Learning Collaboratively with Web 2.0 Technologies: Putting into Action Social Constructivism

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Abstract

In many schools of India, students of even elementary level are encouraged to use computer and the Internet for carrying out assignments independently during the summer break. This reflects the schools' efforts to use the potential of Information and communication technology (ICT) for supporting constructive learning. Technology can also address the social dimension of learning by supporting not merely cooperation but also collaboration. Unlike web 1.0, web 2.0 can facilitate collaborative content creation, thereby making learning a socially constructive process. Therefore, teachers may design learning activities for ICT mediated collaborative work. The first objective of this study was to determine whether assignments that required students to use ICT were also meant for collaborative work. The second objective was to determine whether students preferred individualized or teamwork. Descriptive method was used. Data collected with the help of questionnaire and interview from 72 students and 24 teachers of 12 schools of New Delhi were interpreted. Nonrandom sampling being the limitation of the study, generalizations will not be permitted. It was found that although learners preferred teamwork, the concept of collaborative learning was yet to be implemented by schools and a strong bias towards individualized work with web 1.0 persisted. In the light of the findings it has been suggested that students be trained in web 2.0 technologies and initiated in collaborative learning practices.

Keywords: *elementary education, assignment, Information and communication technology, social constructivism, collaborative learning, web 2.0 technology*

Introduction

There is an oft-repeated accusation that schools in India fail to consider learning as an active and social process. The foreword of the National Curriculum Framework (NCF) (2005) of India, blames schools for emphasizing memory-based short-term information accumulation over meaningful learning. NCF (2005) also emphasises the need for interactive learning as in Indian schools, learning apart from being passive is often an individualized process. NCF (2005) thus urges schools to shift towards an educational paradigm based upon social constructivism that views knowledge creation as an active and social process.

Constraints like high teacher–student ratio, an evaluation system, which emphasizes assessment of product rather than process and encourages rote and recall abilities and teachers lacking the necessary understanding and skills for putting into practice social constructivism could be some of the major impediments to switching over to socio-constructive pedagogies and NCF (2005) seeks urgent reforms in all these areas. However, it is apparent that in many schools the shift has begun, albeit only through the assignments meant for summer breaks. Many schools are ensuring that assignments for the summer vacations require students to use Information and Communication Technology (ICT) for collecting and processing information. This may be considered as a step towards constructivism as students create knoowdge instead of receiving it. However, putting into practice social constructivism would require schools to ensure that learning is an active as well as a collaborative process. This paper is an attempt to study whether assignments requiring knowledge construction by elementary level students are meant for individualized or collaborative learning. It also attempts to determine the kind of assignment students prefer –individual or teamwork.

Theoretical Background

The paper draws from the theoretical underpinning that knowledge is constructed actively by learners within a socio-cultural context. Social constructivism furthers constructivist approach to learning. Proponents of social constructivism are of the view that knolwdge is first constructed in a social context and is then appropriated by individuals (Bruning et al., 1999). Bruner (1960) had emphasised the socio-cultural dimension of learning. As per

the social learning theory of Bandura most human behavior is learned observationally through modeling (Bandura,1977). It is also widely accepted that Vygotsky's (Vygotsky, 1978) zone of proximal development (the distance between the actual developmental level -as determined by independent problem-solving and the level of potential development -as determined through problem-solving under adult guidance or in collaboration with more capable peers) is bridged by collaborative learning opportunities. Therefore, as suggested by Duffy and Jonassen (1992) there is need for collaboration among learners. Collaboration helps students learn more thoroughly, deeply and more efficiently than learning alone and helps in the preparation for the real world requiring team work. Students also learn to depend on one another instead of depending solely on the authority of experts and teachers (Bruffee, 1998). It is thus a preparation for the knowledge age that requires collaboration rather than competition.

As defined by Dillenbourg (1999) collaborative learning is a situation in which two or more people learn or attempt to learn something together. In an elementary school situation, a group of students may collaborate to learn. The functioning of the group may require not just cooperation but also collaboration. Cooperation involves division of responsibility and hence, tasks among participants whereas collaboration involves the mutual engagement of participants and a coordinated effort to solve the problem. Cooperation and collaboration may both involve distributed tasks but cooperation involves division of the main task hierarchically into independent subtasks followed by assembly of the partial products. But collaboration does not involve specific subtasks to be carried out separately and hierarchically by the collaborators. There is a common perception and concern for the task, which in its entirety is taken up jointly. Hence, there is a coordinated, synchronous activity emerging from a continued attempt by learners to build and maintain a shared conception of the problem and ways to solve it. Within such a social setting the inputs are naturally intertwined. Coordination, joint thinking and sharing are thus integral to collaboration at every stage of the work. The author further says that pedagogically collaborative learning is prescriptive as teachers ask learners for it. Psychologically it is descriptive as collaboration is viewed as the mechanism, which caused learning. He also argues that collaborative learning cannot be reduced to either a

mechanism or a method, as collaboration is also a sort of social contract among the participants, which requires them to interact and contribute equally and reciprocally. However, this is too idealistic a proposition and teacher's intervention may be required for it. Hence the teacher has to devise mechanisms to elicit fruitful activity from the participants. S/he has to be alert for meaningful interaction among the group members because explanations, disagreements, arguments, reasoning, consensus will lead to cognition and generation of content that individual activity may not have achieved. Otherwise the benefits of collaboration cannot be harnessed.

Klamma et. al (2007) also require teacher's interventions in collaborative learning. They say that in a Web 2.0 vision, the web is created by those who participate in it. However the teacher can motivate learners towards meaningful participation and contribution only when learners perceive some motive/reward (intrinsic or extrinsic) for contributing. This is based on the social exchange theory, which draws from the rational choice theory of economics (there is a relation between a person's satisfaction with a relation and a person's commitment to that relation, which in this case could be the work to be accomplished through web 2.0 and the willingness of the participants to participate and contribute). Various types of mechanisms have been suggested by the authors to motivate learners viz.- (i) *personal access* or anticipated reciprocity: learner's expectation of receiving useful (additional) information in return; (ii) *personal reputation*: learner feels s/he can improve his/her visibility and influence on others in the network (iii) *social altruism*: learner appreciates the value of sharing knowledge as a public good (iv) *tangible rewards*: learners hope for some kind of tangible rewards like grades, appreciation from teachers, etc. The instructional strategy needs to check that these mechanisms are in place for the collaboration to succeed.

Coordination and sharing of information being central for collaboration, ICT (in this paper the scope of ICT is restricted to telephone and the Internet) can play a significant role. As mentioned by Jarvela, et. al, (2001) computer-supported collaborative learning with the help of modern ICT has great potential to improve teaching and learning. Computer supported social learning systems use technology to control and monitor interactions, to regulate tasks, rules, and roles, and to mediate the acquisition of

new knowledge. Learners negotiate, attain consensus and thereby solve problems (Mitnik, et.al, 2009).

Apart from learning being a social process, one of the demands made on education is to prepare learners for a networked knowledge society that would require collaboration. Hence, children may be provided with opportunities for learning in settings that put into practice the social constructive approach to learning. Web 2.0, aiding collaborative creation of content can facilitate this as against web 1.0 that makes users only consumers of information. Web 2.0 is regarded as new kinds of learning technologies (Rollett, et. al, 2007) and McLoughlin and Lee (2007) have defined web 2.0, as a second generation, or more personalized, communicative form of the World Wide Web that emphasizes active participation, connectivity, collaboration and sharing of knowledge among users. Hence, the number of Web 2.0 empowered e-learning environments is booming (Sigala, 2007). This is because sociability aspects of Web 2.0 tools make them ideal for educational purposes as they can support spontaneous interaction, feedback and support social networks and relationships (McLoughlin and Lee, 2007). Learning thus happens in a socio-cultural environment. Web 2.0 technologies thus introduce a new dimension to education, which becomes not just learner centered but learning centered as learners are the joint generators of content. There is therefore, an emerging need to redefine pedagogy and as suggested by Safran et. al (2007) harness web 2.0 technologies to promote collaborative learning. As said by Boulos, et. al. (2006) web 2.0 technologies like wikis, blogs and podcasts if effectively deployed could enhance learning experiences, and deepen levels of learners' engagement and collaboration within digital learning environments. As far as student's skills are concerned, children of even elementary level are extensively using email and chat and are also at ease with social networking sites like Facebook , Orkut, etc.. Hence, they can be supported to use web 2.0 in schools for learning. As said by Goldman et. al. (2009) ICT has the potential for creating powerful learning environments that support distributed, interactive, collaborative and constructive learning and its assessment and since the use of computer technology by youngsters is on the rise this trend needs to be harnessed for providing education.

Rationale of the Study

Assigning homework (assignments) for summer break that would involve ICT mediated data collection and processing is an emerging trend in schools. Children of even the upper primary level, i.e. grades VI -VIII (grades I –VIII constitute the elementary level of education in India) are using ICT for data collection and processing. This is a welcome step towards the new educational paradigm envisaging constructive learning with the help of ICT and is a definite deviation from the traditional linear transmission of packaged information. However, ICT also has the potential to ensure the socio-cultural dimension of learning by facilitating collaborative work. To determine whether this aspect was also taken care of, this study was undertaken.

Objectives

The objectives of the study were the following:

- To determine whether teachers aimed to create scope for collaborative learning through assignments;
- To determine the preference of students towards individualized/ teamwork.

Methodology

Descriptive method was adopted, whereby data collected through a survey were interpreted. Twelve senior secondary schools of Delhi, affiliated to the Central Board of Secondary Education (CBSE) of India were selected. 24 teachers (two from each school) teaching in the upper primary level were included. Six students of the IX grade of each school were included so as to collect data on the assignments carried out by them in the previous academic year i.e. when they were in the VIII grade. There were thus 72 students. Assignments given in English, Science, Social Science, and Math in which students were required to use ICT for data collection and processing were only considered.

The following tools (constructed by the author and finalized with the help of ten teachers of schools and University, Department of Education) were used for data collection:

- **Questionnaire**: for data collection from students with a set of closed and open-ended questions (requiring brief answers). All the filled in questionnaires had

been received, as there was direct/ indirect acquaintance with students. The respondents were in the age group of 14-16 years. There were 40 male respondents and 32 female respondents.

- **Interview**: An interview schedule was used for interviewing teachers. Interview was held mainly for corroboration (triangulation) of data collected through the questionnaire. The teachers were in the age group of 28 years to 43 years. 18 of them were female and only 6 were male. They were all postgraduates.

Limitation of the Study

The schools, students and teachers were selected in a non-random manner, on the basis of direct/indirect acquaintance. Hence, the findings may not support generalizations.
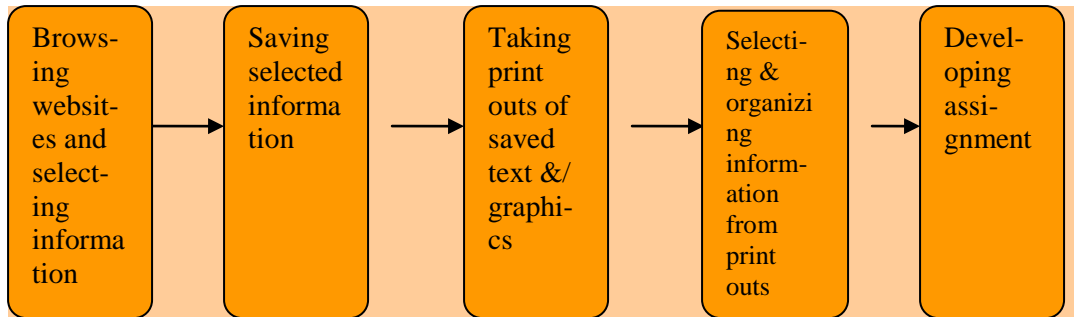
Results and Discussion

The data collected revealed the following:

Nature of assignment: the schools selected for the study being affiliated to the CBSE, perhaps led to common areas being selected for the projects. These areas were environmental sciences, role of International bodies such as the United Nations and its constituent bodies, UNESCO, WHO, and UNICEF; freedom movement of India; biography and contributions of scientists, mathematicians, literary figures, social reformers and statesmen; health and hygiene; cultural heritage of India; book review (only on popular English novels appropriate for children).

Source of information for the assignments: The Internet (World Wide Web) was the first choice of all the respondents. The other sources mentioned were the newspaper, television, reference books and text books.

Information processing: From the response to the items seeking information on the major steps taken for preparing the assignment, the following information was obtained:

| Browsing websites and selecting information | → | Saving selected information | → | Taking print outs of saved text &/ graphics | → | Selecting & organizing information from print outs | → | Developing assignment |

Access to ICT: 72% of the students had computers at home but only about 48% could access the Internet from home. Students without such direct access said that they visited cyber cafes and other places with the required facilities.

Skills for word processing and using the Internet: All the students possessed basic skills - word processing, preparing power points and using the Internet (web1.0). 92% of the students used social networking sites. None of them had used web 2.0 (wikis, blogs and twitter) for creating/editing content.

Collaboration: Only 15% of the assignments were meant for teamwork. But the students had discussions with their peers regularly even for the assignments meant for individual work.

Nature of Assignments

Team assignment 15%

Individual assignment 85%

☐ Individual assignment
☐ Team assignment
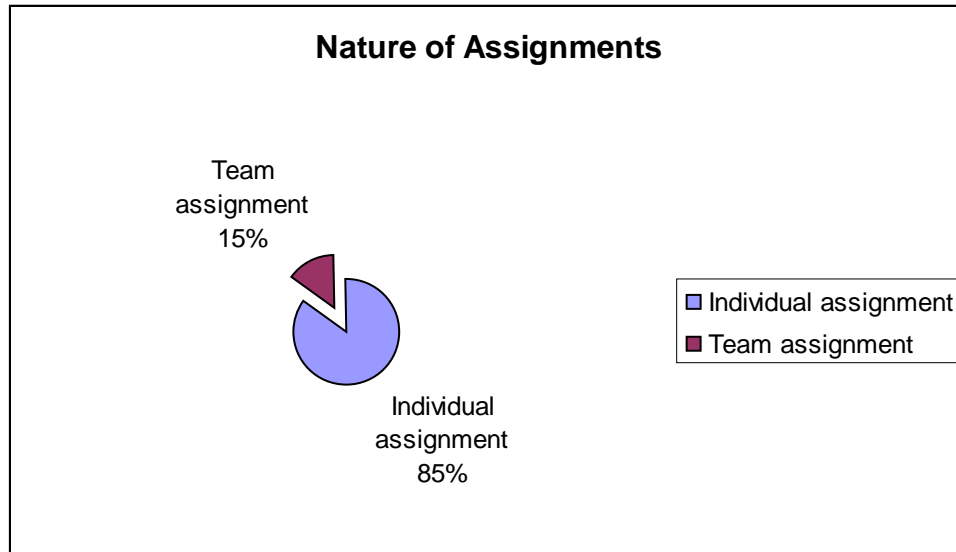
The technology preferred the most for contacting peers for assignments was as follows:

ICT used most for contacting peers

☐ Series1

Telephone   E-mail   Chat (Internet)
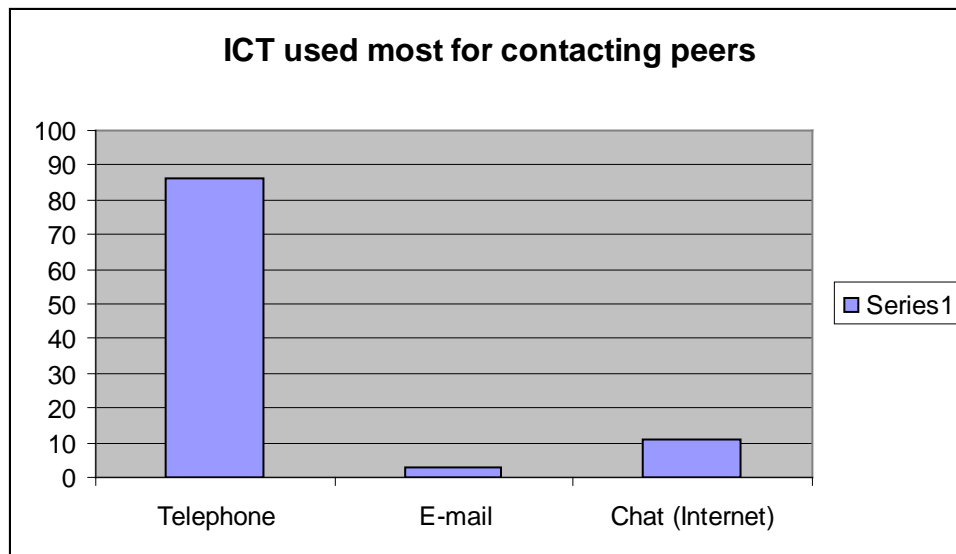
The help received from peers were listed as follows:

- Sharing of content collected/developed through file sharing;

- Development of introduction &/summary/conclusions for the work done;

- Accessing information (web sites; search words);

- Understanding the information collected;

- Information about online sources of ready made power points, book reviews

- File conversion -PDF to word

- Creating Hyperlink , inserting picture &/ audio files

From the response to the items seeking information on the major steps taken for preparing assignments meant for team work, it was found that team members distributed among themselves tasks like data collection, taking print outs of information saved and compiling the report. This shows that even the work assigned by the schools for collaborative work involved at the most cooperation and not collaboration in true sense. Most of the students enjoyed working in teams than alone.

Preference of assignment type

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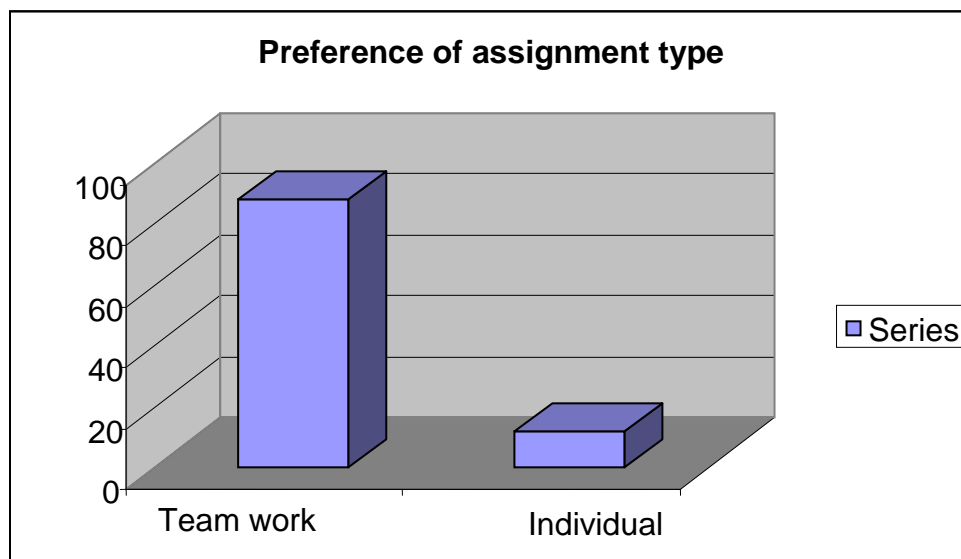
Teachers' role: The teachers selected the topic. For assignments involving teamwork, groups were formed mostly by teachers, sometimes by teachers along with students and rarely by students themselves. They assessed the assignments submitted. Teachers did not provide support while the students carried out the assignments. It appears that teachers

assessed only the product, viz. report/power point/ assignment submitted. The process was neither guided, nor provided with expert scaffolding.

Conclusions and Suggestions for Implementing Collaborative Learning

The study reveals that learners are encouraged to use the web technology but mainly as users of information, which was copied and compiled by them. Whether meaning was attached to the information was not clear as attaching meaning is different from processing information (Bruner, 1990). While processing information metacognition, which has been described by Lawson (1984) as the consciousness of being conscious, the awareness of, how, of any action, might have been involved. However, there also remained a possibility of the assignments being carried out by mechanical compilation of information from various web sites. Although students cooperated regularly mainly through telephonic discussions, the topics selected for assignments could lend themselves to collaborative work and majority of the learners preferred to work in teams but strong bias towards individual work was apparent. Even for assignments meant for teamwork, students at the most cooperated as they divided the work and assembled products of the subtasks. To minimize possibilities of mechanical compilation of information collaborative projects that would foster content creation based on discussions and consensus and above all mutual monitoring may be assigned.

To ensure effective collaboration by learners, teacher's intervention and monitoring of the learning process are indispensable. The teachers' role would therefore not be limited to grouping students and assessing the final products but they would need to perform several other roles. They would need to develop strategies for collaborative projects. While selecting an assignment, the teacher will have to enable contextualized learning with the provision of some amount of pre-existing content, which helps students to link knowledge to be acquired to that already possessed (Safran, et. al, 2007). Teachers should also serve as evaluators of learner accomplishment, both throughout and at the end of the learning experience (Jarvis, Holford and Griffin, 1998). Evaluation, as a continuous process is needed for grading the group as well as individuals as individual inputs are

tracked and monitored. As suggested by Mercier, et al. (2009), without attention to the collaborative process groups can flounder, with divide and conquer approach and exclude team mates whose views and work practices differ. Teachers need to check such practices by tracking the inputs and monitoring collaboration. Scaffolding children is also needed as they collaborate. Scaffolding is undertaken with the explicit intention to support the learner's cognitive development than simply aiding performance on a task. It takes feedback several steps forward by bridging the gap between students' understanding and what s/he needs to understand (Alejandre & Renninger 2009). It can thus make learning an iterative process. The teachers therefore need to adopt pedagogy suitable for collaborative learning

Access to the Internet may be enhanced by upgrading and utilizing the facilities at schools. Since young children are quick learners of ICT related skills, they can be initiated into web 2.0 technologies in no time and with just a few days of training they would be able to master the necessary skills. Interlinked pages, audio, video and image insertion can help the creation of rich multimedia content. The digital repositories thus created can be resources for future use.

There is first a need for a mindset that accepts the validity of collaborative assignments. Secondly, earnest efforts are needed to train teachers and learners in web 2.0 technologies and put into practice web2.0 mediated collaborative learning. The keenness of students to work together on assignments would augment such efforts.

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