Living Walls

A Strategy Towards Educational Reform for Elementary School Children in India

Devyani Tandon

MFA (Design and Technology)
Parsons School of Design
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Faculty: Andrea Dezso

devyani@parsons.edu

1 Introduction

In a world of rapid change, it has become imperative that education empowers us with relevant skills to adapt to the constantly changing environment around us. It is the ability to adapt and flexible thinking skills that will enable people to function effectively in the future. Schools must prepare children to be "dynamic learners" for them to apply their learning to new and unique situations.

I grew up in the cities of New Delhi and Mumbai (Bombay) in India and received my education from two reputed and distinguished private schools. Going through an education system that is primarily academic oriented, there was a strong focus on performing well in examinations. The education system in India hasn't kept pace with the changing needs of society. Learning is a passive process with inflexible curricula and little change in teaching methodology over the years. The sole outcome of the learning is based on performance in tests and examinations.

Through this thesis, I want to explore alternatives to the education process and learning environments and investigate how technology can be used to facilitate this process.

This research paper focuses on two main areas:

Cooperative Learning as an instructional approach that encourages learning outcomes other than achievement
Use of technology to introduce a transition into teaching methods

The research will be used to develop an instructional design strategy for an integrated fifth grade art education module to promote educational reform in India.

2 Context

2.1 Education system in India

In ancient India, the *gurukul* system of education was prevalent which was considered an ideal system. The teacher was the *guru* and the disciple was the *sishya*. The guru imparted knowledge to disciples who lived in the Guru's ashram during their course of education that lasted for 12 years. A guru was regarded as the metaphysical father of his disciples. Besides other subjects, there was great emphasis on religious texts. Gurukuls were accessible only to the upper classes of society and restricted to males.

When the English established their colonial rule, in the 17th century, they encountered an ancient civilization with many languages and religions. They gradually established English language schools that used their system of education. This was one of the reasons for the decline of the Gurukul system of education.

At the time of India's independence in 1947, the literacy rate was a mere 14 per cent. Over the years some of the biggest challenges faced by the Indian government have been to educate the rural population especially the socially and financially backward communities and provide equal opportunity for all. Despite the remarkable increase in the number of schools and universities across the country, the quality of education imparted is questionable. There is disparity in the standard of education provided and in many schools the tendency is to lower standards and attach more importance to quantity rather than quality.

On the other hand are a handful of institutions that provide higher education that is comparable to universities internationally but these are few in number, being limited to bigger cities and beyond the reach of masses. Quality education is limited to urban cities and mostly in public schools and privately owned universities.

2.2 Structure of the school system in India

The structure of the school education system is the 10 + 2 system and its stages are:

Primary School: Classes 1 – 5

Middle School: Classes 6 – 8

Secondary School: Classes 9 - 10

At the end of Class X, the respective State Boards of Secondary and Higher Secondary Education conduct public examinations. Based on performance in these exams students pursue intermediate studies in their chosen subjects (between three main streams of Science, Arts and Commerce). At the end of Class XII, students give public examinations, the All India Senior School Certificate Examination. The most important consequence of school education is scoring a high percentile of marks in these examinations. This would guarantee a position in a reputed college, a good professional career and what is perceived as a successful life. These board exams are considered critical towards deciding a child's future.

Since the number of universities that provide quality education is limited the competition to gain admission into these select few is fierce. Typically, an urban middle class child is pushed by his parents at an early age into trying to excel academically at school. The purpose of education is distorted from trying to bring out what is within, to doing well in exams that make or break your life.

2.3 The classroom environment

The curriculum taught is information heavy, and most of it focuses on the scholastic mind – children who easily grasp math, science and languages. Everybody is taught the same curriculum in the same way with an emphasis on memorizing facts and procedures than on understanding subject matter since scoring high grades in exams is the focus. The fact that children learn in different ways or have multiple intelligences is ignored.

A teacher delivers instruction, students are given assignments, and homework to complete based on it. A typical classroom environment would have the teacher as the main source of information and is seen as a "know-it-all". Study materials primarily include textbooks. The role of a student in the classroom is more passive than active. Competition in classrooms is encouraged with teachers rewarding achievement based on academic success. Students are ranked based on their performance in examinations. Parents encourage competition as well since they do not want their child to be termed as an "average" student in school. Over

the years, students tend to become “winners” or “losers” – students are rewarded for academic proficiency and are motivated to learn whereas low-achieving students may experience failure and feel frustrated.

2.4 Reform

It is a widely accepted fact by students, parents, and teachers alike that the education system in India needs reform. Some schools in the recent years have introduced alternative means of classroom teaching. For instance, NAFL, a school in Bangalore encourages informal interaction amongst students in classrooms and the teacher is more of a facilitator in the process. Sardar Patel Vidyalaya (SPV), a school in New Delhi, doesn’t rank its students. A line of excellence is determined and everybody above that is deemed meritorious and receives a “Merit Card”. Merit Cards extend to extra curricular activities as well. Most students receive a merit card within three years. SPV also has a unique system of teaching all subjects in Hindi which is the national language up to class five. These schools though few in number are bringing a change in classroom environments and by incorporating new teaching methods.

3 Problem Statement

Restructuring an educational system is a complex process that involves radical changes at various levels. As of today, it is true that the Class 12 examination system and the importance of doing well in these exams cannot be done away with completely. Through this thesis, my aim is to experiment towards reform on a small scale at the classroom level. I want to explore the factors involved in developing an instructional design module that would integrate a cooperative learning structure into a classroom environment. The module would be aimed at being integrated with a classroom in India. My motivation is the introduction of new teaching approaches and instruction that guides rather than directs to help foster new ways of learning and equip students better to face real life situations.

Using technology to support and implement this strategy in an India classroom, I hope to emphasize learning with understanding and use other features and advantages of cooperative learning as described further on.

The content and target audience of the module would be an art and design curriculum for 8-10 year olds.

4 Research

4.1 Constructivist View of teaching and learning

Constructivist theories of learning are based on the works of Piaget and Vygotsky. A constructivist view of learning sees learners as active participants in their learning process by constructing or building meaning for themselves. The teacher is a facilitator in the process by giving relevant information using which the students make meaningful connections between prior knowledge and new knowledge. Constructivism transforms the student from a passive recipient of information to being actively involved in the learning process. It emphasizes a focus on well-structured classroom activities. Interaction with peers is an important component of this. Vgotsky propagated that social interaction plays a fundamental role in cognitive development. According to Vygotsky:

"*Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals*."

Another important idea is that of the zone of proximal development, which Vygotsky defines as "the distance between the actual developmental level as determined through problem solving under adult guidance or in collaboration with more capable peers." According to him, " What the child is able to do in collaboration today he will be able to do independently tomorrow."

Cooperative learning methods use constructivist theory and emphasize the social approach to teaching.

4.2 Cooperative Learning

Based on patterns of student-to-student interaction classroom reward structures are of three types:

Competitive Structures

Competitive goal structures are presently the most dominant and widely used in classroom environments. The classroom structure forces students to compete with each other. A students' performance is evaluated based on the performance of other students in the class. Only a small number of students can get the highest

grades. Students try to outdo one another, view classmates' failures as an advantage, and come to believe that the winners deserve their rewards because they are inherently better (Johnson, Johnson, & Holubec, 1994; Johnson et al., 1995). Negative interdependence becomes an important characteristic of this environment.

Individualistic Structures

In an individualistic learning environment a students' success depends on their own efforts and performance in relation to accomplishing a set task. Students are independent of each other and the success or failure of other students doesn't affect the performance of a student.

Cooperative Structures

In a cooperative structure students work in groups to achieve a shared common goal. Cooperative Learning is an instructional task design that engages students actively in achieving a lesson objective through their own efforts and the efforts of the members of their small learning team. (Cooper, 1990)

The idea behind cooperative learning is to alter the traditional structure with the focus of the learning environment being on cooperation amongst students rather than competition. Cooperative learning is different from group work. In group work students may not be interested in helping others achieve goals. A group of students may be sharing a computer station during a class to complete tasks and may chose to help each other, but there is no structure or reason for them to be interested in each others learning. There is no positive interdependence, which is one of the key features of a cooperative learning environment. Simply putting students in a group doesn't ensure cooperation amongst them. In a cooperative group, students' work towards a common goal, which has importance for each individual.

4.2.1 Elements of cooperative learning

The key elements of cooperative learning as described by researchers in this field are as follows:

Positive Interdependance

In a cooperative learning environment, students in a group believe that they "sink or swim together". Each student has a role to play and a contribution to make for group success. Positive interdependence within a group can be structured as follows

Positive Goal Interdependence: This implies that success of an individual student depends on success of the

group.

Positive Reward Interdependence: If the group is successful in achieving its goal, each member is rewarded.

Positive Resource Interdependence: Each member of the group has a part of the information or resources that are required to accomplish the set task.

Positive Role Interdependence: The roles of the members of the group are interlocked with the others' roles.

Individual Accountability

The second important element is individual accountability, which means that each member of the group has to succeed for the group to be successful. Each member of the group is accountable for their individual share of the work. Every member is responsible for the final outcome and each member has to make effort to contribute to the group's task.

Promotive Interaction

This means that group members help and assist each other to work more effectively and efficiently towards achieving the set task.

Interpersonal and Small Group Skills

For the group to work well together, members need to have certain social skills for them to cooperate successfully. In order to co-ordinate efforts to achieve mutual goals, students must:

Get to know and trust one another

Communicate accurately and unambiguously

Accept and support each other

Resolve conflict constructively (Johnson 1990, 1991; Johnson and F Johnson, 1991)

4.3 Cooperative Learning Methods

4.3.1 Student Team Learning

The Student Team Learning model promoted by Slavin is characterized by three ideas:

Team Rewards: A team is rewarded in some way if it achieves a set task.

Individual Accountability: A group's success depends on the individual learning of all its members.

Equal Opportunities for Success: Students contribute to their teams by improving their past performances.

Student Teams - Achievement Divisions (STAD) is a Student Team Learning method that has been extensively researched and developed and can be used to teach a variety of subjects. In STAD, student groups comprise of 4-5 members and are created with respect to the diversity in the class. Students work within their groups to learn material presented by the teacher. They help each other to learn and receive a group performance score on quizzes.

STAD has the underlying idea that students in a group have to help one another to learn the subject matter for their group to succeed. Students study together, discuss and give feedback to each other.

Other widely used methods of cooperative learning include Team Assisted Individualization (TAI) and Cooperative Integrated Reading and Composition (CIRC).

TAI is specifically designed to teach mathematics. Here the instruction is individualized according to a placement test. Students' work on their own units and group members' check their answers and assist each other in learning. CIRC is for teaching reading and writing skills.

4.3.2 Jigsaw

The Jigsaw is a cooperative learning technique where each student is like a puzzle piece that has to fit into a whole for the puzzle or task to be complete. Students in a class are divided into groups to work on segmented academic material. Each group member works on and studies a particular section. After this, members of other teams who were assigned the same section get together as an "expert group" and organize their content. Members return to their teams and teach their group members about their topic. Each student becomes an "expert" on a particular topic. Students could then be tested on the material they have learnt. The effectiveness of the strategy lies in the fact that each student's part is important and the members of each group have to work together towards a common goal.

4.4 Impact of cooperative learning

There has been extensive research investigating the effects of cooperative learning environments in schools. One important aspect studied is the impact of cooperative learning in enhancing achievement and accelerating learning.

4.4.1 Motivational

In a cooperative learning environment, efforts of a student are not just towards oneself but also extend to other members of the group. Students are motivated to help each other and reinforce each other's efforts. There is a change in the incentive to learn since any student who attends class, helps others learn and learns from others is encouraged and praised. This is in direct contrast to a traditional classroom structure.

4.4.2 Cognitive Developmental

Cognitive theories bring to focus the effects of working together in itself. According to Vygotsky, a collaborative activity among children promotes cognitive growth since in the group they would model behaviors more advanced than they would individually.

4.4.3 Cognitive Elaboration

Research indicates that any new information received is better retained in memory and related to existing knowledge if it is restructured and elaborated in some way.

4.4.4 Non-Cognitive Outcomes

Since cooperative learning is a social method, research has proven that there are certain non-cognitive outcomes of cooperative learning. An important outcome of cooperative learning methods is the impact on a students self esteem. Every student has an individual role to play and this could make him or her feel that they are achieving more than they would in a traditional classroom setup. Students can be motivated to learn since they feel that their classmates want them to do well. Cooperative learning increases contact among students as well as develop the ability to take another's perspective.

5 Role of Technology

One of the most important aspects of the use of technology in a learning environment is that it can be effectively used to promote active learning in the classroom. Technology can help in creating environments that are student-centered and can open up new ways of teaching and learning. Instruction carefully designed to include technology in the process can cater to different learning styles of students.

5.1 Instructional Software

Technology is available in different forms and a variety of formats. These could include instructional software in the forms of CD-ROMs and print-based programs such as:

Tutorials: Tutorials present information in segments and then test the students' concepts related to the segment taught.

Simulations: provide controlled learning environments that replicate key elements of real-world environments…a simulation is designed so that the actions a student takes within a simulated environment produce results to those that would occur in the actual environment. (Grabe, 1993)

Drill and Practice: This instructional strategy uses repetition for acquiring skills and information. Software programs that use this provide students with practice on concepts they have already learned.

Since repetition is used for reinforcement, these are good for subjects such as spelling, vocabulary and math. Feedback and correct answers are also given and they could also have varying difficulty levels. Question answer interactions help students learn the material at their own pace.

Educational Games: Instructional activities are categorized as games when the activities emphasize competition and entertainment. If the activity has a winner or loser or focuses the student on competing against established records or standards, the activity has game like qualities. Games also employ fantasy, action, uncertainty, and similar features to make the activity interesting for players. (Grabe, 1993)

Other computer tool applications in a classroom could include the use of word processing software, databases and telecommunications.

5.2 Internet Resources

The Internet, a vast web of interconnected computers, is growing at a phenomenal rate and provides access to a variety of resources. The Internet provides a unique platform that can support collaboration and communication among learners. Learners could be in different physical locations, even in geographically diverse places. Students can send and receive information and communicate with students and teachers in different parts of the world using email and chat interactions. Communication with email provides opportunities for activities such as interpersonal exchanges between individuals or groups, collaboration on information collection and compilation provided by participants.

Discussion groups over the Internet can provide opportunities to send and receive feedback.

The potential of using the World Wide Web as an educational resource is immense. The nature of materials available could vary between online tutorials to providing raw materials. Online tutorials provide instruction geared towards independent learning and also give evaluation activities. On the other extreme are internet-based activities that consist of raw materials or information that may not necessarily be geared towards educational goals. The role of the teacher here is to create and facilitate the learning activity based on these raw materials to help students indulge in unique information processing activities. Activities that use the Internet need to be structured properly since availability or resources does not ensure meaningful learning.

One example of using the web for instruction is the WebQuest model developed by Bernie Dodge at the San Diego State University.

A WebQuest is an inquiry-oriented activity in which most or all of the information used by learners is drawn from the Web. WebQuests are designed to use learners' time well, to focus on using information rather than looking for it, and to support learners' thinking at the levels of analysis, synthesis and evaluation.

The important parts of a WebQuest are as follows:

1. Introduction: This sets the stage and provides some background information to help orient the learner.

2. Task: A task that is doable and interesting. This tells the learner what will be accomplished at the end of the given task.

3. Process: A set of information sources needed to complete the task and guidance on how to organize the information acquired. These sources are pre-selected by the teacher to avoid students from aimlessly surfing. They could include websites, databases on the net, experts available via email and even books. A description of the process the learners should go through in accomplishing the task. The process should be broken out into clearly defined steps.

4. Evaluation: A description of the evaluation criteria that will be used and specification of group vs individual grades.

5. Conclusion: A summary of what was accomplished and learned by the students and encourage students to extend their thinking beyond the contents.

5.3 Advantages and Disadvantages of technology in classrooms

There are several advantages and disadvantages of using technology in classrooms. Some of these are described below.

5.3.1 Advantages

1. Technology can present a unique opportunity for teachers to learn with students and update their own skills.

2. The multimedia capabilities of the computer allow us to present information in a variety of ways. Multimedia formats like graphics, video and animation can capture a students' interest and help students better understand the content presented. This can result in better retention of the material and allow students more diverse experiences.

3. Technology based problem environments are essentially under the learners' control. Flexible exploration is possible and a student can view and access information and material as many times as they want.

4. Simulations and games can provide students with a hands-on experience of real world problems.

5. Software and computer programs can accelerate learning by providing immediate feedback to students. The more immediate the feedback, the better because each step of learning builds.

6. Communication over the Internet has opened new possibilities of interaction with people from different parts of the world. It provides means of communication that are "place independent" and "time independent".

7. Online discussions can help students who do not actively speak up in class to participate since they are no longer inhibited by the presence of peers. Students have more time to reflect and construct their thoughts as well as express them in writing.

8. The Internet presents an opportunity to access an unparalleled amount of information easily that could be used to great advantage of students and teacher.

5.3.2 Disadvantages

1. Schools have to make an investment in the hardware and software, and get connected into the Internet.

2. Techno phobia: Unfamiliarity with computers and the lack of sufficient knowledge may make teachers reluctant and to use technology in the classroom.

3. Teachers will have to be provided sufficient training to successfully integrate technology in the classroom to make meaningful experiences for children

4. A technology enhanced environment may require the teacher to acquire a new role- that of a facilitator and they may not have complete authority in a classroom environment as before.

5. Educators need to recognize that the Internet does not exist specifically to support educational goals. In this regard, the Internet is similar to other information systems we encounter in our daily lives. Students may encounter inappropriate content and material.

6. Multimedia and computers offer new learning environments that require development of new learning skills.

7. Every school or student does not have access and the necessary resources to access and use computers.

6 Conclusion

The research will be used towards the development of an instructional design strategy for an integrated fifth grade art and design module to promote educational reform in India. Technology will be used as a means in a cooperative learning environment.

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