DICHOTOMY IN ONLINE CURRICULUM DEVELOPMENT APPROACHES - CONTEMPORARY ONLINE LEARNING vis-a-vis COMPUTER SUPPORTED COLLABORATIVE LEARNING ENVIRONMENT

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ABSTRACT

The fields of learning theory, distance education theory and online curricular design in practice, are set for a paradigm change. The author in his research study while developing an exclusive **'Computer Supported Collaborative Learning (CSCL) Environment'** *based on* **'Problem Based Learning (PBL)'** *curriculum design for adult learners has found dichotomy* ***vis-à-vis*** **'Contemporary online learning environment'** *which is based on* **'Subject structured'** *curriculum design approach.*

In this paper the author first justifies the need for PBL curricular design -as a paradigm change from the way present online learning environments are designed and developed for adult learners. The necessity of this change is to satisfy the Andragogical needs of adult learners and due to the dichotomy in the theoretical foundations (Objectivists' theory Vs. Constructivists' epistemology & Transactional Distance Theory), which has bearing on the development of an online learning environment. It follows with its implications on different aspects of curriculum development for an online learning environment. The aspects of curriculum considered are categorized as target learners, curriculum design models, Instructor's role, communication design models, teaching/learning methodologies, goal orientation, pedagogical/andragogical philosophies, and development of learning skills and evaluation of learning. These aspects have been found to represent two extreme design views, when represented on a continuum. The implementation of which then lead to development of different types of learning environments.

Today, most of the programmes offered in online learning mode to different target group of learners, are designed based on 'Behaviorist' Pedagogical way of individualized learning. In this type of environment, the learner experiences courses as highly planned, structured for individual problem solving learning and reflection. To an adult learner such a learning environment does not satisfy andragogical needs. On the contrary, development of CSCL environment through an Internet based programme based on the emerging constructivists epistemology, transactional distance theory and implanted through PBL curriculum design will encourage andragogical way of learning. Finally in the above perspective, the paper elaborates and concludes the way instructional design and curriculum development for CSCL would be different to that of contemporary online learning environment.

KEYWORDS

Behaviorism, Cognitivism, Constructivism, Distributed Technology, Pedagogy, Andragogy, Collaborative Technology, Mental Model, Asynchronous & Synchronous Technology, Epistemology, Zone of Proximal Development, Transactional distance, Well and Ill Structured Problem, Problem Based Learning, Portfolio Assessment.

1. Introduction

The providers of contemporary 'Online Education', has inherited the basic philosophies and design practices propagated by the practitioners of *'formal education'*, *'Print Material'* and *'Distributed Technology'* based distance education. Then, with the emergence of interactive features of *'Internet-based Technologies'*, the distance educators over the last two decades replicated the programme/ courses in 'Online' format, making the teaching learning process more flexible. The Indira Gandhi National Open University (IGNOU) India; University of South Australia; Athabasca University, Canada's Open University; Empire State College, New York; NKI Internet College, Norway; etc. (Jose P.et.al;.Paulsen M & Rekkedal T., 2001; Davis Alan, 2001; Lefor P , Benke M. & Ting E., 2001; King B., McCausland H., Nunan T., 2001) are some of the notable examples of online educational universities converted from traditional distance education. It has been observed that most of the contemporary online educators of today use computer-based technologies only to overcome the instructional barriers caused due to geographical distance between learner and the instructor. The technologies are used to transfer knowledge and provide access to the virtually stored knowledge, anytime and from anyplace. Its course design primarily focuses on individual problem solving learning and reflections irrespective of any age group of target learners (Steed Colin, 2000). The important reasons of such an online-courseware design practices are two folds; firstly the implicit 'Behaviorist' learning theory underlying the curriculum design and pedagogy of online education or training and secondly the technological limitations. But today, with the emerging views of 'Constructivist' epistemology and availability of Collaborative features of *'Internet based technologies'*; the instructional design of 'Contemporary Online Learning' is at the crossroad for a change to an exclusive Computer Supported Collaborative Learning (CSCL) environment. The internet tools available for online collaborations are email, chat, audio and video conferencing, multimedia presentation, discussion board, tools to transfer files, program/desktop sharing and other shared spaces. Therefore development of an online learning environment based on constructivist epistemology using collaborative technology tools and 'Problem Based Learning (PBL)' as a curriculum design and strategy for instruction will encourage CSCL.

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2. The Need for PBL Curriculum Design - for Adult Learning

A paradigm change in the present educational programme design and practices, in particular for adults on job is necessary due to the rapid technological developments occurring world over in the industries and the shift towards knowledge based global economy. The Indian economy and the society are not left untouched with this changeover. Therefore, the future development model of any country (including India) would be based on knowledge based economy with high

level of automation, less and less manual work while computers becoming the main tool catering for the information and production needs of all professions (Schmidt, 1999,p2). The Knowledge Based Society (KBS) (Holford J, Jarvis P & Griffin C 1998) of the future would need entirely new range of *knowledge based competencies* which would drive the emerging knowledge based economy of India. Indeed, this is a challenge to the educators to offer training to technical manpower situated all over the country India. This challenge can be fulfilled only by designing an innovative curriculum that can be offered through Internet based learning mode.

Now, the key to design best training/educational environment for a situation, depends upon the way a curriculum developer analyzes, designs, and implements instruction according to the target learners (children/adolescent or **adult**) would like to learn. Research's carried out on adult education show that ***the adults, being mature, autonomous, experienced, self-directed, intrinsically motivated and goal oriented learners, would like to take responsibility for their own learning process/decisions. Their approach to learning is as problem solving, and the style of learning is by drawing on live experiences, constructing knowledge individually, working and learning in-groups (collaborative learning) [Stephen Lieb, 1991 p1; Knowles L., 1984] rather than to be taught pedagogically*** (*like children & adolescent in contemporary online learning*). These are the deciding characteristics of adult learner. Brookfield Stephen D (1989, p122) considered the above 'Andragogy' as "the true method of adult learning" and so does the author. ***Adult educator Brunner, "goes to the extent recommending that adult education should take place in groups exclusively"*** (Stewart D. Keegan D and Holmberg B. (Ed), 1983, p73). ***Based upon above findings, the author concludes to develop an andragogical Internet based problem solving learning environment exclusively in group/ collaborative learning for adult learners. This exclusive group learning on Internet or CSCL environment can only be developed on 'Problem Based Learning (PBL)' curriculum design model.*** *[The PBL curriculum design model is exclusively based on group/team or collaborative learning and also on Constructivist learning theory].*

In order to develop such as environment for a course, the finding of earlier research projects such as **Knowledge Forum** (Lamon, Reeve and Scardamalia, 2001), **Computer-Supported Intentional Learning Environment (CSILE)** (Lamon, Chan, Scardamalia, Burtis & Brett, 1993; Scardamalia M & Bereiter C,1994), **Belvedere** (Suthers D.D., Toth E.E & Arlene W., 1997), and **Web-based Inquiry Science Environment (WISE)** (Sponsored by UC, Berkeley and National Science Foundation Virginia, USA 1998-2003) are considered as its basis. The findings of above research have shown construction of knowledge through negotiation during their collaborative/ group learning. These Problem based computer supported collaborative learning experiences of learners were provided in Local Area Network (LAN) as well as in distributed environment offered through a programme designed

based on traditional subject structured curriculum model. But contrary to above learning as an experience, the CSCL environment is to offer a complete course on Internet based on PBL curriculum design model. Garrison (2000) writes in his paper that in the area of instructional technology of CSCL, much research work still remains to be carried out. The academias has also suggested the development of collaborative environments as an area of current research [Cicognani Anna, 2000 p156; Koschmann T.D. 1992].

Now, it is also evident from the earlier research studies, that the learning theories as metaphors specifies the conditions under which teaching and learning is enabled or hindered in a learning environment. Hence, the author has considered learning theories as the starting point for the research (Perraton 2000) to understand the underpinning theories of instructional design of the existing online learning environment and to evolve 'PBL' curriculum design for adult learning.

3. Metaphors of Teaching and Learning

Mayer (1996) discusses three metaphors - learning as the acquisition of communication (Behaviorism-stimulus-response), learning as the processing of information (Information Processing Theory- received through senses) and learning as the construction of knowledge through individual and social interactions (Constructivism) (Good T.L & Brophy J.E (1990); Kearsley Greg (2003), Miller P.H.(1983 p255); Doolittle P. E., Camp W.G. p2 1999). These three metaphors Behaviorism, Information Processing Theory and Constructivism can be placed at different points on the 'Continuum for Evolution of Learning theories and Acquisition of Knowledge', as shown in figure [1]. (Pl. see on page no. 146).

The instructional design of the Contemporary Online Learning vis-à-vis CSCL environment are greatly influenced due to the dichotomy existing in above learning theories mentioned in the figure (1). These theories decide the curriculum design approach for a programme in an online learning environment. The theoretical foundation for its implementation can be understood as follow.

4. Theoretical foundation of Contemporary online Learning - Behaviorist Learning Theories

The theory of behaviorism concentrates on the study of *overt behaviours that can be observed and measured (Good & Brophy, 1990). The 'Classical Conditioning' of physiologists- 'Pavlov' and Edward Thorndike, and the 'Operant Conditioning' of B.F.Skinner emphasis learning as a process of 'Stimulus-Response (S-R)' pattern of conditioned behaviour. According to these learning models, the knowledge can be transferred and conditioned behaviour can be generalized if positively reinforced* [Kearsley Greg (a) 2001]. But, Behaviorist views the mind as a "black box" in the sense that learning occurs as a response to environment stimulus, totally ignoring the possibility of thought processes occurring in the mind.

The 'Information-Processing Theorists' did not accept this philosophy, as they saw that chains of stimulus-response pair cannot achieve complex learning. In the context of learning and behaving, they maintained that human mind has its definite role and therefore is something more than what was thought by behaviorist. Atkinson and Shiffrin's- 'Information Processing Model' explains the creation of permanent mental representations/schema/structures in long-term memory that affect behavior (Miller, 1983). Just like Behaviorist, Information-Processing theorists also recognize that much of the learning involves establishing associations through *response and repetition to the external stimulants*. They also acknowledge the importance of *reinforcement*, although they stress its role in providing feedback about the correctness of responses over its role as a motivator. The idea that learning occurs from *'parts to whole'* is another perspective that has remained constant for both Behaviorism and Information Processing Theory.

5. Theoretical Foundation of CSCL - Constructivist Learning Theory

The theoretical foundation to design a suitable CSCL environment is 'Constructivist Learning Theory'. 'Constructivism'- epistemology is the school of thoughts, which encourages active role of learners' in the construction of knowledge through individual and collaborative learning experiences. In this connection, *it is appropriate to recall what* ***Dewey John*** *(1963), the American philosopher of education said about the importance of active collaborative learning over traditional (Behaviorist) learning. He states that*

"there is, I think, no point in the philosophy of Progressive Education which is sounder than its emphasis upon the importance of the participation of the learner in the formation of the purposes which direct his activities in the learning process, just as there is no defect in traditional education greater than its failure to secure the active cooperation of pupils in construction of the purposes involved in the studying."

The philosophy of progressive education is a paradigm shift from traditional 'Behaviorist' way of subject structured learning. Hence, considering the Deweys' philosophy of progressive education as basis for the new curriculum design, the Constructivist learning theory that supports CSCL design can be understood as follow.

5.1 Constructivist Learning Theory

Fosnot (1996) and Steffe & Gale (1995) describes Constructivism as a theory of learning or epistemology, which propagates that the learners actively construct their own knowledge, attach meaning from their experience and through interactions within socio-cultural context *(as cited Doolittle P. E., Camp W.G., 1999 p5).* This Constructivism epistemology can be categorized primarily on the theories of learning propagated by psychologists: *'Piaget's- Cognitive Constructivism', 'Glassersfed's- Radical Constructivism' and 'Vygotsky's- Socio-cultural Constructivism'. The philosophical views of these constructivist theorists*

in connection to socially/ collaboratively-constructed knowledge are the basis of instructional design of CSCL.

5.1.1 Principles of Constructivism for CSCL

In order to develop a CSCL environment, the basic principles of Constructivism derived from psychologists: *'Piaget's- Cognitive Constructivism', 'Glasersfeld's- Radical Constructivism' and 'Vygotsky's- Socio-cultural Constructivism';* are summarized as follows: (Heylighen F., Joslyn C. & Turchin V. (Ed.) cited in wbr Cybernetica, 1997, Doolittle P. E., Camp W.G. p5)

a) Knowledge is not passively received either through the senses or by way of communication (Behaviorism cum Information Processing Theory), but is actively built up by the cognizing subjects (Cognitive, Radical, Socio-cultural Constructivist);

b) The function of cognition is adaptive;

c) Cognition is subjects' organization of the experiential world [Radical Constructivist- Glasersfeld(b)] in varying degree (Bryant & Timmins, 2000) of its accurate representation; and

d) The knowledge is constructed through individual and social adaptation interactions.

◆ Implications of 'Constructivists Learning Theories' on Instructional Technology of Online Education

The implications of the identified principles of 'Constructivist Learning Theories' on Instructional Technology of online education are as follows:

a) It strengthens the philosophy of creation of an exclusive problem based learning environment that will encourage group/ collaborative learning for adults [Brunner as cited by Moore (a) 1983].

b) Adults being mature, self-directed learners (Knowles) would like to be 'Autonomous'. Hence, the autonomous learners will take active part in their learning process and will ultimately take responsibility for their own learning [(Moore (a),1983]

c) The ***approach to learning is as problem solving, and the style of learning is by drawing on live experiences, constructing knowledge individually, working and learning in-groups*** -characteristics of adults, necessities a problem oriented project andragogy. In constructivist way of learning it can be implemented through 'Problem Based Learning (PBL)' environment.

Therefore, such a problem based collaborative and learner-team centered learning approach of adults, will lead to 'Zone of Proximal Development (ZPD)' (Vygotsky). The 'ZPD' can be understood as the difference between -'what problem an individual learner is capable of solving independently', and 'problem solving he/she is capable of performing with the guidance or

collaboration of more capable knowledge peer'(Doolittle P.E , 1997, p1; Vygotsky L, 1978 p86; Driscoll, 2000; Wbr Kearsley G.). The capable peer in CSCL environment would be his social partner or instructor himself.

6. Distance Education Theory

It can be seen from above, that the learning theories provides the foundational psychological learning principles to design instruction and develop the curriculum. Now in order to offer programme, the theories of distance education would provide theoretical foundation as to how instruction can be delivered to the learner at a distance.

Now, Moore M.G. [(a)1993; (c) 1991; (b) 1983] in **'The transactional distance theory'** describes that in a distance education programme, there exist not only geographic separation but also a pedagogical relationships between learners and teacher. According to the theory, this transactional distance is a function of three sets of variables namely -the structure of instructional programme, the interaction between learners and instructor and the flexibility of the learner in the learning process i.e.

Transactional distance = f(degree of structure, degree of dialogue, degree of learner Autonomy).

These three key constituent elements of distance education are the directing factors for Internet based online learning. Moore, further explains the third element as follow:

◆ "Learner Autonomy" [Moore M.G. (a)1993; (c) 1991; (b) 1983] is the extent to which learners make "decisions regarding their own learning" and "construct their own knowledge based on their own experience" and social interactions. Moore M.G.(a) (1983 p85) describing the "term learner autonomy, as the extent to which in the learning-teaching relationship, it is the learner rather than the teacher who determines the goals, the learning procedures and resources and the decisions in the learning programme."

Looking to the past practices Davis (1999), comments that the 20th century was constrained by distance. It was self-paced and based on structured independent learning- instructional design model. Peters Otto(2000) says that, such instructional model "reduces the forms of shared learning, and keeps learners away from personal interactions and critical discourse" (p16). On the contrary, Randy Garrison suggest that the 21st century distance education will be characterized by educational transaction design model where learner will construct their own knowledge based on sustained communication and collaborative learning experiences with the community of learners. Therefore, Garrison challenges distance educators for a paradigm shift from 'Structural' to 'Transactional' issues based distance education. This type of transactional design model can be implemented in a Constructivist way of learning through computer supported collaborative learning environment.

◆ Implications of 'Transactional Distance Theory' on CSCL

In CSCL environment Moore's view on 'Learners Autonomy' in true sense can be implemented.

Based on above emerging theories, the ***'Problem Based Learning (PBL)'***

identified as a curriculum design approach for developing CSCL environment can be understood as discussed below.

7. 'Problem Based Learning (PBL) - A Curriculum Design Approach for CSCL Environment

Problem solving learning can take place typically in two situations namely ***'Well-Structured' and 'Ill-Structured' problems solving situations***. The problem situations that are found at the end of contemporary online learning environment are mostly well-structured problems [Jonassen H.D. (a), 1997]. These Well-structured problems are different from the Ill-Structured problems that the learner faces in CSCL environment due to its complexity.

David H. Jonassen H.D. (a), in his paper distinguishes between 'Well-Structured and 'Ill- Structured' Problems. "The ***Well-Structured Problems*** are constrained problems with convergent solutions that engage the application of a limited number of concepts, rules and principles within well-defined parameters" [p65]. ***The well-structured problems in the CSCL are used to assess learning outcomes of individual learners at different formative stages of learning.***

"The ***ill-Structured Problems*** possess multiple solutions, solution paths, fewer parameters with less manipulability, and contain uncertainty about which concepts, rules and principles are necessary for the solution or how they are organized and which solution is best"[p65]. ***This real world ill-structured problem would be - 'Plan, design, develop and implement a sample online learning course based on 'CSCL Curriculum Development Approach'.***

8. CSCL vis-à-vis Contemporary Curricular Development Approach

The implication of theories of learning and distance education that had been discussed above, promotes different curriculum and instructional design approaches for online Internet based education and training. The Curriculum design approach of the contemporary online learning is based on pedagogical way of well-structured problem solving. But the CSCL is based on simulated real world Ill-Structured Problem Based Learning (PBL) curriculum and instructional design approach. According to experts, these Well-structured problems are different from the Ill-Structured problems that the learner will solve in a CSCL, 'Problem Based' Curriculum design approach.

Now, if the contemporary online learning environment is further looked at, then we find that the instructor performs a didactic role and presents web-based course content to a learner for individual learning and reflection through well structured problem solving. In CSCL environment the learners as problem solvers who are situated at geographically distant places collaborate, analyze, synthesize in a group with asynchronous and synchronous communication tools. In such a learning environment the role of the instructor becomes as coach, guide and mentor. The paradigm shift in the development of CSCL environment from that of contemporary online learning environment can be appreciated by the figure (2) (pl. see on page No. 146)

In developing these online learning environments, the Target learners, Curriculum Design Models, Instructors role, Communication design model, Teaching/Learning Methodology, Goal Orientation, Pedagogical/Adragogical Philosophies, Development of Learning skills and Evaluation of learning etc., the instructional design aspects which are considered, represent two extreme design views on a continuum. This 'Continuum Depicting Dichotomy of Online Curricular Design Aspect' is shown in figure [3].(pl. see on page No. 147)

In order to provide further basis to the study done by the author, the various curricular development aspects depicted on the continuum (figure 3) are further summarized in the table (1).

Table (1) CSCL vis-à-vis Contemporary Curricular Development Aspects

CURRICULAR DEVELOPMENT ASPECTS	CONTEMPORARY ONLINE LEARNING	COMPUTER SUPPORTED SUPPORTED COLLABORATIVE LEARNING
Target Learner	Children, adolescents and even Adults who are not at a state of readiness for self-directed learning.	Adults
Learning Theory	Behaviorist and Information Processing Theory (Peters Otto 2000 p1, p2, p8, p9	Constructivist Epistemology
Curriculum Design Approach	Content Structured Curriculum Design Approach- ●Well Structured Content Based Learning - <Part to Whole> approach to achieve the desired learning objectives of the course, the compartmentalized content in parts are sequenced and presented in learning hierarchies in from lower to higher order learning in form of different subjects of a programme. ●The learner interacts with the content material of each subject repeats back to the instructor (reproduction during assessment by solving well-structured problems). It emphasizes on learners' overt behavior on a particular kind of stimulus, which can be modified by rewards and punishments (Skinner). The learner thus learns the skills in parts and develops pre-defined discrete competencies in each subject matter. (Peters Otto 2000 p1, p2,p8,p9) ●The technology mediated communication of learning environments places both instructor as well as	Problem Structured Curriculum Design Approach- ●III-Structured PBL - <Whole to Part> A holistic open ended and simulated real world challenge in form of an ill structued 'problem-based project is decomposed into simple to complex sub-problems with related processes, contextual domain knowledge and is organized in form of web-based contextual domain knowledge/ repository. ●The learner as active problem solver confronts an ill-structured problem assigned to them trough individual and group efforts,decomposes into sub-problems (1...n), designs their own learning environment and processes, progressively constructs indvidual knowledge to achieve the shared goal(s). Thus they develop the requisite real world problem solving competence. ●the technology mediated communication of CSCL environment focuses on 'Learners Team & Design

	individual learner of course at the centre of the learning process. ●Instructor centered Communication- the role of technology is as a sustitute of teacher for delivering instruction by providing access to web-based material and assessing the learner. This model creates a one to one relationship for learning and socialization purposes. ●Learner centered communication the learner through web-based interface interact at their own place and time.	Centered Approach'. The role of technology is to establish/ facilitate communication among peers, tutor, instructor, and with the web-based contextual domain knowledge so as to help the learner to design their environment & learning processes.This creates a multilateral relationship among the learners & Instructor during the construction of knowledge.
Instructional Design Approach	Instructive / Prescriptive- ●In contemporary learning environment,the learner's abilities to share responsibilities for the learning process are ignored and are considered as passive recipients of instruction. (Peters Otto 2000 p1, Moore M. G. [(a) 1993; (c) 1991 (b) 1983, (d) 1980)] ●Believes in the Pedagogical Philosophy that the 'knowledge can be transferred'. (Peters Otto 2000 p1) ●A highly planned, structured, prescriptive, autocratic, algorithmic,guided but often-rigorous study course(s) and tasks for individual reflection and problem solving is created.	Constructive- ●The learner with his previous experiences actively participates in the instructional process. Belives in Constructivist epistemology which supports and ragogical philosophy where the 'Knowledge has to be constructed'. The learners in this democratic environment are considered as autonomous and active participants in the learning process and are treated ultimately responsible for their
CURRICULAR DEVELOPMENT ASPECTS	**CONTEMPORARY ONLINE LEARNING**	**COMPUTER SUPPORTED COLLABORATIVE LEARNING**
	●The Planned courses have thier learning 'objectives','methods', 'materials' and 'evaluation scheme' defined by the tutor himself. (Peters Otto 2000p1)	The learners themselves define thier learning 'goals','objective', select their own 'method', 'materials' and justify thier own learning. In order to ensure uniform learning takes place they are also assessed by the instructor.
	• Develops lower order cognitive skills - develops knowledge, comprehension and application level skills.	• Develops both lower & higher order compex skills. It also helps to develop some desirable interpersonal skills like mutial respect, cooperation, teamwork, leadership etc.
	• Uses tools like email, chat and at times bulletin board etc mostly for socialization purposes & counseling purposes.	• Uses asynchronous and synchronous comunication tools to construct knowledge through collaboration.

Assessment Scheme	***Examination Orientation (Product Focus) -*** Compartmentalized knowledge in form of subjects enable development and assessment of competency subject-wise (bits and pieces. It focuses on examination-based assessment(criterion referenced tests), mostly makingthe learner competing and grading against each other for success rather than focusing on developing processes and for authentic assessment.The students are more passive recipient of assessment. • Individual learning is also assessed by criterion reference testing using well-structured problem.	***Portfolio Oriented (Process cum Product Focus) -*** • The PBL curriculum design approach based on Constructivist psychology moves towards more authentic assessment. It focuses more on the process of learning and degree to which the problem solving competency and the product has been developed. Portfolio gives more information on the process skill developed (how a skill has been developed) justifying the problem solving competencies of each individual learner has acqured; duly supported by evidences. The learners are active during asessment (wbr Cybernetica, 1995) • Individual learning is also assessed by criterion reference testing using well-structured problem.
Instructor Role	***Didactic-*** • The programmes offered are designed based on Behaviorist way of learning that support traditional / conventional didactic role of an instructior as the 'the teacher' (information provider). The role of the instructor is autoratic and through highly algorithmic planned and structured programme, prescribes the content to be learned and learning objectives to be achieved	***Facilitatior, Coach, and Mentor*** • The Instructor in the programme designed based on Problem structured curriculum approach in Cosnstructivism way of learning environment; has a role change in CSCL environment from didactic insstructor to as a facilitator of a democratic collaborative learning environment, coach, guides and mentors the autonomous learners to achieve their shared learning goals(s) (Savin-Baden Maggi, 2000 p62-63, p77, p140).

9.0. Conclusion

The educational theories as metaphors specify the conditions under which learning and teaching is enabled or hindered in an online learning environment. The knowledge of how adult learner learns and the paradigm shift from Objectivist theoretical foundations to Constructivist epistemology has therefore necessitated changes in curriculum and instructional design of online learning courses.

This explorative research study highlights the dichotomies in the learning theories and proposes the instructional and curriculum design issues related to computer supported learning in contrast with contemporary online learning. As compared to Behaviourist pedagogical - contemporary online learning, the computer supported collaborative learning encourage Constructivist way of learning which will enable active role of adult learners' in the construction of knowledge through individual and collaborative learning experiences with the community of situated learners. The innovative CSCL environment will also enable the technical manpower on job to develop new competencies such as real world problem solving skills, higher order complex skills, thinking skills, initiative, creativity, communication skills, leadership ability, systems thinking approach, collaborative work skills, learning to learn skills, etc. in

today's changing technical knowledge and dynamic work culture.

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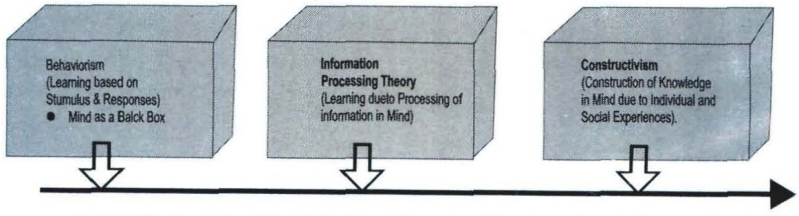

Figure [1] : Continuum for Evolution of Learning Theories & Acquisition of Knowledge

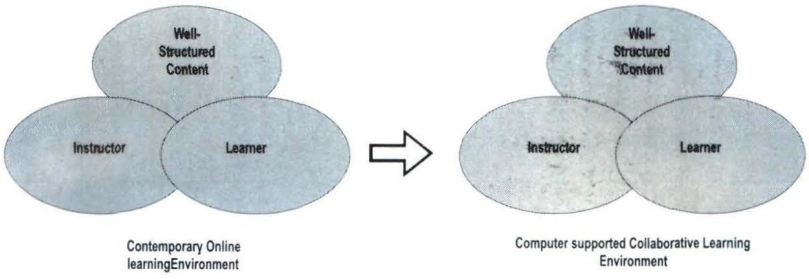

Figure [2] : ParadigmShift in CSCL Environment

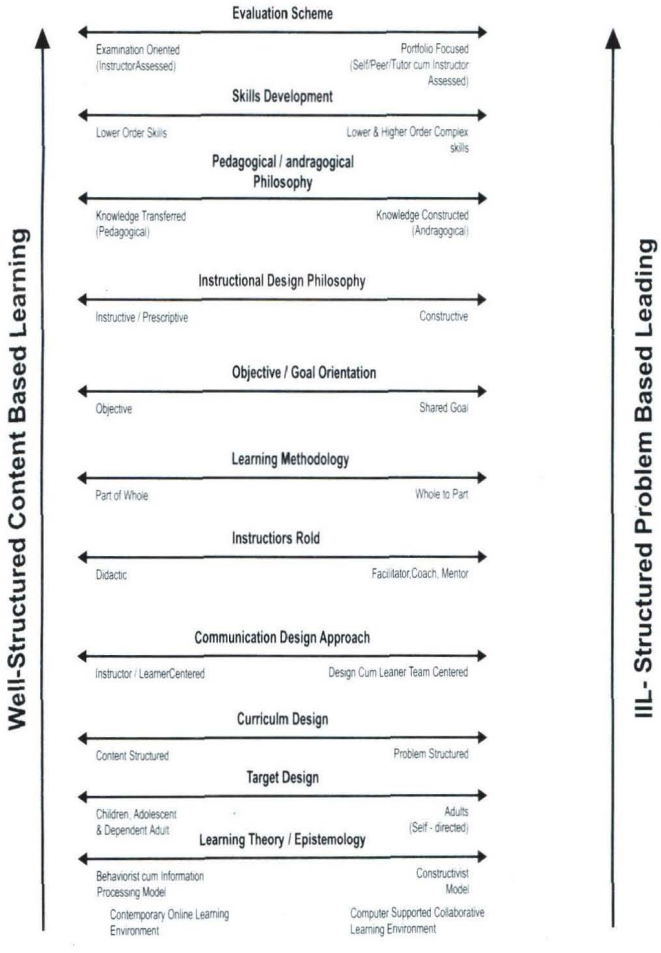

Fig [3] : Continuum Depicting Dichotomy in online Curricular Development Aspects