SAGE researchmethods cases

Evaluating Student Cognitive and Social-Emotional Growth During a High School Mindfulness Course Using Mixed-Method Design

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Abstract

Between 2014 and 2017, an interdisciplinary group of researchers examined whether a high school health class that incorporated mindfulness techniques lowered students' stress and improved their wellbeing. We received a grant from the Institute of Educational Sciences from the United States Department of Education to (1) train high school health teachers to implement the mindfulness-based curriculum and (2) study how the program impacted students. We examined changes in cognitive, social, emotional, and physical wellbeing indicators from before the course to after the course, using a quasi-experimental (intervention and control group with pre and post tests), mixed-methods (concurrent triangulation) design. Data consisted of student responses to psychometric surveys and interviews with a subsample of students. When we compared qualitative findings with quantitative outcomes, we discovered instances of different results through each method. This allowed us to provide explanations and context for certain outcomes. For example, the recent loss of a grandparent explained why one student scored high in social isolation. At other times, the two methods found two different "outcomes stories" from the same student. For example, a student reported in the interview that he was struggling with social interactions, but the psychometric indicators had him in the top quintile of social wellbeing indicators as compared to his peers. This case study discusses methodological approaches to mixed-method educational psychology research, the challenges of making sense of data from different sources, and the usefulness and limitations of mixed-methodologies for psychological outcome evaluations of student wellbeing interventions. We also discuss the process of working as a large group of researchers. This case is useful for students in psychology and education, and it is equally useful for early career researchers.

Learning Outcomes

By the end of this case, students should be able to

- State advantages and drawbacks of different mixed-methods approaches for psychological and educational research
- Identify methodological approaches that lend themselves to particular kinds of research findings
- Evaluate how to make sense of divergent findings from different methods in mixed-method studies

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Project Overview and Context

The research took place between 2014 and 2017. Data collection and the first stage of analysis have been completed. The preliminary results have been presented at national and international

conferences, and research papers are in preparation. The research team consisted of established scholars in psychology and education, early- and mid-career researcher associates, and advanced doctoral students. The team was organized into two main sub-groups, qualitative and quantitative, with the principal investigator coordinating with each. The work process is discussed in more depth below.

The research was designed to study the impact of an educational intervention. Health teachers were trained to present a 12-lesson mindfulness-based wellbeing program (12, 45-min lessons) called *Learning to BREATHE* or L2B. The L2B curriculum focuses on cultivating students' awareness of their thoughts, feelings, and physical sensations to improve their development of emotion regulation and attentional skills.

We performed this research in an Eastern state in the United States at two public, suburban high schools outside of a midsized city. Overall, 385 adolescents aged 15 to 17 participated in answering a battery of surveys and playing cognitive "games" to measure their emotional, social, and physical wellbeing as well as changes in cognitive functions. A subsample of the students was also interviewed to gain a deeper understanding of their experience, certain aspects of the L2B curriculum, and self-defined changes from the students' perspectives. The student population at both schools was ethnically diverse. School A had 23% students of color from various backgrounds (Latino, Black, Asian, first and second generation immigrants), while School B consisted of 62% students of color. They were also socio-economically diverse (14% of students on free/reduced lunch at School A, and 47% at School B), and had a range of academic aptitudes.

The research design was mixed-method and quasi-experimental, meaning that we collected both qualitative (interview) data and quantitative (survey and cognitive "game") data, and that we studied the intervention (the L2B course) in comparison to a control group who did not did receive the L2B course during the study (Creswell, 2013; Creswell & Clark, 2007; Creswell, Clark, Gutmann & Hanson, 2003; Maxwell & Loomis, 2003). In each school, one group of students (n = 132) participated in the L2B curriculum, and a control group (n = 119) participated in the standard district health course curriculum for a total of 251 participants in the randomized controlled trial (134 student participated in the pilot study). Students in both groups at both schools were tested before the intervention and after the intervention to compare scores and measure change between pre-course scores and post-course scores. The students were also interviewed after the intervention to reflect upon what they learned and how the program impacted them.

Gaining access to these schools and administering the surveys posed some challenges, but the greatest challenges involved interviewing the students, which will be discussed in-depth below.

The research questions for this aspect of the project were as follows:

1. How do high school students experience and manage stress in their lives?
2. What are the effects, if any, of a mindfulness curriculum on students' wellbeing?

Research has shown that high school aged students face significant stress relative to other stages of development (Tottenham & Galvan, 2016), which has been attributed to increases in school dropout (Kessler, Foster, Saunders, & Stang, 1995), as well as negative effects on student's grades, healthy decision-making, cognitive functioning, and overall wellbeing (Gumora & Arsenio, 2002; Sapolsky, 2003; Vermeersch, T'Sjoen, Kaufman, Vincke, & Bracke, 2010). With the concerning rates of depression and school drop out, educational psychologists and policy-makers have begun to pay greater attention to how schools can teach students approaches to lower their stress and cultivate student wellbeing to foster healthy attitudes and behaviors. One approach to fostering student wellbeing is through health courses that integrate mindfulness techniques to allow students to de-stress while in class and to learn about effects of stress on wellbeing and decision-making (Broderick & Jennings, 2012). Research on mindfulness for adults has shown positive outcomes for stress reduction and wellbeing (Chiesa & Serretti, 2009; Frank, Reibel, Broderick, Cantrell, & Metz, 2013), which is why this research project set out to understand the effects of mindfulness practices on adolescents, and the possibility of incorporating the techniques in school.

This study is unique in using a quasi-experimental and mixed-methods research design to examine a mindfulness-based intervention facilitated by a classroom teacher in a universal health class. In fact, most research projects on mindfulness and psychological wellbeing rely on quantitative, self-report measures, even though scholars have found limitations to this approach, such as work from Davidson and Kasniack (2015). Heeding this call, our research employed a specific mixed-methodology to better triangulate findings and draw a more detailed picture of the effect of the interventions on students.

Research Practicalities

The research was made possible thanks to a large multi-year grant from the Institute of Educational Sciences (U.S. Dept. of Education). Mark Greenberg and Jennifer (Jenny) Frank from Penn State University were the co-principal investigators (PIs), while a team of quantitative and qualitative researchers performed particular data collection and data analysis tasks. The qualitative team consisted of Deborah Schussler, Julia Mahfouz, and Joseph Levitan, and the quantitative team consisted of Joy Mitra, Yoonkyung Oh, and Kimberly Kohler. Elaine Berrena and Patricia (Trish) Broderick focused on teacher training for implementation of the curriculum, and also developed evaluation protocols for implementation fidelity. Trish Broderick (2013) is also

the author of the L2B curriculum. Each team was fairly autonomous in their respective tasks. This rather large interdisciplinary team spanned the Departments of Educational Psychology, Human Development and Family Studies, Education Leadership, and Special Education.

The large size of the full research team allowed for in-depth data collection from both qualitative and quantitative methodologies but also made communication and setting meeting times a challenge. Each smaller team met separately on a regular basis, and the full team would meet bi-weekly, on average, depending upon the phase of the research project. The large size of the full research team provided depth and expertise for each phase of the research, which was a considerable strength. Despite this strength, there were a number of challenges to overcome in order to complete the research, which we discuss below.

Sampling, Teacher Recruitment, and Access to Schools

Establishing a relationship with schools willing to partner and work to achieve the fundamental goals of the program, and participate fully in the research, is a necessity for any successful project. Regular visits to the schools were required for a variety of reasons. First, it was necessary to solidify the administration's commitment to the project and the changes in the health curriculum, which involved the superintendent and both high school principals. Second, it was necessary to train and support the participating health teachers to implement the curriculum, which included several trainings that supported the teachers' own mindfulness practices and videotaping all lessons across teachers' classes during all phases of the project to ensure quality instruction and fidelity to the program. Trainings were provided both in preparation for implementation and to promote sustainability of the mindfulness curriculum in the school curriculum. Third, a team visited to administer the quantitative student self-report measures and cognitive tasks both prior to the students' participation in the L2B lessons and after they finished the program. Fourth, the qualitative team had to recruit and arrange student interviews. Finally, occasional check-ins with the administrators and weekly coaching calls with the participating teachers were important to maintain the integrity of the relationship. Given the intensity of time required in the schools, it was important to have sites that were within a reasonable distance from the university.

The selection of the sites occurred through pre-existing contacts between both Trish and Mark. As the creator of the curriculum, Trish provides trainings nationally and internationally on how to facilitate the L2B curriculum. Around the time the grant was being proposed, Trish solicited applications to participate in a scholarship-supported training of L2B. All applicants were required to have a letter from their principal stating that the participant would actually teach L2B in the school, in some form, if they attended. The announcement was circulated through a mindfulness listserve. One of the teachers who attended Trish's training was very interested in offering the

L2B curriculum in her health classes. Mark also had been in contact with the district where the schools were ultimately selected for other research projects, so there was a positive prior relationship. Given the diversity of the district, the interest of a teacher who had received some training, and a positive relationship with the administration, the district was a good fit.

The trained teacher encouraged another teacher at the other district high school to participate. Trish also presented a short program to the district's health department to gauge additional interest. Although it seemed more teachers were interested in getting involved, the time required for teacher training and then the abbreviated time for their regular health curriculum when implementing the L2B lessons seemed to deter other teachers from participating in implementing the L2B curriculum. However, we were able to recruit other teachers at both schools to participate in the research by being a part of the "business as usual" control group. This involved allowing the team to collect pre- and post- quantitative self-report measures and cognitive tasks around the same time as the intervention teachers.

Clearly, it is important to select research sites that meet the goals of the research. We were very fortunate because the two schools where we conducted the research not only fell within the same district, but also had some interesting demographic differences. One of the schools was more affluent and less racially/ethnically diverse, while the other was more diverse and less affluent. This allowed us to examine different cultural and contextual influences.

It is also crucial to work with flexible and collaborative partners. Fortunately, the teachers were very helpful in navigating practical issues and tensions of school research. For example, they helped the team figure out how to combine the realities of course schedules with ideal quasi-experimental design. In fact, the collegial relationships that developed between teachers and research team members strengthened the research process. For the qualitative team, the teachers were extremely helpful for gaining insight into the subtlety of the implementation and their classroom dynamics, and providing the contextual descriptions that are so important to qualitative research.

Ethical Clearance

Receiving approval from the university ethics board—and maintaining that approval when making changes and updates to the protocol—was a time intensive process. Joy Mitra worked closely with the Institutional Review Board of Penn State, whose representatives were very helpful, but also rigorous and stringent on ensuring that the research process conformed to the strict ethical standards of the university and the protection of minors.

The IRB staff members were particularly concerned about ensuring that the privacy of the

students was protected. Also, as the students were all minors, special protections are in place to ensure that students were not coerced into participating in the research. This includes the kind of incentives students can receive for participating in the research. For example, the IRB staff did not want to have minors receive cash payments as an incentive. Instead, small items, like water bottles, gift cards, or backpacks were deemed acceptable incentives.

The primary lesson from Joy's IRB work is that establishing a collaborative relationship with the individual responsible for ethical clearance is extremely useful as she or he can have useful time-saving tips. Also, for research that requires certain changes throughout the research process (which most multi-year research does, in our experience) the IRB staff member can facilitate those changes and provide advice about when those changes require a formal modification and when they do not.

Each data collection approach needed to be approved by the IRB board, from the survey instruments, to the cognitive "games," to the interview protocols. Since the students were under 18 years old, the collection instruments also required consent from parents, which was a difficult challenge, considering that this required getting the consent letter home to all the parents of the students involved in the L2B program and the students in the control group who were taking the surveys. The IRB and school district approved a protocol where parents responded with "passive consent," which was very helpful. Passive consent means parents return the form if they do **not** want their child to participate in the research. If we did not receive a reply from parents, then students were able to participate. In addition, students provided their assent to participate on the first page of the online surveys students completed during their health class. The subsample of students who were interviewed had to provide additional consent. Their parents had to provide active consent, which involved returning a consent form stating their agreement that their child could participate in the interview, and the students had to provide their consent. Because it was difficult to achieve active consent to complete the interviews, we offered gift cards as incentives for participating.

Research Design

We used a quasi-experimental, (intervention and control group with pre and post tests), mixed-methods (concurrent triangulation) design to study the effects of the intervention (Creswell, 2013; Creswell & Clark, 2007; Creswell, et al., 2003; Maxwell & Loomis, 2003). The research consisted of three phases. In Phase 1, the team worked with one teacher to implement the L2B curriculum and test out the lessons, the video recording process, and the coaching protocol. Phase 2 was the pilot research, where we implemented all of the data collection instruments on multiple L2B classes, with two teachers, but we did not collect data from control classrooms. We then amended certain data collection practices to ensure reliable implementation in Phase 3: the

controlled trial.

In the Phase 3 controlled trial, the teachers implemented the L2B lessons in their health classes while other health teachers at each school taught the standard district-wide health curriculum. The students of all classes took the refined battery of surveys and cognitive “games” about 2.5 months apart, so that measurement occurred before the intervention group began the L2B program and after they finished (see *Web Resources* below, for a sample list of published surveys used for this project). During Phase 2, students in the intervention group were interviewed after participating in L2B, while in Phase 3 students in the intervention group were interviewed both before and after participating in L2B. In the mixed-methods research, we use data from both Phase 2 and Phase 3.

Although the design is fairly straightforward we had a number of difficulties in getting all students to take the surveys seriously. Joy reported that some of the students would simply click through the questions too quickly to have been reading the survey items, and there was an incident where a few students got up and caused some ruckus in the classroom while the students were filling out the surveys. The researchers could not help this, but we did take note of the possibility of erroneous data.

In part, the issue of student attention occurred because we underestimated the time commitments—and accompanying frustrations—of filling out surveys. Students and teachers face constant interruptions of instructional time by State-mandated tests, Advanced Placement exams, College Boards, and so on. The teachers are always working upstream to stick to curriculum, and the students sometimes feel overwhelmed by the amount of time they spend answering multiple-choice questions on the standardized tests that they are required to take. Given this context in the classroom, our 2-day data collection activities (which for controlled trial classes occupied six full classes of instructional time) sometimes led to frustration and resistance on the part of students (and even sometimes for the teachers, too). This is an important lesson learned in the data collection phase for school-based research. Schools are very busy places, more so now than ever, and researchers need to have high sensitivity to teachers’ and students’ time. Knowledge about time constraints is best understood through discussion with teachers and with students.

The qualitative team also had to recruit a subsample of students to volunteer for the interviews. We decided that we would go to the schools and offer students some incentive to come talk to us about the research project and to ask if they would be willing to volunteer. We started this process by asking the teacher to tell the students in the L2B health course that we would have pizza and soda for them to learn about the qualitative aspect of the research project. Once we all had pizza, we asked the students if they wanted to volunteer to be interviewed. We did this on

two separate occasions. We arrived at the school a bit before the students' series of lunch breaks in order to set up the pizza and sodas. We had a number of students come in during each period.

Convincing adolescents to do something that may be outside of their immediate interests is never an easy endeavor. Fortunately, each person on the qualitative research team had been a K-12 teacher, and one had been a principal, so we put on our "teacher hats" to explain to the kids who we were, what we were doing, and why we needed their help. We also told the students that if they completed the interviews, they would receive a US$15 gift card. We told the students that they needed to have their parents sign a consent form, and then we would text them about a time to meet either at the school or by phone. We were careful not to be coercive in any way, and follow the proper IRB guidelines.

Some students were more interested than others. We had over 30 students say that they were willing to participate in interviews, but only 19 students ended up getting the paper work signed and completing the interviews. This was a little disappointing to the qualitative team as it limited the diversity of students from whom we were hoping to collect qualitative data. However, we were still able to complete our research objectives.

Getting adolescents to volunteer to do anything, even with the promise of some kind of reward, is a difficult aspect of school-based research. Although we were all teachers and knew the age group, there are characteristics of the teenage stage of development that just cannot be controlled for—mostly that they are wrapped up in their own lives. Without a significant investment or a major incentive (we offered a minor incentive), many teenagers are unlikely to follow-through on their tertiary, extra curricular commitments, and those who do, often need constant reminders.

Recruiting volunteers for this study had a significant methodological drawback. We were unable to achieve maximum variation sampling (Patton, 2005), which would have provided a more comprehensive set of findings for the qualitative aspects of the research. The students who were willing to be interviewed were generally responsible, moderately to high achieving teenagers. Nonetheless, we did achieve some diversity in the sample. Furthermore, the qualitative data allowed us to triangulate the quantitative findings and add complexity and nuance to the outcomes report of the intervention. Before we discuss those outcomes, however, we need to go a little more in depth on the data collection.

Data Collection Design

We collected quantitative data and qualitative data concurrently to triangulate the findings

(Creswell, et al., 2003). This means that we collected the quantitative data in a separate process from qualitative data even though both sets of data were collected during the same time period. To perform this task, the quantitative team developed their protocols separately, though with input by the qualitative team, and the qualitative team developed their protocols separately, but with input from the quantitative team as well.

An expert in their particular methodology led each team. It was an interesting experience to delve into the different epistemologies, or approaches to knowledge and gathering data, that each method asserted when creating each protocol. It was tricky to reconcile these different approaches because the quantitative team approached their survey selection and creation through finding carefully worded, direct questions that measured the outcomes of interest and tested their hypotheses. So, the items were tested for validity and reliability. This means that the quantitative team made sure that the questions were validly measuring the right ideas (that the stress survey was actually measuring stress) and that they were reliable (meaning that the stress survey was accurately measuring the amount of stress) (Fink & Litwin, 1995). This approach in some ways runs contrary to the inductive approach that the qualitative team wished to employ for the student interviews. We sought to understand how the students made sense of and experienced the L2B course, in their own conceptualizations, and any changes they may have noticed within themselves because of the course. The qualitative team spent considerable time creating the open-ended, constructively neutral questions to allow students to find the words that made sense to them in order to understand their experience from their perspectives as much as possible, while still focusing on the topic of the mindfulness course.

When the qualitative team showed the interview protocol to the quantitative team for feedback there was some confusion about the approach, and why the questions were so broad. We explained that one of the benefits of qualitative interviews is the opportunity to delve deeply into the contextual, experiential knowledge from the students' perspectives, in their own words. We wanted to know what they found important and useful instead of imposing certain ideas on them. In addition, our experience as qualitative researchers has helped us realize that when individuals are asked directly how something has impacted them, they frequently either do not know or they offer responses lacking in clarity. However, when those same individuals are asked to describe a situation or tell a story, their responses provide rich reflections about the same phenomenon. Because we wanted to conduct a truly mixed-methods study we also wanted to develop some questions that might correspond across methodologies. As a result, at the end of the interview we incorporated some more direct questions about the programming and certain constructs in order to make sure all topics were covered directly.

Another aspect of data collection design is to develop analytical approaches to understand the

data collected. For the quantitative team, their deductive approach to data gathering ensured that the analytical approaches, such as analysis of variance (ANOVA) and Latent Class Modeling, were already part of the data collection design. For the qualitative team, we needed to develop a codebook that would allow us to code the data and find themes within the data relevant to our investigation. In qualitative research, developing code-schemes can happen both *a priori* (before the data is collected) and *a posteriori* (after data are collected). We decided on a hybrid approach where we developed codes for specific themes that we wanted to understand. For example, we used some of the quantitative indicators, such as mindfulness and stress, as codes. However, we also allowed ourselves the flexibility to find emergent, or unanticipated themes coming out of the interviews. This allowed us to uncover important data that contributed to our understanding of the influence of the L2B program, which we had not anticipated.

Methods in Action

Out of the many strengths and challenges within mixed-method research the most salient for our particular research project was how to incorporate the information gathered from each method to create an accurate understanding of how each individual experienced stress in their lives and how the L2B program impacted them. We decided to utilize the qualitative data for two main purposes: (1) contextual information about each student's unique situation and (2) explanatory information about each student's unique experience with the L2B program and how they were impacted in different ways.

To achieve this, we first had to figure out what outcomes and relevant constructs were covered by both methods. Because the qualitative work was more inductive and emergent, and the quantitative data were more deductive and structured, we decided to use particular constructs from the quantitative data that overlapped with the emergent themes that came out of the qualitative data. We settled on 10 themes that overlapped. Table 1 below demonstrates how we were able to bridge constructs:

Table 1. Construct Bridge.

Quantitative constructs	Qualitative constructs
Self-compassion	Emotional well-being
Internalizing behaviors—depression, rumination, anxiety	Emotional well-being
Attention—mindfulness, mind wandering	Mindfulness

Physical symptoms—sleep, somatization	Physical well-being
Stress – school, peers	Stress
Relationships – social connectedness	Interpersonal interactions, belongingness
Emotion regulation	Mindfulness (nonreactivity)
Externalizing behaviors—substance use, consequences	Physical well-being
	Academics
	Efficacy

After significant discussion, we settled on an approach to combine the two sets of data. From the student surveys, the quantitative team already had the aggregated results of the pre- and post-intervention outcome measures. We decided to utilize the quantitative data for the 10 students we interviewed and compare them individually to the whole sample. Once we had this information, Deborah, who headed the qualitative team, created a “quantitative profile” describing each student along the eight constructs from data analyzed by the quantitative team. This quantitative profile essentially was a short descriptive memo about each student based on the quantitative outcomes and how they changed or didn’t change as a result of participation in the mindfulness class. The students from Phase 3 also completed an additional round of data collection, with follow-up data taken 5 months after they completed the L2B program.

For the qualitative analysis, Julia and Joe created descriptive memos for each student using only the qualitative data to describe their profile based on the 10 qualitative constructs. We selected relevant quotes from the interview transcript, and performed a content analysis to examine what the student said about each construct. We then constructed a “qualitative profile” that interpreted student quotes.

Understanding the Findings

Once we completed the profiles separately, we then brought the quantitative and qualitative data together to see what we could learn from the comparison. We should note that the quantitative and qualitative profiles were written independently, meaning Deborah did not refer to any qualitative data while completing the quantitative profiles, and Julia and Joe did not refer to any

quantitative data while completing the qualitative profiles. The team did this purposefully as we felt it was important to create a profile for each student based only on one methodological paradigm to get a full sense of what each set of data "said." When the outcomes were compared across methodologies, many findings made sense, but some of them were confusing, though ultimately helpful. Below are two examples about how the quantitative and qualitative data worked together to provide triangulation for cases of divergent data "stories," as well as what that triangulation looked like and meant for this work.

Example 1

Javier, (a pseudonym), had a surprising finding when it came to mindfulness. Compared to the pre-test, both his mindfulness and mind-wandering scores went up. We expected that if mindfulness scores went up, then the mind-wandering scores would go down. Because this did not happen, we were curious to understand why. In the qualitative analysis, Javier talked specifically about his difficulty staying focused, but that he was now more aware of his mind-wandering as a result of learning mindfulness techniques, which explained the surprising outcomes.

Example 2

Hannah (also a pseudonym), scored lower than the average of her peers on social connectedness in her survey responses post course, and she scored relatively higher on rumination post intervention as well, (which is the opposite of the desired outcome). However, during her interview, she said that she relied upon her friends to relieve stress, and talked positively about her friends. She also mentioned that she lost her grandmother a few weeks before the semester, which was very challenging for her and for her mother, who she ended up needing to support. She said that this was the most challenging and stressful experience of her life, and that it was isolating. However, she said that the L2B course was helpful for her to become aware of these feelings and reduce her stress. This explained why, although all other indicators showed her to be a healthy young person, and that the L2B course had a positive effect on her wellbeing, certain outcomes showed negative results.

Finding meaning in divergent outcomes, such as in these examples, was a complicated process for the mixed-method design we utilized. For example, it is difficult to know how the averages of the student outcomes were affected by these individual circumstances. In theory, individual circumstances would affect both control and intervention groups equally, so this kind of background would be controlled for by the quasi-experimental design from a group analysis standpoint. However, contextual circumstances are still experienced differently by each student and the mindfulness class may have affected how they responded to a stressful life event.

Though challenging, we found important information from this mixed-method approach that is unique to the use of a coordinated approach using both methodologies. For example, Javier and other participants offer evidence that there are two ways in which the mindfulness training could have supported students' growth. The practices might help youth increase their mindfulness and lower their mind wandering, or alternatively, the practices might increase students' awareness *about* their mind wandering, which indicates greater self-awareness, and potentially far less mind wandering in the future. The mixed-methods approach uncovered this potentiality, which would not have been discovered with only a quantitative or a qualitative approach. In a quantitative approach, there would not have been explanation, personal insights, and context offered for these findings. For the qualitative methods, the outcomes would not have been as clear cut or easy to understand in terms of larger populations if we had only interviewed students. These findings will be able to contribute to more in-depth theoretical constructs about the relationship between mindfulness practices and wellbeing measures, which is why this methodology offers useful insights, even if it can be more conceptually and practically challenging than single method approaches.

Practical Lessons Learned

Based on the discussion so far, we learned some practical lessons about quasi-experimental, concurrent triangulation, mixed-methodologies for psychological research:

1. *Ensure you perform both methods in-depth.* The quality of the findings would not have been nearly as robust if only the quantitative team or the qualitative team attempted to collect and analyze the data using both methods on their own. There is a value to methodological specialization, as long as both teams are able to be open and also learn and value others' methodological approaches.
2. *Work in groups.* It is helpful to have a large team to perform concurrent triangulation for a quasi-experimental research project, so that the data collected can be in-depth and high quality for both methods. It is also helpful to have team members who possess an openness and appreciation for both approaches. There are some challenges with large teams, however, such as communication and the ability to integrate the different epistemological frameworks that each orientation offers. Patience, a willingness to learn, and good humor are the best tools for ensuring all ends up well.
3. *Find a balance between autonomy and communication.* Autonomy, combined with a lot of communication is a valuable but complicated endeavor. In this case, it lead to some tensions among the group to get everyone on the same page, but in the end, it was worth it.
4. *Strong interpersonal skills are helpful for gaining access to a school research site.* Constant communication and mobilizing various social networks are important for gaining access to

schools. It is not easy to convince people within a school to agree to participate in a research study, but some incentives for the teachers are often helpful, if you have the money. It is also important to build trust and ensure that there is a two-way relationship between the school and the researchers.

5. *Work closely with your institution, if possible, for ethical review.* Institutional review of ethics for school research is a long and tedious process, but it pays to be friendly with your review specialist so that changes to the protocol can be facilitated more easily.
6. *Test your tools.* Testing and discussing your research tools are essential for quality data collection. Although this was not discussed in the case specifically, it is important to remember.
7. *Understand the developmental stage of your research population.* Without the proper motivation and communication techniques, it might have not been possible to convince teenage students to engage in qualitative research, and even with that knowledge it was difficult. It is important to know the developmental stage and the related approaches for working with your research population.
8. *Overestimate how much time it will take to collect data.* Anticipate the issue of limited time for data collection, and look for the best balance between the time requirements for data collection and the value of the data collected. Teacher enthusiasm for working with a cutting-edge curriculum does not extend to providing so much time for data collection. Additional upfront time at study initiation to build support and understanding for the goals of the study might be time well spent, as well as discussions about navigating time commitments with teachers and students.

Conclusion

This case study demonstrates the value, as well as some of the difficulties and lessons learned, in a mixed-methods approach for a quasi-experimental design research project in a high school context. This mixed-method approach allowed our research team to uncover useful information that would not be understood with only one method. Although there was a significant amount of discussion and it was difficult to reconcile the different approaches, ultimately we were able to find a useful synthesis for the design. The outcomes of the qualitative–quantitative comparison offered us a more holistic picture of the learning and changes that students underwent in a high school health course that incorporated mindfulness.

Exercises and Discussion Questions

1. What are the strengths and weaknesses of working in a large research team? What might be some ways to mitigate the disadvantages?

2. We called the design of this study quasi-experimental, concurrent triangulation, and mixed method. What do each of these terms entail for the research design, that is, what do each of the terms mean? What are other approaches that might get at the same data and analysis?
3. Because the research was performed in a similar cultural context to the background of the researchers', in this case study, we did not discuss context and culture very much. However, culture and context are essential considerations for any research project. Do you think this study could be performed in cultural contexts different from a public high school in an Eastern U.S. state? If so, why? If not, why not?
4. How did this study navigate the differences between quantitative and qualitative epistemologies? How else might researchers navigate these differences?
5. What are some of the drawbacks for this particular research design? What are some of its unique strengths?
6. Why are interpersonal skills so important in this kind of research project?
7. If you were to perform a research project similar to this case, what design elements would you keep, and which would you change?
8. Writing prompt: Create your own mixed-method, quasi-experimental research plan to test an educational interventions' effect on students. Take into consideration the lessons learned from the case.

Further Reading

Davidson, R. J., & **Kaszniak, A. W.** (2015). Conceptual and methodological issues in research on mindfulness and meditation. *American Psychologist*, 70, 581–592.

Metz, S. M., **Frank, J. L.**, **Riebel, D.**, **Cantrell, T.**, **Sanders, R.**, & **Broderick, P. C.** (2013). The effectiveness of the Learning to BREATHE Program on adolescent emotion regulation. *Research in Human Development*, 10, 252–272. doi:http://dx.doi.org/10.1080/15427609.2013.818488

Web Resources

*Learning to Breathe*http://learning2breathe.org/

Self Compassion scale –Short form, 12 items (SCS-SF, Raes et al., 2011) https://self-compassion.org/wp-content/uploads/2015/02/ShortSCS.pdf

*Primary Health Questionnaire, 8 items (PHQ, Spitzer et al., 1999)*http://www.phqscreeners.com/select-screener/111

The Rumination and Reflection Questionnaire (RRQ, Trapnell & Campbell, 1999) http://www.mindfulness-extended.nl/content3/wp-content/uploads/2013/07/RRQ-Rumination-Reflection-Questionnaire1.pdf

*Generalized Anxiety Disorder, 7 items (GAD, Spitzer, Williams, & Lowe, 2006)*http://www.integration.samhsa.gov/clinical-practice/GAD708.19.08Cartwright.pdf

Child and Adolescent Mindfulness Measure (CAMM-SF, *Greco, Baer & Smith, 2011*) http://www.ruthbaer.com/academics/CAMM.pdf

*Difficulties in Emotion Regulation Scale (DERS, Gratz &, Roemer, 2004)*http://cairncenter.com/forms/difficultiesinemotionalregulation_scale.pdf

*Social Connectedness-Revised (SCC-R, Lee, Draper, & Lee, 2001)*http://depts.washington.edu/uwcssc/sites/default/files//Social%20Connectedness%20Scale-Revised.pdf

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