STUDENTING: THE CASE OF "NOW YOU TRY ONE"

Peter Liljedahl & Darien Allan

Simon Fraser University

Studenting is defined as what students do while in a learning situation. A subset of studenting behaviours, that we call gaming behaviours, subverts the intentions of the teacher. In the research that we present here we confirm a taxonomy of studenting behaviours observed while grade 10 students are independently solving a problem to test their understanding of the days lesson. Results show that 79% of the studenting behaviour observed subvert the intentions of the teacher.

INTRODUCTION

In 1986, Gary Fenstermacher introduced the term *studenting* to describe the things that students do to help themselves learn; from paying attention to following instructions, from practicing to studying, from reviewing to seeking help, from trying to understand to ensuring they understand, etc. In 1994 Fenstermacher expanded this definition to also include the other things that students do while in learning situations – things that do not actually help them to learn.

> [T]hings that students do such as 'psyching out' teachers, figuring out how to get certain grades, 'beating the system', dealing with boredom so that it is not obvious to teachers, negotiating the best deals on reading and writing assignments, threading the right line between curricular and extra-curricular activities, and determining what is likely to be on the test and what is not. (p. 1)

Taken together, the understanding of studenting as what students do while in a learning situation expands our ability to talk about student behaviour in classroom settings. More specifically, it gives us a name for the autonomous actions of students that may or may not be in alignment with the goals of the teacher. As such, studenting extends constructs such as the didactic contract (Brousseau, 1997) and classroom norms (Cobb, Wood, & Yackel, 1991; Yackel & Cobb, 1996) to encompass a broader spectrum of classroom behaviours – behaviours that are not predicated on an assumption of intended learning. Consider, for example, the following anecdote:

> At the end of a lesson Ms. Teacher assigns some homework from the textbook to be completed by next class. At the same time she provides the students with the answers to the homework questions. Her reason for doing this, she explains to the class, is that she believes that in order for the students to better learn the day's concept they need immediate feedback on their efforts as they try out their new knowledge. One of her students, Stuart, goes home and copies the work from a friend who has already completed the homework assignment. Stuart's reason for doing this is that he wants full credit for having done the homework.

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From the teacher's perspective Stuart is meeting all of the benchmarks for learning – he paid attention in class and he did his homework. From Stuart's perspective he is meeting all of the benchmarks for getting a good mark – he is getting full marks for attendance and homework. There is a rationality to Stuart's actions that is overlooked if we examine it through the oft used lens of learning. Stuart is not learning, at least not in the way that the teacher intended. But he is studenting. Specifically, he is studenting in a way that *beats the system*.

Studenting has appeared infrequently in the literature, and when it has been used it has been limited to only some aspects of studenting, and then only within particular learning situations. Goldin (2011) explores studenting from the teacher's perspective focusing on the historical and sociological aspects of studenting and limiting her study to the nature of student work, the politics of studenting, and what the student brings to the work. Aaron (2010), on the other hand, looks at studenting from the perspective of the student and focuses on the rationality of studenting behaviour within the context of high school geometry instruction. In particular, she looks at those behaviours relating to the work students do in instruction and the tacit knowledge they bring to it. Both of these studies neglect the subversive aspects of studenting that Fenstermacher introduced to the concept in 1994.

It is exactly these aspects of studenting that we are interested in. More specifically, we are interested in the studenting behaviours that are not in alignment with the teacher's goals and expected actions, yet are missed by the teacher during the activities of teaching. We have come to refer to this class of studenting behaviours as *gaming* behaviour, as in the students are *gaming* the system.

METHODOLOGY

The data for this study comes from an ongoing larger research project in which studenting behaviour is being studied across a large number of mathematics classroom contexts. The data for this research consist of classroom videos, field notes, and post observation interviews with students. Using a grounded theory (Charmaz, 2006) approach these data are continually analysed between observations. From this analysis, over time, a number of interesting studenting behaviours has begun to emerge within a number of contexts. As these behaviours emerge and clarity is gained, coding for these now known studenting behaviours in subsequent observations becomes easier. Over time a form of saturation is reached as new observations of these contexts no longer reveal new studenting behaviours. When this occurs we can say that a taxonomy of studenting behaviour in a certain context has been reached. So it is with the context that is being presented here.

Context

Having worked in a number of grade 10-12 (ages 15-18) classrooms wherein the teachers use a transmission model of instruction we had reached a saturation point

around the context of *now try this one* (as we have come to call them) problems. These are the problems assigned, usually one at a time, by a classroom teacher immediately after s/he has done some direct instruction concluding with some worked examples. We recognize the rather traditional approach in this method of teaching and, although we would not ourselves approach the teaching of the topics in this fashion, we make no judgement about it here. The purpose of this research is not to try to change teaching but rather to observe studenting behaviour within whatever teaching method we observe. As it is, this method of teaching is the most prevalent method we have encountered at the grade 10-12 levels.

Data

The data for what we present here comes from a single lesson on completing the square as a way to graph quadratic functions being taught in a grade 11 classroom (n = 32). Because saturation had already been achieved our codes were already well established. As such, for this study no video was used. Instead, we simply used our pre-established codes to annotate observed student behaviour on a supplied seating chart of the classroom during the *now try this one* phase of the lesson. Immediately after these observations, while students began to work on their assigned homework, as well as for a few minutes after class, we collected very brief interview data from a number of students selected based on the different behaviours we saw exhibited during our observations. The interviews were short (1-4 minutes) and were audio recorded using a portable digital recorder. For the most part these interviews consisted of a brief declaration of what we had observed them doing and one or two questions regarding their reasons for their behaviour. This was not foreign to the students as the lead author had previously spent several lessons doing similar research in the same class; although not always in the context of *now try this one* problems. In all, data from 15 interviews was collected by the two authors in a time of 25 minutes. Added to this were lengthier interviews with the teacher before and after the lesson in order to ascertain her goals for the lesson in general and the *now try this one* problems in particular. In the post interview we shared with her some of the behaviours we had observed as well as some of the responses the students had given during our brief interviews and asked to her to respond to these vis-à-vis her own goals.

Analysis

These data were then analysed using a framework of analytic induction (Patton, 2002). "[A]nalytic induction, in contrast to grounded theory, begins with an analyst's deduced propositions or theory-derived hypotheses and is a procedure for verifying theories and propositions based on qualitative data" (Taylor & Bogdan, 1984, p. 127 cited in Patton, 2002, p. 454). In this case, the theory we were attempting to verify was the taxonomy of *now try this one* studenting behaviour that had emerged over time within a variety of classrooms.

RESULTS AND ANALYSIS

From the analysis of the data our previously established taxonomy of five main studenting behaviours was confirmed. In what follows we present each of these studenting behaviours exemplified with excerpts from the data.

Amotivation

Of the 32 students observed for this study three (all boys) displayed a general lack of attention towards the lesson. They were generally disengaged and disinterested in the lesson. Visibly they paid little attention, took no notes, and when they were asked to try to solve an example on their own they made no attempt to do so, or to seek help. When asked about their lack of interest they each gave a different explanation.

Frank	"I don't get it." [shrugging his shoulders and looking back down at his cell phone]
Andrew	"My tutor will help me with this tonight."
Jason	"I'm just tired today."

When we shared these comments with the teacher after the class she replied that she was not surprised.

Ms. Duo	"Frank and Andrew are never engaged. They're often absent or late and when they are here they don't do much. Andrew has a tutor and uses that as an excuse to not do anything in here … but he is still failing the course. Jason is always here but he isn't doing any better."

(Ryan & Deci, 2002) would likely refer to them as amotivated. Amotivation is a deeper problem that goes well beyond the context that we were focused on. As such, we initially considered not including these cases in the taxonomy. However, we decided against this for two reasons – this behaviour was seen in almost every class and its inclusion allows us to account for all of the behaviours seen during the *now try this one* context.

Stalling

Four students exhibited a behaviour that we came to call stalling. Stalling behaviour are actions that can be seen as legitimate, that are not out of place in a normal classroom or during the course of a lesson. What made these actions interesting to us was their timing. As soon as the students were asked to do a question on their own two students suddenly had to go to the bathroom, one needed to sharpen their pencil, and one couldn't find a calculator (even though the question didn't require one). When we asked the students about these coincidences they had a variety of superficial reasons justifying their actions:

Jessa	"I had to go. That's all."
Barry	"I waiting until there was a break in the lesson."
Jenny	"My pencil broke."
Drew	"Calculators are allowed so I wanted to use one."

When pushed about these reasons, however, two things emerged that were common to each of these four students. First, all of them expressed that the *now you try one* was an unimportant part of the lesson; "like a break". The reason for this, they all revealed, was "because in a few minutes the teacher [was] going to provide the answer". Taken together, these students were seeing a redundancy between their efforts to solve the problem (had they done so) and the teacher presented solutions. This redundancy exists only within a context where the purpose of the *now try this one* problem is the production of notes.

Faking

There is one final category of non-trying behaviour – faking. Two students (both girls) exhibited this behaviour. These girls had two things in common – they had impeccable notes and from the front of the classroom they both appeared to be trying to solve the problem. It was only from our vantage point in the back (and side) of the classroom that we were able to detect what was really going on. Physically all of their actions were those of students who were working. Their heads were down and their pencils were moving. In reality, however, neither of them was actually writing anything on their paper, even though one of them even made the pretence of erasing a mistake. When asked about this they both gave the same general answer,

Keesha "I don't want to mess up my notes".

When pushed on this point they both came back with the same answer that the stallers did – that the teacher will soon provide the solution. However, they added to this a nuance that the stallers did not mention, and perhaps did not care about.

Jennifer "Not only will she give us the answer, she will give us the best answer. This is the one I want in my notes."

The importance of the best answer, as opposed to just a correct answer, is important when the goal is to produce perfect notes, a goal that both of these girls clearly shared.

Mimicking

The nine aforementioned students aside, the remaining 23 students all tried, at least in part, to solve the *now you try one* problem. Of these, 17 were mimicking. Visibly these students engaged in the problem and tried to solve it. Some made mistakes, some gave up, but most succeeded in arriving at the correct answer. Successful or not, what these students all had in common was that they referred to their notes, or the notes on the board, OFTEN. Closer observation and our questioning revealed that the students in this category were not so much relying in understanding as much as simply following the solution pattern laid down by the teacher in the example that she had worked through immediately prior to the *now you try this one* problem. The constant referencing to the previously solved problem was symptomatic of the students' attempts to map characteristics of the example problem onto the current task. When asked about this mimicry behaviour these students claimed that they were doing what the teacher wanted them to do.

John "This is how we do things in this class. The teacher gives us an example and we write it down. Then she gives us one to try and we copy what we did in the example."

When we asked the students who had failed to get an answer about what happened their general response was that the *now try this one* question "must have been" different from the example question.

Samantha "I got lost somehow. I'm not sure where. I thought I was following the rules."

For Samantha, like the rest of the students in this category, the "rules" is a solution pattern to be copied.

Reasoning

The remaining six students demonstrated a behaviour of reasoning. These students not only attempted the problem but progressed through it in a reasoned and reasonable manner with minimal references to prior examples. This is not to say that the prior examples did not play a role in their solutions, for they did, but as a whole rather than the line by line copying that the mimics performed. Further observation of this group of students, as they tackled additional problems, confirmed that they had a good understanding of the mathematical relationships and skills at play. Given this, we asked these students if the teacher's examples had in any way contributed to their understanding of the *now try this one* problem. For the most part the students indicated that what the teacher's examples gave them was a new combination of things that they already knew.

Kenneth "I don't know. Maybe. … I mean it all makes sense. If anything maybe the examples just showed me what kinds of questions are possible."

That is, although they seemed to know all of the pieces they had never thought to combine their knowledge in this way.

The one exception to this was Ryan, who on several occasions (during the lesson that was observed for this study as well as others) anticipated the teacher's next example or next question. That is, unlike the others in this category, Ryan was able to combine his knowledge without being shown how to do this.

DISCUSSION AND CONCLUSION

Having spent time in this particular class before we knew that this teacher made extensive use of *now try this one problems*. As such, prior to our observation we asked the teacher to explain to us what her intentions were with the tasks and what she expected the students to do with them.

Ms. Duo Well, I use them to give the students a chance to check their understanding of what we had just learned. This way, if they don't understand something we can catch it right away.

Researcher And what do the students do with these problems?

> Ms. Duo For the most part they do the problems. You'll see when we are in there that there are a couple of boys in the back that don't do them but they don't really do anything. Everyone else, though, does them.

Ms. Duo's expectation is that the students will do these problems as a way to test their understanding and she believes that, for the most part, this is what they do. In the post lesson interview she confirmed her expectation.

> Ms. Duo So, as predicted, those three boys in the back didn't do much. But everyone else was pretty much on task. I mean, they didn't all get the problems right, but they did them. And the ones that made mistakes had a chance to learn from their mistakes when we went over it.

The data does not agree with either Ms. Duo's pre-lesson prediction or her post-lesson reflection. Of the 29 students in the class that the teacher thought were acting in alignment with her goals, only six actually were. The other 23 students were stalling, faking, or mimicking understanding. Their actions were not actually what the teacher thought they were. That is, 23 out of 29 (79%) students were subverting the intentions of the teacher, and doing so in ways that the teacher was not aware of. Now, it could be argued that those students who were mimicking understanding by mapping the solution process from one problem to another were exhibiting expected behaviour, but keep in mind the words of John and Samantha. From the perspective of the students, they were not trying to test their understanding. They were *copying* and *following the rules* – neither of which is what Ms. Duo intended.

These findings are consistent with our research in other contexts as well. Across the board students are finding ways to game the expectations of the teacher in ways that the teacher is not aware of. In many cases these behaviours are centred on proxies for learning and understanding, such as mimicking, that are not actually conducive to learning – but appear to be in alignment with the teacher's goals.

From the perspective of the student, however, there is a certain rationality to their actions that we are trying to understand using theories from behavioural economics, such as minimisation of effort, economy of action, bounded rationality (Simon, 1955), loss aversion, and risk aversion. At the same time we are exploring game theory to try to understand potential performance goals when students ‘game the system’ (Baker, Roll, Corbett, & Koedinger, 2005), the behaviours and related consequences when students engage in ‘playing the game’ or ‘playing the system’ (Dryden, 1995), and students’ behaviour in response to incentive grading systems (Newfields, 2007).

Finally, it is worth noting that since we brought to the attention of Ms. Duo the taxonomy of the behaviours we had observed within her lesson she has begun to make changes to her teaching. It seems as though the kind of knowledge generated by research into the gaming aspects of studenting behaviour can be a powerful catalyst for initiating teacher change.

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