

Theory to Practice Curriculum Project

Option 2: Connecting selected curriculum practice to classroom practice.

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Description

The draft proposal for this project stated that a combination of the Social Efficiency Ideology and Egan's Imaginative Learning and Cognitive Tools Approach as its philosophical foundation. However, after researching and detailed reading, the ideologies cannot be combined. Hence, it is proposed that the philosophical foundation of this project is Egan's Imaginative Learning and Cognitive Tools Approach.

Social Efficiency Ideology aims to efficiently and scientifically carry out a task for a client (Schiro, 2008, p. 178). It is believed that knowledge exist outside of the individual and provides individuals with the skills they need to function in society (Schiro, 2008, p. 179). Social Efficiency educators view learning as a process of shaping learners' behaviors. (Schiro, 2008, p. 180), they see children as raw material that have to be shaped into desirable adults (Schiro, 2008, p. 181). Teachers are merely managers of learning conditions and materials designed by a curriculum developer and are to act in strict accordance with directions provided by the curriculum (Schiro, 2008, p. 185). Evaluation is strictly based on a priori standard based in normative values (Schiro, 2008, p. 185).

I disagree with these founding tenets of Social Efficiency Ideology and although the Curriculum Ideologies Inventory graph results indicated a preference for the Learner Centered Ideology, having a Standard Five Class, with Secondary Entrance Assessment Examination pending; it was not a lucrative alternative. The Social Reconstruction Ideology tenets were unsuitable for the present curriculum and the Scholarly Academic Ideology proved to be

problematic as children's memory were short-lived and the meaning derived askew resulting in a poor overall performance by many (ierg.net, 2008). However, Egan's Imaginative Learning and Cognitive Tools Approach seemed to be compatible with the curriculum content and was harmonious with some of my personal beliefs developed from years of teaching experience.

Firstly, the world is changing so rapidly it is difficult to predict the skills and attributes that will be in demand in just a few years ahead. We are preparing children for jobs that do not yet exist (Fitzgerald & Nielsen, 2008). Hence there is a need for an education that caters for the whole human being and all its faculties (Fitzgerald & Nielsen, 2008). Imaginative learning was developed from Vygotsky's notion of how our intellectual growth occurs by picking up and array of cognitive tools from our society and the human and natural environments with which we interact (Chodakowski & Egan, 2009). Added to this notion is the recognition that it is difficult to separate cognition and emotions, that our thinking is oriented and shaped by our bodily emotions (Chodakowski & Egan, 2009). Therefore, it will be prudent to use an approach that will engage students' emotions and imagination in connection with the curriculum (ierg.net, 2008).

The child is not viewed as "raw material" but as in possession of a sense-making toolkit that is emotional in nature (Chodakowski & Egan, 2009). This toolkit is invented by our cultural history and recapitulated (ierg.net, 2008). These tools are further shaped and developed by the socio-cultural experiences of the child (ierg.net, 2008). So children have the innate ability to make individual meaning and cannot be fashioned into a specific product like we do with raw materials.

Hence the role of the teacher is to help students become excited by learning, to ensure that students not only learn knowledge but understand the meaning of the knowledge and in so doing help students to attain improved test performance and academic achievement (ierg.net, 2008). Teachers must recognize that children’s thinking and emotions are most deeply and energetically engaged when their imaginations and emotions are at play (ierg.net, 2008).

Imaginative educators believe that there are five zones of understanding described by Kieran Egan as; Somatic, Mythic, Romantic, Philosophic and Ironic; which can be accessed in different ways to develop different kinds of understanding (ierg.net, 2008). Imaginative Education Research Group website explains it as ...

The process of climbing through these five zones is not a steady and inevitable one. Children do not “naturally” develop one kind of understanding at a particular age, and another kind at another age. All kinds of understanding are closely bound up with the cultural context, the place and time, in which the child develops them (ierg.net, 2008). It is also important to realize that these kinds of understanding are not completely distinct from one another, just as one ecological zone blends into the next with no clear dividing line. Nor are later kinds of understanding necessarily “better” than earlier kinds. Each kind of understanding brings new capacities with it, but these work best if they can be combined with earlier capacities rather than replacing them. In Imaginative Education, the challenge is not only mastery of new tools for understanding the world, but also not losing mastery of old tools. Even if, at different ages and for different tasks, certain kinds of understanding are used more than others, we rarely use only one tool to construct meaning (like we rarely construct an object with only one tool) (ierg.net, 2008).

It is also important to note that from each of these zones we have inherited tools that were invented and developed by our ancestors to make sense and to adapt to the world such as stories, metaphor, humor, binary opposites, forming images, and so on (ierg.net, 2008).

An important by-product of imaginative education is the development of intrinsic motivation as it encourages pupils to ask themselves and each other questions which focus attention and initiate learning. Pupils tend to take responsibility for and direct their own learning (Milne, 2008).

Evaluation can take many forms under the Imaginative Education Ideology. It recognizes the traditional forms of testing as evaluation as well as it evaluate students' progress during the activity. Its aim is not to teach for test, but by engaging children in learning it develops a greater understanding and meaning of the knowledge learnt causing children to perform better in test.

Teaching is becoming more complex and more demanding in the 21st century (Parrouy, 2008). Learning is about being involved in meaningful events that increase students' understanding of the world; it is about authenticity, being actively involved and experiencing variety (Wiggins, 1998). Therefore, imagination is critical component of education young people for a sustainable future. (Jensen, 2008)

Curriculum Aim

Students will use mythic and romantic cognitive tools to solve problems involving mean, mode and median.

Rationale

Students often confuse the meanings of mode, mean and median and fail to remember the method used in calculating each. I chose this topic as it is a fore runner to the teaching of

statistics. Statistics is a topic that always comes in the S.E.A. with a high mark value. This unit attempts to use a story and other cognitive tools to help students differentiate among the three concepts and to aid in remembering methods in calculating each concept to solve problems.

Stories give shape and affective meaning to events (Egan, 2009). It is one of the most powerful tools for imaginatively engaging students (ierg.net, 2008). They orient our emotions to their content. Hence it can be a very effective tool if use with any curriculum material (ierg.net, 2008). The fictional story frame in this unit serves to give each concept a persona and provide a contrast. Personalizing is closely related to stories as it converts events or content that has no personal traits into something more engaging by giving it human characteristics (ierg.net, 2008). As a result this tool serves to colour events by enhancing attention and intensifying interest among students so as to heighten understanding (ierg.net, 2008).

Drama used in this unit infuses play and social interaction to engage students in pleasurable activities to enlarge students capacity to imaginatively grasp knowledge (ierg.net, 2008). Here students are provided with an imaginary situation in which they can derive an algorithm to solve a mathematical problem.

The final lesson in this unit uses binary opposition and association with the heroic to find the sum and missing numbers given the mean. Dividing the concept of mean into opposites serves to help students reverse the process of finding mean to derive the sum hence helping them grasp the concept by making discriminations. Association with the heroic tool enables one to overcome the mental challenges of performing task in reverse as association with things or people that have heroic qualities gives them the confidence to face situations by taking on those

heroic qualities (ierg.net, 2008). So while being imaginatively engaged in this activity students easily process the skills involved in performing reversal of mean.

It is hoped that at the end of this unit that the strategies employed will help students to develop meaning so that they will understand each concept clearly, accurately solve problems presented and embed this knowledge in long term memory.

Unit and Lesson Plans

Topic: Statistics – Mode Mean and Median

Target Age: 10 to 13

Planning framework: Mythic and Romantic Understanding

Unit length: 2 weeks

Unit outline:

PLOs

- Calculate mode, mean and median from a set of raw scores.
- Solve problems involving mean.

Cognitive tools used: Story, personalizing, drama, and association with heroes, binary opposite (greed vs generosity).

Story

This is the story of the 3Ms. The 3Ms were really brothers and people who met them for the first time thought they were similar but they are quite different. Mr. Mode was well known wherever he went as he seemed to get involved in all the activities of the town. Mr. Median was obsessed with orderly arrangement and sitting in the middle wherever he went. While Mr. Mean was a very greedy business man who tried to outsmart everyone.

Lesson one: Identifying mode (personalizing)

This lesson will give personal attribute to mode by describing it as a person who is very well known. Students will identify anyone they know like that. Students will then transfer understanding by identifying mode in raw scores.

Lesson Two: Identifying median (personalizing, drama)

In this lesson students will imagine the median as a person (physically built like a Sumo Wrestler) who is obsessed with arranging things in sequential order and then places himself in the middle. Class will be divided into two groups to demonstrate this.

Lesson four: Calculating mean (personalizing)

Mr. Mean being very greedy always tried to outsmart others by finding the sum and dividing it by the number of items.

Lesson five: Given mean find sum and or missing number (heroic, binary opposite)

Justice League (link to familiar cartoon characters) saves the day by undoing the mean. In reversing mean's actions he finds the sum and even missing numbers from the equation.

Conclusion: They like to travel in the land of statistics. So we when we learn more about pictographs, bar graphs and frequency tables we will meet them again.

Evaluation:

Evaluation will take two forms:

Summative: Students solve problems involving mean, mode and median.

Formative: Evaluating students' performance during the lesson this is for feedback, diagnostic and remedial purposes.

Lesson plans

<p>3. Students arrange raw scores in sequential order to facilitate easy identification of the mode.</p>	<p>Presents raw scores on the whiteboard. e.g. 17,13,18,24, 8,18, 9, 8 , 3,24, 18 Asks question to elicit from students that they need to arrange data in sequential order.</p>	<p>Expect that some students will be able to select mode without this step. Allow them to but the answers are wrong they must present the data in sequential order.</p>
<p>4. Students define mode.</p>	<p>Asks question to elicit definition of mode. Write definition on chart e.g.</p> <div style="border: 2px solid blue; padding: 10px; margin: 10px 0;">  <p>Mode is:</p> <ul style="list-style-type: none"> ▪ The value from the set of scores that occurs most often. ▪ It is the most popular value. <p>Tip: Arranging it in sequential order makes it easier to spot.</p> </div>	<p>Allow students to dictate definition to express the meaning they made. This should help in memorizing what mode</p>
<p>5. Students identify sets with no mode or bimodal.</p>	<p>Clarifies problems with set of data containing no mode or bimodal. Some sets can have no mode or more than one modal value.</p>	<p>These problems should arise out of discussions with students.</p>
<p>6. Students work in pairs to solve problems (website Math Goodies) involving mode.</p>	<p>Monitors students :</p> <ul style="list-style-type: none"> • To ensure they are accurately identifying mode. • To clarify misconceptions • To ensure students are engaged in discussion on topic. • To encourage active participation from both parties. • To encourage students to ask each other questions and to provide support for their answers. 	

7. Students identify the use of mode in real situations.

Initiates discussion to encourage students to identify or think of ways that mode can be useful.

To make more meaningful by applying knowledge to aspects in life.

Encourage students to explain.

Here they may share their own not fictional stories.

Home Work/ Evaluation:

Exercises given from Mathematics Textbook pg.148

<p>3. Students transfer knowledge by finding median given raw scores.</p> <p>4. Students work in groups of four to solve four problems involving median.</p> <p>5. Students review by defining median and how it is calculated.</p>	<p>Observes dramatization to see if they understand the concept.</p> <p>Presents an odd set of items. 1, 3, 4, 1, 6, 7, 2, Asks students to find median. Highlights the difference in answers if numbers are not placed in order. Presents an even set of items. 3, 5, 6, 1, 4, 6, Asks students questions to elicit how they will find the median.</p> <p>Divides class in groups of four, one student must be the recorder in each group. Gives students number cards. Directs students to use number cards to create and solve problems with median. Demonstrates – using number card create problem and provide solution. Record problem and solution. Monitors students</p> <ul style="list-style-type: none"> • To ensure they understand the task given. • To clarify misconceptions • To ensure students are engaged in discussion on topic. • To encourage active participation from all parties. • To encourage students to ask each other questions and to provide support for their answers. <p>Ask questions to elicit a definition of median and how it is calculated. Record information on chart and attach the record sheets from group work.</p>
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Let these activities be student driver
Refer to story and personality of Mr. Median for clarification.
Allow them to dramatize if they wish

Median likes to be in the middle.



To find median:

1. Arrange in sequential order.
2. Select value in the middle.
- *3. If there are 2 values in the middle add them and divide by 2 *

<p>6. Individual work: Students solve problems involving median (Integrated Mathematics p. 248).</p> <p>7. Students identify the use of median in real life situations.</p> <p>Home Work/ Evaluation: Textbook- A New Comprehensive Mathematics. W. Furlonge p. 117</p>	<p>Observe students at work. Give assistance to students if required.</p> <p>Initiates discussion to encourage students to identify or think of ways that median can be useful.</p>	<p>} Always refer to story when clarifying</p> <p> </p> <p>} To make more meaningful by applying knowledge to aspects in life.</p> <p>Encourage students to explain.</p> <p>Here they may share their own stories.</p>
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<p>3. Solve problems finding average and in groups of two compare answers with partner.</p> <p>Home Work/ Evaluation: Exercises given from Subnaik Mathematics Textbook pg. 149</p> <p>Follow-up Activities: Finding sum given mean and amount of numbers Finding missing number given mean and the value of some of the numbers.</p>	<p>Monitor students to ensure</p> <ul style="list-style-type: none">• Understand concept.• Using the correct steps• Give clues to any computation problems that may arise• They compare and not copy	<p>Remember to use elements of the story to clarify.</p>
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Reflection

Years ago when I began my teaching career we were taught that using a story or a dramatization was an integral part of introducing a lesson. It was believed then that if children's attention was captured at the beginning of the lesson then interest is maintained throughout the lesson. Nevertheless after many years of teaching I realized that this was not so. Sometimes interest was lost at the end of introducing the lesson and more was needed to be done to help students develop meaning. Many times after the introduction, lessons would deviate to include a story, joke, dramatization or some episode from the past in an effort to help students understand content taught. These strategies seemed to be more effective in maintaining interest and developing meaning. Therefore, the imaginative learning which includes cognitive tools approach was a welcomed ideology.

Imaginative learning ideology stated that techniques such as story should be used throughout the lesson to teach content as they maintained interest and keep children engaged by providing an affective link to the content, thus making things more meaningful (Egan,2009). It seemed that the outcome of these lessons supports this theory.

First of all, classroom management was not a problem. All the boys were so interested in the stories and dramatization that no one misbehaved. This supported Fitzgerald and Nielsen (2009) claim that making teaching and learning engaging counteracts behavior problems. When they took part in the dramatization they all automatically returned to their seats when I asked, "So how can we apply this to math?"

The lesson appealed to multiple intelligences as all students figured out what to do. I did not have to give any instruction or assistance to solve the problems presented. They, themselves figured out how the apply elements of the story to mathematics. Mostly, I enjoyed when the boys

generated questions about possible problems they envisaged. They ask what will happen if there was no popular item or if two items were popular. I intended to teach this but I did have to introduce these ideas, they did. Hence it demonstrated a level of critical thinking. They found the lessons humorous, an unintentional cognitive tool appearing in these lessons. They are always sharing a joke or seem to find something to laugh about in every scenario. They remembered funny incidents without any effort. Humor seemed to ignite imagination, encourage flexibility of the mind (ierg.net, 2008) and sustain memory.

When we move on to statistics there was no confusion of the concepts. They remembered and often referred to the story and to personalized attributes given to the concepts. Therefore, it improved memory. The boys, who were exposed to this topic before, stated that they were no longer confused. I was amazed when they explained situations in really life they could apply these concepts. Tyreek said that his aunt used this when selling insurance, they linked it to fundraising activities in school, games, business activities and even a way to con people (an undesirable outcome of the lesson).

I too enjoyed these lessons. The energy exhibited from the students left me feeling satisfied. The accuracy in solving the problems made me feel very accomplished. The feedback from the students was also encouraging. Before I began teaching these lessons I informed the boys that this was a new idea on teaching and at the end I will be giving them a questionnaire (see appendix 1) to evaluate the idea. I stressed that I wanted their honest opinion as it would help me be a more effective teacher. Below is a graph showing some of the results.

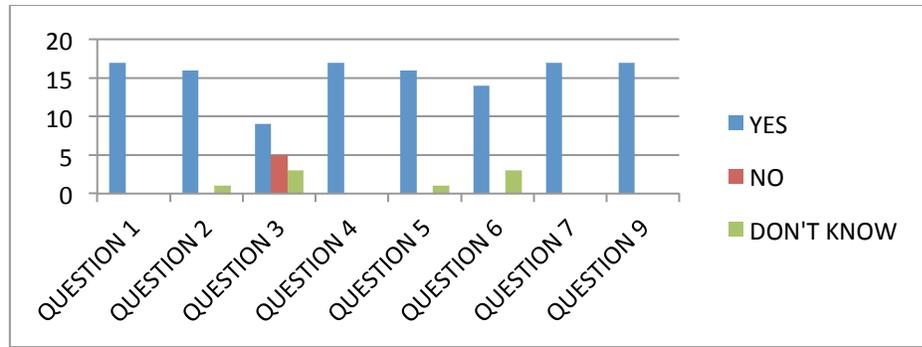


Figure 1: The Results of the questionnaire evaluating the Imaginative Learning Ideology

The results showed an overwhelming support for the strategies employed. They thought it was enjoyable, easy to understand, they learnt new things, they could link the personalities given to the concept with people they knew and they thought that it was meaningful as they could use it in real life. Other comments made were that they enjoyed group work as they were able to discuss problems help others and get help, although at times they felt that some members were too bossy and it was a challenge to keep others on task as the discussion sometimes deviated to others topics. They recommended that other classes share in this experience.

The observations and feedback given indicates that this ideology can certainly make the teaching learning experience more meaningful. It does not require lots of resource, nor take more time. (ierg.net, 2009)What it requires is thoughtful imaginative planning of lessons so that it will appeal to the students' emotions. I need to begin to document techniques used and note effectiveness of lessons. It will take time but it will be time well spent.

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Appendix One

Questionnaire

KINDLY FILL OUT THE QUESTIONNAIRE BELOW SO THAT YOUR TEACHER CAN HAVE SOME FEEDBACK ON THESE LESSON TAUGHT. **ALL THE QUESTIONS BELOW RELATE TO THE LESSON ON MEAN, MODE AND MEDIAN.**

Tick **YES** if you **agree** with the question.

or

Tick **NO** if you **disagree** with the question

or

Tick **DON'T** know if you **neither agree nor disagree**

1. Did you find the Mathematics lesson enjoyable? Yes No Don't know

Tell me why

2. Do you think that the lessons were broken into steps to make it easier to understand? Yes No Don't know

3. Did working in groups and peers help you to understand better? Yes No Don't know

a) What was the BEST part about working in groups?

b) What was the HARDEST part about working in groups?

Yes No Don't know

4. Did you learn anything new?
5. Did the story help you understand the topic better? Yes No Don't know
6. Can you match the people you know with those in the story? Yes No Don't know
7. Do you think what you learnt about mean, mode and median can help you in real life? Yes No Don't know
8. Give me an example of how you might use mean, mode and median in real life.

9. Do you find that the jokes use in the story help you understand? Yes No Don't know

Comments:

What did you like and dislike about these lessons?

Suggestions:

Any ideas about how we can make this lesson more interesting?
