational culture, virtual organizations, telework*, and *quality management*. This type of ergonomics helps to organize the learners and the learning to best effect, and tutors have an important role to play. As an effective learning ergonomist, ODL tutors could create learning process and opportunities that matches the course tasks and demands with the learners' background and ability; the aim here is to ensure the learners are able to learn and perform accordingly.

By virtue of profiling ODL students' lives-would provide the essentials and fundamentals to various stakeholders in ODL to develop and enhance the physical, cognitive and organizational ergonomics of learning within an ODL environment. In an attempt to illustrate the profiling effects to learning ergonomics, this paper provides an analysis of students' profile and narratives from a case study conducted to elicit students' perspectives and experiences learning within the ODL environment.

PROFILING THE LEARNERS

Within the Open Distance learning literature and the developments over the 8 generation of ODL, there have been many research conducted to study various issues and aspects of ODL using various methods and research instruments. There have been many research attempts to understand the learners. Today, we know that ODL learners will always be homogeneous and heterogeneous regardless of geographical location, gender, age, and other circumstances. We also know that, in the best interest of any group of learners, and ODL institutions and providers, there is no One-Fit solution or best practices that can be adopted to ensure ODL success or improvement that would maximize learning support for all ODL institutions. This article proposes that by means of understanding the learners' profile, an ODL institution and its stakeholders (i.e. administrators, module writers, IT personnel, tutors and others) would be able to customize the program and deliverables better based on the specific of the learners' profile. The more we know of our learners quantitatively and qualitatively, the more we could customize the learning deliverables. The quantitative data that are collected would yield certain attributes like age, background; however the qualitative ones through research and continuous reflection would yield a stronger student-centeredness approach to ODL improvements. Profiling the learners through narratives is a method that this article prescribe to improve ODL ergonomics.

Profiling the learners within the Open Distance Learning provides a rich and meaningful attributes to understanding the learners, and potentially help to improve ODL.

The use of a narrative inquiry and the development of case stories offer multiple perspectives in understanding Open Distance Learners. This type of method gives meaning to the learners' own lives. Each contextualized 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. Such approach, also uses the form of a story map or a profile to present a meaningful cross-case comparison. The "case story" approach provides descriptive knowledge which must be understood in context.

This becomes a way for a learner to critically reflect on earlier or current perspectives of their own learning and experiences in order to construct or reconstruct meaning in the their life within an open distance learning environment.

The word "profile" can be used interchangeably with "narrative" and "story" throughout the process. 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 understanding is paramount to ODL continuous improvement, and compliments other efforts to strengthen ODL offerings, systems and deliverables.

The profile organizes the learners' recounting of past and present experiences and future intentions under the rubric of character, setting, events, conflicts, incidents, themes and resolutions (or outcomes). Such profile 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 is a meaningful way of organizing thinking and is 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 programs and will be unique to the institution or ODL program. As an illustration, this article will used a qualitative study conducted at Universiti Utara Malaysia as a point of reference to profiling the learners.

THE STUDY SUMMARY & FINDINGS

This paper is based on a study on students' perspectives and experiences on *distance learning* at Universiti Utara Malaysia (UUM). This 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 Malaysia distance learners in the northern state of Kedah and Perlis. Eighteen learners were involved and selected on the basis of voluntary participation and ability to share their distance learning experience and perspective with much openness. Different research methods were used with *interview* remaining as the primary method for data collection, supplemented by *students' journals* and *photographs*. The information needed for this study was *individual*, *detailed* and *contextual*. Finding out about the circumstances under which the learners study, the practicalities of studying and getting into the mind frame of learners were important elements of this study. This research was based on the following three epistemological attitudes adopted from by Segall (1990,1998):1) .*Metaphysical*: What is the story - exploring how the learners' address causality, intention, existence and truth about their distance learning; 2.*Historical*- search for understanding of how learning barriers and challenges began. How or what causes the learning barriers that learners face in their pursue of distance education?; 3.) *Pedagogical*-What can the institution do to improve the educational experience of distance learning?; How can the institution make changes to the existing distance learning courses and programs, and assist learners in their endeavors based on feedback and knowledge generated from this study? The findings shared in this study can be seen as providing a holistic understanding or conceptual framework for understanding student learning from the learners' perspective.

Following are the research questions developed for this study:

1. How do the learners perceive and experience their ODL programmes and courses?
2. What is the meaning of ODL for the learners?
3. What are the contributing factors that facilitate or deter learning?
4. How do the learners cope with the challenges?

This study offers research potential regarding learning support in distance education. The challenge, however, is to ensure that learning support in ODL is sufficiently addressed in striving towards a better distance learning experience.

Various findings and conclusions can be drawn from the study. Some of these include:

1. Teaching and learning in ODL must be student-centered;
2. Transitions is a challenge particularly moving from f2f to ODL environment;
3. The learners are heterogeneous – have various background and experiences which is marginalized for learning purpose;
4. Learners' value learning interaction and support
5. Effective learning interaction is still considered insufficient by learners'.
6. The learners value timely feedback from their teachers regarding course assignments, exams, projects and their inquiries.
7. Learners come from culturally induced passive learning- they went through education system which was largely teacher-centered in the past, hence conditioning them to be 'passive' in learning interaction, etc.
8. The learners' dependencies on tutors, and their desperation, were constantly evident in the data.
9. The northern states may be lacking in ICT infrastructure and support compared to bigger cities in peninsular Malaysia- Wi-Fi services; internet-intranet; cyber-cafes; etc.

Such illustrative example focuses on the learners' antecedent learning experiences and the relationship between these experiences, current experience as a learner in distance learning program and future intentions. The interview data from the individual learner is presented as a "case story" which offers multiple perspectives in understanding the distance learning experiences exemplified within the ODL programs at the institution.

Each contribution is then profiled in a unique way that represents a coherence story line based on the themes that surfaced in the study. This profile captures the learners' narration of their personal learning experiences in the most comprehensible, logical and systematic manner. The profiling process begins by rearranging the data or discourse that took place by compartmenting the discourse according to headings or themes as illustrated by the following table.

	Self	Family	Educational Background	Professional Background	Learning Experiences	Note
Past Experiences						
Present Experiences						
Future Intentions						

This helps to put the discourse in perspectives, and assist in the construction of a particular story map of each and every learner that was involved in this study. Over time, such undertakings produce holistic insights into the learner and in many ways, such profiling analysis provides insights into:

- The patterns of a learner's self-identity, their culture and community and any transformations that take place over time are telescoped by the learner in the telling of his/her story. The challenge of the ODL programs may enrich, enhance, or affect a learner in ways that may not show to the outside world but may be incorporated in the individual's story.

- Comparison between story cases, which in turn can be used to understand how 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 behavior 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 behavior" (Ferdman, 1990, p. 185).

- Reflecting about what takes place during their tenure as learners, their school and family lives, their current learning practices, the community of distance learners, and to predict what the future might hold for them. A narrative is developed or constructed in the telling. The narrative tapped both their experiences and their potentialities. The process became "in part a shared narrative construction and reconstruction through the inquiry" (Connelly & Clandinin, 1990, p. 5).

Cross analysis on the individual learner profile would then provide a particular group profile analysis. The latter would than provide value and meaningful information which this paper proposes may improve ODL ergonomics making learning much more meaningful, manageable and effective.

PROFILING INPUTS INTO ODL ERGONOMICS

The case findings of the research provide descriptive knowledge which must be understood in context. The quintessential characteristic of case studies is that they strive towards a holistic understanding of cultural systems of action (Feagin, Orum, & Sjoberg, 1990) within the research setting and context.

The research findings provided an opportunity to analyze the learners' words into something meaningful, their past, present and potential literacy experiences. The approach relies on three dimensions: *time, personal* and *empirical*. The *time* outlined as past, present and future, the *personal* ranging along a continuum from disorder and confusion to organization and clarity, and the *empirical* situated in self, family, community, schooling, and work.

CONCLUSION

Using learners' stories and experiences as a text is a useful approach and provides all participants a deep and multi-layered understanding. The deeply personal responses from learners can be described as implicit and subtle. There appears to be a relationship between the developments of an individual's voice as an essential component in the development of their sense of self (Belenky, Clinchy, Goldberger, & Tarule, 1986). The learners narratives can reflect a process of self - discovery. In this study, the narrative qualitative approach promotes the development of learners' voice and self through critical reflection on their life experiences and the circumstances of their life as distance learners at Universiti Utara Malaysia. This in turn offers an ODL institution and all the prominent stakeholders to reflect and improves. The data provided enables the institution to customize r make changes that would promote student centeredness. But most important of all, learners' profile and such narrative are apt to improve the learning experiences that the student will undergo. The learners have always been labeled as the most important clientele, as such customizing the ODL programs that maximizes learning is the way forward that would provide better satisfaction and reduces the dropout rates of ODL learners.

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