

Learning about selecting classroom tasks and structuring mathematics lessons from students



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Abstract

As part of a larger project¹, students' views on their preferences for particular types of mathematical tasks were sought, as well as how they describe their ideal mathematics lesson, and their responses to specifically prepared tasks from sequences of lessons. The students had particular views about both tasks and lessons and were able to articulate their views. Teachers would do well to seek to find out the types of tasks and lessons that particular students prefer, and to be more explicit about what they are intending to do in every one of their lessons.

Introduction

There are many sets of recommendations about characteristics of effective teaching, which are generally compiled theoretically, or from surveys, or from descriptions of exemplary teachers (see Clarke & Clarke, 2004; Hattie & Timperley, 2007; Education Queensland, 2010). The research summarised here attempted to examine the views of students on the types of tasks they value, and the structure of lessons that they prefer.

While there have been many studies seeking students' attitudes, values, beliefs and motivation, the approach reported here aligns with Zan and di Martino (2010) who argued that emphasis should move from measuring attitudes to describing them. They argued for more narrative approaches to describing student attitudes, including

with large samples, with the goal of understanding behaviour.

This research perspective also adopted a similar perspective to that of Daniels, Kalkman and McCombs (2001), who argued that even though students are able to articulate coherent views on issues of pedagogy they are seldom asked to do so, and that students are particularly able to comment on classroom and school environments. Allen (2003) similarly argued that there has been too little attention to students' perspectives of aspects of teaching and class organisation. It is recognised that teaching involves much more than finding ways to present the content, and is connected to relationships, student self-regulation (Dweck, 2000) and motivation (Middleton (1995), so it is relevant to seek students' perspectives on these issues.

In terms of seeking students' views about tasks the project chose to focus data collection on the extent to which they felt they learned, and whether they liked particular types of tasks since these seemed to be main determinants of their decisions on engagement. In the piloting of our instruments we found that the students were able to respond to both types of prompts without requiring further clarification. Our approach was to seek some responses to predetermined scales as well as some free format narratives by the students to allow their real concerns to emerge. We collected three complementary sets of data, giving a breadth of types of data and therefore greater insights into the views of students. The three separate data sets are not presented here due to space limitations but will be presented in the workshop. A summary of the findings are described in the following sections.

¹ TTML is an Australian Research Council funded research partnership between the Victorian Department of Education and Early Childhood Development, the Catholic Education Office (Melbourne), Monash University and Australian Catholic University. Barbara Clarke and Doug Clarke were also researchers on the project.

Responses of students to predetermined prompts about tasks and pedagogies

A survey was designed to gather responses on aspects of lessons and tasks from a cross-section of students. As well as seeking information on various aspects of lessons, we also included specific items asking students to compare different types of tasks and to indicate their preferences.

The items on general aspects of pedagogy were adapted from Clarke et al. (2002) and Sullivan et al. (2009), and the items on tasks were written specifically. There were 930 students in 96 classes across 17 schools who completed the survey.

To summarise the results from the survey, it seems that at each of these middle years' levels there is a range of student satisfaction and confidence, and teachers should be aware of the views of each of their students. It also seems that teachers make a difference to students' responses and teachers need support not only to find out students' levels of satisfaction and confidence, but also on strategies to address negative responses. Each of the task types presented were liked most by some students, and likewise each of the types was rated as the one from which they can most learn; this suggests that teachers need to use all types of task in their teaching. A related issue is that students may need support to gain benefits from tasks that they do not like or do not feel that they can learn from. It seems important that teachers make students aware of the purpose of tasks and what it is the teachers are hoping the students will learn from them. The students seem to like tasks that are easy yet feel they learn best from tasks that are challenging. Of course, we would hope that students can also learn from tasks they find easy, and like tasks that are challenging. Again, it may be important for teachers to illustrate or

emphasise the role of the tasks and the nature of the challenge they offer.

Narrative descriptions of students' perceptions of characteristics of desired mathematics lessons

Using a different approach, we also sought insights into students' perceptions of the desired characteristics of mathematics lessons through their narrative responses. It was hoped in this way to gain insights into the ways students described their desired characteristics, rather than by rating lesson characteristics prepared by us. We did this through open-ended responses to particular prompts on the overall survey.

In summary, the main impression from their responses is their diversity, and there are clearly many ways in which students respond to lessons. There were two trends in their lesson descriptions of, on one hand, students recalling effective teaching of a content topic, whereas there were others who remembered interesting aspects of the pedagogy. In explaining their choice of lesson, the main category of responses related to fun, but learning something new was also frequently cited. We note that the descriptions of hated lessons also referred to particular topics. So while recognising that some students dislike some topics, teachers are advised to focus on the students' learning of content, and to choose interesting and fun ways to engage students in that learning.

Students' essays on their 'ideal maths class'

We also sought students' views on lessons and teaching through a particular prompt seeking narrative responses. We asked the students in two of the schools that completed a lesson sequence to write an essay, the particular prompt of which was:

Write a story about your ideal maths class. Write about the sorts of questions or problems you like to answer, what you like to be doing and what you like the teacher to be doing in your ideal maths class.

The intention was to gain insight into what the students recalled about their mathematics classes, and it can be assumed that these responses can be taken as indicative of the lesson features that the students like. The following is an example of a typical student's essay, presented as it was written:

My favorite maths would start with a 10 min introduction were the teacher explains the game to all of us and still allowing time for questions. The games would be 2+ people for a competition and people will split into groups and will organize who plays who 5 min every one will be playing at all times unless there is an odd amount of people we will play for 25 min. at the end of the Lesson the groups will figure out who was the winner and people can share what they Learnt Liked and strategies they used. Sharing is for 10 min. for my second option I would do real life problems Like 250 grams of sugar for \$10.50 or 750 grams for \$33.15. I like real life problems because they could help me one day and its set out differently than math. for this the explanation is for 5 min this is because you don't need to explain the rules.

In this response there were two key elements: the use of a game, and the use of real-life problems, but the real implication is that this is indicative of the detail that students used to describe the ideal class.

In summary, it seems that the responses to this prompt about an ideal lesson seemed dependent on the teacher. In

synthesising the responses, students liked lessons that used materials (although these were not structured materials), were connected to their lives, involved games, were practical with some emphasis on measurement, in which they worked outside, with the method of grouping being important, and over half of the students claim to like to be challenged. An interesting result was that, contrary to expectations, many students claimed to like help from the teacher only after a period of effort.

Conclusion

It is clear that there is much that can be learned from the responses of students. The students who responded to these instruments are clearly aware of aspects of teaching, including those aspects that are subtle. While most of their comments are not surprising, they do endorse strongly many of the pedagogies that some teachers seem reluctant to adopt. One clear implication is the need for teachers to use a variety of tasks and lesson structures, a recommendation that one suspects has particular significance for secondary teachers. Another implication is that, since not all tasks or lessons can be those preferred by students, teachers need to make efforts to explain the choice of task and its purpose, and to explain the goal of particular pedagogies that they might use.

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