Abstract (AJ)
This paper deals with the fundamental purpose of improving the ergonomics design for open
distance learning/education which could improve students’ learning performance and reduce
dropout rates. The issue confronting learning ergonomics which design characteristics in the
learning process and the environment is its influence and impact on learning performance
adaptability. The authors believe that the promotion of research on students’ narratives and
perspectives on open distance learning and maximising the usage of information from their data
and profiling of their lives can improve institutional, physical and mindset ergonomics in open
distance learning. The learners’ lives and perspectives (profiles) provide a narrative stimulus,
establish the importance of stories and provide a student’s voice which functions as an
illustrative example of their perspectives on their learning experiences. This can result in
possible improvements in course design, facilitation of meaningful and inviting learning
experiences, student comfort and productivity; the accumulation of these attributes could
reduce learning frustrations in the process of acquiring new knowledge.
Keywords: learning support; ergonomics; institutional ergonomics; physical ergonomics;
mindset ergonomics; profiling learners’ lives; open distance learning.

Abstrakt (SJ)
Článok sa zaobera základnými účelom zlepšenia ergonomie zameranej na verejne prístupné
dištančné (diaľkové) vzdelávanie, ktoré by mohlo zlepšiť výsledky vzdelávacieho procesu
študentov a znížiť mieru neúspešnosti v štúdiu. Téma je zameraná na konfrontáciu ergonomie
vo vzdelávacom procese a v prostredí a jej možnosti adaptácie a vplyvu na proces vzdelávania.
Autori sú presvedčení, že výsledky výskumu, založeného na perspektívach a pohľadoch
študentov na verejne prístupné dištančné vzdelávanie a využití výsledkov výskumu študentov,
môže zlepšiť ergonomiu verejne prístupného (diaľkového) vzdelávania z pohľadu
inštitucionálneho, osobného a názorového. Život študentov a ich perspektívy (profily) poskytujú
podnete, príklady umožňujú študentom vyjadriť sa, čo slúži ako príklad využitia ich názorov na
skúsenosti so vzdelávaním. Tento prístup umožňuje priniesť zlepšenia v prístupe k tvorbe kurzov
na základe skúseností a podnetov od študentov, ktoré budú zamerané na jeho potreby a získanie
znalostí. Na základe týchto prístupov je možné znížiť frustráciu v procese získavania nových vedomostí.

Kľúčové slová: podpora vzdelávania, ergonómia, inštitucionálna ergonómia, ergonómia zamieraná na jednotlivcov, ergonómia zohľadňujúca názory študentov, podnety zo života študentov, verejne prístupné dištančné vzdelávanie

INTRODUCTION

In spite of extensive improvements and developments in Open and Distance Learning (ODL) such as the advancement of technology and educational tools, established e-learning platforms, newly formed ODL institutions and providers, improved programmes and courses, achievements in Open Educational Resources (OER) and better tutor training programmes, student dropout or attrition rates in ODL around the world continue to be very high. These rates are reported to be in the range of 30% - 45%. Various reasons and factors have been associated with the dropout phenomenon 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). However, what actions and research have ODL stakeholders pursued to rectify or improve the situation? How and in what ways have the research findings been used to improve learning? What role does learning ergonomics in ODL play in reducing attrition rates?

The 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 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.

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. Although some research has been carried out documenting performance benefits associated with ergonomics improvements to classrooms and to computer-based educational work stations, more research on the issue of learning ergonomics improvement in ODL is required. 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. Although learning may not be “tangible” in principle, it is fundamental to all facets of human life and activities and requires attention and continuous improvement. The landscape of Higher Education (HE) has changed significantly over the last two decades, making HE more competitive and demanding to manage. 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.

Nevertheless, the authors acknowledge that in some ways, innate learning attributes contribute to educational human performance. However, some research on ergonomics also seems to suggest that design factors have an equally important contribution to make to learning performance. Thus, it should be explored further for the benefits and survival of ODL. 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.

Smith's (1966) work remains one of the most distinctive efforts to apply a well-defined human factors/ergonomic perspective to education. Smith and his team evaluated a broad range of design factors such as audiovisual techniques, textbook design, training programme design, programmed instruction methods, etc., that can be expected to influence learning and educational performance. Given that the publication of this work took place some three decades ago, it is timely to explore whether the educational process and educational systems pertaining to ODL 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 the ODL segment to improve learning as it is becoming an important avenue and
strategy to democratise education, making it much more accessible and flexible for learners everywhere in the world. The 24/7 modality certainly requires ODL systems to be effective and efficient with an increase in human performance (success rates of completion among learners).

1 DEFINING LEARNING ERGONOMICS

Learning ergonomics refers to the interdependence of educational performance and educational design. It is about finding the “best fit” that promotes and improves the learning performance and ability of distance learners. In ODL, ergonomics can be defined as the science of educational performance and design to continuously promote and maximise learning potential among learners (IEA 2000). It is geared to enhance learning, making the process much more student-centred, inviting, accessible and more supportive for the learners in all aspects of the ODL operating system and functionality. The system of designing ODL system would help enhance the interactions in their process of acquiring knowledge through new tools. It is becoming one of the fastest modalities with the advances of technology.

To a significant degree, the performance of students and educational systems are context dependent. This is true in traditional education and it is equally true for ODL. Students, tutors and institutions may be greatly similar or different one from the other. As such, finding one “best fit” or solution that would work with all students, institutions and systems may be difficult. There is no one “best fit” or perfect practice of ODL that can be implemented by any ODL institution as long as the system from time to time increase students performance in completion of their studies. These institutions can, however, learn from each other on various management or design issues in ODL while not adopting any one model for implementation. The UK Open University is said to be a very dynamic Open University model. Similar accreditation has been awarded to the Athabasca Model (Canada), the Indra Gandhi National Open University (IGNOU), the University of Phoenix (USA) and others. But due to geographical locations, learners’ profiles and demographic data, cultural differences, etc., many ODL institutions have to localise their approach with practices they consider effective and practical. Today, the Open University Malaysia (OUM), Universiti Sains Malaysia (USM), Wawasan Open University (WOU) and Asia e-University (AeU) are some of the successful ODL providers in Malaysia. They are similar and different in many ways.

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.

Variations in students’ performance in ODL, for example, may be 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 the performance of students and educational systems that may arise as a consequence of the poor design of the institutional and physical ergonomics to support learning.

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.

2 ERGONOMICS AND OPEN DISTANCE LEARNING

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).

It is also not just a physical fit that matters 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. This information on learners’ human factors that may be used to support learning. Such an endeavour seemingly would provide an opportunity to continuously improve ODL experiences among learners and minimise non-completion rates among them.

In summing up, ODL learning ergonomics is concerned with the understanding of the interactions between learners and other elements within an ODL system. 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).

The ODL ergonomic concerns 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).

As practitioners in ODL, we work within an application domain that offers educational training, courses and services to the learners. 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/re-design the way we teach and provide learning opportunities (Dzakiria, 2004) for future improvement.

3 TYPES OF ERGONOMICS IN OPEN DISTANCE LEARNING

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.

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. This provides an ongoing challenge to many ODL tutors and stakeholders because learners in ODL are seldom homogeneous. In summary, physical ergonomics is about understanding the effects of these environmental aspects to learners and how ODL providers should try to increase maximise learning by improving ergonomics physically.

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. As effective learning ergonomists, ODL tutors could create learning processes and opportunities that match course tasks and demands with the learners’ backgrounds and abilities. The aim here is to ensure that the learners are able to learn and perform effectively by fully adapting the ergonomics institutionally.

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.

Course writers and designers would normally be looking at this cognitive process, then try 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’ backgrounds with the optimal learning tasks and requirements in a particular course is pertinent to students’ performance. Such ergonomic consideration also includes a reasonable length of time to enable learners to work on and finish a particular task or assignment.

What is crucial here is to understand that ODL learners may often be very heterogeneous. The ability to learn varies among learners and recognising this is crucial to the design of the learning ergonomics. Different groups of learners may require different support systems and types of assistance.

**4 PROFILING LEARNERS**

Within the ODL literature that spans eight generations of ODL establishments, extensive research has been conducted to study a range of issues and aspects of ODL using various methods and research instruments. Many attempts have been taken to better understand the learners. Today, we know that ODL learners can be homogeneous and heterogeneous regardless of geographical locations, gender, age and other circumstances. The stakeholders in ODL (which include the learners, tutors, institutions, providers, programmes, supports, etc.) can also be very similar or different one from the other. We also know that in the best interest of any group of learners and ODL institutions and providers, there is no “one-fit-for-all” solution or best practice that can be adopted to ensure ODL success. There is also a difficulty in suggesting improvements that would increase the learning support provided by the ODL institutions. The authors propose that by understanding the learners’ profiles, an ODL institution and its stakeholders (i.e., administrators, module writers, IT personnel, tutors and others) can effectively customise its programmes and deliverables to meet the learners’ needs. The more we know about our learners, be it through quantitative or qualitative measures, the more effective will be the customisation of the learning deliverables. The quantitative data that are collected would yield certain attributes like ages and backgrounds while the qualitative information that is obtained from in-depth research and continuous reflection would yield a stronger student-centredness approach to ODL improvements. Profiling the learners through narratives is a method that this article prescribes to improve the overall ODL ergonomics where learners’ aspects of learning will be considered to maximise learning in ODL.
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. Such an approach also uses the story map or 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 learners to critically reflect on earlier or current perspectives of their own learning and experiences in order to construct or reconstruct meaning in their life within an ODL environment. The learners’ ways of interacting with other humans and providers could certainly improve learners’ impression of the services as a support system.

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 the continuous improvement of ODL and complements other efforts to strengthen ODL offerings, systems and deliverables.

Such profiling organises 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). It 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. Through their stories, providers and stakeholder could improve the learning conditions and boost students’ performance in ODL. Thus, the success rate of completion of studies will improve as students feel that students’ learning is always care for by ODL providers or stakeholders.

As an illustration, the authors will describe 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 will bring benefits to both providers as well as the clients.
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 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. This research was based on the following three epistemological attitudes adopted from 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: a search to understand how learning barriers and challenges begin while embarking on their journey as open distance learners. 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 and distance learners? How can the institution make changes to the existing distance learning courses and programmes and assist learners in their endeavours based on feedback and knowledge generated from this study? The findings shared in this study can be seen as providing a holistic or conceptual framework for understanding student learning from the learners’ perspective and how we can potentially increase their motivation and success.

The following are 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?
- 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 marginalised.
- 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.
- 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 an illustrative example 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 study" offering multiple perspectives in meaningfully trying to understand the distance learning experiences exemplified within the ODL programmes at the institution.

Each contribution is then profiled in a unique way that represents a coherence story line based on the themes that had surfaced in the study. This profile captured the learners’ narration of their personal learning experiences in the most comprehensible, logical and systematic manner. The profiling process began with a rearrangement of the data or discourse into sections with headings or themes. This helped to put the discourse in perspective and assisted in the construction of a particular story map of each and every learner who was involved in this study. In due course, this produced a holistic insight into each learner. In general, this type of a profiling analysis provides meaningful and critical insights into the following:

- 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

- 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).

- 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).

Cross analysis on the individual learner’s profile would then provide a particular group profile analysis. 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.

6 PROFILING INPUTS 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:

- **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 familiarise 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.

- **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. It is essential to obtain adequate information about the learners so that they can be profiled effectively and supported effectively. The personal support is fundamental to the learning ergonomics improvement in ODL.

- **Maintaining students’ motivation and enhancing their staying power**

As stated previously, ODL learners can be homogeneous or heterogeneous and they are mostly adult learners who resume learning with various commitments. They always 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. As such, the authors believe that in order to keep ODL students motivated throughout their studies, the first point above is of a paramount importance. 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. Short-term and long-term objectives must be clearly defined to the learners. 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.

- **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, that 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. The institutions should try to reduce the unnecessary burden off their learners’ shoulders.
As stipulated earlier, physical, institutional and mindset ergonomics are the three types of learning ergonomics that need to be considered in optimising ODL deliverables. The findings extracted from the case stories of the learners confirm that they are fundamental of sustaining success of open distance learners.

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. There appears to be a relationship between the development 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 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. This in turn offers the institution and all the prominent stakeholders an opportunity to reflect and suggest improvements for better services for busy working learners. The information and knowledge provided from such research enables the institution, in particular, to customise and bring about changes to ODL that would promote student-centredness. But most important of all, the learners’ profile and such narratives are apt to improve the learning experiences that would support study completion. ODL institutions have always publicised students as their most vital clientele that must be attended to at all times. It is, therefore, pertinent for ODL institutions and providers to customise ODL programmes and courses that maximise learning and increase support for learning. Improvements to the institutional, physical and mindset ergonomics will be the way forward for an improved, balanced and enriching ODL experience. It is hoped that as the learners get better services, more learners can complete their programmes successfully as their learning ergonomics is always monitored by institutions as ODL providers.
Dr. Hisham DZAKIRIA is presently an Associate Professor at Universiti Utara Malaysia. He has just recently completed his attachment as a fellow at Commonwealth of Learning (COL), Vancouver, Canada. With a desire to learn and to respond quickly to maximise personal growth to contribute effectively in his chosen career path, Dr. Hisham completed his Doctor of Philosophy (PhD) in Professional Development majoring in Open Distance Learning. He continued to train himself with technological advancement in ODL through on-the-job experience and training. He has a Masters of Arts in Linguistics with a Minor in Communication and two bachelor degrees from Brock University, St. Catharines, Ontario, Canada majoring in Education and Applied Linguistics. Over the last 10 years, Dr. Hisham has conducted various training jobs for the government and private sectors in Malaysia, Thailand, Sri Lanka and Indonesia. These include on-the-job training that focuses on e-learning, Open Distance Learning (ODL) support systems and adult learning, Teaching English as a Second Language (TESL), English as a Second Language (ESL), English for Language Learning (ELL), English for Specific Purpose (ESP), Communication, ICT in education, CPD courses, HR related programmes which include: Change; Strategic Planning, SWOT analysis, 360 Degree Change and others. He has also conducted and completed consultancy projects under the Asia Bank of Development for various government bodies in Bangladesh, Sri Lanka, Thailand and Indonesia. He has also conducted consultancy projects with the Commonwealth of Learning (COL) for UNHCR on evaluating Online Writing Courses. He has developed knowledge and skills to offer educational techniques, tools and experience on ODL, Open Educational Resources (OER), CPD, profiling distance learners and their learning styles. Dr. Hisham has also successfully completed extensive academic research and consultation projects within given deadlines and managed to publish his work with the international academic community via successful publications in high ranking international journals e.g., Open University, Cambridge, Malaysia Journal of Distance Education (MJDE), Turkey Journal of Distance Education (TOJDE), Malaysia Online Journal of Instructional Technology (MOJIT), The Qualitative Report Online Journal, etc.

References
7. Dzakiria, H. & Idrus, R. (2003). Teacher-Learner Interactions in Distance Education: A case of Two Malaysia Universities, Turkish Online Journal of Distance Education, 4(3).

Contact information
Hisham Dzakiria
Universiti Utara Malaysia—MALAYSIA
Phone: +1 778 2510622
Fax: + 604 7758210
hisham@uum.edu.my
hdzakiria@col.org