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Improving Distance Courses: Understanding Teacher Trainees and their Learning Styles for the design of Teacher Training Courses and Materials at a Distance

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Abstract

Literature on distance education and teacher education seems to show that what we do not know about Distance Teacher Trainees[1] (DTT) and their learning process involved exceeds what we know about it. As more DTT enroll in distance education programmes globally, distance education providers and institutions will witness trainees coming with different backgrounds and experiences begin to take advantage of this learning opportunities. One important variable in the effectiveness of distance learning is the preference of the distance learner for a particular learning mode. A key to maintaining distance learners participation in learning lies in understanding the Learning Styles Preferences (LSP) and the processes involved. This is also true for teacher training. There is much greater variation in the range of LSP and how to address them when preparing distance training materials and courses. The primary purpose of this paper is to propose ways in which individual learning differences should be accommodated when designing instructional learning materials in print for DTTs. Kolb's (1984)model on learning cycle and styles are discussed to provide instructional design guidelines which accommodate each stage of the learning cycles and individual differences between DTT in processing and presenting information and knowledge. In addition, issues on teacher education, distance learning, individual differences, and ways in which the 'differences' can be accommodated when designing learning materials for DTT are also discussed. This paper resonates the idea and belief that if attempts are made to match learning styles of DTTs and andragogy with content to be learned, distance teacher educators (DTEs)and instructors can develop better instructional materials with greater prospects of success. Getting to know and understand the teacher trainees and their learning process involved must first be addressed to facilitate the diverse needs of the Malaysian teacher trainees.

[1] *Refers to teacher trainees who receive training via a distance program at higher education*

Introduction

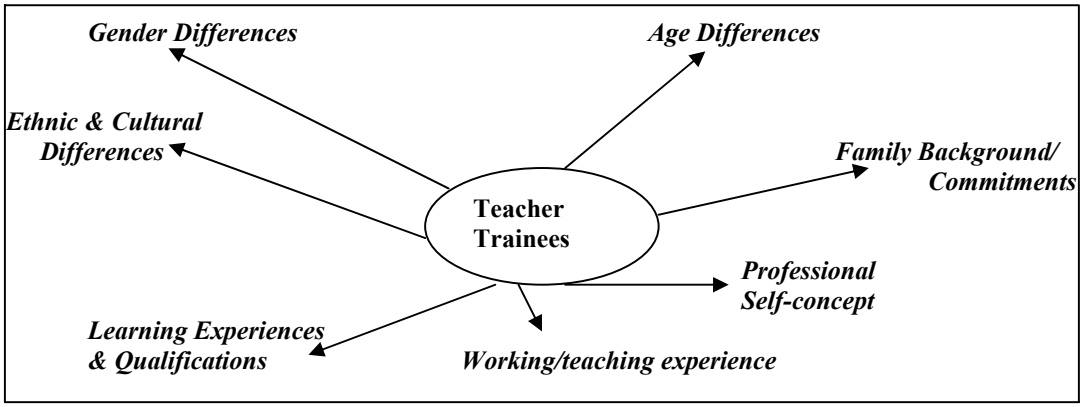
Distance education (DE) has the potential to provide access to higher education (HE) to all prospective DE learners in various disciplines including teacher training program or teacher education in Malaysia, by promoting equality and higher standards in educational teaching and learning regardless of geographical barriers. As DE has become a popular instructional delivery mode, many research has turned to investigate DE instructional design and delivery. However, research in distance learning among the academic community has focused primarily on instructional design considerations. Universities for example have been very concerned with how to structure and deliver distance courses (i.e method of transmission, use of technology, the web; scheduling, acoustics, physical environment, instructional methods, etc.) Such emphasis on structure and delivery has not been matched by an emphasis on learning (Gibson,1998), an area that has a potential to change and improve distance teaching, learning, material and course development. Consequently, knowledge in this area is rather limited. Gibson(1998) noted that what is not known about distance learning exceeds what we know about it. Therefore, an effective DE provider needs to integrate efforts from all, teacher trainees (TTs) as distance learners being the most important of all. Meeting the learning needs of distance teacher trainees (DTTs) is the foundation of DE. Certainly, it is also a foundation to improve DE materials and course development.

In a DE setting, the process of student learning may be even more complex than the conventional 'face to face' setting. The reason being, perceived obstacles learners encounter may be different from one distance learner to another with varying degrees of complexity. The situation may even be more so in Malaysia as cultural diversity adds on to the existing complexity of today's DTTs heterogenous profile. As Calderhead and Shorrock (1997) pointed that 'classification of ideologies' in education have characterized reform movements within the U.S. These "orientations refers to a body of values and beliefs about teaching and teacher education that influence to shape teacher education courses." The academic, practical, technical and critical enquiry orientation views "offer a perspective on teachers' professional preparation and simultaneously have implications on the design of teacher education courses" (1997:p.1).

Every DTT like any DL brings with him or her a profile (as suggested by diagram 1) which may be similar or different with other DLs. Holmberg (1995) points out that there is "no evidence to indicate that distance learners should be regarded as a homogeneous group; however as indicated by Gibson (1998:p.10) "…distance learners do share broad demographic and situational similarities that have often provided the basis for profiles of the "typical" distance learner in higher education."

However in terms of learning style, there are three possibilities: that every DL is in certain respects like all other DLs; like some other DLs or like no other DLs. Therefore, there is a need to study the DTTs learning in trying to understand the learning process, the learning style preferences (LSP), the learning challenges and barriers, and how the DTTs cope to survive distance learning.

Diagram 1: The Diversity Among DTTs



For the purpose of this paper, attempt will be made to shed some light on the need to understand the DTTs, the learning process they go through and their learning preferences in order to improve or better develop DE materials and courses. This paper will first provide an overview of the literature on learning style and approaches to learning relevance to distance education. This paper introduces some of the basic premise of learning styles and the different theories pertaining to learning styles. Kolb's (1984) theory of experiential learning will then be highlighted, and then we will show how a knowledge of LSP can guide in the development of appropriate instructional strategies. For this purpose, development of a '*Hospitality*' Course is used as an example of how Kolb's model can be integrated with the understanding of LSP in developing or improving a DE instructional and learning materials.

Distance Education Perspective

There is a substantial proliferation of DE courses and programs at the higher education level, and universities are continuing to pour human and monetary resources to further the development of DE offerings. As more and more learners enroll in distance education courses in Malaysia we will see learners with different backgrounds begin to take advantage of learning opportunities. Hence, this entails pedagogical change in teaching and learning at higher institutions. DTEs have to realize the various 'baggage' that these learners bring, their perceptions of the learning experience, and the

coping and adapting processes they develop. Hence, their learning preferences which must be addressed to gain an understanding of how to better meet the diverse needs of these DTTs, and improve the quality of the DE materials development, courses, instructions, and the learning process. Learners according to Dewar, (1995) & Hartman, (1995) who are actively engaged in the learning process will be more likely to achieve success. Similarly, DTTs who are dynamically occupied in their own learning will begin to feel empowered. They will gain control of their learning and training, and as a consequence, their personal attainment and self-direction will rise.

Nevertheless, crucial questions that need addressing here are: How do you get DTTs to be actively involved in their learning?, What mechanism are there that DTEs or instructors can readily use to motivate the DTTs? As proven by many researchers (Bickey & Rodman, 1995; Dewar, 1995; Hartman, 1995), the key in getting learners to actively involved in learning is by understanding *learning style preferences* (LSP). It has also been shown that adjusting and developing instructional and learning materials and courses to meet the needs of a variety of learning styles will benefit learners (Agogino & His, 1995). We feel that this is true for all learners including DTTs. The LSP is a mechanism, and is loaded with data that have the potential of assisting DTEs or instructors for example to build and develop DE materials that are *learners sensitive* and *learners centered*. LSP requires an in-depth analysis and understanding of the prospective learners.

Previously, in the area of learners' approaches to learning, researchers were concerned with how learners achieved high levels of success and understanding of the learning materials. Using different pedagogies, the researchers established strong evidence for the existence of distinct and particular ways of approaching learning which successful learners need to use in order to be successful. The task hence falls on DTEs to improve the quality of teacher training courses and offering various approaches for enhancing the effectiveness of teacher education by providing and developing appropriate instructional and learning materials.

Pask (1977) noted that a resourceful learner, or as he describes it 'a versatile learner' which refers to a learner who could switch between comprehension learning (involving divergent thinking) and operation learning (using factual detail and logical analysis), appeared to have some close similarities to deep level processing learner. There is a need for learners to relate what they were learning to what they already know, and be able to make linkages with other topics if they were to truly understand what they were learning. A number of findings emerged from these early research

which were of particular interest and concern to those involved in teaching. The three most important findings are:

1) the types of intellectual demand made by different subject areas were likely to vary, and that learners' approaches to their studies might therefore also vary;
2) the extent to which the approach adopted by the teacher matched the student's own preferred style of learning could affect the likelihood of a student's success, and
3) the assessment strategy employed could affect the approach learners used. Subsequently this propels many other studies which sought to investigate the relevance and applicability of these ideas in many different contexts and to different types of learners.

In addition, Schroeder (1996) points out that the 'typical' learner learning profile is changing on campuses today and there is much greater variation in the range of the LSP to be considered. Therefore it would be wise to understand what LSP are, and how to address them when preparing instructional materials for adults. As DTTs like any DLs are suggested to be a heterogeneous group of learners, an understanding of their LSP when preparing instructional materials is even crucial as there are "striking differences in the way people learn and process information…" (Birkey & Rodman ,1995)." Therefore, we feel that perhaps one important commitment that a DTE or instructor can do is to be *sensitive, aware and realize* that there are diverse learning styles among the DTTs.

The benefits of distance education are no doubts numerous. However, there is also a 'downside' to it. Learners who are able to study their courses at 'any time and in any place, at the learners 'own convenience' can all too frequently end up trying to fit their studies into odd corners of time in between trying to meet the continuing demands of families and jobs. Also, conditions at home may not be suitable for study. Overcrowding, noise, lack of privacy, lack of required space to spread out books or to write assignments are, for many DLs, the reality of home based study. However, these learners are usually highly motivated and, as mature adults, have life experience upon which they can draw, and to which they can relate their learning to.

The heterogeneous make up of DTTs, the vast development in global higher education, the continuous development of educational technology and information communication technology (ICT) and the very different learner experience of today's learning and the continuing concern

about distance learners completion rates in DE has drawn attention to the potential pedagogical benefits of the work on learners' approaches to study. Such genuine concern has attracted different research in the area. Many of the studies by DE researchers on DLs approaches to study have tended to focus on simple comparisons between learners studying at a distance and those studying campus based courses (Richardson, 1994; Wong, 1992; Morgan, Gibbs and Taylor, 1980). However, there has been an increasing recognition of the importance of investigating the effects of variables other than the mode of study on approaches to learning. The ASI has been used successfully in research into learning effectiveness with learners on open and traditional basic vocational education courses (Calder and McColum, 1998) to examine gender effects; age effects (Richardson,1994); and varying amounts of experience in higher education. Although the importance of environment, as well as heredity, to children's learning has been well debated (Burt, 1970), there have been not many research done by DE researchers into a possible association between DLs study environment and their use of different approaches to their studies.

The evidence from the research on whether there are differences in study approaches between DTTs as DLs and campus based learners appears to be somewhat ambiguous. Wong (1992) reports that Harper and Kember found no significant difference between distance and campus based learners studying similar subjects but did find that the age of the learners appeared to 'have a strong influence on the observed learning style'. However, some studies have found differences in approach between distance and campus based learners. Morgan, Gibbs and Taylor (1980) reported that, while UKOU learners had greater intrinsic and lower extrinsic motivation, there was nevertheless a greater tendency for them to adopt a surface approach.

A number of studies report a significant relationship between a learner's approach to study and the discipline in which the learner is studying (Ramsden, 1984; Entwistle, 1981). Two reasons have been proposed for this. One suggests that learners adopt their learning approach to the perceived expectations of the discipline, while the other draws attention to the different way that knowledge is constructed in science as opposed to the arts or social sciences. For example, Ramsden argues that 'Learning tasks in science are typically described as hierarchical, logical, heterogeneous, and are rule and procedure governed' (Ramsden,1984).

The importance of age in relation to approach to study has been identified in a number of different studies of distance education learners. The evidence in Harper and Kember, (1986) for consistently

points to younger learners adopting a surface approach while older learners are more likely to adopt a deep approach.

In summary, an analysis of the literature generally shows that there are compelling evidence that LSP has direct link to learning success. Understanding LSP is potentially an avenue to improve learning, and building and developing a better course material--one that are student sensitive and student centered, flexible and meeting the diverse needs of the learners.

Types of Learning Styles

Analysis of the literature shows that there are many different types of learning styles. Nevertheless, Curry's (1991) categorization of human learning differences to characterize learning styles (as described in Table 1) is a useful one. It can be divided into four levels as described below:

Table 1: Types of Learning Styles

Type of Learning Styles	**Description:**
Instructional & Environmental Preferences	Are the most observable traits. There are 5 plausible dimensions that mark various preferences: • *Environmental preferences* regarding sound, light temperature, & class design; • *Emotional preferences* addressing motivation, persistence, responsibility & structure • *Sociological preferences* for private, pair, peer, team, adult or varied learning relations; • *Psychological preference* related to perception, intake, time, & mobility. .
Social Interaction Models	Refers to how human in specific social contexts will adopt certain strategies to perform certain tasks.
Personality Models	*R*efer to the level at which our deepest personalit traits shape the orientations we take toward the world The popular *Myers- Briggs Type Indicator* categorizes people as extroverts/introverts sensing/intuition, thinking/feeling, an judging/perceiving. How individuals rate along thes scales indicates tendencies in their attitudes towar engaging the world. This model anchors ou preferences in our very own personality make-up. Fo educators, the question is not simply one of trainabl skills or attitudes but recognizing that learners wh have fundamentally different instincts are in th classroom. They are unlikely (or unable) to b successful when limited to activities that are nc compatible with the attitudes they bring into th learning situation.

Information Processing Models	*A*re an effort to understand the processes by which information is obtained, sorted, stored, & utilized. Probably the most recognized idea about information processing is the right brain/left brain discussion. More complex approach is Kolb's approach to experiential learning which has become a much used model. He maps out four quadrants and shows how they can serve as stages of *wholistic learning* (individual styles are seen as particular strengths in th process).

Learning Styles and Its Effect on Academic Performance

There is a confusing array of terms that may be similar, yet are quite distinct. For example, how are the following three words similar and different?-***learning preference, learning strategy and leaning style***. The three terms need to be differentiated, and Curry's (1991) definitions are adopted, and shown below:

Learning Preference:	Favoring one method of teaching over another
Learning Strategy:	Adopting a plan action in the acquisition of knowledge, skills, Or attitudes
Learning Style:	Adopting a habitual and distinct mode of acquiring knowledge.

Having a clearer concept of the terms, lets move on to a crucial question: What evidence is there that individual differences in learning styles can effect performance in learning settings? How do we know for sure? Much empirical research as shown by Riding & Grimley,(1999); Richardson (1994) signals that learning styles can hinder or enhance academic performance in several respects, although little research has been done on the relationship between instructional design of learning materials and learning styles. This seems to suggest that there is a distinctive research gap particularly on the relationship between instructional design of learning materials and learning styles, and how this may or may not have an effect on academic performance.

Litzinger & Osif describe ***learning styles*** as "the different ways in which children and adults think and learn (1992:p.73)". They see that each of us develops a preferred and consistent set of behaviors or approaches to learning. In order to better understand the learning process, they break it down into several process:

a. ***cognition:*** how one acquire knowledge

b. ***conceptualization:*** how one process information

c. ***affective:*** one's motivation, decision making styles, values and emotional preferences will also help to define their learning styles.

Building on such premises, as supported by the literature, we believe that LSP has an effect on academic performance. Although learning styles can be seen as a continuum, usually learner come to prefer, and rely on, one style above the others. And it is these main styles that instructors need to be aware of when creating instructional materials. And it is this LSP that helps a learner to be successful in his or her learning. Whether it is surface learning versus deep learning, or whether it is individualistic or independent versus group learning, it is the end product which counts the most-the effectiveness of the teaching and learning, and performance of learners.

Applying the Learning Styles Research to Learning Materials Development

There are many ways to "teach" as there are to learn. Nevertheless, the fact remains that we do not see the world in the same way. The same goes for learning. Different DTTs do vary in their preferences on how, when, where and how often to learn.

Distance teacher educators or instructors can design a systematic set of activities that utilize all learning styles before completing an assignment. A model like Kolb's (as shown in diagram 2) can be taken as a set of stages that must all be addressed to provide comprehensive learning of a subject. A student will be expected to be strong in one quadrant but need assistance in others. This systematic, program-oriented approach asks the instructor to go beyond content. He or she needs to organize the course around a model of learning styles that recommends different types of learning activities at each stage of the learning process. Course material becomes organized around themes or problems with the emphasis on how learners develop skills using the content. This model allows each learner to contribute using his or her preferred style while experiencing other styles.

Instructional design is always a complex and challenging task to complete as there are an array of tasks or considerations that one needs to look at when designing or developing a distance teaching and learning materials. However it needs to be emphasized that instructional design decisions be made objectively based not only on desired learning outcomes, but also on motivational, cognitive and most important of all on the learner's perspective and experience. This view of the learning process takes into account contextual and learner variables, and may lead to a constructive improvement – the learners' perspective on course and content design. As expressed by Honebein

et al, (1993), the learner context is crucial in the design process. Research in learning styles is important because it has the potential to provide knowledge and information on learners' learning process. Such understandings surely can be used into the development and design of the learning materials. Materials developers for example, need to take into account the different research on learning styles, and to design materials for flexibility, diversity and balance. The understanding of the learners, their circumstances, their learning process, their LSP, and what they have to say about learning are the most constructive feedback that materials developers should consider. Research on learning styles are the main avenues, and perhaps be a good data base for distance teacher trainers and educators and other researchers and materials developers to reflect and improve their teaching in the future.

Kolb's (1984) Theory of Learning Styles

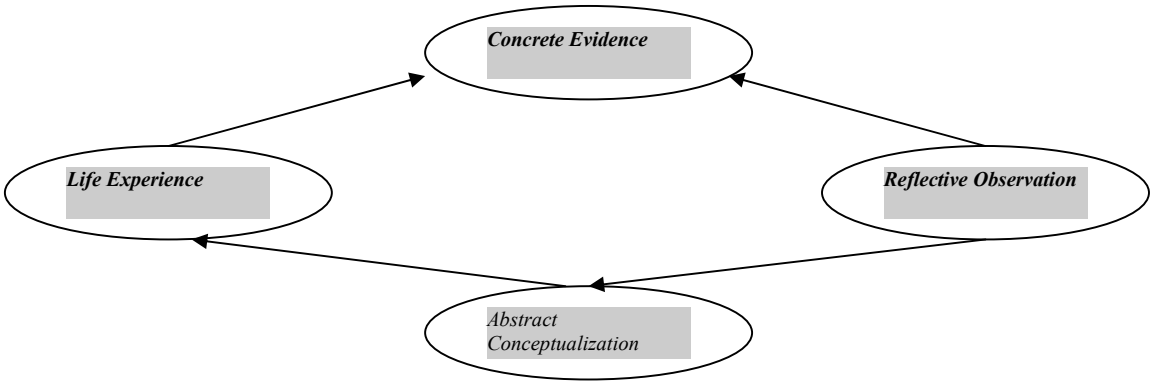
Kolb's description of learning style is seen on a continuum running from:

1. *concrete experience*: being involved in a new experience
2. *reflective observation*: watching others or developing observation about own experience
3. *abstract conceptualization*: creating theories to explain observation
4. *active experimentation*: using theories to solve problems, make decisions

This is a powerful model of a learning cycle and should be a starting point of any teaching and learning materials development because of its consistency with stages of cognitive growth and development. The basic premise of the theory is that learners progress through a learning cycle in which experience leads to observation and reflection, which then lead to concept formation. For the purpose of this paper, some modifications are made on Kolb's 1984 Model. *Concrete Experience* is changed to *Concrete Evidence*. Semantically this paper argues that both terms meant the same. However, the cycle of *active experimentation* provides *evidence s*ome learning or experiencing. In most cases, in an active learning and experimenting, it does provide a good learning experience, so much so 'concrete evidence' of the learning process is made available. Next, the cycle of *Active Ex Eperimentation* is modified *to life experience*. Again, semantically the latter term can be argued to be the same. However, learning is not always about experimenting 'something'. It does however allow one to experience 'something' i.e learning, etc. The terms active experimentation entail a strong association with science, lab work, etc. Life experience is a term we feel to be more flexible

and can be used and associated with many different areas and field of interest. The modification of Kolb's 1984 model is described in the following diagram

Diagram 2: Kolb's (1984) Modified Stages of Learning Cycles



Integrating Learning Styles

Kolb's learning cycle is convincingly an effective learning model. If the learning tasks and activities are balanced by taking into account the Kolb's learning cycle then, the instructional design process for example would benefit. The DTTs differences could be accommodated by presenting information not only in text based form, but also through visuals and perhaps life experience. The multimodality of presentations has the power to enhance learning. The 21st century is no longer about using the *chalk and board* technique in teaching, rather it is more about using the 'better' technologies' such as the multimedia, the internet, field trips, inquiry learning, discovery learning, etc. This is in lieu with the context of *change.* There has been a rapid rate of technological change over the years globally which speculates the future of learning technology. As confirmed by Squires & et. Al (eds.) (2000) that learning technology has change significantly for the better, and is becoming and integral part of, the provision of higher education, enhancing practice and providing the means for innovation in teaching and learning. Hence, if learning technology is to realize its potential, it must be integrated into the daily practice of higher education. Thus, institutions will need to change in order to accommodate the new possibilities.

Thus, it is imperative that learning materials be designed for maximum flexibility and diversity by developing tasks and activities which integrate the various stages of Kolb's learning cycle. This could be true for any courses and for traditional campus based programs and distance learning

programs. The Kolb's learning cycle is adopted here primarily to cater to the learning needs of DTTs by balancing task design to ensure that it encompassed:

1. activities to help DTTs to cope with each stage of the learning cycle.
2. tasks and activities to cater to individual DTT needs;
3. multimodality presentations of information

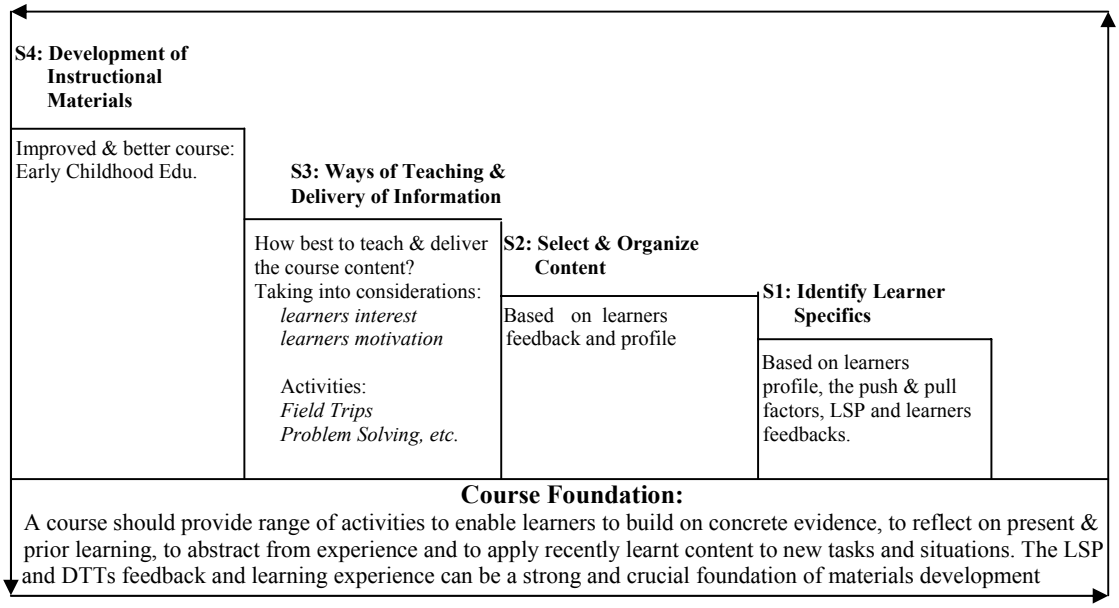
To illustrate the potential of Kolb's learning cycles in developing course material, we use a hypothetical course titled: Early Childhood Education, a course offered to DTTs of Early Childhood Teacher Training Profram . This course is used as an example of how the modified Kolb's learning cycle could be integrated in the material and instructional design. Like any other courses, this course is designed to primarily teach the DTTs about the subject-in this *case Early childhood education in Malaysia*. It encompasses the 4 Kolbs learning cycle as provided in the following diagram:

Diagram 3:Adapting Kolbs' Learning Cycle to Hospitality Course Design

Kolb's learning Cycles	Course Adaptation
Abstract Conceptualization	At this stage, learners are being introduced to Early Childhood Education concepts and theories, and its importance in their training. This is a foundation building process.
Life Experience	Field work/trip is integrated in the course to give learners opportunities to experience on the subject matter relevant to the course i.e a trip to local nursery, and early education centers and primary schools to learn and experience the subject matter first hand.
Concrete Evidence	The field work to nursery and early childhood centers gives a concrete evidence and a better understanding the importance of early childhood education. It s an experience one can refer to.
Reflective Observation	As a required assignment, learners will be asked to write a report based on the field trip. The life & concrete experience allow the learners to reflect on issues relevant to the visit and to the course, and such experience will allow the DTTs to do a reflective writing based on the experience they had.

At the end of the term, DTTs' feedback on the course which encompasses *the push and pull factors of the course, the content of the course, the teaching, the evaluation components, and learners suggestions on improving the course* will be collected and analyzed. It is such data that potentially has the power to improve any course design and development as described in diagram 4. Equally important, DTTs feedback allows a course to be continuously improved from one semester to the other, and the pointed arrow in the diagram that goes in a cyclic motion describes this continuous improvement. Last but not least, in course such as Early Childhood Education Course, field trips provide an enjoyable and effective mean of learning style because such LSP give them a better grasp of the learning and teaching content. Hands-on learning experience such as this one is equally important for campus based program and a distance program. Hypothetically, a distance education course could replicate such activities and project similar results of success.

Diagram4: Development & Improvement of Course Materials as an on-going Process



To summarize, the hypothetical *Early Childhood Education course* design guidelines were based on Kolb's experiential learning cycle (with some modification) and applied to develop learning skills and prepare learners for independent work. Applying the four stages of the Kolb's learning cycles led to the development of a range of activities to enable DTTs to build on concrete evidence, to reflect on present and prior learning, to abstract from experience and to apply recently learnt content to new tasks and situations. In addition, learning activities can be designed with a strong focus on metacognition and problem solving. Throughout the course, DTTs can be confronted with situations and contexts which are problematic and in need of development, for example their own study skills and management strategies. Through inquiry into how others might approach tasks and by comparing this with their own situations, DTTs reflected on aspects of their situations that require change. Reflection and evaluation then led to action, and the learners created an improved study plan in which goals were identified. As much as this works for the campus based learners, it can equally work and be successful for DTTs.

Summary

Learning styles research can give DTEs or instructors new directions for making changes in their classrooms and will continue to do so in the future. Different social groupings, alternative activities, more complex projects can all been introduced as efforts to create opportunities for DTTs to use their various strengths in dealing with different varying course materials. Despite the wide range of models, the concept of learning styles has gained growing attention from educators because it provides a stable-enough characterization to plan pedagogical strategies. These strategies appear more responsive to the DTTs needs. They seem to provide better learning opportunities. They give fresh direction to alternative teaching. Some general conclusions across the LSP models are as follows:

- Learners will learn better when using preferences in which they're successful;
- Learners will be better learners when they can expand their preferences;
- When teaching accommodates various preferences, more learners will be successful;
- Instructors can construct activities that include specific (& multiple) learning preferences, and this can be done by adding alternatives or, completing learning cycles that incorporate all styles or, by utilizing holistic, complex tasks.

Interestingly, one consequence of studying learning styles is the recognition that teacher trainers too have their own teaching approaches. While these may have become habitual, and while the trainers and instructors may define the classroom according to their and not students' preferences, teachers have to acknowledge that their styles will not necessarily suit the DTTs in their classroom. As have been emphasized, distance teacher trainer needs to be *student sensitive* and more *student centered*. In the Malaysian context of education, this is particularly important to ensure the new generation of DTTs are 'better' learners i.e agile, good problem solvers, effective thinkers, independent, etc.

This paper has described how Kolb's learning cycle and associated learning styles may be integrated into the design of learning materials to ensure that DTTs needs and preferences are accommodated. It is suggested that Kolb's learning cycle (1984) can be combined with more conventional methods of instructional design of learning materials, such as events of instruction. The paper also emphasized the need for teacher training materials to be evaluated in terms of learner responses and preferences so that teacher training instructional designers can learn about the needs and cognitive styles of learners and become more responsive to these needs in the design of materials. In addition, we stressed that to improve design of instructional materials, knowledge

about individual DTTs differences need to be integrated and connected directly with the design process, so that instructional materials are not only flexible, but also supportive of diversity and capable of accommodating a wide range of learning styles. Finally we would like to point that the literature on learning styles and individual differences provides a rich data for instructional designers. Consideration of these literature can lead to a greater understanding of learners' approaches to study, greater awareness of individual trainee differences in learning and improved course design to cater for diverse needs of DTTs who are largely 'heterogenous'.

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