APPLYING LANGUAGE LEARNING THEORIES TO THE USE OF VIRTUAL CLASSROOM IN TEACHING LITERATURE – A PILOT STUDY

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Technology is pedagogically neutral and can therefore be applied quite merrily to many theories and pedagogies (Nichols, 2003). However, McLeod (2003) suggests researchers to consider principles of virtual learning by means of historically grown learning theories like Behaviourism, Cognitivism, and Constructivism.

Behaviourism & Virtual Classroom

The behaviourist theory is influenced by researchers like Watson, Thorndike, Pavlov, and Skinner. According to Skinner (1974), learning is a chance in observable behaviour caused by external stimuli in environment. Behaviourists see the mind as a black box in the sense that a response to a stimulus can be observed quantitatively, totally ignoring the effect of thought processes occurring in mind. They look at overt behaviors that can be observed and measured as indicators of learning (Good & Brophy, 1990).

Atkins (1993) highlights four aspects relevant for realising virtual learning courses with respect to the behaviourist theory:

1. Students should be told the explicit outcomes of the learning so that they can set expectations and judge for themselves whether or not they have achieved the outcome of the online lesson. Learning materials should be broken down into small instructional steps being presented in a deductive way by means of starting with a rule, category, principle, formula or definition, giving positive examples to reinforce understanding, and showing negative examples to establish conceptual boundaries.

2. Teachers have to define sequences of instructions using conditional or unconditional branching to other instructional units and pre-determining choices within the course. The learning materials must be sequenced appropriately to promote learning. The sequencing could take the form of simple to complex, known to unknown, and knowledge to application. The sequence and pacing through the materials are usually beyond learner control.

3. To maximise learning efficiency, students may be routed to miss or repeat certain sections based on the performance on diagnostic tests, or on tests within the sequence of learning

activities. Nevertheless, the teacher may also allow a student to choose the next instruction out of a set of activities, giving the learner more control over the learning process.

4. Students are supposed to build proficiency by frequent review or revision with check tests at strategic points or repeat practice with feedback. Instructional design emphasises low error rate and the usage of remedial loops back through material if necessary. Reinforcement messages should be used to maintain motivation. Students must be tested to determine whether or not they have achieved the learning outcome. Online testing or other forms of testing and assessment should be integrated into the learning sequence to check the learner's achievement level and to provide appropriate feedback. The implications on virtual learning can be summarised by the concept of drill and practice, portioning materials and assessing learner's achievement levels, and giving external feedback. (Moedritscher, 2006)

Cognitivism & Virtual Classroom

Ulric Neisser, Robert Gagne, and Noam Chomsky are some of the proponents of Cognitivism. Cognitivists consider learning as an internal process that involves memory, thinking, reflection, abstraction, motivation, and meta-cognition (Ally, 2004). They look at learning from an information processing point of view, where the student uses different types of memory during learning. Information is received through the senses into the sensory store before processing occurs. The information persists in the sensory store for less than one second (Kalat, 2002). If it is not transferred to working memory immediately, it is lost.

The cognitive theory recognises the importance of individual differences and of including a variety of learning strategies to accommodate those differences. Learning styles refer to how a learner perceives, interacts with, and responds to learning material. Cognitive styles describe learner's preferred way of processing information (i.e.) a person's typical mode of thinking, remembering, or problem solving.

According to the cognitivist learning theory, teachers have to consider the following aspects for realising virtual learning courses:

1. Strategies should be used to facilitate maximum sensation in students so that the information they perceive and attend to transfers to the working memory. Examples include the proper location of the information on the screen, the attributes of the screen (colour, graphics, size of text, etc.), the pacing of the information, and the mode of delivery (audio, visuals, animations, video, etc.).

2. Strategies should be used to allow students to retrieve existing information from long-term memory to help make sense of the new information. Examples include advanced organisers, conceptual models, pre-instructional questions, etc.

3. Information should be chunked to prevent overload during processing in working memory (Miller, 1956). If the learning items exceed a number of five to nine, the teacher should provide linear, hierarchical, or spider-shaped information maps. To facilitate deep processing, students should be asked to generate information maps during the learning process or as a summary activity after the lesson (Bonk & Reynolds, 1997).

4. Strategies requiring the students to apply, analyse, synthesise, and evaluate information in real life scenarios should be used to promote deep processing of information and higher-level learning.

5. Virtual learning materials should include activities for the different learning and cognitive styles. With respect to dual-coding theory, information should be presented in different

modes to accommodate individual differences in processing and to facilitate transfer to long-term memory.

6. Students need to be motivated to learn by means of learning strategies addressing intrinsic motivation (driven from within the student) and extrinsic motivation (teacher or performance driven). The teaching strategy should enforce students to use their meta-cognitive skills by reflecting on what they learn, collaborating with other learners, or checking their progress.

7. The teaching strategy should connect learning content with different real-life situations so that the learners can relate it to own experiences and memorise things better. The transfer to real-life situations could support the development of personal meaning and contextualisation of the information.

Cognitive learning theory focuses on the students' ability to receive, process, and transfer of information into long-term memory for storage. The teachers have to consider different aspects like chunking the learning content into smaller parts, supporting different learning styles up, initiating higher concepts such as motivation, collaboration, or meta-cognition, etc. Although the cognitive approach is well suited for reaching higher-level objectives in virtual learning, it is not applicable if the students lack relevant prerequisite knowledge. The teacher has to ensure that the instructions are appropriate to all skill levels and experiences, which is evidently costly and time-consuming.

Constructivism & Virtual Classroom

John Dewey, Jean Piaget, and Audrey Gray are some of the proponents of Constructivism. Constructivism represents a paradigm shift from education based on behaviourism to education based on cognitive theory. Behaviourist model for instructional design develops a set of instructional sequences having predefined outputs which are used for subject development. Cognitive theory concentrates on the conceptualization of students' learning processes and exploration of the way information is received, organized, retained and used by the brain (Thompson et al, 1996).

Gagnon and Collay (1999) state that in constructivist paradigm, knowledge is constructed by learners during (1) active learning, (2) making their own representation of action, (3) conveying meaning to others, and (4) explaining things they don't understand completely. At the minimum, a learning environment contains: the student and a setting or space wherein the student acts, uses tools and devices, collects and interprets information, interacts with others, etc. (Wilson, 1996)

According to constructivists, knowledge is not received from the outside or from someone else; it is the individual student's interpretation and processing of what is received through the senses that creates knowledge. Students should be allowed to construct knowledge rather than being given knowledge through instruction (Duffy & Cunningham, 1996).

A major emphasis of constructivists is 'situated learning' which views learning as contextual. Learning activities that allow learners to contextualize the information should be used in virtual learning.

1. Learning should be an active process. Students should be active doing high-level activities such as asking learners to apply information in practical situations, facilitating personal interpretation of learning content, discussing topics within a group, etc.

2. Students should construct their own knowledge rather than accepting that given by the instructor. In virtual education, learners experience the information first-hand which gives them the opportunity to contextualise and personalise the information themselves.

3. Collaborative and co-operative learning should be encouraged to facilitate constructivist learning. Working with other students gives real-life experience and allows the students to use and improve their meta-cognitive skills. When assigning students for a group work, the teacher should take care to match the expertise level and learning style of the students so that the team members can benefit from one another's strengths.

4. Learners should be given control of the learning process. Besides, there should be a form of guided discovery where learners can make their decision on learning goals, but can also use some guidance from the instructor.

5. When learning online, students should be given time and opportunity to reflect the learning content. Embedded questions on the content can be used throughout the lesson to encourage reflection and processing of the information.

6. Learning should be made meaningful for learners. The learning materials should include examples that relate to students so that they can make sense of the information. Assignments and projects should allow learners to choose meaningful activities to help them apply and personalize the information.

7. Learning should be interactive to promote higher-level thinking, social presence, personal meaning, etc.

According to Heinich et al. (2002), learning is the development of new knowledge, skills, and attitudes as the student interacts with the information and environment. Students receive the learning materials through technology, process the information, and then personalize and contextualize the information. In the transformation process, learners interact with the content, with other students, and with the teachers to test and confirm ideas and to apply what they learn.

Examples of constructivist learning can be found within the scope of experiential learning, self-directed learning, context-aware learning, and reflective practice. Constructivism has a variety of advantages like the presentation of content from multiple perspectives, active knowledge construction, development of meta-cognitive skills, etc. Its few drawbacks are problems in adequately evaluating the learning process, lack of instructional resources to respond to the multitude of student interests or higher effort to create context-based learning content, restrictions on driving the learning process to a certain direction, higher drop-out rate due to a lack of extrinsic motivation for students with low capabilities on self-directed learning, etc.

Constructive Learning Environments (CLE) and Learning through Games are the two major approaches built on constructivist model of learning. These systems provide effective playing grounds for the students to try out what they learn and get constructive feedback. The playing ground drives learning as well, since the focus is on learning whatever is required to handle the assigned task well. The playing ground can take a variety of forms from the simple descriptive problem solving to simulated building of a device (Sasikumar, 2008).

For example, a chemistry lab CLE allows the students to load various chemical constituents used in a lab (acids, bases, salts, indicators, etc.) into typical lab equipments like beakers, pipette, etc. and mix them as they like. Indicators can be added to check the status and transitions of ph values. The system shows elaborate details for each product selected by the learner. It also tracks the behaviour of products added in the containers. These are powerful ways for students to internalise the concepts of chemical reaction in a virtual classroom.

Developing a CLE is a challenging task, in general. Unlike simple e-books or video lectures, CLEs require the system to possess a sophisticated domain model. The system needs to model the various components of the task (e.g. the various compounds in the chemistry lab scenario), the way they interact with each other, the result of such interactions, and the various misconceptions that a student can have in the domain. All of these are open ended problems. Developers device various engineering approximations and solutions to bring reality to the virtual CLE (Sasikumar, 2008).

Pilot Study by Belgiliya Lincy of C.T.T.E College for Women, Chennai

Chevalier T. Thomas Elizabeth College for Women is located near Perambur in Chennai. It is the first self-financing college under the University of Madras. It offers courses like B.A. (English), B.Sc. (Maths, Physics, Computer Science), B.Com (Gen., CS, A&F), BBA, and BCA. It has post-graduate courses like M.A (English) and M.Com (General). It also offers M.Phil (Full-time) and Ph.D (Part-time) in English and M.Phil (Full-time) in Commerce.

S. Belgiliya Lincy of II M.A. (English) did a pilot study on *Teaching "A Raisin in the Sun" Using Virtual Classroom*. She enrolled as an online teacher in Wiziq.com. She chose or created content with pedagogic value. She shared the trailer of *A Raisin in the Sun* in the virtual classroom as a Pre-reading activity. After viewing the trailer, the participants were asked to complete a quiz on the trailer. This was to check their prior knowledge, prediction, and inference. She shared a PPT on the *Elements of the Play "A Raisin in the Sun"* and made the participants to do another quiz testing their understanding of genre, plot, characters, sets, costumes, language, etc. Then she shared a Word file describing the literary elements in the play. She made the students read the important quotations and explanations and write assignments and do projects on the play *A Raisin in the Sun*.
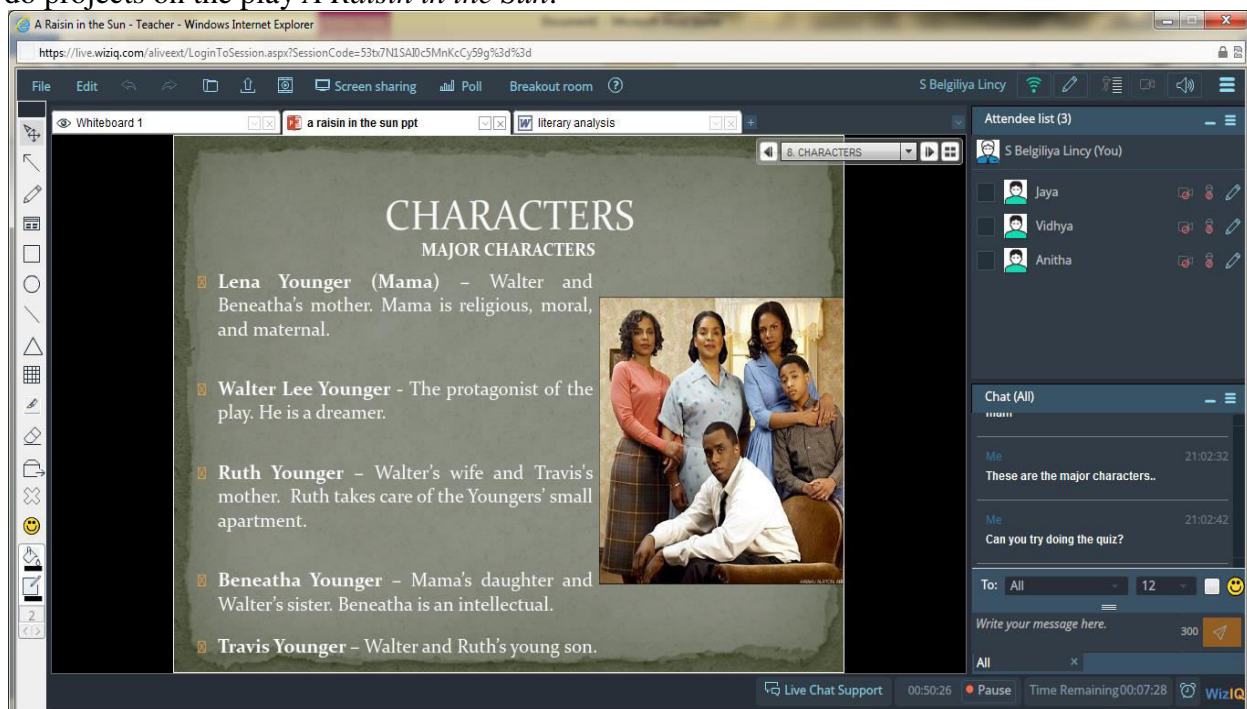
Applying Behaviourism to Lincy's Virtual Classroom:

Participants were clear about the outcomes expected out of the virtual learning course. The whole play was broken into small instructional steps i.e., lessons in the form of Video Trailer, PPT, and Word document. The sequencing was from simple (predicting the main idea) to complex (literary analysis). The participants could repeat seeing/reading certain sections (elements of the play or literary analysis) and repeat doing the online quizzes and assignments/projects. The participants' achievement levels could be easily measured, and feedback could be given frequently.

Applying Cognitivism to Lincy's Virtual Classroom:

The instructional materials (Video Trailer, PPT, and Word File) were chosen or created to grab the attention of the students, maximizing the transfer of information to their working memory. The quiz on the video trailer (pre-instructional material) checked their prior knowledge on Afro-American Literature. Information was chunked to prevent memory overload. The PPT described the elements of the play slide by slide while the Word file contained information on literary analysis along with important quotations from the play. The assignment questions helped the students apply, analyse, synthesise, and evaluate information in real life scenarios. Information presented through different modes (Video Trailer, PPT, Word File) facilitated the transfer of information to long-term memory. Students were extrinsically motivated by the teacher and intrinsically motivated by the new technology (virtual classroom).

Applying Constructivism to Lincy's Virtual Classroom:

Students were allowed to share their personal interpretation of learning content (*A Raisin in the Sun*) through the assignments, projects, and group discussions. They were not restricted to teachers' ideas alone; they got an opportunity to contextualise and personalise the information themselves using the Video Trailer, PPT, etc. In the virtual classroom, they interacted with the teacher and other participants, facilitating collaborative and co-operative learning. They were allowed to take up the quiz anytime and decide upon their learning goals. Embedded questions on the content (quizzes and assignments) helped them in reflection and processing of information. The embedded activities helped them in choosing meaningful activities, applying and personalizing information, and constructing new knowledge.

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