Effect of Best Possible Self Writing Activities on Preservice Teachers' Attitudes towards Technology Integration

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Abstract

Preservice teachers' attitudes towards technology integration influence their motivation for and future behavior in teaching, but effective interventions to modify attitudes towards technology integration are scarce in teacher education programs. This quasi-experimental study redesigned and integrated one of the most widely used positive psychology interventions—Best Possible Self (BPS)—for use in a stand-alone technology integration course to measure its effect in improving preservice teachers' attitudes towards technology integration. While results show no statistically significant difference between the control and treatment groups, the treatment group had more positive trends (significant increase in positive attitudes) than the control group (no significant increase in positive attitudes) even under the negative influence of pandemic. The results of this study suggest a need for continued development of and research on this type of activity.

Keywords Attitudes · Best possible self · Preservice teachers · Technology integration

Introduction

Technology use is “no longer an option but a core requirement of today's schools” (Richards, 2017, p.253), yet, in a national study conducted in Turkey, most preservice teachers of third and fourth graders (72% of 814) consider technology supplementary, and only 5% regard it as an integral part of their teaching (Korucu-Kis & Ozmen, 2019). In teacher preparation programs, preservice teachers' considering technology as an add-on is not sufficient, however, especially when a situation such as the COVID-19 pandemic can force a sudden transition from face-to-face to online teaching.

Teachers need to leave their teacher preparation programs with a solid understanding of how to use tech-

nology to support learning. Effective use of technology is not an optional add-on or a skill that we simply can expect teachers to pick up once they get into the classroom. Teachers need to know how to use technology to realize each state's learning standards from day one. (U.S. Department of Education, Office of Educational Technology, 2017, p. 35)

Preservice teachers' attitudes about technology predict and influence the extent of technology integration in their future teaching (Bai & Ertmer, 2008). For this reason, teacher education programs need to integrate effective strategies within programs or courses to develop preservice teachers' positive attitudes towards technology integration (Bai & Ertmer, 2008). Most programs, however, are designed to emphasize technology skills and knowledge more than attitudes towards technology integration (Kay, 2006). Therefore, interventions that can effectively enhance preservice teachers' attitudes towards technology integration are needed in teacher education programs and courses. However, the design of such interventions can be challenging.

Best Possible Self (BPS) is one of the most widely used positive psychology interventions to increase optimism, positive affect, and positive expectations about the future (Heckerens & Eid, 2020). BPS guides participants to think and write about their best possible future life (King, 2001). Repeatedly envisioning their best possible selves may

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increase preservice and new teachers' self-awareness and optimism about their future teaching practice, resulting in more positive attitudes towards teaching (Chan, 2006). Although there is a large body of research on the efficacy of BPS in laboratory settings, and psychology researchers frequently promote the use of such positive psychology interventions in classrooms (e.g., Seligman et al., 2009), little research has been done in authentic classroom settings, especially for the purpose of attitude enhancement.

In this study, we redesigned BPS to meet our particular needs as educators. The purpose of this study is to examine the effect of three adapted BPS writing activities (BPS, BPS-as-a-teacher, BPS-in-technology-integration) on preservice teachers' attitudes towards technology integration in their future roles as teachers, when compared to a control group.

Literature Review

Attitudes and Attitudes Change

Attitudes, “which are positive and negative judgments that are constructed out of our beliefs and experiences, are primary indicators of a person's intent to perform a behavior” (Cullen & Greene, 2011, p. 31). Attitudes are also defined as “a person's psychological evaluations of an object, person, or event” (Watson et al., 2020, p. 91). Learning that intends to change the strength of attitudes (e.g., negative, slightly positive, very positive, and so on) is defined as attitudinal learning (Briñol & Petty, 2005). Compared to beliefs, which are difficult to change (Cullen & Greene, 2011), attitudes towards a specific object or phenomenon, in this case technology integration, can be enhanced through exposure to and experience with technology (Levine & Donitsa-Schmidt, 1997), technology course learning (Yildirim, 2000), and technology-enriched environments (Mitra & Steffensmeier, 2000). Because specific attitudes are strong predictors of specific future behavior, change of specific attitudes also predicts specific behavior change (Ajzen et al., 2018). Thus, in education, attitude change is identified as a core learning objective (Gagne et al., 1992).

Preservice Teachers' Attitudes towards Technology Integration

Preservice teachers' attitudes towards technology integration serve as strong predictors of their intention to integrate technology in their future teaching (Anderson & Maninger, 2007; Huang & Liaw, 2005; Meelissen, 2008). For example, Sang et al. (2010) conducted a study of 727 preservice teachers in four universities in China, and the results showed that their attitudes were the most significant predictor of their willingness to use technology—more significant even

than their self-efficacy in teaching and computing skills. The results of Cullen and Greene's (2011) study of 114 preservice teachers indicated that preservice teachers' attitudes were significant predictors of both intrinsic and extrinsic motivation to use technology.

Other research has focused on the relationship between attitudes and other factors in driving or predicting future behavior. Knezek and Christensen (2008) proposed the *will*, *skill*, and *tool* (WST) model, which identified three factors that contribute to technology integration: *will* (attitudes towards and beliefs in technology use), *skill* (knowledge and ability of technology use), and *tool* (accessibility to technology tools). In Morales's (2006) study, the WST model explained up to 90% of the variation in technology integration for Mexican and US teachers. Farjon et al. (2019) measured the predictive value of the WST model among 398 first-year preservice teachers; the results showed that WST explained 60% of the variation, and that *will* was the strongest predictor.

Interventions for Enhancing Preservice Teachers' Attitudes

Given the critical role that preservice teachers' attitudes towards technology integration play in their future teaching with technology (Uslu & Buman, 2012; Sang et al., 2010; Cullen & Greene, 2011; Farjon et al., 2019), experts have called for positive attitude enhancement through teacher education programs (Bai & Ertmer, 2008; Hew & Brush, 2007). However, many teacher education programs were designed to focus more on knowledge and skills than attitudes and beliefs (Kay, 2006). Even though many strategies (e.g., integrating technology use in all the courses, multimedia-based approaches, improving educators' technology use, etc.) have been used in teacher education programs, a stand-alone technology integration course is typically used to teach educational technology (Kay, 2006). However, a well-designed stand-alone course is an effective way to improve preservice teachers' knowledge, skills, beliefs, and attitudes (Anderson & Maninger, 2007). Anderson and Maninger (2007) suggest that instructors consider adding instructional activities in their teaching to enhance of beliefs and attitudes. But to date, little research has explored interventions or activities aiming to facilitate positive attitudes towards technology integration in teacher education programs.

Fluck and Dowden (2013) designed a purposeful intervention to positively influence preservice teachers' beliefs about information and communication technology (ICT). This intervention was designed as an assignment that asked 436 preservice teachers to mentally travel to their future ideal digital classrooms. They could freely use any technology to enhance their teaching and students' learning, after which they

redesigned an existing sample curriculum by integrating technology into their ideal classrooms. Through this envisioning process, the authors hoped to build a new belief that technology integration was an integral part of their teaching instead of an add-on. About 95% of the preservice teachers successfully passed the assignment according to a rubric that highlighted higher-order thinking. While it was not realistic in this study to assess the full impact of this envisioning process longitudinally, the results showed that this envisioning intervention could be a promising activity to enhance preservice teachers' beliefs about the integral nature of technology in the classroom.

Guiding preservice teachers to envision and reflect on their possible selves in their future teaching is an excellent way to enhance their professional identity or self-image, which is essential in predicting their future identity and teaching behavior (Erdem, 2020). In Erdem's (2020) study, *possible selves* theory, which highlights that individuals' hoped-for (want to be) and feared (avoid to be) selves may impact their future behavior (Markus & Nurius, 1986), was used as a framework to explore the relationship between preservice teachers' possible selves and early teachers' identity. Results from Erdem's (2020) study of 350 preservice teachers in Turkey reveals that their hoped-for selves are a significant positive predictor of their early teacher identity. In contrast, the feared selves are a significant negative predictor. Thus, this study strongly recommends that teacher education programs promote positive attitudes because the preservice teacher period is an ideal time to cultivate a professional identity.

Liu and Geertshuis (2016) proposed that teachers were most likely to integrate technology when they felt technology use aligned with their identity. For example, teachers with tech-savvy identities feel more comfortable using technology in their English teaching (Emara, 2020), and both in-service teachers (Higgins & Moseley, 2001) and preservice teachers (Wang et al., 2004) with constructivist identities are more willing to use technology in their teaching. Chan (2006) indicated that repeatedly practicing with future-oriented hoped-for selves might promote positive attitudes, raising preservice or in-service teachers' self-awareness and cultivating their identity in teaching. This idea is echoed by a widely used positive psychology intervention: Best Possible Self (BPS) asks participants to think and write about their best possible selves, assuming the ideal scenario for their lives (King, 2001). Therefore, when applied in a stand-alone technology course, a BPS intervention may have the potential to promote preservice teachers' positive attitudes towards technology integration through targeted and repeated practice.

Potential of BPS in Increasing Preservice Teachers' Attitudes

BPS was first used by King (2001) as a writing activity about the best possible future self that could be used as an alternative to writing about trauma in the therapeutic setting. The activity's effects on well-being were measured, and the results showed that BPS was the same as or more effective than writing about trauma in increasing subjective well-being—defined as more life satisfaction and positive affect combined with less negative affect (Librán, 2006)—and decreasing health center visits, and was less upsetting. The original instructions of the BPS intervention used by King (2001) are:

Think about your life in the future. Imagine that everything has gone as well as it possibly could. You have worked hard and succeeded at accomplishing all of your life goals. Think of this as the realization of all of your life dreams. Now, write about what you imagined (King, 2001, p. 801).

Even though there is no direct study providing evidence of BPS's effects in increasing positive attitudes, BPS's effects in increasing well-being, positive affect, and optimism are fundamental for its potential to increase positive attitudes. Since King's initial study, there has been a "rapidly expanding body of literature accumulating around" the BPS intervention (Schueller et al., 2014, p. 93) and BPS's effectiveness in increasing positive affect and optimism was confirmed by three systematic literature reviews and meta-analyses (Loveday et al., 2016; Carrillo et al., 2019; Heekerens & Eid, 2020). First, Loveday et al. (2016) conducted a systematic literature review, including 31 qualified studies with 4616 participants. They summarized that BPS was "a viable intervention for increasing optimism, positive affect, health and well-being" for "diverse groups including students, adults, depressive individuals and suicidal inpatients," and "can be effective when administered in-person or on-line and repeating the activity appears to enhance efficacy" (p. 607). Second, Carrillo et al. (2019) systematically searched and chose 29 qualified studies with 2,909 participants to examine BPS's overall effectiveness through a meta-analysis. Their results showed that "the BPS is an effective intervention to improve wellbeing ($d = 0.325$), optimism ($d = 0.334$) and positive affect ($d = 0.511$) comparing to controls" (p. 1). Finally, for practical use purposes, Heekerens and Eid (2020) also systematically searched and chose 34 randomized controlled studies with 4,462 participants, then coded and evaluated BPS's effectiveness through several meta-analyses. They concluded that the BPS intervention could be effective in increasing positive affect and optimism (positive future expectations), but that "effects on positive affect were strongest among studies

that assessed momentary affect immediately after the intervention, whereas effects on optimism were only significant if conceptualized as positive future expectations rather than a general orientation in life” (p. 1).

There are at least four reasons that the BPS intervention has the potential to increase preservice teachers’ positive attitudes towards technology integration by being integrated into a stand-alone technology course. First, BPS is a short writing activity that usually lasts no longer than 20 min and can be completed in as little as 10 min for a single session (Carrillo et al., 2019), although its effectiveness can be enhanced through repeated sessions (Loveday et al., 2016). Second, BPS’s delivery method is flexible, which means that its effectiveness is comparable whether it is delivered in-person or online (Loveday et al., 2016). Third, BPS is a future-oriented writing activity focusing on a hoped-for self, which could be an excellent practice to enhance preservice teachers’ identity. Especially when preservice teachers are specifically guided to reflect on their BPS, BPS as a teacher, and BPS of technology integration in their future teaching, these reflections may have the potential to improve preservice teachers’ attitudes towards technology integration (Chan, 2006; Erdem, 2020; Heekerens & Eid, 2020). Finally, BPS is effective in increasing positive affect and optimism (positive future expectations), both of which can result in positive attitude change, especially when preservice teachers are asked to reflect on their own future and specifically on teaching and technology integration (McElwee & Brittain, 2009).

Research Questions

While BPS is a widely used positive psychology intervention and undergraduate students are the dominant participants in BPS research studies, no study has yet been conducted on preservice teachers for attitude enhancement purposes (Carrillo et al., 2019). In this study, we adapted and redesigned three BPS writing activities (BPS, BPS-as-a-teacher, and BPS-in-technology-integration in their future teaching). These were integrated into a stand-alone introductory technology course in a teacher education program. The purpose of the adapted BPS activity was two-fold: to promote overall student well-being as promised by positive psychology literature (discussed in a separate article, Duan et al., 2021) and to improve students’ attitudes towards technology integration. This study focuses on the second purpose, by exploring the following two research questions:

1. Do the BPS activities impact preservice teachers' attitudes towards technology integration?
2. Is the change in attitudes in the treatment group significantly different from the control group?

Methods

Context

A stand-alone introductory technology course in a teacher education program at a large public research-intensive Midwestern university was chosen for this study. This course is required for all students in this program, and it is one of the largest courses in the College of Education usually with more than 100 students enrolled. It is a typical three-credit, 16-week course offered in both the Fall and Spring semesters. Usually, students take it during their first year. The purpose of this course is to prepare preservice teachers to integrate technology in their teaching. Each week, students attend a 50-min lecture on Monday and a 110-min lab on Wednesday to practice and complete tasks related to technology tools. This course is taught by a teaching group comprising the instructor and several teaching assistants (TAs). The instructor teaches Monday’s lecture, which is also attended by TAs, who help to organize learning activities in the class. TAs teach Wednesday’s lab sections independently under the guidance of the instructor.

After approval from the university’s Institutional Review Board, this study was conducted in the Spring semester, 2020. The course was set up with two lecture sections taught by a single professor and eight lab sections, each taught by different teaching assistants. Figure 1 shows the course structure (Duan et al., 2021). A quasi-experimental method was used in this study to assign participants to the control or treatment group based on the lecture section. The writing activities were integrated into the course as part of the assignments, which were worth 10 points in total (2.6% of the 392 points available in the course). Since the lab sections are much longer than the lecture, all research activities were conducted during the lab time.

Participants

A total of 105 undergraduate students were enrolled in this course during the Spring semester of 2020 (Fig. 1). All of the students were also preservice teachers with diverse majors, such as elementary education, social studies education, math education, and agriculture education. All the participants were 18 years of age or older. Fourteen students (six in the treatment group and eight in the control group) were excluded because they either dropped the course (seven students), did not complete all the research activities (five students), or met them only minimally (two students, who wrote few words and selected the

Fig. 1 Course structure

same choices for all the scales). Based on the instructor's approximately 30 years of experience teaching this course, the number of students who dropped the course or did not complete the activities is average.

Ninety-one participants (Control group: 41; Treatment group: 50) completed all the required activities. In addition, participants in the two groups had the same mean age (19 years). Table 1 includes the demographic information across groups.

Writing Activities Design

We expanded the BPS activity from Peters et al. (2010) to encompass three themes designed to encourage students to reflect on aspects of their best possible future lives beginning

with the most general and becoming increasingly specific: (1) **BPS**: envision one's best possible future self; (2) **BPS-as-a-teacher**: envision one's best possible self as a future teacher; and (3) **BPS-in-technology-integration**: envision one's best possible self while utilizing technology within one's future classroom. For the treatment group, the purpose of the adapted BPS activity was two-fold: to promote overall student well-being as promised by positive psychology literature (discussed in a separate article, Duan et al., 2021) and to improve students' attitudes towards technology integration. This study focuses on the second purpose.

For the control group, a neutral writing activity named *A Typical Day* was also adapted from Peters et al. (2010) and expanded to encompass three themes to match the treatment group: (1) **Typical Weekday**: describe what you usually do

Table 1 Demographic information across groups

	Treatment		Control		Full sample	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender						
Female	30	60.0	33	80.5	63	69.2
Male	20	40.0	8	19.5	28	30.8
Year in school						
Freshman	22	44.0	25	61.0	47	51.6
Sophomore	23	46.0	14	34.1	37	40.7
Junior	5	10.0	1	2.4	6	6.6
Senior			1	2.4	1	1.1
Age						
18	14	28.0	11	26.8	25	27.5
19	16	32.0	19	46.3	35	38.5
20	17	34.0	9	22.0	26	28.6
21	2	4.0	2	4.9	4	4.4
22	1	2.0	0	0	1	1.1

in your typical weekday; (2) **Yesterday**: describe what you did yesterday; (3) **Typical Saturday**: describe what you usually do in your typical Saturday.

Each writing activity included a prompt for students to read, after which they were directed to consider their response for one minute and then record their thoughts for 15 min, providing as many details as possible. Figure 2 shows the instruction of BPS for the treatment group, and Fig. 3 shows the instruction of *Typical Weekday* for the control group. Although structured similarly to BPS activities used in laboratory settings, we named these required course

assignments “self-reflection activities” to make them more relevant to the learners.

Instrument

This study used the Attitudes toward Computers in Education (ACE) scale to measure preservice teachers’ attitudes towards technology integration. van Braak (2001) designed a 12-item version ($\alpha = 0.89$) of ACE, utilizing a 5-point Likert format scale with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), which was used to measure 236

Fig. 2 Instruction of BPS

01 00

The exercise you will do is to think about your best possible self for one minute and then write down your thoughts. ‘Think about your best possible self’ means that you imagine yourself in the future, after everything has gone as well as it possibly could. You have worked hard and succeeded at accomplishing all the goals of your life. Think of this as the realization of your dreams, and that you have reached your full potential. Thus, you identify the best possible way that things might turn out in your life. Please, start thinking of your best possible self for 1 minute.

15 00

Now, I will ask you to write about your best possible self for 15 minutes. The only rule we have about writing is that you write continuously for the entire time. If you run out of things to say, just add more details. Don’t worry about grammar, spelling or sentence structure, just write. Please start writing.

Fig. 3 Instruction of typical weekday

01 00

The exercise you will do is to think about a typical weekday in your life for one minute and then write down your thoughts. ‘Think about your typical weekday’ means that you take notice of ordinary details of weekdays that you usually don’t think about. These might include particular classes or meetings you attend, people you meet, things you do, typical thoughts you have during the day. Think of this as moving through your typical weekday, hour by hour. Thus, you identify how a typical weekday looks like for you. Please, start thinking of your typical weekday for 1 minute.

15 00

Now, I will ask you to write about a typical weekday in your life for 15 minutes. The only rule we have about writing is that you write continuously for the entire time. If you run out of things to say, just add more details. Don’t worry about grammar, spelling or sentence structure, just write. Please start writing.

teachers' attitudes about the effectiveness of technology integration in the classroom. van Braak's (2001) ACE scale was justified and confirmed specifically for measuring attitudes towards technology in education, as distinguished from attitudes toward computers in general. Sang et al. (2010) used an 8-item ACE version adapted from van Braak (2001) to measure 727 preservice teachers' attitudes towards technology use in the classroom and found good internal consistency ($\alpha=0.81$). Farjon et al. (2019), who applied a 10-item ACE version to examine 398 preservice teachers' attitudes towards computer integration in the classroom, also found good internal consistency ($\alpha=0.896$). We chose to use Farjon et al.'s (2019) 10-item ACE version in the present study because it is the newest version we can find for preservice teachers. Since the course selected for this study aims to prepare preservice teachers to integrate many types of technology, and not just computers, we changed the word "computer" to "technology" in the scale. The remaining language matched Farjon et al.'s (2019) 10-item ACE version.

Procedures

The treatment group participated in BPS, BPS-as-a-teacher, and BPS-in-technology-integration, while the control group participated in three neutral Typical Day activities (typical weekday, yesterday, and typical Saturday). Six writing samples including all three writing activities for each group were included in the Table 2. Further qualitative analysis based on the writing content will be included in another manuscript. Writing activities were conducted in weeks 2, 3, and 4 of the semester. A pre-test of ACE was conducted in week two, just prior to the first writing activity, and a post-test of ACE was conducted in week four, immediately following the third writing activity.

This study was conducted during the early stages of the COVID-19 pandemic. The pre-test and the first writing activity were on January 22, 2020 (week 2), and the post-test and the third writing activity were on February 5 (week 4). About one month after the post-test, on March 14, the campus was closed and all courses were transferred online.

Data Analysis

After checking the assumptions for the t-test, neither normality nor homogeneity were violated. A paired t-test was used to analyze the ACE change in each group to examine if the treatment group showed a significant ACE change. An independent t-test was used to analyze the ACE change ($\text{Diff ACE} = \text{Post ACE Mean} - \text{Pre ACE Mean}$) between the two groups to see if the treatment group showed a more significant ACE change than the control group.

Results

A paired t-test was conducted to answer research question 1, and an independent t-test was conducted to answer research question 2. The description information is included in Table 3. The change of ACE mean scores for the two groups is displayed in Fig. 4.

Research Question 1: Do the BPS activities impact preservice teachers' attitudes towards technology integration?

To answer this question, a paired t-test was conducted independently in each group. The results show a significant (at $p < 0.05$) increase of ACE in the treatment group from pre to post ($t(49) = 2.21$, $p = 0.03$), but no significant difference of ACE in the control group ($t(40) = 1.79$, $p = 0.08$). This means, statistically, BPS activities increased preservice teachers' positive attitudes towards technology integration, but the neutral writing activities did not.

Research Question 2: Is the change in attitudes in the treatment group significantly different from the control group?

An independent t-test was conducted across the two groups to examine if the change in attitudes was significant compared to the control group. The difference between post and pre was calculated and is displayed in Table 3. Results of independent t-test show no statistical significance (at $p < 0.05$) between the two groups ($t(89) = 0.25$, $p = 0.80$). This means, statistically, the change of ACE in the treatment group is not significantly different from the control group.

Discussion

This study integrated three adapted and redesigned BPS writing activities into a preservice teachers' technology integration course in a teacher education program. Their effectiveness in increasing preservice teachers' positive attitudes towards technology integration was examined. Results show a statistically significant increase in positive attitudes in the treatment group, but the change in attitude was not significantly different from the control group. Nevertheless, these results are promising because the BPS intervention has the potential to increase preservice teachers' attitudes towards technology integration even under the conditions of the COVID-19 pandemic. In fact, data reported in this study are part of a larger longitudinal study related to the use of purposefully adapted BPS activities in this context (Duan et al.,

Table 2 Writing Samples in Both Groups

BPS in the treatment group	Typical Day in the control group
<p>Writing activity 1: BPS</p> <p>When I think of my best possible self, I think of myself about ten years from now. I am married to a loving husband and have 2 or 3 kids with plans for another one. Our family has 2 dogs. Ones named tuck and the other one is Otis (both boys). We live in a suburb of a big city in the midwest. Maybe Indianapolis, maybe somewhere else. We live close to my little brother and his family, and our kids play together all the time. We are very close. I work in a high school or a middle school co-taught special education classroom- mild intervention. I work in a private school similar to the one i went to where the staff and students all truly care for one another. My husband is also successful and works hard every day, but also makes time for the family and to spend time with us. I am happy and healthy and so are my children. We also live close to my best friend Becca and my mom and dad so that my children have a strong relationship with them. Our house is a perfect mixture of modern and rustic and has an open floor plan. We host dinner parties and friend get togethers on the weekend because I love hosting people any chance I get. My kids are happy. They do whatever makes them happy. Sports, theatre, art, boy scouts, etc. I let them choose their own path because that's what my parents did for me. My house is the cool house that my kids and their friends always want to hang out at. We have family dinner when we can, but not every night because we are very busy and the kids have a lot of extracurriculars around dinner time. I cook dinner because I enjoy it, and the family loves my cooking. I get stressed, but I know how to handle it so i rarely freak out or lose my temper. My students love me. I have a classroom that fosters positivity and learning. My students have a sense of trust for me because they know I will always take care of them and put them before myself. I get to volunteer in my free time. I have spent a few years in my twenties traveling with my husband before settling down to start a family. I want to see the world, and i will do whatever it takes to get to do it. I exercise and keep my body healthy so i can be a good role model for my family and my students. my life is filled with love, and i never have to doubt that my family is in my corner. we live in a nice neighborhood, and our neighbors have kids too so they're all friends and hang out until dusk playing every night after school. everyone is happy. we have our lows, but we get through them together. we take family vacations once a year. I want my children to see the world. we are not a family that fights a lot. we all mesh really well together and want the best for one another. my kids do well in school, and go on to live a wonderful life</p>	<p>Writing activity 1: Typical weekday</p> <p>My typical week varies day-by-day but I typically wake up from 8–9, depending on when my first class is that day. It takes me a while to actually wake up so I set many alarms, to make sure that I will actually wake up and get out of bed. After my alarms go off, I am on my phone for about 10 min to try to fully wake up before I get out of bed. Once I finally get out of bed, I wash my face and brush my teeth. After that, I do my hair and makeup and get dressed. If I am being efficient that day, it will take me about 30 min to get ready but if I feel I have more time, I will drag it out for as long as possible. I try to be as quiet as possible when getting ready because my room-mate is usually asleep because her classes do not start until later in the day. If I have time before my first class, which I usually don't, I will make some breakfast or coffee. I then look at my calendar and planner and plan out my day. By this time, I am either running late or am right on time. I pack everything that I will need for the day in my backpack and head to class. On my way out of the building, I always rinse out and fill up my water bottle. I also always listen to music on my way to class because it puts me in a better mood. Then, I make it to class, hopefully about 5 to 10 min early. I will sit through class and usually take notes in a notebook or loose-leaf paper. If I have a break throughout the day, I will update my planner and calendar with new assignments, quizzes, deadlines, and exams. I usually don't have time in my schedule to eat lunch so once I get home from classes, I eat a snack. I have a full day of classes so when I get home, I try to relax for a bit until I go to dinner. I will usually get dinner with friends at a dining court. After dinner, I will usually go some-where to work on homework or study. Most of the time, I end up at Starbucks. A lot of the time, I will meet a friend there or a friend will meet me there. I find that I am much more productive if I have someone studying with me because they can keep me accountable. I also find that I am less likely to zone off and people-watch or listen to other people talking if I have someone else there with me. Once I get there, I look at my planner and make a to-do list of everything I want to get done in the study-session. After planning, I will get up and get some coffee or tea and then start studying. I am usually done studying around 8 or 9. I usually try to go to the gym a few times a week so sometimes I will go before or after my studying. I shower after I go to the gym and then will relax, usually hanging out with a friend and watching Netflix. I try to get to bed at a reasonable time because some of my classes begin in the morning, and I am not a morning person. I usually watch Netflix or scroll through my phone before bed until I feel tired enough to go to sleep. I always have a water bottle next to my bed and try to finish it before I fall asleep. I have no issue falling asleep, which is sometimes a curse, so I usually end up falling asleep with my light on or my phone still with me</p>
<p>Writing activity 2: BPS-as-a-teacher</p>	<p>Writing activity 2: Yesterday</p>

Table 2 (continued)

BPS in the treatment group	Typical Day in the control group
<p>My best possible self as a teacher is to be able to inspire students. Once I get my degree I can and find a career meant for me, I will flourish. What I mean by that is finding out what I want to teach and what grade as well. I remember reading an article about finding which grade is perfect for you would increase work productivity. Say I want to work with elementary kids, but I quickly find out that I want more challenging topics to debate on. I would get burnt out with teaching 1st graders so instead, I should teach junior high or up. Being the best possible self as a teacher is what you dream to do when you have the job, but what most people fail to realize is the workload that comes along with it. I want to be able to have my future students think that I am passionate about what I teach, not that I am just there to do a job. By being able to show the passion I have for teaching, I will be able to inspire students. I want future students to know that I care about them and not just for their grade, but as a person. Everyone deserves to be cared for and some students definitely do not just get that. During my freshman year of high school I was going through a tough time with life. I had this one teacher who always made sure I was okay and talked to me regularly about anything. Then I had this one teacher who would just lash out on me if I would not participate. Having a teacher that cares will boost the students to want to learn more about a subject. I want students to trust me with my knowledge so I can teach them what I know. I want to be the teacher that will be a sponsor of a club one day such as a debate team or a leadership club. I also want to make learning fun. I want to have students be more encouraged to participate instead of shame to not say anything. My best possible self as a teacher is really just being an overall nice person. Without kindness, people would not listen, trust, or understand the true meaning of being a teacher</p> <p>Writing activity 3: BPS-in-technology-integration</p> <p>My best possible self of applying technology in my teaching career in the future would be being open to new possibilities. I know that technology is everchanging so being able to be open to new ideas, especially from students, will allow my classroom to be more than average! I would incorporate technology into lessons by using sites such as MindMeister to create a presentation over the material. I could also use Quizlet Live when studying for a test to let students be able to collaborate and work together to find an answer. I would also use technology for assignments. In the future, I can see most schools having the funds to switch from all books to all laptops or handheld devices such as iPad for assignments. This would allow me to make an assignment that would be beneficial to all students. For example, I could have the students do an assignment where they pick a political figure and make a presentation over their choice of figure. This would allow for their creativity and communication skills to shine. I could also use technology to make lesson plans in the future. I can incorporate it into my everyday teaching and allow the students to get a taste of digital literacy. I could also be seen as being an innovative teacher whose classes are fun because of the technology use I do in class. By being open to change, or being innovative, teachers in classrooms can incorporate different types of learning styles all in one lesson. You could do groups of three different types: audio, visual, and hands-on. The audio group could be a crash course video explaining the types of branches and what they do. The visual group could read an article about the three branches. The hands-on group could create a skit about the branches of government and how they came to be. By using this type of technology we could bring the classroom more together on understanding topics in one's own way. Not only will technology include everyone in the classroom, but it will also lead the way for future students to start thinking independently</p>	<p>Yesterday, I woke up somewhat late at 11 am. I woke up with a bit of a headache because I had been suffering from a migraine the week prior. I laid in bed for a while because I did not have much to do that day. I then went to Buffalo Wild Wings with my boyfriend. We both ordered mozzarella sticks and I ordered an ice water. I also got a small boneless Honey BBQ wings. We ate our food and then got the check from the waitress. After Buffalo Wild Wings, we went to Walmart. At Walmart, I got napkins, a facemask, and a new shower loofa. Then, I went back to my dorm and worked on some homework. Then it was time for dinner so I went with my roommate to a dining court and had some pasta. After dinner, I went back to my dorm and watched a few episodes of Grey's Anatomy before showering. After showering, I went over to my boyfriend's house and we started the first Lord of the Rings movie. After about an hour, we walked to Third Street Market to get some movie snacks and drinks. When we got back to his house, we watched a few minutes of the Basketball game and then went back upstairs to finish the movie. Once we finished the movie, we went to bed</p> <p>Writing activity 3: Typical Saturday</p> <p>I usually sleep in on Saturday mornings until about 10 or 11 am. Once I wake up, I will usually go to Hillenbrand for breakfast/lunch with my roommate. After that, typically, I will go to Walmart with my boyfriend. After we go to Walmart, I will put away the things that I bought for the week and go to the gym. I spend about an hour at the gym. When I am at the gym, I start with a little bit of yoga and stretching to get warm and ready to work out. Once I am warm, I will go on an elliptical machine for about 20 min, a stairmaster for about 20 min, and a cycling bike for about 20 min. After that, I stretch and then head home. Once I get home, I shower and then dry and straighten my hair, do my makeup, and get dressed. After showering, I will try to get some homework done. I usually go to Starbucks and get some coffee before studying, if I leave my dorm. I like to study either at Krach, Third Street, Starbucks, or in the study rooms/lobby in my dorm. I will try to get a few hours of homework or studying done. After I am done studying, I will usually get dinner with my boyfriend. After dinner, we hang out with our friends and my roommate. Some weekends, we will go to a party at either my boyfriend's house or my cousin's house. I try to get into bed as early as possible, because I need a lot of sleep to be as productive as possible on Sunday</p>

Table 3 Description information of ACE in two groups

Variable	Group	Pre		Post		Diff ACE	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
ACE	C (n=41)	37.44	4.92	38.61	4.49	1.17	4.18
	T (n=50)	40.34	5.43	41.32	5.53	0.98	3.14

C=control group, T=treatment group. Diff ACE=Post ACE – Pre ACE

Fig. 4 Mean scores of ACE from pre to post

2021). In Duan et al.'s (2021) study, BPS's effectiveness in increasing participants' overall well-being was measured. Results revealed the surprising fact that not only did the BPS fail to increase well-being, but the control group showed a more positive trend than the treatment group.

Duan et al. (2021) discussed that BPS might not be an effective intervention for the purpose of improving well-being during the pandemic for the following reasons: 1) The intolerance of uncertainty under pandemic conditions are negatively associated with well-being (Satici et al., 2020); 2) Future-oriented planning interventions might make people feel worse under the conditions of the pandemic (Zacher & Rudolph, 2020); 3) In contrast, people were more willing to write about their daily life under the pandemic, which might make the "neutral" writing activity *Typical Day* less neutral than it is under the normal conditions. This may be especially true of the last neutral writing activity focusing on *Saturday*, which might promote enhancement of well-being insofar as reflecting on leisure time is associated with well-being increase (Ryan et al., 2010).

With these mitigating factors in mind, BPS's potential effectiveness in increasing preservice teachers' positive

attitudes towards technology integration might be impacted by its inability to improve overall well-being under the conditions of the pandemic. This is because BPS is not as effective as it is under normal conditions in increasing optimism (positive future expectation) and positive affect (positive emotions), which have been shown to be associated with positive attitudes. Based on this background, the results of this study are promising and suggest a need for future research to test the effectiveness of BPS under more typical conditions in promoting positive attitudes towards technology integration among preservice teachers.

Limitations

In addition to the influence of COVID-19 disruptions to students' lives, this study has other limitations. The findings of this study reflect one course at one specific university and are not generalizable. In addition, the relatively small sample size and use of a quasi-experimental design (rather than random assignment) might have impacted the likelihood of discovering statistically significant findings. Finally, we did not collect demographic data on participants' prior or current

experiences that might impact their beliefs about technology in education, nor did we control for it (for example, a student might currently work as a teacher's aide in a school setting). It is hoped that these traits would be randomly distributed across the control and treatment groups.

Conclusions, Areas for Future Research, and Implications

This study adapted BPS, one of the most widely used positive psychology interventions, for use in a technology integration course to improve preservice teachers' attitudes towards technology integration. The results show positive trends, but a larger-scale study is needed to determine whether there is a statically significant impact. Considering the influence of the pandemic, additional studies conducted under more typical conditions will contribute to assessing its effectiveness. A qualitative study utilizing the content of students' written responses to the BPS, BPS-as-a-teacher, and BPS-in-technology-integration reflection prompts may provide insights into preservice teachers' attitudes towards technology integration, which may inform a redesign of this activity with the goal of developing a technique that could be used to promote lasting attitudinal change (Bai & Ertmer, 2008). This study provided a potential intervention to the currently lacking or insufficient methods used to promote preservice teachers' positive attitudes towards technology integration.

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