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## Not Asking for Help/Feeling Dumb: Preservice Elementary Teachers Reflect on Math Classes

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**Abstract:** Preservice elementary teachers have had a variety of experiences in their math classes which influence their willingness to engage in math as well as their confidence in doing so. This study examined the responses of two sets of preservice elementary teachers, in 2017 and in 2022, to questions about their "best" and "worst" experiences in math classes. Previous research has seldom asked preservice elementary teachers to examine what they do as students to create a better math experience and research is only now beginning on how COVID-19 may have affected student behavior. Inductive analysis revealed that the emotional intelligence of teachers greatly affected preservice elementary teachers' willingness to meaningfully engage in math. For example, a recurring theme in the data was a strong sense of not wanting to appear dumb, which prevented the students from asking questions or seeking help when needed. This study demonstrates that the classroom environment plays a significant role in preservice elementary teachers' success in math, confidence and comfort level with the subject, and, undoubtedly, how they will eventually teach math to their future students.

**Keywords:** Classroom environment, emotional intelligence, math, preservice elementary teachers.

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### Introduction

Evaluations of teaching effectiveness in college courses began in the 1920's (d'Apollonia & Abrami, 1997). Yet, while college students are regularly asked to evaluate the teaching in their courses, they are rarely asked to evaluate *the learning*. That is, they are asked to identify what the professor did well or did poorly, but students are not asked what *they* did, as students, in terms of their approach to the subject to help or hinder their own learning. Nor are they typically asked to identify any of the pedagogical methods used by their professor and connect it to their own learning. Given that even elementary age students are "aware of their classroom environment and how it can affect their learning," both in terms of what the teacher did and what they themselves did (Bianchi, 2018; Shih et al., 2019), it is essential to discover how college students— in particular, those who will become teachers – reflect on the learning environment (Cavendish et al., 2021; Rasid et al., 2020).

### Literature Review

The particular focus in this article is on preservice elementary teachers and the experiences they have had in math classes. These students are especially qualified to comment on teaching effectiveness, given that they take courses on the topic (Thakur, 2013). Prior to delving into describing the current study, let's set the stage by considering related research.

#### *Students' Perceptions of Effective College Learning*

Self-regulation refers to a student's ability to monitor their own learning and adjust their behaviors to increase learning. This ability plays a major role in student success in college math courses (Elhousseini et al., 2022; Johns, 2020). Yet, though students may have many study strategies, their self-regulation likely remains under-developed (Peverly et al., 2003). In addition, studies show that teachers, including mathematics teachers, are often poor at self-regulation in the classroom

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(Gürel et al., 2022). The classroom environment certainly affects self-regulation – that is, if the environment is perceived as unsupportive, students may give up on their self-regulation strategies (Turner et al., 2002).

Interestingly, among students 11 to 14 years of age, a study of 120 students in Turkey found that the students could give pictorial and written descriptions of their mathematics learning and the teacher's teaching. However, it was concluded that, unfortunately, the students viewed mathematics as passively listening to the teacher (Hatisaru, 2020).

In a large study that asked students to answer the question *what is the best way to learn math*, 43% of the respondents stated that one needed a good professor. Although the survey was intended to have students describe what *they* needed to do, the student respondents “reported that first and foremost they needed a ‘teacher,’ ‘instructor,’ or ‘professor’ to help them succeed in mathematics.” Further, they described needing a good professor and not wanting to “teach themselves.” This last comment seemed to be in reference to not liking flipped classrooms and/or online learning, which they sometimes view as not even having a teacher (Berry et al., 2019).

In the same study, students acknowledged that they need to practice problems and wanted a printed textbook. They also expressed the desire for a classroom culture that allowed them to ask questions, without fear of appearing dumb. Although the students felt that they should ask questions, doing so was dependent on their feeling safe (Berry et al., 2019).

Students seem to recognize at a young age that they should seek help from their teacher, but they also – early on – develop the desire not to appear “dumb” in other students’ or the teachers’ eyes (Newman & Schwager, 1993; Prabhu, 2022) and, thus, they devise elaborate strategies “to escape being labeled as stupid” (Covington, 1992, p. 85). Students with learning disabilities are particularly unlikely to ask for help (Turner et al., 2002). Not surprisingly, research has shown that seeking help increases academic achievement (Miles & Vela, 2022; Sun et al., 2018).

Overall, students don’t appear to be very aware of how they could be more proactive in learning math. They express the need to have their professor do a lot to help them without necessarily reflecting on their own role in the learning process.

#### *Students’ Perceptions of Effective College Teaching*

When students are asked what effective college teaching is, they indicate that they want a relationship with the professor (Groves & Welsh, 2010; Miron & Mevorach, 2014). Students express that they would feel more confident if they had teachers they could trust and who would support and encourage them (Groves & Welsh, 2010). In a Canadian study, the students stated that “the relationship with the teacher is vitally important” (Saul, 2005, p. 19).

Students seem to be moving away from desiring teachers to lecture well and more toward having teachers provide opportunities to work problems themselves with teacher assistance, as needed, and ample opportunities to ask questions (Kaur, 2022). Students wish to be engaged (Hu, 2020). They also want real-life examples from their professors and appreciate having professors who themselves have had experience applying the subject in the “real world” (Groves & Welsh, 2010; Hu, 2020).

In a study of 90 engineering majors, students identified three broad areas as representing the essential traits of an effective professor: character, competence, and connection. *Character* included such traits as being humble, enthusiastic, on time, and having a flexible attitude. *Competence* was described as the professor understanding the subject matter and providing adequate examples. *Connection* referred to traits such as learning students’ names and interacting with students. Taken together, then, “[e]ffective teaching requires an individual (1) to be thoroughly versed in his/her area of expertise, (2) possess personal attributes worthy of emulation by the students, and (3) a desire for openness with the students designed to produce the synergistic relationship necessary and conducive to learning” (Martinazzi & Samples, 2000).

Another study asked 330 students to list the top five characteristics of an effective college professor. Nine characteristics emerged: respectful, knowledgeable, approachable, engaging, communicative, organized, responsive, professional, and humorous (Delaney et al., 2010). Walker’s study (2008) revealed a similar list: prepared, positive, high expectations, creative, fair, personal, creates a sense of belonging, compassionate, humorous, respectful, forgiving, and admits mistakes. A more recent study by Bledsoe et al. (2021) is consistent with these previous studies, as the researchers found that students express a desire for teachers who care about their learning, engage them in the process, and work “especially hard to support student learning” (p. 27).

Lowman employed a creative method in the pursuit of revealing traits and attributes students look for in their teachers. He used approximately 400 nomination letters for teaching awards written by students to analyze what students think is exceptionally good teaching. He concluded that good teaching “spurs students to an active involvement in their own learning” (Lowman, 1995, p. 2). Such active involvement occurs from two dimensions of the professor. The first dimension is the professor’s skill at “creating intellectual excitement” (which includes clarity of examples, as well as having an emotional impact) (Lowman, 1995, p.21). The second dimension is the professor’s awareness of students and communication skills with them. Such communication should increase the student’s enjoyment and motivation to learn.

Ralph (2003) analyzed professors' research on effective teaching and found that exceptional teachers have a "caring posture" toward their students. This fits well with what students say that they need. Further, students want to learn. Students see a professor as being exceptional if they themselves feel that they learned a lot (Gusthart & Harrison, 2003).

It would seem that particular attributes of professors can be conducive in further developing students' self-regulation abilities, thereby enhancing learning. Furthermore, for future teachers, the combination of having had effective teachers and taking an active role as learners can impact the classroom environment once they enter the teaching profession. It is expected that they will work on creating – and sustaining – a positive learning environment for their future students.

### Methodology

The present study started in 2017 with the primary objective being to determine whether preservice elementary teachers were aware of their contributions to the success of a math class. Four questions were asked regarding their own and their past instructors' behavior in both the "best" and the "worst" math class they had experienced. The data were gathered, stored, and not used further at that time. Then, these same questions were asked of a new sample of respondents in 2022 and the results were compared.

#### *Research Participants*

In 2017 and again in 2022, a class of preservice elementary teachers (78 students in 2017 and 84 students in 2022) responded in writing to the following four questions:

- 1) What did you do as a student in your best math class?
- 2) What did the teacher do in your best math class?
- 3) What did you do as a student in your worst math class?
- 4) What did the teacher do in your worst math class?

Students were not prompted to think back to a high school math class. While it is possible that some students were referring to secondary-level math courses in their responses, it's expected that they were most likely commenting on their more recent experiences with math courses in college.

#### *Research Questions*

The study was intended to address three research questions:

- 1) Do students identify specific behaviors/activities that they engage in to contribute to the success they experience in math? If so, what are they?
- 2) Do students identify specific behaviors/activities that instructors engage in that contribute to student success in math classes? If so, what are they?
- 3) Have the types of behaviors and activities that the sample of students identified in 2017 changed from those identified by a sample of students in 2022?

#### *Data Analysis*

Students were asked to provide written responses to the four open-ended questions presented to them about their "best" and "worst" math classes. This generated a large set of qualitative data. We employed content analysis of these data. Both of us -- independently and repeatedly -- read through all of the data to gain a sense of recurring themes. This approach followed Bengtsson's (2016) admonition: "[T]o increase the validity, at least two investigators should perform the analysis separately and then discuss their results and obtain consensus" (p. 11). Then, still separately, each of us formed categories of the responses the students provided. Eventually, we compared categories and reached consensus on the resulting themes. As such, we "avoid[ed] using preconceived categories (Kondracki et al., 2002), instead allowing the categories and names for categories to flow from the data." This approach of immersing ourselves in the data "to allow new insights to emerge" (Kondracki et al., 2002) can also be described as "inductive category development" (Hsieh & Shannon, 2005, p. 1279).

### Results

Students noted that in their best math class, they paid attention, did the homework, participated in class, and asked the teacher for help when needed. Some representative quotes follow:

- Developed a note-taking method that worked for me, asked my teacher to help with problems I didn't understand, participated in class (actively), always did my homework.

- I took detailed (color coded) notes, did all the homework problems, went in during lunch to go over problems with the teacher
- I paid attention while the teacher taught the lesson. I also did all of my homework and asked for help when I needed it.
- I really participated in the class discussion. I had a personal relationship with the professor.
- Listened and asked questions when I didn't understand. Made sure I did all the assigned homework problems.

Such comments demonstrate students' sense of agency – i.e., they were active participants in the class, they completed their homework, and they sought help when needed.

In their worst math class, students admit to not paying attention, not asking for help, and not doing the homework. They fell asleep during class, had a poor attitude, didn't focus, and didn't apply themselves. However, the order of this is unclear. Does the student fail to put forth any effort from the start, or does the student begin with good intentions but end up losing interest and slacking off because the teacher has failed to create an atmosphere in which the student believes success is likely? While there is undoubtedly variability, and a host of factors involved, our data lead us to conclude that, for the most part, the success of students in math classrooms depends upon the classroom environment. Examples of responses highlighting the importance of the classroom environment include:

- Not go to the teacher because I didn't feel comfortable enough. I do better when I like the teacher.
- Not asking for help/feeling dumb.
- Got frustrated with the teaching method and stopped trying on homework.
- Would get frustrated; be embarrassed to ask questions.
- Refused to go in for help because my teacher didn't want to help.

There were a few responses in which students blamed themselves, acknowledging that they didn't have a good attitude:

- Showed up with a poor attitude. Did homework wrong.
- I was not motivated to do my work and felt like everything was super hard.
- Had a very negative attitude about the class.

The students stressed that teachers in their best math classes expressed passion and enthusiasm, actively involved students, provided thorough explanations, and taught the material in multiple ways. Teachers cared about students individually, checked in with each student, worked one-on-one with anyone who wanted to, answered all questions, and were approachable. Teachers took the time in class to work problems, helping students to be successful solving the problems. The teachers got the class engaged, working lots of examples, with a good classroom pace. Respondents described the teachers in their best class in the following ways:

- She was patient and caring. She listened when someone had a question during class, versus just during work time.
- They went through problems like the ones on our homework/tests to make sure we knew what we were doing. Went through the problems slow and talked through it with us.
- Show a few examples of each problem than [sic] try one out on your own then she would answer questions and correct it.
- Was approachable, didn't give overwhelming amounts of work, was funny, cared about the students, always willing to help.
- Made a personal connection to each student he had and cared deeply about his students' success and well being. He also never gave us busy work and made sure every student understood the information. If they didn't he would provide extra resources to those students.

While some students mentioned that the teacher did not contribute to making the class a poor one, others mentioned aspects that made the class very difficult for them. For example, the teacher seemed unapproachable, which did not allow them to ask questions. Worse, sometimes the teacher was mean or made the students feel dumb or humiliated. Other comments stressed that sometimes the teacher moved too fast, gave too much homework, didn't actively involve students, and were one-dimensional in the way they taught the material. The students then became overwhelmed. This fits with their behavior, which was to give up. A sampling of responses follows:

- He refused to provide help when he didn't feel like it
- Was not approachable, only explained concepts one way, moved too fast.

- Not really care how the students did or if they understood material
- He never explained in depth how to work the problems and if you went in before class to ask a question he would call you stupid and wouldn't help out.
- The teacher only used one way to teach and that strategy was very hard for me to learn.

Although it was not common, a few students commented that teachers preferred male students and/or "top" students. It is important to also note, though, that some students did feel that the teacher was doing their best. A few examples follow:

- The teacher did a good job teaching the class by teaching at a pace that everyone could keep up with.
- It was over covid so she did her best but I didn't have the motivation.
- In the worst math class I ever had, calculus, the teacher was super helpful and she tried to help me understand. But no matter what, some subjects just wouldn't click for me or took me longer than the other students to understand.

#### *Comments on Sample Comparison*

There was no real distinction between student responses from 2017 and those from 2022. There were just two comments about COVID-19, with both stating their "worst" math class was during the height of the pandemic, when everything was fully online. However, it does not appear that what students want from their teacher is dependent on in-person versus online learning, as long as there remains a mechanism for getting questions answered. A teacher that is not receptive to questions in person is the worst situation, according to our participants.

### **Discussion**

Because there is data from 2017 and 2022, one of the research questions addressed whether the identified behaviors and activities had changed over those times. For this same reason, the literature review contained both older and newer studies. Both in the literature and in this study's results, there does not appear to be any change. The pandemic does seem to have affected phenomena such as student mental health and college enrollment (both have declined) in the United States (Causey et al., 2023; Selingo, 2021). However, the identified behaviors and activities remain rather constant.

Another research question addressed whether students identify specific behaviors/activities that they engaged in to improve their chances of success with mathematics. Our study found that students do identify activities that they sometimes failed to do (although this was often because the teacher had failed to create a supportive atmosphere). Our participants also identified behaviors and activities that promoted their success (e.g., asking questions, doing the exercises, attending class). These results differ from previous research that found that students were not good at self-regulation (Elhousseini et al., 2022; Johns, 2020; Turner et al., 2002).

The final research question addressed what students' perceptions of teaching were. A central theme emerging from these data speaks to the emotional intelligence (EI) of teachers. As described by psychologist Daniel Goleman (1997), EI refers to the ability to recognize and understand one's own emotions as well as the emotions of others. van der Kolk (2014) notes that "[e]motional intelligence starts with labeling your own feelings and attuning to the emotions of the people around you" (p. 354).

Self-awareness and self-regulation are key components of EI, as are social skills and empathy. Comments from this sample of students highlight key attributes of helpful teachers – namely, tuning into the students' needs, understanding where the students are coming from, meeting the students where they are, etc. To return to the data, consider these statements that respondents used to describe their experience in their best math class:

- Trusted my teacher and could be honest with her.
- My teacher made me believe that I was capable of solving each problem.
- She made herself really approachable for help and really cared if you got the material or not.
- When they saw that I was struggling, they asked me if I would like help.
- They cared about teaching it in different ways until students understood it instead of just moving on to the next lesson.

Such comments demonstrate that teachers in these students' best math classes were able to see things from the students' perspectives, were aware of what the students needed, and cared about them.

By contrast, the teachers in these respondents' worst math classes would appear to be low in EI – i.e., they aren't meeting students where they are. Indeed, they don't seem to be seeing things from the students' perspectives, are not providing a safe and supportive environment, nor do they – as noted earlier – demonstrate flexibility in the way they teach the material. Again, returning to the data:

- They didn't know when we were struggling. They just wanted to teach the material and move on.
- Acted like the students were dumb when they didn't understand. Went to fast when explaining things.
- Made fun of us, was super condescending, was always sending kids out in the hallway/punishing them, didn't care if we understood.
- Got frustrated at confused students.

Fortunately, EI is a competence that can be developed.

This final theme is in agreement with much of the literature that identifies students' desire to have a caring and supportive relationship with their teachers (see for example, Bledsoe et al., 2021; Gusthart & Harrison, 2003; Prabhu, 2022; Ralph, 2003). It is interesting that, while students do identify behaviors that they should be doing, these behaviors are not possible when they are protecting themselves from harm. Thus, a supportive and caring teacher is a necessary condition. Certainly a teacher has to be more than supportive and caring, but without this, success is difficult to achieve.

A key takeaway based on the results of this study is that higher EI among teachers leads to a classroom environment conducive to learning. Other studies have reached the same conclusion and, in recent years, there has been a push to include "emotional education" in the training that preservice teachers receive. Valente and Lourenco (2022) assert that "a new model of pre-service teacher education is needed that included EI as necessary training for teachers." Similarly, Abiodullah et al. (2020) recommend: "The teachers and all stakeholders in school education should give adequate space to co-curricular activities for emotional well-being of both teachers and the taught" (p. 139). Markowitz and Bourffard (2020) also support training for preservice teachers to teach with a social, emotional, and cultural lens. "Teachers with well-developed skills tend to develop more positive relationships with students, and research shows that those relationships are key to successful teaching" (p. 7). It is crucial that teachers develop their own EI which can, in turn, help their students to do so as well. van der Kolk (2014) states: "In addition to reading, writing, and arithmetic, all kids need to learn self-awareness, self-regulation, and communication as part of their core curriculum" (p. 354).

### **Conclusion**

This study examined data from 2017 and 2022 regarding what students felt they did in their "worst" and "best" math classes, and what they felt instructors did. We find a strong emphasis on students needing the classroom environment to be supportive. For example, they want to feel free to ask questions without feeling "dumb." Students want to feel that the instructors care about their learning. Our participants identified activities that helped their learning (e.g., pay attention, do the homework, ask questions) and the opposite activities that hindered their learning (e.g., did not pay attention, did not do the homework, did not ask questions). However, it was often the case that students resorted to such activities when they felt the instructor was not receptive to students. When instructors create an atmosphere of judgment, students shut down. Negative views of mathematics start in elementary school. It's very important that elementary teachers have a positive view of mathematics. One of the simplest ways to accomplish this is to create a positive, non-judgmental atmosphere for future elementary teachers in their college math classes.

### **Recommendations**

The results of the present study led the researchers to focus on EI even though this was not a guiding concept from the outset. Rather, through inductive analysis of the data, the importance of teachers possessing qualities and aptitudes that are consistent with EI was revealed. It is recommended that future research more fully interrogate the role of EI and that, as others have also suggested, preservice teachers are given more opportunities to have training that will develop their EI.

### **Limitations**

The study has limitations based on the sample, which was limited to two classes in two different years at the same university. Qualitative research always has the limitation of author interpretation. The main limitation, however, is how the participants interpreted "best" and "worst" math class. For example, perhaps their "best" class was one that they did well in because it was very easy for them. Another iteration of the study could include either more information in the prompts or Likert Scale items to accompany the short-answer questions.

### **Authorship Contribution Statement**

Latterell: Conceptualization, data acquisition, design, analysis, writing. Wilson: Design, analysis, writing, editing/reviewing.

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