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ENABLING CRITICAL LEARNERS AND TEACHER TRAINEES VIA EXPERIENTIAL LEARNING

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ABSTRACT

Learning is a complex process that not only merely involves gathering of information or knowledge but also depicts the process of which knowledge is accumulated. The process of learning is not about accumulation of material of learning but involves the process of changing conceptions. In this context, the focus of this study is on exploring the students' learning preferences in terms of Experiential Learning (EL) styles. A better understanding of EL would allow curriculum planners and implementers of teacher education programmes to come up with ways to increase the teaching and learning experiences of Initial Teachers (ITe). The purpose of this paper is to offer a better insight into the EL practices at Teachers Education Institute. In doing so it is hoped that the study will provide relevant input to develop appropriate training and learning strategies for developing and enhancing teacher education in Malaysia. A self-administered questionnaire was used for this purpose. The respondents of this questionnaire were 91 ITe designated to become special education teachers. To identify new EL categories, factor analysis using varimax rotation was performed. Three categories of EL emerged through this approach. They are 'Lecturer's Teaching Aids', 'Lecturer's Teaching Variety' and 'Lecturer's post lecture support'.

Key Words: Experiential learning, Learning styles, Teacher education, Teaching aids, Initial teachers

INTRODUCTION

In initial teacher education, the concern is to produce `thinking 'individuals who would eventually become critical and reflective teachers. Many teacher educators emphasize on creating opportunities for teachers to use the learning experiences and apply them in their pedagogical practices. The application of this process establishes a good knowledge base in which teachers would be able to use their prior knowledge and experiences in the teaching learning environment. This study focuses on experiential learning styles of Initial Teachers (ITe) using the theories of cognitive thinking and Kolb's learning style inventory and a modified Honey and Mumford's (2000) learning style questionnaire as the theoretical foundation.

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In this paper, we defined EL as a way of introducing experiential learning concepts to Initial Teachers (ITe), as well as representing complex classroom environment and allowing reflections on specific purposes and manners on learning to learn. EL approach encourages ITe to become actively involved in their learning by providing means to generate a more conducive academic oriented scenario. It allows them to reflect on the emotional and rational dynamics of teaching in a classroom, enabling them to generate meaningful and effective learning.

We defined learning styles as individual's preferential focus on different types of information, the different ways of perceiving the information, and the understanding the information (Romanelli, Bird, and Ryan, 2009). Learning styles is an area of interest for many. An in-depth study about initial teachers' EL practices is much needed. Research is needed to clarify how much difference it makes if teaching methods are incongruent with a student's style. Studies that speak to the role and potency of style, seen in conjunction with other important variables, would help educators significantly. The development of better instrumentation to identify styles should be a key part of such research.

The aim of this study is present, explore and discuss EL practices and management of training implications in initial teacher training using factor analysis. This study looks into the different learning styles (as evidenced via the instruments used in the study) and attests these styles to the approaches used by the lecturers. We hope the data obtained would help to provide significant information to help trainers create a positive and productive teaching -learning environment.

This research paper has four main parts. First, a literature review discussion on EL styles, continuum and taxonomy. In the second section, research framework and methodology is explained. The third section of this paper presents the summary of the empirical results of the study. Finally the last section is devoted to a discussion on the results as well as providing implications for initial teacher education.

LITERATURE REVIEW

Learning is a multifarious process that involves many variables. Some of the factors identified are heredity, environment, culture and socialization that play a prominent role (O'Neil, 2003) in propelling individuals to learn. There are two aspects of learning: the act of learning something and the act of expressing that learning (Moon 2004). According to Moon (2004), the act of learning involves `taking in ideas' and the quality and quantity of that act of learning is evidenced via the `expression of ideas' either verbally or in a written manner. He also claims that the crucial aspect is the expression of ideas as these expressions are testimony to the evidence of learning.

The development and increase of learning theories is a constant feature in the academic world. Each learning theory sheds some light on the processes of teaching and learning. However there is not one specific adult learning theory which can be applied to all adult learning environments (Jackson, 2009). An adult learning theory which is widely dispersed in the academic literature is Kolb's model of experiential learning and learning styles (Manocherhi, 2008, Arp & Woodard, 2006). Kolb presents four learning stages in the experiential learning cycle. They are reflective observation (RO), active experimentation (AE), concrete experience (CE), and abstract conceptualization (AC). A brief description on them is shown in Table 1. Depending on which stage a learner is; learners are identified as divergers, assimilators, convergers and or as accommodators (Sherow, 2000).

Knowledge of their learners' styles will help educators in creating effective and productive learning environments (Karim, 2012). For example, divergent learners when faced with new materials will learn better when educators function as motivators instead of just lecturing them (Sherow, 2000). On the other hand, assimilator learner learns better through reading and listening to the lectures given by the educators (Sherow, 2000). Conversely, for convergent learner, educators should function more as a coach, for they learn through trial-and-error. In such instances, the educator's regular feedback will enhance the learning process i.e convergent learner. Equally, for accommodator learner, an educator should monitor their learning. Accommodator learns through self-discovery. Activities which are unstructured suit them best. An educator's supervision and facilitation will ensure these kinds of learners do not divert away from their goal i.e learning.

Research has shown that beginner teachers possess preconceptions and experiences about teaching and learning. Formations of these preconceptions takes place during their school days itself (Shulman 1987). By observing the teaching –learning environment, these learners implicitly conjure images about teaching and learning (Richard, 1998) and these images play a vital role in viewing a teacher training program (Richards, 1998).

The tension in training and learning emerges when the initial teachers find their preconceptions and beliefs conflict with content presented in the training programmes (Richards, Ho, and Giblin, 1996). As such teacher education programmes must provide opportunities for initial teachers to be able to `raise their consciousness to the nature of personalized theories which inform their practice'.

This can be achieved when the initial teachers embark on a journey of self-awareness and realization on the discrepancies between their personal beliefs and the content as presented in the training course. The process of raising their awareness can be realized through the experienced learning ie the four stages as stated in Table 1.

Description of Learning Stages in Experiential Learning

The experiential learning stages are shown in Figure 1 below. The first stage emphasizes the importance of observation as tool for capturing data for learning. The reflective observation phase helps the learners to diversify their perspectives and look at issues of concerns in a multifaceted manner. In this phase the learner is gathering and assimilating the experiences via observation and subsequently making judgments based on the data gathered. However at the point of making judgments the learner keeps an open view to varying dimensions and perspectives of the focal learning issue. Eventually this process develops the learner to be more critical (in terms of selecting relevant and appropriate examples) and achieve the learning goal.

The second level looks at the learner transferring theoretical knowledge to practice. Through this active experimentation stage, the learner gathers the information and uses the information to assess the learning concern. The process of bridging theory to practice can be challenging where at times theory belies practice. At this juncture the learner plays the role as the accommodator in terms of ensuring that the end outcome is achieved. The learner may need to make modifications and changes to complete the learning task.

The third level is the `concrete experience 'stage whereby the learner converges and accumulates experiences through interaction with people. The concrete experiences gained by the learner are then transmitted as learning outcome. The learner uses the experiences and makes appropriate inclusion and changes to his existing beliefs and knowledge base.

The fourth level which is the abstract conceptualization stage involves higher order of thinking. The learner functions as a assimilator where the data and experiences are gathered and synthesized .The learner also assimilates the knowledge gained and uses the learning in relevant context. At this point the learner is highly critical and independent in making informed judgments based on a specific situation or context.

An Experiential Learning Style Theory in Practice

The EL learning style theory provides a general description of how the learners would most effectively acquire information. A teacher needs to seek ways to make the process of making conceptions and establishing the knowledge base catered to the abilities and needs of the learners. For instance, a visual learner could be start by observing visual or pictorial representation of the `learning item or issue' and reflects on the generated data by looking at multiple angles and perspectives before arriving at a judgment point.

This particular EL learning theory relates how learners would learn effectively. As presented in Table 1: the four levels as indicated in the stated table provide insight to the learners' way of `making sense of the learning'. In this manner the trainer merely provides the stimulus in which the learner needs to take on more accountability in unraveling the learning tasks. The four learning stages as depicted in Table One and Figure One relate to the process on gaining and processing knowledge. The learner could gain and process knowledge via any of the three learning style preferences; visual, auditory and kinesthetic mode. Hence, the experiential learning theory encompasses the four levels of learning and three manners of learning (visual, auditory and kinesthetic).

METHOD

The objective of this study is to determine the factors that govern experiential based learning model for improving initial teacher education in Malaysia. Research instrument in the form of a questionnaire was used to determine initial teacher's experiential learning styles and practices. The items in the questionnaire were adapted from an EL learning style theory (Honey and Mumford, 2000).

However the number of questions in the questionnaire was less than usual. This reduction was necessary to enable statistically analysis, when the sample size is small. Questions related to expert judgment, best described EL characteristics were selected. They assisted to identify and match initial teacher's EL styles preferences. These questions covered the theoretical assumptions of EL style (See Table 2).

Irrespective of age, all learners will use the three modalities shown in Table 2; visual, auditory and kinesthetic. To determine any dominant EL style all those three modalities were included in the questionnaire. The questionnaire consisted of 19 variables, of which 2 were socio-demographic variables and the remaining 17 variables describing learning attitudes (Table 3). A five point likert scale ranging from strongly disagree to strongly agree was used to characterize the level of agreement.

A total sum of 91 questionnaires were completed and returned. The respondents were initial teachers (ITE) who were enrolled in a teacher education programme. One of the course these ITE had to take is Action Research (AR).

The questionnaire was analysed using factor analysis. Neal (2010) posited that for factor analyses to be carried out, there must be at least four to five times as many observations as there are variables (i.e excluding demographic variables). For the purpose of the

interpretation, each factor was composed of variables that loaded at 0.4 or higher (Malhotra, 2010). Prior to the factor analysis, the data were screened for normality of distribution. Bartlett's Test of Sphericity (X^2 test) and Kaiser-Meyer-Olkin measure of sampling adequacy was performed. Two ways were used to determine the number of factors. They were an eigenvalue greater than 1 and the results of the screen test. Each factor consisted of items with loadings greater than 0.40. As this was an exploratory study, an alpha level of 0.05 was used as the margin of statistical significance (Malhotra, 2010). A common factor analysis method known as the Varimax Rotation (Neal, 2010) was employed to extract teacher's knowledge.

To support the findings and seek further clarification on some of them, six lecturers were interviewed separately. They were asked to comment on the factors that emerged. Since it was meant only to support the findings, verbatim transcription was done, and only certain points were used in this study.

RESULTS

The overall research objective of the study was to determine the factors that govern the experiential learning of initial teachers. Data was analyzed using the Statistical Package for the Social Sciences (SPSS 14.0). As this was an exploratory study, an alpha level of 0.05 was used as the margin of statistical significance (Malhotra, 2010). A common factor analysis method known as the Varimax Rotation (Neal, 2010) was employed to extract initial teacher's EL.

Two statistical measures were used to help assess the factor ability of the data: Bartlett's Test of Sphericity (X^2 test) and Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO). In this study, the null hypothesis, that the population matrix is an identity test, is rejected by Bartlett's Test of Sphericity. The approximate chi-square was significant at 0.05 level, allowing for factor analysis. The value of KMO statistics was 0.656, is above the required level i.e 0.5, confirmed this.

For the purpose of interpretation of results, each factor was composed of variables that loaded 0.40 or higher on the factor (See Table 4). The total variance explained statistics displayed the initial eigenvalues, extraction sums of squared loadings, varimax rotation sums of squared loadings. In all, the three factors explained 33.43% of the total variance (See Table 5).

Using eigenvalues greater-than-one rule (Neal, 2010) and scree plot, three factors were extracted. The three factors were labelled as "Lecturer's Teaching Aids", 'Lecturer's Teaching Variety' and 'Lecturer's post lecture support'.

DISCUSSION

The first factor (i.e "Lecturer's Teaching Aids) shows that initial teachers learn better when their lecturer uses teaching aids such as paper, transparency and whiteboard when lecturing. However mere use of them is insufficient, as learning increases when the lecturer writes on them during teaching. Item 10 highlights such preferences.

The first factor reflects learning style of assimilators. Teacher educators must have the ability to deliver their lectures in a systematic manner. Teacher educators must prepare their materials in advance. The current practise of giving a 'handbook' to all initial teachers at the beginning of the semester augurs well for such learners. In the 'handbook', contains all the information, such as list of reading materials.

In the long run, initial teachers who are trained in such manner will be more receptive to instructions. As such whenever Ministry of Education (MOE) needs to disseminate new information to its teachers, teachers such as those in this study would be in better position to interpret the requirement of MOE. In other words the current criticism leveled against the cascade mode of disseminating information, information gets distorted and misinterpreted, could be avoided. At the same time, with the advancement of technology especially those related to disseminating information, MOE would save millions of dollars in getting/delivering information/instruction to its teachers. And this money could be used for other academic related purposes.

The exclusion of Item 8 (*I prefer to use electronic media such as email to communicate with my lecturers*) needs to be rectified. Learners prefer an input driven mode, as evidenced by item 6, 11, 12 and 13. Over dependency on learning materials prepared by lecturers does not augur well in producing teachers who are independent learners. Hence there is a need to inculcate independent learners amongst these initial teachers.

However the blame does not lie totally on the initial teachers. Lecturers should empower initial teachers to source for learning materials independently. Teacher educators need to cultivate the habit of using electronic media in communicating with their students. For example, only one of the lecturers teaching this course had the habit of communicating through email. (S)He uses emails to provide lecture notes, while the rest of the lecturers prefer to photocopy lecture notes for their students. Figure 3 shows students' receptiveness of email. It indicates that teacher educators need to take the initial steps in using electronic email. The lecturer who used email admitted there was some resistance towards this approach initially. However the students did realise the merits of this approach. They were able to post questions even after lecture. Besides improving their writing skills, the students found it to be very effective in seeking response to their queries.

Such attempt will have spillover effects. Initial teachers who are exposed to the use of new technology in teaching and learning are better aware of the perils and danger of using them. For instance one initial teacher highlighted the need to have good internet connection to use 'emails'. This student noted that a prerequisite to use technology in teaching and learning is the infrastructure must be in place and of the highest quality.

Apart from providing lecture notes via email, teacher educators should equip initial teachers with relevant skills to enable these teachers to become reflective and critical individuals. As presented in the data, the initial teachers value lectures as a source of information and channel of gaining knowledge. With regards to this, practitioner should take heed on the structure and delivery of the lecture to ensure learning is optimized .The internet could function in as online resource room in which learners can gather more materials and information to reinforce their understanding of their learning. As stated in Table 1, these learners as assimilators who like lectures, analogies, systems, case studies, models, and readings could be trained to use technology as the supplementary mean to access knowledge. Using the internet, teacher educators can encourage initial teachers to use the online resource room to gather materials in order to compare readings and studies of a specific topic.

The second factor, 'Lecturer's Teaching Variety' presents data indicating initial teacher learning style of a converger. The learner learns from experiences where by the foundation of learning takes place on trial and error. These learners prefer field work and learn through observation and practical based activities. They value feedback and appreciate supervision from content experts to seek obvious link between tasks on hand and a problem.

The respondents of this study were involved in preparing a project paper as part of their course requirement. Each respondent is assigned to a lecturer to supervise their work. Lecturers teaching this course had observed the questions posed by the students indicated the application of the theories learnt. For instance, if data collection was the topic of lecture for that day, questions raised during consultation revolved around it.

The depth of question raised revealed the application of the theories taught. One lecturer noted that the students applied the 'data collection' procedures advocated during the lectures. The feedback sessions and supervision by the lecturers helped scaffold initial teachers to meet their learning objectives. This further reinforces the manner in which these initials teachers as convergers gain knowledge.

The third factor 'Lecturer's post lecturer's echoes learning style of an accommodator. It highlights the need for teacher educators to supplement their lectures. Existence of a library is a norm in all teacher institutes. Long operating hours and ample of books provides extra reading materials. For such learners, lecturers should provide a reading list, where it could be found in the library. Besides ensuring availability of the reading materials, lecturers should take note of their students' age and interest. Too sophisticated and advanced reading materials might discourage some from reading it. For example, an article which contains too many mathematical equations requires the reader to have a good grasp of mathematics. As such, those without a good grasp of mathematics might shun away from this article. On the other hand, omitting such articles could be deemed as depriving them of a chance to read them. Therefore selection of reading materials must be given careful consideration, utmost consideration and careful planning will benefit the reader. Above and beyond, lecturers must ensure that their students are reading these materials they have suggested. One way of ensuring this is through tutorials tasks. In order to attempt the tutorial task, students will have to read the articles. Lecturers could assign each student a different article. This will require students to read individually.

These learners prefer the challenges of new experiences, involvement with others, assimilation and role-playing. They like anything new to be explored. They enjoy problem solving activities and often prefer to work in small group. The post lecture learning activities should contain the above mentioned features to enable committed and willing learners. Teacher educator could design learning tasks that requires the initial teachers to work in small group with challenging learning issues. These groups of learners enjoy working with new information and hence the learning task should be designed in a way that encourages the learners to expand their knowledge base.

CONCLUSION

This paper explores the experiential learning style of initial teachers in order to develop and utilize effectively and efficient teacher education strategies and methods. Appropriate teaching and pedagogical strategies in teacher education will promote effective methods to improve the teaching and learning of students at school level.

The mission of an education institution is to create and disseminate knowledge to enable students' to acquire and use the received knowledge effectively. In the context of teacher education, acquiring and use of the knowledge of the receiver i.e initial teacher would be transmitted to their students during the teaching and learning once they are placed in schools. Therefore besides understanding the new knowledge, initial teachers should be able to use this new knowledge effectively. These initial teachers' learning will be reflected in their teaching, when they are placed in schools.

Hence forth teacher training institutions play a significant role in nurturing and enabling these initial teachers to be effective learners and teacher in particular. As such teacher education institutions need to have the right atmosphere to support learning. Conducive environment consisting adequate consultation time and space are of importance.

Conducive environment is necessary for the lecturer and initial teacher to discuss. Lack of space and time often pose a problem. Though 'consultation time' is made available by the lecturers, it did not favour the initial teachers, as it often clashes with their timetable. A more applicable time which is more convenient to both lecturers and initial teachers must be made available for a more meaningful and substantial discussion to take place.

Besides timing, lack of physical space for the lecturer and initial teachers to meet also posed a problem. For example, the respondents in this study were from an institute which was built in 1959, where rooms were not designed for consultation activities. Some of the lecturers had indicated that often consultations were held at public places such as canteen or restrooms, where privacy was limited.

Teacher education institute must have the resources and provide the avenue for initial teachers to learn in a conducive environment. Ample opportunities must be created for them to explore and experience new and various kinds of learning. These training institution function as the `stepping stone 'in which these young initial teachers form their principles of learning and eventually the principles and beliefs in teaching. Thus it is pivotal the training institutes take heed to create a positive environment to nurture and guide these initial teachers to experience learning in a meaningful and significant manner.

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Table-1. Description of learning stages in experiential learning

Stages	Name	Description	Learning style
1	reflective observation Diverger	The learner careful observes before making a judgment. In some instances the learner will begin to look at different perspectives, and search for meaning of the new experience	Likes to use journals and brainstorming. Lectures are helpful if they provide expert explanations and analysis.
2	Active experimentation accommodator	The learner will take some risk, more so when have the ability to get things done, and influencing people and events through action.	Prefers the challenges of new experiences, involvement with others, assimilation and role-playing. Likes anything new, problem solving, and small group discussions
3	Concrete experience converger	The learner learns from experiences, by relating to people	Likes laboratories, field work, and observations. Likes feedback, coaching, and obvious links between the task-on-hand and a problem.
4	Abstract conceptualization assimilator	The learner makes logical analysis of ideas, and plans systematically and acts on the intellectual understanding of a situation	Likes lectures, analogies, systems, case studies, models, and readings. Talking with experts is normally not helpful

Table-2. Classification of Experiential Learning Based Model

Conceptualization of Experiential Learning style model used in research		
Seeing based experience (visual receiver)	Hearing based experience (auditory receiver)	Doing based experience (Kinesthetic receiver)
• Memorizes by creating images • Easily put off by visual distractions • Finds verbal instructions difficult • Remember faces • Strong on first impressions • Enjoys using colour • Often a quick thinker • May focus on the 'big picture' and use advanced planning	• Talks to self-aloud • Memorizes by steps in a sequence • Very aware of rhythm • Easily distracted by noises • May have difficulty with written instructions • Remembers names • Enjoys music and the sounds of words • Enjoys talking and listening • May need time to think	• Enjoys doing activities • Will try new things – likes to get involved Outgoing by nature; expresses emotions by physical means • May find spelling difficult • Likes to solve problems by physically working through them • Is affected by touch or lack of it. • Likes physical rewards • Enjoys holding objects

Source: Adapted from Dunn & Griggs (2003)

Table-3. Items Description

Item	Statement
1	I prefer to be given written instruction.
2	I prefer to be given oral instruction.
3	I learn a topic effectively by asking questions to my lecturer.
4	I learn a topic effectively through discussion with my lecturer.
5	I learn a topic effectively when experiencing it.
6	I learn a topic by reading about it.
7	I learn a topic by discussing with my friends.
8	I prefer to use electronic media such as email to communicate with my lecturer.
9	I can solve a problem when oral instruction are provided.
10	I can solve a problem when written instruction are provided.
11	I understand a topic when the lecturer writes on paper.
12	I understand a topic when the lecturer uses a transparency to explain.
13	I understand a topic when the lecturer writes on the board.
14	I understand a topic when the lecturer explains using a LCD.
15	I learn effectively when an assignment requires problem solving.
16	I learnt better when doing practical simulations of presented topics.
17	I learnt easily when the lecturer has experience on the topics taught.

Table-4. Rotated Component Matrix

Rescaled Factors			
	1	**2**	**3**
Item 1	0.010	-0.119	-0.310
Item 2	**0.552**	-0.049	0.201
Item 3	-0.060	0.262	0.137
Item 4	0.214	**0.759**	0.075
Item 5	0.016	**0.767**	-0.015
Item 6	-0.329	**0.523**	-0.059
Item 7	0.352	0.125	**0.595**
Item 8	0.206	-0.159	**0.545**
Item 9	0.089	-0.275	**0.656**
Item 10	0.254	0.021	0.137
Item 11	**0.713**	-0.025	0.105
Item 12	**0.814**	-0.022	-0.048
Item 13	**0.697**	0.046	0.199
Item 14	**0.782**	-0.019	0.099
Item 15	0.399	-0.364	-0.028
Item 16	0.243	0.051	0.094
Item 17	-0.092	0.315	0.018
Item 18	0.060	0.177	-0.060

Table-5. Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.051	22.506	22.506	4.051	22.506	22.506	3.199	17.773	17.773
2	2.302	12.791	35.298	2.302	12.791	35.298	1.909	10.604	28.376
3	1.615	8.970	44.268	1.615	8.970	44.268	1.901	10.562	38.938
4	0.937	5.539	49.807	0.937	5.539	49.807	0.833	9.182	48.120
5	0.850	4.947	54.754	0.850	4.947	54.754	0.696	8.424	56.544
6	0.703	4.716	59.470	0.703	4.716	59.470	0.247	6.925	63.470
7	0.600	3.000	62.470						
8	0.515	2.930	65.401						
9	0.472	2.286	67.687						
10	0.344	2.180	69.867						

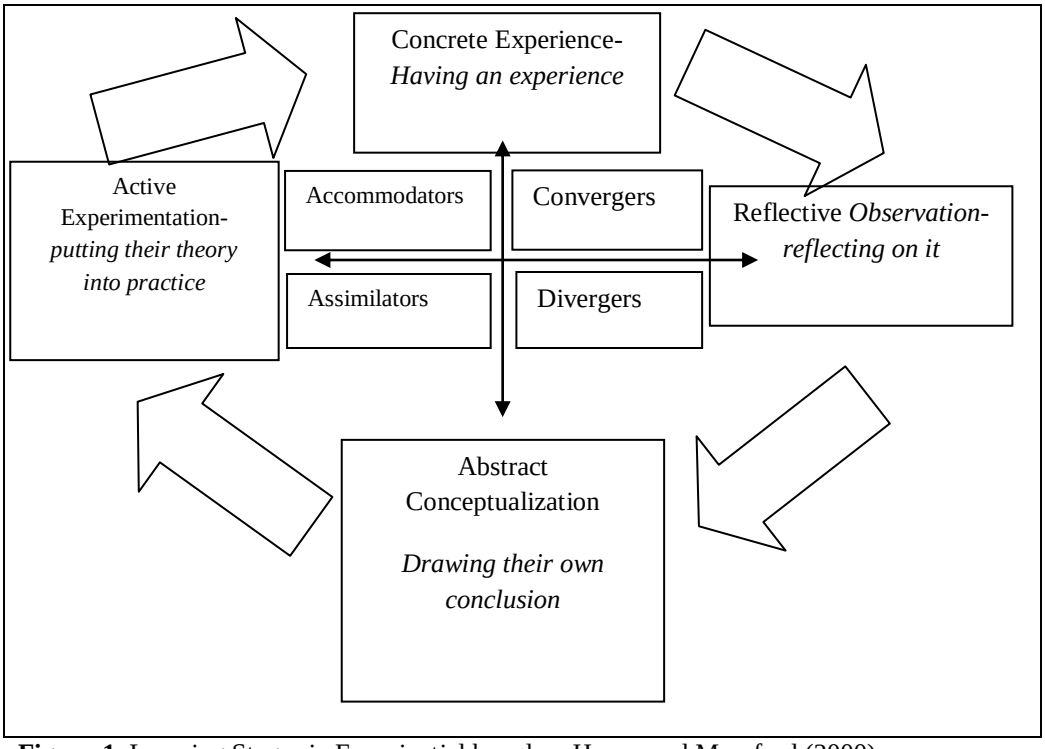

Figure-1. Learning Stages in Experiential based on Honey and Mumford (2000)

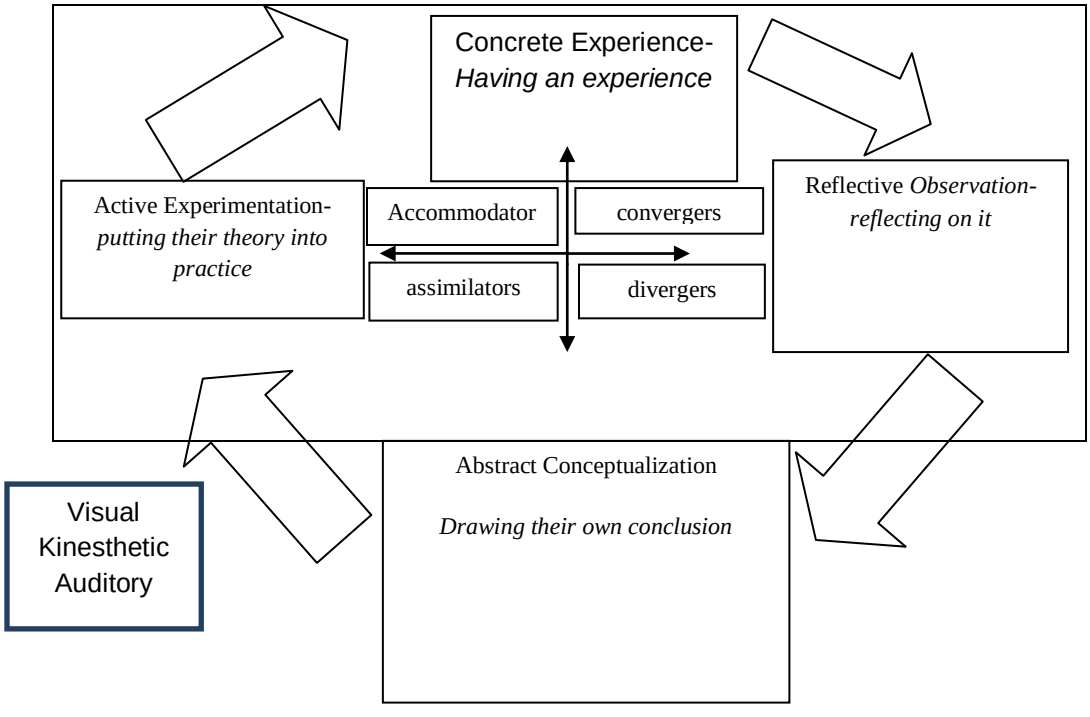

Figure-2. Experiential Learning Levels and Preferences (Adapted from Honey and Mumford, 2000)

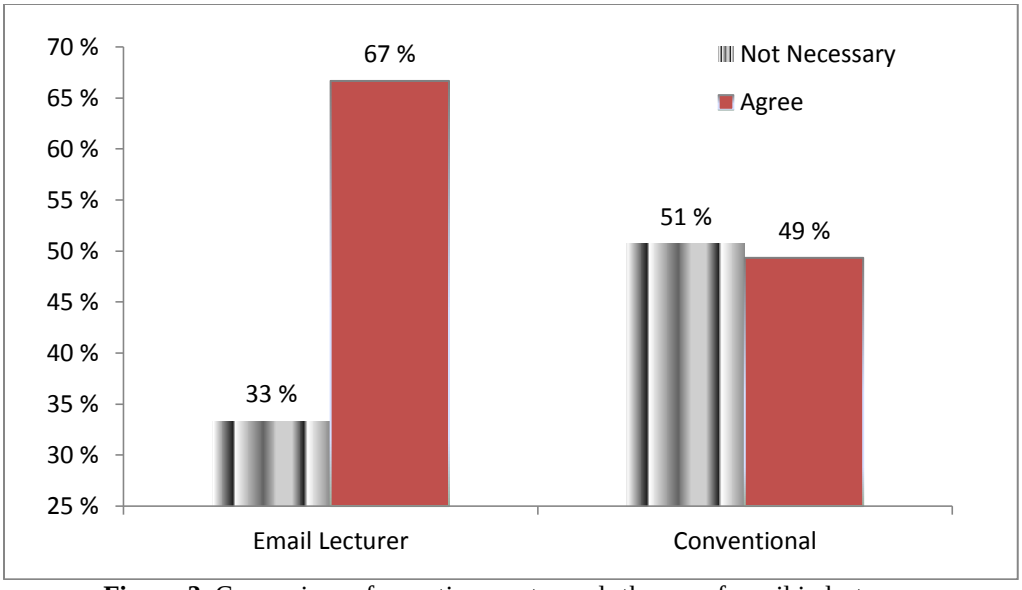

Figure-3. Comparison of receptiveness towards the use of email in lecture.