A novice researcher modeled the Common Knowledge Construction Model (CKCM) (Ebenezer & Haggerty, 1999) in a 7th grade class by exploring and categorizing students’ conceptions of how waste was produced in the human system. Based on students’ conceptions, she developed a sequence of lessons and taught the concept of excretion. The regular classroom teacher noted that if he were to implement the CKCM, (a) class preparation and assignment corrections will require more time, (b) heavy class load will be a limiting factor, and (c) there will be satisfaction because of student learning through peer interaction. This collaborative study enabled both participants to experiment with the CKCM in the Indian context.

INTRODUCTION

Teacher centered pedagogical practices, which focus on acquisition of facts, still dominate the Indian science classrooms. This might be partially due to such constraints as large student enrollment in each class (Laxmidevi, 1999), more focus on passing tests rather than application (Rao, 2003), non-availability of modern facilities for classroom teaching (Joseph, 2003), and motivation to get good marks so that student admission to engineering and medical colleges is strengthened (Kapur, 2002). Transmission of facts results in clutter of 'inert ideas,' which the students are not able to use effectively in familiar contexts and creatively in open-ended problem-solving situations (Rao, 2003). The NCERT-The National Curriculum Frame work for School Education prepared in accordance with the recommendation of the ninth Five Year Plan (1997-2002) emphasizes the child as the constructor of knowledge (NCERT, 2000).

A teaching model that promotes students’ construction of knowledge, and purposefully accommodates such knowledge in lesson sequences is referred to as the Common Knowledge Construction Model (CKCM) (Ebenezer & Haggerty, 1999). This teaching model advocates scientific reasoning through conceptual change inquiry using students' multiple meanings of natural and social phenomena. CKCM is a philosophically sound teaching model that is premised on Marton's "relational learning" (Marton & Booth 1997), Bruner's view of language as culture's symbolic system (Bruner, 1986), Vygotsky's zone of proximal development (Vygotsky, 1978), and Doll's post modern thinking on scientific discourse and curriculum development (Doll, 1997).
PURPOSE
The purpose of this paper is to provide insights into how a classroom teacher viewed the CKCM when a novice researcher modeled the CKCM in the teacher’s 7th grade classroom. The study will also give us some sense of the classroom teacher’s initial impressions of the CKCM when the researcher models learning from the CKCM perspective.

METHODOLOGY
The study took place in a private school in Pune. We selected a standard seven class consisting of 39 students, comprising of 15 girls and 24 boys, who come from middle to lower middle class families living in the school neighborhood.

To enable the teacher to understand the CKCM, we explored 7th standard students’ ideas of how waste was produced in human systems, by directing their thoughts to a meal of the day. The idea generation took place in the regular class time, one 50 minute period by asking the following questions:

*How are waste products produced and removed?*

*Draw how waste products are produced and removed?*

We collected their “idea sheets” and categorized their ideas into “phenomenographic categories” following the research tradition of Marton and Booth (1997). The categories are:

**By eating food**—“By eating, the waste products will come out. by eating they are produced” (n=4)

**By eating and digesting food**—“They are produced by when we eat it, is going to be digested so this is the way waste is produced” (n=8)

**More food than the body requires**—“They are produced when we eat more food that is not required for our body the left over food becomes waste” (n=2)

**In-take of needed food and excretion of the left over food**—“They are produced when we eat food it gets digested and all we need for our energy, like protein calcium etc and the left over is waste” (n=4)

**When we eat the food the good products are taken and bad are excreted**—“They are produced when we eat the food the good products are taken and bad are excreted…first we eat the food it goes in the stomach and in the small intestine which takes the good products and the large intestine which take the bad products are excreted.” (n=1)

**The intake of vitamins first**—“They are produced after we eat the food the digestion takes place the vitamins will go into the body and then when waste food are left it will be sent out.” (1)

**Kidneys produce waste products**—“With the help of our kidneys” (n=4)
Digestion of food and urinary ducts—“They are produced because of digestion takes place in our body and produced in urinary ducts” (n=1)

The researcher, upon the invitation of the regular 7th standard classroom teacher, developed a lesson sequence based on the above ideas, and taught the class a unit on the excretion of animals for a period of 2 weeks. Subsequently, an in-depth interview was conducted for more than an hour with the classroom teacher who observed the researcher teaching the unit from the CKCM perspective.

RESULTS

What follows is an excerpt of the regular classroom teacher’s views about the CKCM. We quote in his own words:

CKCM need a lot of preparation like I need to give a lot of activities to them and correct those activities and I have to think a lot what kind of activities I should give them and every time I should change their activities. Moreover the discussion, journal, Brochure, I have to correct them. So it takes a lot of time for me. Coming to the Indian context where a teacher is given so much class load (24 period per week) one week, it will be difficult to implement this system in all the classes. If I have to do for the classes, I need some assistance or else I should be given less class load. Then only I can concentrate completely...because usually I teach with lecture method where there is not much interaction. Students will listen but I do not know if they are getting what I am teaching. Sometimes they answer and sometimes they look at me with a blank face. But with this method I was really impressed and I know for sure they understood the subject. In this method, you went in a different way. You asked for their ideas and you made them to think. Their ideas were written and through that guideline you went to your own route and taught the subject. And moreover they still have to do activities and so they thought about it. In my methods, I will give them notes. In this method they themselves write the notes. Definitely your method is a good thing and I am sure they understood better...I saw some of the students who are very dull in my class, those who don’t talk much in the class, also interacted with some of the students and I see them involving with others and eager to finish their activities. That is pretty good evidence...Here we have big classes like 60 or 70 in a class. In these classes we cannot implement. But in this class, which has 40 or 45 students, we were able to do this. But if students are quiet and not naughty, we can do it. But if there is so much noise, then I cannot do it alone. I think if the class is about 20 or 25, I can very well implement this. Because activities are there and they are engaged in those activities using their mind. They have no time to do any naughty things. That is what I have observed...Usually we follow the textbook pattern and guidelines given in the textbook. Here we don’t go like that. We go by student’s ideas and directions. I feel sometimes we may go away from the subject. I mean from the textbook guidelines. Suppose we have to give them some basic knowledge about excretory system, we have to teach digestive system. That kind of thing will
take little extra time for the class. May be I cannot finish it within the time given...Children like fun and this learning is fun and free. Because activities are there group discussions are there. Usually in the Indian set up in the classroom we don’t let students talk too much. That is why they don’t like to come to school and learn in the classroom. In this learning we let them talk about the subject and moreover we let them do some activities in the classroom like how they use color pencils and draw something at home, same thing we let them do in the classroom. But we did it for the subject. That made it very interesting and they did all these very well. Moreover they like this kind of activities. Every time when the period starts they are eager to think and I saw this eagerness in them whenever there was an activity.

DISCUSSION

The classroom teacher revealed the following insights about the CKCM model: requires much preparation, needs to reduce class load; highly interactive; student understanding is better; the size of class needs to be considerably reduced; learning is fun; and students are eager to learn. Because this is the first time the researcher attempted to implement the CKCM, she was able to see first hand, how it played out in the classroom. Both the researcher and teacher developed understandings of how students generated their own ideas based on the meaningful experiences provided in the classroom.

This classroom-based research context gave the participants the opportunity to generate useful knowledge for themselves. Because of this experience the participants may experiment with inquiry-based conceptual change models such as the CKCM in school science. In particular, they have developed the capacity and confidence to implement lesson sequences that aim to explore, assess, develop, and monitor children’s ideas of science concepts.

References


