

Constructivism in the Primary School Curriculum

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Abstract

The aim of this study was to examine whether the 5th grade elementary school curricula of Oriya, English, Mathematics, and Environmental science (EVS) courses were congruent with the principles and standards of the constructivist education. Qualitative research methods were used in this small-scale case study which was conducted in an elementary school in Oringabalisahi upper primary school, Orissa. The data were gathered through semi-structured interviews and document analyses in the academic year of 2009-2010. The population of interest consisted of 1 BEO, 1 Oriya teacher, 3 English teachers, 4 Mathematics teachers, and 3 Environmental science (EVS) teachers. The findings indicate that the performances of the curricula under investigation are congruent with the principles of the constructivist education. Similarly, the stated and unstated intents of the curricula are congruent with their performances and the standards of the constructivist education.

Key words: Education, Primary school curricula, Constructivism, Constructivist approach.

Introduction

Constructivism is an epistemology, or a theory, used to explain how student know what they know. The basic idea is that problem solving is at the heart of learning, thinking, and development. As people solve problems and discover the consequences of their actions - through reflecting on past and immediate experiences - they construct their own understanding. Learning is thus an active process that requires a change in the learner. This is achieved through the

activities the learner engages in, including the consequences of those activities, and through reflection. People only deeply understand what they have constructed.

A constructivist approach to learning and instruction has been proposed as an alternative to the objectivist model, which is implicit in all behaviorist and some cognitive approaches to education. Objectivism sees knowledge as a passive reflection of the external, objective reality. This implies a process of "instruction," ensuring that the learner gets correct

information. The psychological roots of constructivism began with the developmental work of Jean Piaget (1896 - 1980), who developed a theory (the theory of genetic epistemology) that analogized the development of the mind to evolutionary biological development and highlighted the adaptive function of cognition. Piaget proposed four stages in human development: the sensor motor stage, the preoperational stage, the concrete operational stage, and the formal operational stage. For Piaget, the development of human intellect proceeds through adaptation and organization. Adaptation is a process of assimilation and accommodation, where external events are assimilated into existing understanding, but unfamiliar events, which don't fit with existing knowledge, are accommodated into the mind, thereby changing its organization. Countless studies have demonstrated - or tried to discredit - Piaget's developmental stages. For example, it has become clear that most adults use formal operations in only a few domains where they have expertise. Nonetheless, Piaget's hypothesis that learning is a transformative rather than a cumulative process is still central. Children do not learn a bit at a time about some issue until it finally comes together as understanding. Instead, they make sense of whatever they know from the very beginning. This understanding is progressively reformed as new knowledge is acquired, especially new knowledge that is incompatible with their previous understanding. This transformative view

of learning has been greatly extended by neo-Piagetian research.

The Russian psychologist Lev Vygotsky's (1896 - 1934) relevance to constructivism derives from his theories about language, thought, and their mediation by society. Vygotsky held the position that the child gradually internalizes external and social activities, including communication, with more competent others. Although social speech is internalized in adulthood (it becomes thinking), in his experiments, Vygotsky studied the difference between the child's reasoning when working independently versus reasoning when working with a more competent person. He devised the notion of the *zone of proximal development* to reflect on the potential of this difference. Vygotsky's findings suggested that learning environments should involve guided interactions that permit children to reflect on inconsistency and to change their conceptions through communication. It has since been extended in the *situated approach* to learning.

Vygotsky and Piaget's theories are often contrasted to each other in terms of individual cognitive constructivism (Piaget) and social constructivism; some researchers have tried to develop a synthesis of these approaches, though some, such as Michael Cole and James Wertsch, argue that the individual versus social orientation debate is over-emphasized. To them, the real difference rests on the contrast between the roles of

cultural artifacts. For Vygotsky, such artifacts play a central role, but they do not appear in Piaget's theories.

Constructivist Processes and Education

There are several competing constructivist views in education. Constructivists tend to celebrate complexity and multiple perspectives, though they do share at least a few educational prescriptions.

Prior knowledge

Constructivists believe that prior knowledge impacts the learning process. In trying to solve novel problems perceptual or conceptual similarities between existing knowledge and a new problem can remind people of what they already know. This is often one's first approach towards solving novel problems. Information not connected with a learner's prior experiences will be quickly forgotten. In short, the learner must actively construct new information into his or her existing mental framework for meaningful learning to occur.

For example, Rosalind Driver has found that children's understanding of a phenomenon (interpretations that fit their experiences and expectations) differ from scientific explanations. This means that students distinguish school science from their "real world" explanations. Studies of adult scientific thinking reveal that many adults hold non-normative scientific explanations, even though they have studied science. This is what the

philosopher referred to as *inert knowledge*. Asking students what they already know about a topic and what puzzles them affords an opportunity to assess children's prior knowledge and the processes by which they will make sense of phenomena.

Constructivist curriculum

A constructively oriented curriculum presents an emerging agenda based on what children know, what they are puzzled by, and the teachers' learning goals. Thus, an important part of a constructivist-oriented curriculum should be the negotiation of meaning. A mathematics teacher, guides students to make sense of mathematics by comparing and resolving discrepancies between what they know and what seems to be implied by new experience. In constructivist classrooms, curriculum is generally a process of digging deeper and deeper into big ideas, rather than presenting a breadth of coverage. For example, in the Fostering Communities of Learners project where students learn how to learn, in knowledge-building classrooms where students seek to create new knowledge, or in Howard Gardner's classrooms where the focus is on learning for deep understanding, students might study endangered species, island biogeography, or the principles of gravity over several months. As students pursue questions, they derive new and more complex questions to be investigated. Building useful knowledge structures requires effortful and purposeful activity over an extended period. This perception calls to mind several new approaches in education that share their basic assumptions

with constructivism. All these approaches are learner-centered and converge in the view that each student should be actively engaged in learning activities, taking account of individual differences. Some new approaches such as active learning and problem-based learning give the impression that they are actual practices of the constructivist classroom. Similarly, the integrated approach, which mainly draws on constructivism, seems to be a prerequisite for the constructivist classroom practices.

Educators may feel impressed by the powerful influence that constructivist thinking has exerted in a broad context, when they see that the above identified overlap and connection between new approaches to education is grounded in a single source, which is the constructivist background.. The field in which the teachers feel themselves the least competent is Measurement and evaluation. These results can be interpreted such that the constructivist approach is generally viewed positively by the stakeholders, whereas certain practical problems need to be addressed. In such a setting, this small scale study is anticipated to contribute to the evaluation of the renewed curricula, as one of the preliminary studies to be followed by a series of comprehensive studies.

Objectives

This study aims to explore whether the 5th grade elementary school curricula of English, Oriya, Mathematics and EVS

courses are congruent with the principles and standards of the constructivist education. In this framework, it examines the congruence between 1) the performances of the curricula under investigation and the Principles of the constructivist education, and 2) The stated and unstated intents of the curricula and their performances and the standards of the constructivist education. 3) The present study also aims to produce findings that would lay the foundations for the subsequent studies.

Research Approach

Qualitative research approach was employed for the study. The population of the study was all the elementary school teachers of Bhuban block of Dhenkanal district. The sample of the study consisted of 1 Block Education officer of Dhenkanal districts of Orissa and 11 teachers- 1 Oriya teacher, 3 English teachers, 4 Mathematics teachers and 3 Environmental science (EVS) teachers. Two semi-structured interview forms were developed for the BEO and the teachers in line with the purpose of the study and data derived from the literature review.

Findings

This section outlines the findings obtained first from interviews and then from document analysis.

Interviews

Firstly, views of the BEO, and then those of the teachers were revealed. Where teachers were quoted, they were assigned

codes instead of identifying their names for privacy reasons as follows: Oriya Teacher (OT), English Teacher (ET), Mathematics Teacher (MT), EVS Teacher (EVT). Each code is used with a number.

Interviews with the District inspector of school

Interviews with the district inspector of schools reveal that they think highly of the constructivist approach and in particular, are happy with the results obtained from the early stages of elementary education (grades up to 5th). As far as the later stages (grades 6th-7th) are concerned, they mentioned the chaos caused by parents' lack of understanding about the Level Assessment Exam (LAE) and students' increased tendency to go to government institutions to supplement their formal courses and complained that this created a tiresome burden, making the things worse for everyone. They relied on the support from the 'Measurement and Evaluation Unit' Self-assessment checklists, attitude scales, rubrics, etc. developed by these School units in cooperation with the teachers were in use. Information regarding the students is exchanged in the process of interaction between the teachers, though no system exists to keep regular records of acquisition of each student.

Interviews with the Teachers

Teachers' views on questions contained in the interview form are classified in five sub-headings - *Acquisitions, Content, Learning*

Processes, Assessment Strategies and Instructional Resources. For each sub-heading, teachers' views are first outlined in two categories according to their being positive or negative, and this is followed by excerpts from the statements of them.

1. Acquisitions

The Oriya Language Teacher did not comment on the issue. Other teachers did not make negative comments, stating that the new curricula help the students acquire intellectual skills such as increased awareness, ability to make inferences and transfer the knowledge, to relate their learning to the real life situations, to think critically, to classify, to read graphical information, and to expand on their ideas. Below are the excerpts from the statements made by six teachers.

"It is enormously important that the student is aware of his merits and limitations. This approach enables it." ET1

"I think their awareness increased since they learn by doing and experiencing. I am happy with the new system." ET2

"*Prediction* has a very important place in this curriculum. If a student cannot predict how long one meter is or how long this room is, then what is the use of teaching him the units of measurements. This curriculum gives the student that skill. Take for example decameter or hectometer as units of measurement taught in the past. Who knows where exactly they are used? Decameter is used to measure the area of a field, corresponding to acre.

The new curriculum comes to the rescue of the students in such things. It tries to create a visual picture in the student's mind. The child gets it right away....but unable to transfer this knowledge to other areas. In the present curricula, 'how can a child spend his money at the greengrocer's' is the kind of questions we focus on. What is learnt in the classroom is used in the real life situations. Believe me. Children are more successful now." MT1

"Of course, I appreciate the new curriculum. Establishing relations and critical thinking are its outstanding features. For instance, we used to work on tables only where the program so prescribed, and finished with it once and for all at the end of the class. However in the present curriculum, almost all subjects were explained with the help of activities or we have a models, charts and development tasks. These are really important. Children are getting used to this sort of thinking." MT3

"Sir, what on earth is it for? Students abandoned this kind of questions. Now teachers ask 'where to use it in the daily life?' The student then come to realize "what it is used for' There is an increased awareness." EVT2 "In other words, we are happy. We make them discover...we try to elicit the answers from students. We demand examples from them. In the old Curriculum, you would directly present the information...The present one gives more room for elaborating on ideas." EVT1

2. Content

Below are the excerpts from the statements of four teachers:

"In particular, grammar points are ignored. They are implicit. But there is no way a student can learn even English without mastering the fundamental rules of grammar... In this age, you cannot approach the child with a poem on fires. It is absurd to ask the students to write a poem on fires using such vocabulary as fire engine, fire brigade. That is no way to give Oriya language education."

"...it gives the impression that the curriculum is relieved of excessive workload only to create a mass of activities with unnecessarily repetitive task. This should be done with fewer and better texts". OT1

"No matter how often he repeats, a child of this age inevitably makes mistakes because he does not come across sufficient number of math problems. There are so many activities and we have little time to spare for math problems. Then this puts the children in a disadvantaged position in our system overloaded with exams...Parents resent this situations. "Our kids keep studying the same topics they have already learnt in the 4th grade." they complain and ask when their kids will start to make real progress. We have faced such problems." MT3

"...Teacher has other roles to play, like guiding the students. After the 5th grade, things are never the same. It is a

paradox to expose the kids to multiple choice tests when preparing them for Navodaya School. I think this is one of the acute problems in Orissa (MT4)”

“Course topics are dealt with superficially. Teaching points are very general...Students have a good grasp of the things, though. But when you get into details, then you see the gap, leaving many things unanswered...” EVT1

“The new curricula aim at urging the students to think for themselves anyway...It seems to be overloaded with activities, but the learning environments are not suitable for that. It is not possible to execute all tasks in the classroom. And the time spared for all these is limited”.

3. Learning Processes:

Below are the excerpts from the statements of three teachers.

“...Thus it gives the impression that the curriculum is relieved of excessive workload only to create a mass of activities with unnecessarily repetitive tasks. Each text contains words frequently repeated and sentence formation tasks. A fifth grader will be fed up with using every word in a sentence. Activities should not be so tedious. What will a clever teacher do? I am proud to say he will become eclectic, merging the new and old methods and will make the things work.” OT1

“In fact, we have been using the constructivist approach for the last five years... We never introduce the

grammatical points without involving student. That is to say we don't simply present the rules and ask the students to answer questions or form sentences on the basis of these rules... Our teaching is spontaneous. So we practice different activities in different classes. There may be significant gaps between the classes... Moreover individual work, pair or group work is extremely important for us. Some students learn better when they work individually, but others have a better grasp of the things when they find themselves in a teaching game...It is student-centered, a process guided by the students (manage the direction of activities). I mean, our teaching practice is not based on mere instruction, but we teach through activities and games. What is more, since this kind of teaching is achieved through letting the students learn by doing, we try to give them as much freedom as possible”. It is the student who decides what he will add to his portfolio. ‘I want to put this assignment in my portfolio. He says...” ET1

“So many activities in a limited time may be challenging. I guess it could better be achieved in a teaching environment that provides opportunities for working with the students on individual basis. This creates much more meaningful learning environments for us.”EVT3

4. Assessment Strategies

Teachers' Views on the Evaluation Methods in the Curricula Below are the excerpts from the statements of four

teachers on the subject. Parents have biases towards the new system. They simply have yet to adapt to the curriculum. So this curriculum imposes on us the task of educating both the students and the parents. In my opinion, there should be a meeting to brief the parents every weekend.” OT1.

“As Environmental science teachers, we are really enthusiastic about performance evaluation tools. In the past, all the students cared about was to get a full mark. Nowadays this is not so much of a concern. They are now more in control and aware of their learning. We really want to have measurement tool. They really help the students a lot.” EVT1.

“We’ve had problems with performance or project assignments that require the involvement of parents. As I said, I think parents are not fully aware of the consequences of their attitudes. They interfere with the progress of the assignment too much, in order to make sure that their kids get a high mark. But our goal is to equip students with analytical thinking skills. That is why we constantly remind the parents to step back. They should be convinced about it.” EVT2

“The problem is that we have to cope with too many evaluation materials and as I said, we have limited time. On the other hand, there is a mass of knowledge we have to get across to students. So we have to find a midway. During the term, we engage students in evaluation activities so that they can get used to such methods.

When each activity involves evaluation, then these results in an enormous loss of time and the students give us the same feedback. They say ‘Sir, let’s do it quicker’ or ‘let’s skip it’ they just want to ignore it and go on. They are fed up with the tasks being repeated over and over again. I wish we could find a midway to engage the students in learning and evaluation tasks together, without making them bored.” EVT 3.

5. Instructional Resources

The Oriya language Teacher, English Teachers and Environmental Science Teachers did not make comments on the supplementary reference materials. Mathematics teacher stated that use of supplementary resources other than the course books is inadequate. Here is the excerpt from the statements of the three teachers on the subject. “We may have problems about resource books. Of course, textbooks provided by the Sarva Sikhya Aviyan (SSA) contain a great number of activities. But where they fall short of meeting the needs, we have to supplement them with additional material.” MT2.

“I wish I could get assistance on the projects. We face difficulties in developing projects. we have no computer to internet access, we have no time for that. I wish there were more resources and materials available to us.” MT3.

Document Analysis

Document analysis was confined to teacher’s handbooks for four courses and

Guide on the Renewed Elementary School Curricula Sarva Sikhya Aviyan (SSA Findings relating to the congruence between the performances and principles of the constructivist education are as follows:

1. The acquisitions of the curriculum are congruent with the principles of the constructivist education.
2. Care has been taken to ensure that lesson contents based on the spiral model and the different courses are appropriately inter-related.
3. Learning processes and the methods of measurement-evaluation are congruent with the other components of the curriculum.
4. Curricula fail to support students to an adequate degree in terms of supplementary teaching materials / recommended resources.

Discussion and Conclusion

In view of the findings obtained from the interviews and document analysis, and after making sure those evaluations that ,the following judgment was made . The findings of the research demonstrate the congruence between the intents and performance of the curricula and the standards of the constructivist education.

However, a more penetrating look into the results obtained brings onto surface some ambiguities with regard to content, learning processes, evaluation processes and the use of resources. As far

as content is concerned, three problems - superficial treatment of learning subjects, dynamism /flexibility of the curricula. How to best achieve incremental repetition of knowledge and skills in a spiral model congruent with the constructivist education principles and information processing modes of the human mind? This question seems to be unresolved in the case of the former two problems. Being dynamic and flexible is one of the essential principles of the constructivist approach. This may entail to go where the students' questions take the teacher to. In such a case, the question is how far can a teacher venture to proceed? The teachers interviewed expressed their concern over leaving the students' questions unanswered relating to teaching points treated superficially only to get back to and expand on them when the curriculum demands so. It is another uncertainty how such a course of action will result in later. Another matter that is shrouded in mystery is how the implicit teaching method adopted for every concept and all students and amid a vast number of activities will affect the deep learning throughout the process.. The curricula lose its continuity and effectiveness when students start to study at private education institutions after the 5th grade. Though entrance test conducted by Navodaya Vidyalaya is an examination that tests the analytical thinking in congruence with the renewed curricula, parents are concerned over the individual competition. The fact that this exam assumes that the constructivist approach

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is implemented uniformly all over Orissa creates another question mark in respect of the basic principles of the constructivist approach. How this will affect the learning processes through which each student is expected to proceed to his target and at his own pace is a matter that requires attention. Most of the teachers are busy with the official paper work of SSA they are not concerning about the adpotation of constructive method . The learning processes and evaluation processes overloaded with activities cause loss of time in actual practice. Another problem that may impede the implementation of the curricula is that parents intervene too much in the performance assignments in pursuit of higher marks for their kids.

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