

Design and Implementation of a Structured Academic Controversy for Preservice Teachers in a Computer Education Licensure Program

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Abstract: Developing skills to navigate and address potential controversial issues can be beneficial for preservice teachers and their future teaching careers. The implementation of a Structured Academic Controversy (SAC) instructional model is one method to help preservice teachers better understand controversial topics from multiple perspectives. This study found that preservice teachers in a Computer Education Licensure (CEL) program who were exposed to a SAC had positive perceptions about the implementation of this instructional model, and stronger beliefs in their own abilities to address controversial issues in their future schools and classrooms.

Keywords: structured academic controversy, instructional design, preservice teachers, computer education licensure, technology integration

Introduction

Navigating controversial issues and being able to explore those issues from multiple, diverse perspectives is an important skill for educators to foster with their students (Avery, Levy, & Simmons, 2013; King, 2009; Parker & Hess, 2001). Incorporating controversial issues into the classroom can also help engage students more deeply with their curriculum (Hess & Posselt, 2002; King, 2009) as well as give students a safe space to explore ideas that differ from their own (Avery, Levy, & Simmons, 2013). The Structured Academic Controversy (SAC) instructional model is one strategy that can be beneficial in providing students the opportunity to approach controversial issues from multiple perspectives. This collaborative learning strategy was developed by Johnson and Johnson (1979; 1993) in order to help students learn how to address controversial issues in a structured (i.e. scaffolded) nature, and in an academic setting (Avery, Levy, & Simmons, 2013; Johnson & Johnson, 1979; Khourey-Bowers, 2006; Parker & Hess, 2001). Typically, SACs are centered around a single issue, which is to be approached from a “Pro” and “Con” perspective by student groups (Avery, Levy, & Simmons, 2013; Johnson & Johnson, 1979). SACs have been implemented both with preservice teachers and across a wide variety of K-12 subject areas (Avery, Levy, & Simmons; 2013; Johnson & Johnson, 2009; Khourey-Bowers, 2006; Parker & Hess, 2001). Research has demonstrated the potential for SACs to

help students develop a more positive attitude towards conflict and towards working with others from diverse backgrounds (Johnson and Johnson, 1979; 1993; 2009). Additionally, in a 2009 meta-analysis of 39 studies involving SAC, Johnson and Johnson found that “SACs compared favorably to debate and individualistic learning in terms of student achievement, cognitive reasoning, perspective taking, motivation, attitudes toward task, interpersonal attraction, sense of social support, and self-esteem” (Avery, Levy, & Simmons, 2013, p. 109).

Prior to beginning an SAC, there are several instructional design decisions that must be made. These consist of: (1) Choosing the topic; (2) Preparing instructional materials; and (3) Structuring the controversy (Johnson & Johnson, 1979). The topic should be one that engages the students, connects to the curriculum, and involves some form of controversy (Johnson & Johnson, 1979; Parker & Hess, 2001). The instructional materials should include a clear description of the task, the different positions, and resource materials to help the students structure their arguments (Johnson & Johnson, 1979). Finally, the structure of the controversy should involve heterogeneous student groups to support “spirited and constructive argumentation and increase [d] appreciation of different views” (Johnson & Johnson, 1979, p. 60).

The implementation of SACs involves multiple steps as well. Once students have been grouped and assigned to a different position or viewpoint by group, they will begin the “Learning positions” stage where they will research their positions and build their argument. Next, student groups will present their arguments and other groups will ask clarifying questions. Following presentations, a class-wide discussion will be held where students will challenge and support the arguments that have been raised. Reversing perspectives is often included in a SAC at this point as well, and students will present the opposite viewpoint from their original presentation. Finally, students will be asked to reach an individual decision on the controversial issue and provide justification and rationale for their decision (Avery, Levy, & Simmons, 2013; Johnson & Johnson, 1979). Overall, the benefits of SACs arise not only from the research, presentation, and discussion over each group’s position, but also from the consideration of controversial issues from multiple perspectives.

Method

The purpose of this study was to implement a SAC with preservice teachers in a Computer Education Licensure (CEL) course in order to better prepare preservice teachers to handle controversial issues they may face as future teachers and technology leaders, and to better understand the perceived effects, benefits, and limitations of the implementation of the SAC model. In this study we sought to answer the following two research questions:

1. What are the effects of implementing a SAC on students’ perceptions towards controversial technology-related issues?
2. What are the perceived instructional benefits and limitations of implementing a SAC in a preservice teacher education course?

Context and Participants

The Computer Education Licensure (CEL) program is a 21-credit add-on licensure program that prepares preservice teachers to teach K-12 computer science and serve as technology leaders in schools (e.g. integration specialists, technology coaches, etc.) upon graduation. The implementation of the SAC was conducted at a large Midwest university in one of the required courses of the above described CEL program: “K-12 Technology Leadership.” The focus of the course was to examine technology leadership and integration from school-wide and district-wide perspectives. Twelve students were enrolled in the semester-long course; two were sophomores, ten were juniors, and all were members of the CEL program.

Instructional Design and Implementation

The choice to implement a SAC in this course was based on feedback the instructor had received from previous student evaluations. Multiple students had requested additional activities that offered real-world connections in order to help them better understand the benefit of course material outside of the classroom. Field experiences were already being used throughout the course; therefore, to address this specific need the instructor decided to implement a SAC, with the addi-

tion of an expert panel representing different stakeholder perspectives.

For the implementation of the SAC the instructor followed the steps outlined above with minor modifications which will be discussed below. Prior to beginning the SAC, the students were given the pre-survey instrument to complete [Appendix A]. The instructional design and implementation occurred as follows:

Design:

Choosing a topic: The topic for this SAC was “Should 1:1 iPads be rolled out school-wide in K-4 classrooms?” This topic was selected because a nearby school district was engaged in a public debate over this issue with parents, teachers, administrators, and technology leaders arguing for and against the rollout. The positions members of these groups held in this debate were utilized exactly in the SAC implementation (parents: con, administrators: con, teachers: pro, technology leaders: pro). This topic was a natural fit for the SAC model, offered clear real-world connections to the students, and was in alignment with the course content

Preparing instructional materials: A presentation was prepared outlining the topic, student grouping, and resources for research. The presentation also included an actual news video showing the discussions amongst the local school district and was used as the hook for the SAC. Finally, the presentation included the four different perspectives and their positions, the assigned student groups, a breakdown of the position presentation requirements and format, and suggested resources to explore while conducting research.

Structuring the controversy: Students were assigned into four groups with three students in each group. The groups included a mix of grade levels (elementary/secondary), subject areas, and experience levels in an attempt to create the most heterogeneous groups possible. Students were told that each group would be given 10-12 minutes to present which would be followed by a 15-minute question and answer (Q&A) session where members of the audience and the expert panel would ask clarifying or challenging questions.

Implementation:

Learning positions: Students began this activity by researching their positions and creating a presentation (using Google Slides or PowerPoint) to support either the “Pro” or “Con” side of the argument they had been assigned. One class period (3 hours) was dedicated to this research task, and students were allowed to continue their work outside of class prior to their presentation which took place the following week.

Presentations: Students were given 10-12 minutes to present their positions for their classmates. The order of presentations alternated between “Pro” and “Con” perspectives. Following each presentation, a 15-minute period for questions and answers was held in order for the audience and expert panel to ask clarifying or challenging questions.

Discussion: At the conclusion of all four presentations a 10-minute class-wide discussion was held over the topic in which students asked questions, supported their arguments against challenges that were raised, and continued the discussion of issues that were not addressed during the presentations and Q&A sessions.

Expert Panel Remarks: An expert panel to represent each of the stakeholder positions was invited to the presentation class (3 hours). The expert panel included 4 experts: A parent of elementary school students; a technology leader and early elementary iPad integration expert; a previous school administrator; and a 4th grade teacher. In addition to their contributions during Q&A sessions, each member of the expert panel took five minutes to provide concluding remarks and offer additional questions, insights, and ideas for the students to consider moving forward.

Decision-Making and Reflection: At the end of the presentations and discussions students were given the post-survey instrument [Appendix B] during which they were asked to make their final decision on the issue, provide justification, and answer additional reflection questions about their experiences regarding learning with a SAC.

The decision to include the expert panel (which is not typically mentioned as a SAC step) was made in order to better provide students with feedback from professionals from the field. Though not outlined as a necessity in SACs, the instructor believed the inclusion of this expert panel would be highly beneficial for the students to meet their desire for making real-world connections.

Data Sources

Data were collected via the pre and post student surveys. The pre-survey consisted of five open-ended questions and sought to capture students' perceptions about controversial technology-related issues prior to beginning the activity [Appendix A]. The post-survey consisted of 12 open-ended questions and acted as a culminating reflection. Additional questions were also added to the post-survey; these asked the students to reflect over their experience, perceptions of SACs, and the handling of controversial issues [Appendix B]. Both surveys contained a final question used for anonymously connecting pre- and post-survey responses in order to compare the change in each individual's responses before and after the SAC implementation.

Data Analysis

Content analysis (Patton, 2002) was used to uncover core consistencies and patterns across the data and then to identify emerging themes from those patterns found within student responses. Once the emerging themes in the response data were identified, they were categorized between the two research questions this study sought to answer. In order to improve the reliability of the findings the authors utilized an investigator triangulation (Patton, 2002). All themes were identified and categorized individually before the two researchers came together to reach agreement on any differences. Finally, descriptive statistics were used in order to analyze

quantitative information (e.g. how many students said they would use a SAC in their future classrooms, how many students said they found the expert panel to be beneficial, etc.).

Limitations

The primary limitation of this study was the self-reported nature of the survey data which was inherently prone to self-presentation bias (Baker, 1994; Baldwin, 1999; Bielefeldt, 2002). Additionally, 12 students were enrolled in the course that semester, and therefore the potential sample size was limited. Finally, two weeks (6 hours of class time) were available in the course curriculum for the implementation of the SAC. This implementation time over the two-week period limited the amount of preparation time that students were given for their culminating presentation, and did not leave time for the "reversing perspectives" step that is often included in the SAC model.

Results and Discussion

Student Perceptions Towards Controversial Technology Issues

At the conclusion of the SAC implementation, 100% of the students (n=12) stated that the SAC was beneficial in preparing them to think about controversial technology-related issues in new and different ways. For example, one student stated:

[The SAC was] a very eye-opening experience, seeing the perspectives of so many, and also perspectives of well-respected leaders (our panel). It was nerve wrecking (sp), but it is a reality I need to prepare for in order to be the best tech coach or teacher I can be in the future. It's also good to practice controversy - especially in an area you are pursuing - because it prepares you better for conflict and helps you improve.

This sentiment was echoed by the other students who agreed that the SAC was beneficial in helping them think about and approach controversial issues differently in the future. Additionally, students' ideas of what constituted a controversial issue differed from pre to post-survey. Following the SAC, 83% (n=10) students discussed additional controversial technology issues that they did not mention prior to the SAC activity, and that they believed they might potentially encounter in their future careers (e.g., student privacy and data security (n=4), technology costs and budgeting (n=4), and screen time (n=2)).

Therefore, in answer to the study's first research question, these results would suggest that the implementation of the SAC was beneficial in increasing students' understanding of what constitutes a controversial technology issue, as well as in helping students think about how they might approach such issues in future professional settings.

Benefits and Challenges of the SAC Implementation

Upon completion of the SAC, 100% of students (n=12) said they would use SACs, or a similar approach, in their future classrooms. Additionally, three main themes emerged from analyzing student survey responses with regard to the benefits of the SAC: (1)

Benefits of the expert panel; (2) Benefits of examining the issue from multiple perspectives; (3) Benefits of real-world connections. Three themes related to challenges also emerged from analyzing student data: (1) Lack of scaffolding and structure; (2) Lack of diversity of opinion; and (3) Lack of time.

Benefits of the Expert Panel. The inclusion of the expert panel was perceived as beneficial by 100% of the students (n=12). This benefit was described by students as being “helpful,” “practical,” “awesome,” etc. One student emphasized this by stating, “I really enjoyed the panel because they gave great feedback and questions that made me really think about the issues behind technology in the classroom.” Another student commented, “I loved it! [The panel] provided us with great insight from their real-world experiences!” These results would suggest that, although expert panels are not necessarily considered to be a necessity for SAC implementation, this addition might be beneficial for those instructors looking to help preservice teachers make additional real-world connections. The authors noted that the expert panel also helped to facilitate what Parker and Hess (2001) describe as “scaffold[ing] students into impressively demanding discussion which otherwise may be beyond their reach” (p. 277). This was particularly evident during the Q&A sessions where students consistently exemplified advanced understandings of the topics at hand. Thus, the authors suggest while implementing a SAC that bringing in experts to represent various perspectives improves students’ buy-in and reinforces their learning experiences during the culminating activity. If physically bringing experts into the classroom is not possible due to time, travel, cost, etc., then bringing experts in through online means (i.e. Skype, Google Hangouts, etc.) might make for easier implementation and provide similar outcomes.

Benefits of Examining the Issue from Multiple Perspectives. When asked, “How did being exposed to multiple perspectives affect your understanding of controversial issues in a school setting?” all students (n=12) responded positively. Student responses indicated that examining a controversial issue from multiple perspectives helped them think of perspectives and ideas they had not thought of before, build empathy, and rethink ideas and misconceptions they previously held. One example comes from a student who reported:

Being exposed to both sides helped to open my eyes to other people’s opinions on why they may not want [iPads] in the classroom for their children. Being able to hear why they thought it was not a good idea has helped to prepare me for how to answer any questions and concerns they may have.

In regards to rethinking previous ideas and misconceptions, one student wrote, “There were a lot of different perspectives, like administrators, that I did not think of before.” These results would suggest that implementing a SAC might help students consider opinions outside of their own as well as to potentially revise previous understandings or positions on controversial issues. The authors believe that if time allowed, the incorporation of the “Reversing perspectives” stage of the SAC would have been additionally beneficial in helping students relate to perspectives outside of their own.

Benefits of Real-World Connections. Finally, many students (n=9) mentioned that this activity helped them make real-world connections through the incorporation of the expert panel, and through the subject matter and activity design. For example, one student stated:

I found it extremely valuable to get feedback from our panel of experts. I always love to hear advice and input from people who have been a part of the education system and know what it is like. I also liked that we got to hear multiple perspectives on the issue because that is the best way to form an informed opinion on an issue.

Another student echoed this idea:

I think that some strengths were the eye-opening perspectives it gave, the dynamic of politely presenting these dynamics and being okay with disagreement, and preparing ourselves for what may come in the future as we enter a field that people might not always be on board with.

These findings would suggest that the incorporation of an expert panel, as well as the careful selection of a topic that connects to both the curriculum and to real-world situations, can be beneficial in helping students better understand how what they are learning can be potentially applied once they enter the field.

Challenges Due to Lack of Scaffolding and Structure. Several students (n=5) mentioned that they would have benefited from increased scaffolding and structure, as well as from more clear expectations as to what was to be included in their presentation and how to handle controversy that arose during the Q&A sessions. For example, one student stated, “I would have liked there to be guidance on how to handle challenges just because it seemed like there were challenges and disagreements more than recognizing any of the positive points the groups had made.” Another student mentioned how they struggled with the controversial nature inherent within the SAC:

I felt people didn’t want to try and fight for a different side. They struggled a lot with putting their mindset somewhere else and fighting for a different view. Also, students didn’t realize that just because someone was fighting for a side didn’t mean that they were believing in it.

These findings would suggest that in addition to a more clearly defined structure, students may benefit from a pre-SAC briefing on how to discuss controversial issues in a positive manner, and a reminder that the opinions expressed during the presentation are not those of the individual, but rather those of the perspective they are representing.

Challenges Due to Lack of Diversity of Opinion. Multiple students (n=5) also expressed difficulty arguing against a perspective that the rest of the class and half the expert panel supported. In other words, as the students were in the CEL program, the majority held a positive belief towards the implementation of iPads in the classroom. All but one student (n=11) favored the rollout of iPads in K-4 classrooms when asked about their individual perspective in the pre-survey. Therefore, these students found it difficult to not only take on

a perspective outside of their own, but also to argue that perspective for an audience who was largely invested in technology integration. One student explained, “Most of the people on our panel supported 1:1 iPads. I wish there were more people we could have seen support against the 1:1 iPads.” Another student followed up by stating, “Arguing against a topic everyone in the room was for was extremely difficult and uncomfortable at some points.” Despite these claims, as mentioned above, all students (n=12) found benefit in examining this issue from multiple perspectives. Therefore, these results would suggest that if possible, finding a topic that not only has real-world connections, but also has more of an even breakdown of opinion between the “Pro” and “Con” side may be beneficial. Additionally, while diverse student opinions might have existed, even with half of the panel presenting the cons of the 1:1 iPad rollout, students may have felt uncomfortable expressing those opinions if they perceived themselves to be in the minority, as Hess (2009) argues can occur.

Challenges Due to Lack of Time. Two students mentioned that they would have preferred additional time while preparing their presentations. Students were given three hours of course time, in addition to one week outside of class to prepare for the presentation, and 3 hours for class presentations and the expert panel; however, additional time would have been helpful in order or all students to feel comfortable and prepared. SAC preparation and implementation takes a relatively longer time to implement compared to other instructional methods, and a longer time for students to prepare themselves to defend their positions. As students were able to present and defend their positions successfully in the presentation week, the feeling of not having enough time may be due to the novelty of the SAC model implementation or to having an expert panel physically in the classroom. More frequent implementations of SACs may help students gain efficiency in the research and preparation process and may help with their confidence in presenting to peers and an expert panel.

Conclusion

This study would suggest that the SAC instructional model is a beneficial approach specifically for preservice teachers studying educational technology, as well as more generally in any classroom in which teachers aim to provide a space for students to learn more about addressing controversy in a positive way. This study also supports Parker and Hess’s (2001) argument that SACs “encourage [preservice teachers] to uncover and feature the controversies that suffuse the subject matter they are planning to teach” (p. 276) as shown through the preservice teachers’ willingness and excitement to incorporate SACs in their future classrooms. Additionally, and whenever possible, the incorporation of an expert panel to assist in providing feedback and real-world connections appears to be beneficial. In summary, fostering students’ abilities to navigate controversies and examine issues from multiple perspectives are beneficial skills, which can be addressed by the implementation of SACs in the classroom. By implementing a SAC in a college classroom, instructors can help preservice teachers consider multiple perspectives to controversial issues in their future workplaces, and also provide preservice teachers with first-hand exposure to SACs as an

instructional approach that they might potentially incorporate in their future classrooms.

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Appendix A – Pre-survey questions

1. Do you think there are controversial technology-related decisions that might need to be made in your future school or classroom? If so, please provide some examples. What makes these examples controversial?
2. Do you feel prepared to make decisions about controversial technology-related issues in your future school or classroom? Why or why not?
3. Do you feel prepared to look at controversial technology-related issues from different perspectives, outside of your own? Why or why not?
4. What consequences do you think might arise from having to make controversial technology-related decisions in your future school or classroom?
5. What is your opinion on 1:1 iPad use in K-4 elementary classrooms? In other words, should K-4 students be given 1:1 iPad tablets to use in their classrooms? Please provide justification and reasons for your opinion.
6. Please enter the last 3 digits of your phone number (To keep track of answers between pre- and post-survey)

Appendix B – Post-survey questions

1. After completing this activity, do you think there are any additional controversial technology-related decisions that might need to be made in your future school or classroom? If so, please provide some examples. What makes these examples controversial?
2. Do you feel prepared to make decisions about controversial technology-related issues in your future school or classroom as a result of this activity? Please explain.
3. How did being exposed to multiple perspectives affect your understanding of controversy in school settings?
4. What consequences do you think might arise from having to make controversial technology-related decisions in your future school or classroom?
5. After completing this activity, what is your opinion on 1:1 iPad use in K-4 elementary classrooms? In other words, should K-4 students be given 1:1 iPad tablets to use in their classrooms? Please provide justification and reasons for your opinion.
6. What do you think were the strengths of our Structured Academic Controversy Activity?
7. What do you think were the weaknesses of our Structured Academic Controversy Activity?
8. Are there any differences in how you will approach technology-related controversies in your future school or classroom as a result of this activity?
9. Do you think our Structured Academic Controversy activity was helpful in preparing you to think about controversial technology-related decisions in new and different ways? Why or why not?
10. What were your thoughts on having a panel of experts asking questions and providing feedback?
11. Would you consider using a Structure Academic Controversy activity in your future school or classroom? Why or why not?

