Research paper

How am I a creative teacher? Beliefs, values, and affect for integrating creativity in the classroom☆

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HIGHLIGHTS

- Creative anxiety and fixed mindsets are barriers to teachers' creative development and practice.
- More adaptive beliefs and feelings about creativity develop by reshaping myths and assumptions.
- A blended PD approach can enhance teachers' agency and seed new classroom practices.
- Improved mindset and self-efficacy resulted from a deeper understanding and personal creative and reflective practice.
- Creative teaching and learning can begin with basic routines for the classroom leading to further integration.

ARTICLE INFO

ABSTRACT

This study addresses the gap in research on integrating creativity and arts integration in the classroom by describing and testing a blended professional development (PD) model guided by the theory of change that teachers' understanding and beliefs about creativity are foundational to their development as a creative teacher and to their classroom implementation. Using an explanatory sequential mixed methods design, the study demonstrated increased beliefs about teachers' ability to teach for creativity for $n = 30$ rural K-12 teachers and illustrated teachers' perceptions of early implementation of creative routines in practice. (Word count: 91).

Creative potential, or the ability to generate new, useful, meaningful, and high quality ideas (Runco & Jaeger, 2012), has been identified as one of the top three most important skills for individuals to thrive and find fulfillment in today's world (World Economic Forum, 2016). Unfortunately, this trend toward creative development and fulfillment in work has not been prioritized in the preparation and ongoing professional development (PD) of teachers. Though declared as a national priority by organizations and countries around the world, such as Australia (Jefferson & Anderson, 2017) and the Organization of Economic Cooperation and Development (Vincent-Lancrin et al., 2019), the preparation of teachers to support students' creative development continues to lag behind these policies. According to a recent international survey of curriculum, there is little support for teachers to turn policies that emphasize creativity into actual practice (Patston, Kaufman, Cropley, & Marrone, 2021). To date, training opportunities are rare in pre-service education (examples include: Kimhi & Geronik, 2020; White, 2006) or in-service training (Jefferson & Anderson, 2017; Kettler, Lamb, Willerson, & Mullet, 2018) to help teachers understand and integrate research-based, effective ideas about creativity into their teaching. We argue that the field of teacher education needs more examples of how teacher creative development can be accomplished.

In the effort to understand the barriers to creative development in teaching, teachers' beliefs about and affect toward creativity have been identified as key barriers to target (Bereczki & Kárpáti, 2018). Teachers hold implicit beliefs about creativity that can be misguided or conflicted (Gralewski & Karwowski, 2016). Without a research-based understanding, subjective and cultural myths about creativity will be counterproductive and drive teachers' away from their own creative development and the integration of creativity in the classroom. This study begins to address this gap between research and practice by studying the professional development of the creative teacher.

1. Developing teacher creativity

When asked about creativity, teachers often hold conflicting beliefs which can be a deterrent to teaching creativity in the classroom (Bereczki & Kárpáti, 2018; Katz-Buonincontro, Perignat, & Hass, 2020). Therefore, addressing conflicted teacher beliefs about creativity may lead to more consistent and effective teaching in the classroom. Creativity can be personally meaningful at what is called the *mini-c* "creativity" level, and once mini-c creativity is established, creativity can grow to have lasting influence at the *Big-C* level of culture and society (Kaufman & Beghetto, 2009). In addition to novelty, creativity often includes effective, meaningful, and, often, surprising ideas or solutions (Plucker, Beghetto, & Dow, 2004).

Teachers may recognize the societal value of creativity (Rubenstein, McCoach, & Siegle, 2013); yet, observational research indicates creative learning opportunities remain rare in practice (Katz-Buonincontro and Anderson, 2018). For instance, teachers tend to have little tolerance for creative characteristics in students, such as nonconformity (Lee & Seo, 2006) and may consider, inaccurately, students' academic prowess as a sign of being creative (Gralewski & Karwowski, 2012). This confusion about creativity results, in part, from a general lack of pre-service preparatory and in-service training opportunities to learn about creativity and how it relates to teaching and learning (Bereczki & Kárpáti, 2018). These kinds of training opportunities appear to be idiosyncratic and localized rather than widespread (Orr & Kukner, 2015; White, 2006).

1.1. Starting with teachers' beliefs about creativity

Teachers' beliefs about creativity can be either a powerful catalyst or barrier to the growth of the creative teacher and their classroom practice; as such, they are an important focus of teacher training. Bereczki and Kárpáti (2018) suggest beliefs are an individuals' representation of reality and what is held to be true or false, regardless of the support for that representation; beliefs "… guide our goals, emotions, decisions, actions, and reactions" (p. 27). In their review Bereczki and Kárpáti (2018) provide several key takeaways. First, teachers tend to hold more democratic and inclusive views about creativity; yet, contextual factors can lead to opposing beliefs. Second, even when teachers hold adaptive beliefs about creativity, their classroom practices may be incongruent due to insufficient knowledge and skills, job-related stress, anxiety about creativity, or other related factors. Third, teachers' understanding and confidence to enact new practices may still be forming and not yet actionable. Table 1 illustrates the system of beliefs underlying teachers' creative agency influencing teacher practice for creativity. This study explores how this system of beliefs functions and changes for teachers through targeted professional development experiences.

As Kettler et al. (2018) pointed out, decades of research suggest teachers often manage classrooms with a focus on conformity in thinking and behavior, hold negative attitudes toward unconventionality, and discourage risk-taking. If students become risk-adverse, they do not learn how to take sensible risks (Kaufman & Beghetto, 2013). When creative openings inevitably occur in the classroom due to an obscure comment by a student or arriving to a topic for which the teacher has no background, teachers can model risk-taking by letting the classroom explore those possibilities. To become equipped to model risk-taking can be supported by helping teachers understand and accept the benefits of "unplanning" their instruction (Beghetto, 2019). When teachers integrate the creative process through regular classroom routines, they relinquish some power over classroom discourse and enhance students' creative learning (Jónsdóttir, 2017).

1.2. Teaching for creativity

The integration of creativity into the classroom is multi-faceted and complex (Jeffrey & Craft, 2004). The relationship between creativity, teaching, and learning can be broken into a three-part framework: teaching for creativity, teaching creatively, and creative learning. Each part contributes to the system of beliefs and classroom practices of a creative teacher (Lin, 2011). Teaching for creativity promotes a learning environment that encourages students' creativity and sense of agency to be creative when opportunities arise. For instance, a math teacher can ask students to embody abstract mathematical procedures, such as division, with gestures (Alibali & Nathan, 2012). Teaching for creativity is giving up control, facilitating new connections, and setting conditions for all students to engage in the open-ended creative process.

1.3. Creative teaching

Teaching creatively is the capacity to be imaginative, willing to take risks, reflective, and open in how they teach. Teachers must embrace the performativity of teaching with a sense of competence, curiosity to respond to students' interests and ideas, and openness to take risks to develop their creative potential (Orr & Kukner, 2015; White, 2006). As in other creative endeavors, being creative in teaching means facing the uncertainty of how things will turn out and the anxiety that often follows those states of uncertainty (Daker, Cortes, Lyons, & Green, 2019). Tolerating the ambiguity of open-ended questions and divergent paths of students' thinking will likely help teachers resist the need for closure and control (Kruglanski, Atash, De Grada, Mannetti, & Pierro, 2013).

1.4. Creative learning and arts integration

Fundamentally, the design of creative learning must promote opportunities for students to make and share new meaning about what they learn (Beghetto, 2016). A relevant example that illustrates how these processes relate is the interdisciplinary integration of the arts into other content and instruction. Arts integration provides a meaningful way for teachers to insert the creative process and structured uncertainty into any classroom subject area or skill through a variety of modalities—movement, dramatic enactment, 2D and 3D visual representation, rhythm, and sound, among others. Arts integration can be thought of as a learning process that meets the evolving objectives of both an artistic discipline and non-arts content area using interdisciplinary practices (Burnaford, Brown, Doherty, & McLaughlin, 2007). For instance, science teachers can integrate process drama techniques, such as *tableaux vivants,* to allow students to embody and enact different abstract scientific processes, collaboratively (Anderson & Beard, 2018). That kind of social, creative, and open-ended process can deepen student engagement and memory retention (Hardiman, Rinne, &

Table 1
Teachers' creative agency: The underlying system of beliefs and resulting classroom practice for creativity.

Beliefs and Understanding About Creativity	Classroom Practice for Creativity
1 Holding a growth mindset about creative potential in both self and students	Praising and emphasizing effort and process (e.g., multiple drafts) rather than talent and final product
2 Creative self-efficacy in teaching	Willingness to take creative risks and try out new exercises and approaches in teaching
3 Valuing creativity for students in school and acknowledging the importance of non-conformity	Encouraging all students to participate and share ideas and work, reinforcing that unique interpretations and approaches can expand possibilities for all
4 Tolerance for ambiguity when facing uncertainty in the classroom	When creative openings emerge (e.g., unexpected student questions), teachers let the class explore possibilities, resisting premature closure
5 Understanding that the creative process will look differently for each student and that students need autonomy	Allowing students autonomy to make decisions about their creative learning process and set conditions that are motivationally supportive
6 Empathy for students' vulnerability of creative expression	Modeling risk-taking for students and emotional regulation to make the emotional experience explicit
7 Self-efficacy and valuing for integrating the artistic process into learning	Integrating creative and artistic routines and resources into instruction and curriculum, regularly
8 Understanding that uncertainty must be structured into the learning process to foster creative learning	Teachers engage in lesson "unplanning" to make sure there are scaffolded opportunities that require students to face ambiguity, make their own interpretations, and follow their own learning path

Yarmolinskaya, 2014). With visual arts integration, a math teacher could engage students in woven artworks, asking them to plot and transform certain shapes on the coordinate grid made in their crafted loom (see link for more details: http://www.artcorelearning.org/modules-math-coordinategrid). Quality arts integration exemplifies the idea of *lesson unplanning* to create opportunities for *structured uncertainty* and learner autonomy (Beghetto, 2019), and challenges teachers to step into the discomfort of working with media and modalities that may be new to them. Those moments of structured uncertainty and risk-taking are key for creative teaching and learning—where it is not clear what the next step or best approach may be. The professional development approach described in this study introduces both fundamentals about creativity and the role that basic artistic practices can take to integrate creativity into teaching and learning, seamlessly.

2. Developing the agency to be a creative teacher

Suggesting teacher beliefs are foundational to adopting new techniques, Guskey (2002) proposed that once teachers observe a positive change in student learning, a shift in teachers' beliefs and attitudes will be more lasting and lead to actual shifts in practice. From that perspective, shifting beliefs and attitudes toward creativity requires new knowledge, firsthand experience, and basic, practical ways to implement in the classroom. We situate this progression within a social cognitive theory perspective (Bandura, 1986, 2018), where self-beliefs and values underly the human drive toward agency, and these self-beliefs and values about creativity are key to transforming creative potential to creative action (Karwowski & Beghetto, 2018). There is currently a paucity of resources to design effective PD for the creative teacher and a lack of empirical evidence that teachers' agency about creativity can change (Kettler et al., 2018).

2.1. Present study

The present study aims to address the gap in research-based professional development for teacher creativity by analyzing and describing the teacher experience of a blended in-service PD approach to develop teachers' creativity and related arts integrated instructional routines. The theory of change illustrated in Fig. 1 reflects some the core features of the model of creative behavior as agentic action proposed by Karwowski and Beghetto (2018), suggesting that beliefs, values, affect, and metacognition toward

creativity—the creative teachers' sense of agency—is key to transforming potential into action. Based on this theory and the research reviewed, teachers' effective integration of creativity in the classroom likely hinges on a set of core beliefs, values, and affect, measured in this study: (a) growth creative mindsets; (b) creative self-efficacy; (c) valuing of creativity for students; (d) experience of creative anxiety; (e) need for closure when facing ambiguity; and (f) perceptions of efficacy of arts integration.

This study emerged from early stages of a 4-year project funded by the U.S. Department of Education to develop a blended PD model for creative engagement in arts integration designed to reach and support rural and remote U.S. teachers. Teachers engaged in an online, fully self-directed and self-paced 14-h Foundation Course for Creative Engagement and an experiential, in-person 2-day Summer Institute. This sequence provided research-based ideas, personal reflection opportunities, and in-person collaborative experience with creative strategies inside and outside the arts (see course syllabus in the Appendix). When teachers had completed course material, they (a) reflected thoroughly on their own creative resources, (b) understood conditions for creative engagement, (c) practiced creative routines themselves, (d) understood how process-focused arts integrated curriculum can be an effective route toward creative teaching and learning, and (e) understood the role that metaphor and reflection play in creative learning and meaning-making.

We expected increased creative self-efficacy in teaching, desirability for creativity in teaching, growth mindset for creative development, value of creativity for students, and positive perceptions of arts integration for creative learning across content areas. We expected teachers' creative anxiety, fixed mindsets about creativity, and need for closure in ambiguity in teaching would decrease. As a result of those changes, we expected teachers to experiment with creative techniques in the classroom during the months following the training. This study used an explanatory sequential mixed method design and three research questions:

1. Based on analysis of pre- and post-survey data (Phase 1 quantitative), to what extent did teachers' beliefs and affect related to creativity and arts integration improve?
2. Based on analysis of teacher focus group data (Phase 2 qualitative), how do teachers describe what they learned in the PD experience in the areas of creativity and arts integration and how they used what they learned in their classrooms?

Fig. 1. Hypothesized changes in teacher beliefs, affect, perceptions, and practices for creative teaching and learning.

3. Based on the mixed method sequential analysis (Phase 3), how do the Phase 2 focus group results compare to and extend the Phase 1 survey results?

3. Method

Given the study's goal to understand how teacher beliefs about teaching for creativity changed after the PD experience, the study applied an explanatory sequential mixed method design (Creswell & Plano-Clark, 2018). Our team used a pragmatic approach to inquiry that emphasizes practical aspects of research by bridging quantitative and qualitative methods (Morgan, 2014). This approach conjoins epistemological standpoints across post-positivist/constructivist (qualitative) and positivist (quantitative) research methods.

In Phase 1, we designed and administered a quantitative survey to examine within-subject change of teachers' beliefs and affect regarding creative potential, creative teaching and learning, and arts integration for creative engagement. We used a pre- and post-assessment quasi-experimental design without a comparison group (Cook, Campbell, & Shadish, 2002). In Phase 2, we gathered teacher reflections and descriptions in focus groups to unpack their PD experience, beliefs about creativity, and actual implementation of teaching for creativity in the 3−4 months since their training when they took the survey. Given the lack of a comparison group for Phase 1 quantitative analyses, Phase 2 focus group data identified convergence or divergence from Phase 1 data to extend understanding of results (Morgan, 2014).

3.1. Sample

The sample of participating teachers voluntarily enrolled in the blended arts integration PD, based on the collaboration between their district and other organizations partnering in the federal grant. Participating teachers hailed from four Pacific Northwest schools in rural regions that ranged in size and extent of rurality according to categorization of the National Center for Education Statistics. In total, there were $N = 30$ teachers who completed the Foundation Course and Summer Institute and both pre- and post-surveys. Two teachers were not available for the follow-up focus groups, resulting in a sample of $n = 28$ teachers for the qualitative phase of this mixed method study. Demographic characteristics and professional experience data were not gathered from teachers. Based on general observations, teachers varied in years teaching,

subject area, and grade level. More than two-thirds of the teachers identified as female, and the majority of teachers were white. Table 2 provides more details.

3.2. Procedures

3.2.1. Teacher professional development

The online Foundation Course for Creative Engagement and the in-person Summer Institute provided teachers a sound, research-based understanding of creativity in teaching and learning through reflective, experiential, and arts integrated instruction and application. Participating teachers consented to participate in all research activities and agreed to complete the online course material and attend the summer institute before receiving payment.

Online Learning Materials. The online Foundation Course (a sample page is depicted in Fig. 2) was made up of six modules with 2−4 lessons per module. Each module was about 2−3 h in length and included interactive instructional packages with video, narrated slideshows, pop-up interactives, creative exercises, reflective processes, and brief creative assignments. All content was designed, written, and narrated by authors of this study with expertise in online instructional design, creativity in education, and arts integration. Teachers logged into the online platform and completed brief surveys prior to starting the course. Project partners sent each participant a sketch journal and a small pack of *metaphor cards* (i.e., small cards with clip art images of common objects and scenes) to use in the course when prompted. Table 3 describes the focus of the modules and lessons; teachers were required to complete each module in order to proceed to the next. The course was designed to support teachers with useful research, mental models, language, examples, and routines for exploring the creative process in teaching and learning. For instance, teachers explored their own personal creative resources (Anderson, 2020)—creative beliefs and attitudes, creative thinking, and creative behaviors. They responded to the question—How Am I creative?—by creating a metaphorical *creative avatar* collage in their journal (see the Appendix for examples). They photographed their work, uploaded it to the course, and shared it with colleagues and facilitators. In this way, the course presented general, research-based ideas about creativity using basic, accessible arts integrated techniques to aide teacher sense-making and personal reflection.

The course content summarized the state of research in education, motivation, creativity, and the arts. Throughout the course, participants were asked to experiment with key concepts and

Table 2
Description of participating schools and teachers.

School	Grades	Rurality	5−17-Year-olds Living in Poverty[a]	# of Focus Group Participants	Participating Teacher Gender
School A	9−12	Town: Fringe	30.7%	10	Female: 6; Male: 4
School B	6−8	Town: Fringe	30.7%	8	Female: 6; Male: 2
School C	K-8	Rural: Remote	23.9%	6	Female: 5; Male: 1
School D	K-12	Rural: Distant	28.0%	4	Female: 4; Male: 0

Note. The categories and codes for rurality and remoteness are derived from the National Center for Education Statistics, retrieved from https://nces.ed.gov/ccd/districtsearch/.
 [a] The percentage of children aged 5−17 living in poverty within each LEA service area is derived from the US census data and retrieved from https://www.census.gov/data-tools/demo/saipe/saipe.html.
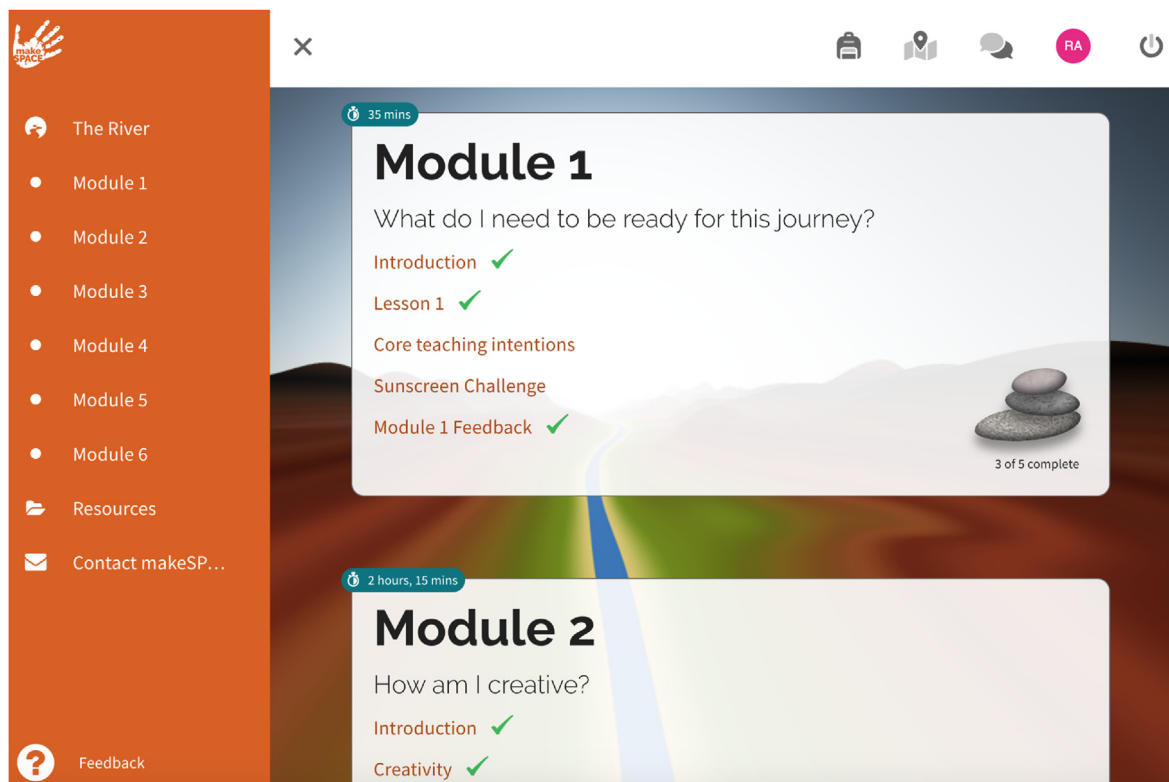
Fig. 2. Landing page for online professional development courses in creativity and arts integration.

Table 3
Module scope and sequence for foundation course.

Module 1: Welcome & Orientation	Lesson 1.1: Overview of Foundation Course and online platform
	Lesson 1.2: Pre-program reflection, challenge, and survey
Module 2: What is creativity? How am I creative?	Lesson 2.1: Introduction to personal creative resources, process, and potential
	Lesson 2.2: Stories of creative risk-taking and growth with arts integration in the classroom
	Lesson 2.3: Reflecting on the development of personal creative resources
Module 3: How do I make space for creativity?	Lesson 3.1: Introduction to conditions for creative engagement
	Lesson 3.2: Small steps: Creative routines in the classroom to habituate creative engagement
Module 4: What is arts integration? Why does it work for students?	Lesson 4.1: Intro to artistic processes and practices
	Lesson 4.2: The *trans*-disciplinary creative process of diverse artists in the world
	Lesson 4.3: Breaking down the design and purpose of quality arts integration
Module 5: How do I begin to integrate creative and artistic process into my classroom?	Lesson 5.1: Revisit routines for creative engagement
	Lesson 5.2: Intro to 3 Core Arts Integration Strategies
	Lesson 5.3: Cross-cutting practices in arts integration — metaphorical thinking and reflection
	Lesson 5.4: Intro to metaphor in learning — embodied and linguistic meaning-making
	Lesson 5.5: Intro to reflective practices — making learning personal, meaningful, & enduring
Module 6: What's next?	Lesson 6.1: Identify and commit to opportunities for creative engagement in your classroom
	Lesson 6.2: The 2019 Summer Institute and your Foundation Course micro-credential

practices, such as structured uncertainty, metaphorical thinking, divergent idea production, and active reflection using introductory visual arts techniques, such as collage. Teachers experienced the Foundation Course as if it were a river journey, modeling how metaphors can be a gateway into creative thinking and meaning-making. For instance, after beginning their "river journey" teachers were prompted with a typical scenario—they had forgotten sunscreen at home. They would need to come up with solutions for how to protect themselves from the hot sun overhead. Teachers engaged with different types of general creative thinking and were asked to consider how they could integrate those exercises into their grade level and content area (see Appendix for sample routines). Participants were encouraged to think of divergent and unusual ideas. Throughout the course, teachers were asked to reflect on their process and the emotions they experienced using different artistic modalities, as well (e.g., writing, sculptural, and gestural). Teachers were able to download protocol to integrate the creative and reflective routines into their classroom and content.

In-Person Summer Institute. The 2-day Summer Institute was hosted just before teachers returned to school. The experience provided hands-on, collaborative, and carefully facilitated experiences with creative routines, active reflection, and arts integration

strategies and learning experiences in music, media arts, theater, and the visual arts. Four of the authors facilitated the summer institute experience. Teachers received protocol to adapt to their classroom context. The Summer Institute reinforced an open attitude for risk-taking and shared creative experiences. Practicing simple creative and artistic routines with facilitated support prepared teachers to bring these routines back to their classrooms. Additional courses were under development at the time to cultivate instructional skill to design and implement more intensive arts integrated strategies for creative engagement across content areas. Teachers started the Foundation Course before attending the Summer Institute. Several teachers finished the course prior to attending the summer institute and most finished afterwards.

3.2.2. Teacher survey protocol

The teacher survey was completed during initially logging onto the online platform and after completing the course. Teachers were asked to complete the survey by choosing one response to each question using a six-part Likert scale (i.e., 1 = Strongly disagree, 2 = Disagree, 3 = Slightly disagree, 4 = Slightly agree, 5 = Agree, 6 = Strongly agree). Teachers were provided with the following definition of creativity so that there was more consistency in how teachers would interpret the questions before and after completing the training: *While there are several ideas about the definition of creativity, creativity generally is the ability to derive novel, high-quality, and relevant ideas, products, or services. Before responding to the following questions, please think about your teaching practice and reflect on what creativity means to you and your students.* Survey items were mixed across constructs to avoid common response biases (Anderson, Thier, & Pitts, 2017). All survey items are included in the Appendix.

3.2.3. Focus group protocol

We conducted eight 90-min focus group sessions with 2−4 teachers per group across six weeks during the winter of 2019−2020—four months after the PD experience. Following the positivist orientation of the quantitative survey data collection phase, the philosophical orientation of the focus groups was constructivist, aimed at eliciting socially constructed thoughts, beliefs and experiences of the teachers (Creswell & Plano-Clark, 2018).

Some focus group questions were developed from survey results to understand changes detected. We asked teachers about their experience during and after the training, regarding (a) shifts in beliefs and affect, (b) creative engagement since completing the PD, and (c) experience in early implementation (see Appendix). The questions were asked in a systematic order consistent with best practices used in conducting focus groups, allowing each study participant to expand upon their blended PD experience (Berg, 2004).

Each focus group was scheduled as a face-to-face meeting at the teachers' schools at the end of the school day. To warm-up and develop rapport, facilitators brought an interesting object to the session and asked the group to pass the object around and come up with a story, individually, about what the object could be. The facilitator participated and encouraged participants to have fun with the task. Audio-recordings of the focus groups were transcribed and coded, and coded data were analyzed by themes.

3.3. Survey measures

Most of the quantitative scales used in this study demonstrated substantial reliability and discriminant and convergent validity in a recently published study with a similar sample (Anderson, Bousselot, Katz-Buonincontro, & Todd, 2021). From a social

cognitive theory perspective (Bandura, 1986), teachers' desire of creativity for teaching and value of creativity for students relates to their agency and action in the classroom. Three items from an extant instrument were used to assess teachers' desirability of creativity for teaching (e.g., *being creative will help me be a successful teacher*) and four items from an extant instrument were used to assess teachers' value of creativity for students (e.g., *students' creative potential can enhance their learning;* Hass, Katz-Buonincontro, & Reiter-Palmon, 2016). Additionally, social cognitive theory suggests that teachers' creative self-efficacy in teaching (e.g., *I feel that I am good at coming up with novel ideas for* teaching) and self-efficacy for teaching with arts integration (e.g., *I feel prepared to design arts integration into my classroom teaching on my own*) should play a role; we used extant measures from past research (Anderson & Pitts, 2017).

Creative mindsets. Following research on self-theory about ability, creative mindsets have become a focus of interest to the creativity field as a key set of epistemic beliefs about how creative potential develops (Anonymous 2020b; Karwowski, 2014). We used an extant instrument and made improvements on items to ensure greater reliability and alignment to mindset theory (Hass et al., 2016). Four subconstructs were measured with four items each: (a) General-theory fixed creative mindset thinking about students (e.g., *Students either are creative or not–trying hard makes no difference*); (b) General-theory growth creative mindset (e.g., *Effort and work are more important than raw talent when it comes to creativity*); (c) Self-theory fixed creative mindset (e.g., *I have a certain amount of creative potential, and I can't really do much to change it*); and (d) Self-theory growth creative mindset (e.g., *As a teacher, I can always increase my creative potential through learning and practice*). Additionally, two important affective barriers to teacher development for creative teaching and learning are *creative anxiety* and a high *need for closure* when faced with ambiguity in teaching. Need for closure was measured using three items (e.g., *When teaching, I don't like situations that are uncertain*) from the Need for Closure Scale adapted to the teaching context (Kruglanski et al., 2013). Creative anxiety was measured with four items from the Creative Anxiety Scale using a 1-to-5 scale with 1 = Not at all and 5 = Very much (Daker et al., 2019). Perceptions of the *efficacy of arts integration* to affect student behavioral, cognitive, and affective engagement positively, used an extant 14-item scale from past research, with two contraindicative items (Anderson & Pitts, 2017).

3.4. Phase 1 quantitative data analysis

We used within-subjects analysis of variance with the factor of time (Pedhazur & Schmeklin, 1991) to test our hypotheses that teachers' beliefs, perceptions, and affect toward creative potential and creative teaching and learning would change as a result of the PD experience. Our study was limited by not having a comparison group; as such, effect sizes would be an important indicator of the robustness of changes detected. We included the within-subject effect size Cohen's d for each statistically significant change detected, where $d = 0.20$ is small, $d = 0.50$ is medium, and $d = 0.80$ is large (Cohen, 1992). We report statistics and Cronbach's alpha internal consistency in Table 4.

3.5. Phase 2 qualitative data analysis

An integrative mixed method data analysis approach, based on Caracelli and Greene (1993), was used. In this approach, one data type generates a set of categories, which become a framework for analyzing the second type of data. We analyzed the survey results first, which generated a list of categories: (a) Fixed and Growth Creative Mindsets, (b) Improved Creative Self-efficacy in Teaching,

Table 4
Results of within-teacher ANOVA for perceptions, beliefs, and affect related to creative teaching and learning.

Teacher Perceptions	Period	∝	Mean (SD)	*p*-value	Cohen's *d*
Creative self-efficacy in teaching	Pretest	.88	4.50 (0.76)	.014	0.38
	Posttest	.84	4.77 (0.64)*		
Desirability for creativity for teaching	Pretest	.97	5.63 (0.66)	.358	0.20
	Posttest	.91	5.74 (0.41)		
Fixed creative mindset about students	Pretest	.80	4.69 (1.43)	.000	1.81
	Posttest	.98	1.85 (1.69)*		
Growth creative mindset about students	Pretest	.84	5.30 (0.74)	.091	0.43
	Posttest	.74	5.58 (0.55)		
Fixed creative mindset about self (teachers)	Pretest	.90	4.15 (1.71)	.000	1.28
	Posttest	.95	2.03 (1.61)*		
Growth creative mindset about self (teachers)	Pretest	.99	5.51 (0.76)	.143	0.35
	Posttest	.95	5.73 (0.45)		
Value of creativity for students	Pretest	.81	5.17 (0.70)	.001	0.59
	Posttest	.85	5.54 (0.54)*		
Self-efficacy for teaching arts integration	Pretest	.80	4.18 (1.11)	.311	0.23
	Posttest	.88	4.40 (0.89)		
Need for closure in ambiguity in teaching	Pretest	.76	3.06 (0.94)	.487	0.12
	Posttest	.72	2.94 (0.86)		
Creative anxiety	Pretest	.84	3.18 (1.02)	.008	0.87
	Posttest	.93	2.33 (0.94)*		
Perceived efficacy of arts integration	Pretest	.90	4.71 (0.65)	.000	1.01
	Posttest	.89	5.31 (0.53)*		

Note. *Denotes statistically significant difference between pretest and posttest at *p* < .05 or lower. ∝ denotes the Cronbach's alpha internal consistency and reliability across survey items in each factor.

(c) Reduction in Creative Anxiety, and (d) Integrating Creativity into Classroom Practices. We used those categories to code the focus group transcriptions, connecting the quantitative data to the qualitative data (Caracelli & Greene, 1993; Rossman & Wilson, 1985).

After establishing the coding categories, the focus group transcriptions were uploaded into Dedoose qualitative software. Two authors reviewed, segmented, and coded the text as a team. They chose to discuss and review the focus group transcriptions in team meetings to establish accuracy and validity of codes prior to one researcher doing an initial coding (Miles, Huberman, & Saldaña, 2014). We chose an alternative to inter-rater (Anderson, Guerreiro, & Smith, 2016), where one researcher conducted the first coding and initial analysis and the second researcher reviewed the data, coding, and analysis to enrich the analysis and clarify any points of confusion or contradiction between researchers. The researchers compiled the data within each focus group based on the four categories listed previously and analyzed those data across focus groups to identify consistent patterns, subthemes, agreements, and divergence within the sample as a whole. When claims surfaced about the teachers' perspectives and experience, we looked to corroborate, contrast, or expand that claim with additional evidence from other participants. We aimed to ensure the authenticity and heterogeneity of voices by representing the range of variation in teacher responses within each theme and chose to include quotations that represented consistent patterns, corroborations across multiple participants, as well as divergent or contrasting ideas (Merriam, 2009). A third researcher reviewed the analysis, requesting more rationale or clarification about patterns or selected quotations.

3.5.1. Mixed methods validity and reliability strategies

A common mixed methods validity strategy is to focus on the careful "development" of one set of results to develop another set of results (Greene, Caracelli, & Graham, 1989). In this study, we used the survey results to guide the coding of the focus group data (Onwuegbuzie, Bustamante, & Nelson, 2010). In addition, we employed the principle of thick description (Ryle, 1949) during the writing process. Each category used sufficient detail about

subthemes to provide context to enhance validity and the nature of transferability to another teaching context (Merriam, 2009). After forming claims and corroborating evidence, we identified links between categories that incorporated the quantitative findings from Phase 1. Passages of text that included confusing or ambiguous concepts were coded multiple times by both raters. An audit trail of this process was included to trace decisions and emerging interpretations.

4. Results

Generally, quantitative results indicated substantial changes at small, medium, large, and very large effect sizes across teacher beliefs, perceptions, and affect regarding creative teaching and learning and arts integration. Some factors hypothesized to change did not demonstrate change due to ceiling effects at pre-training, in some cases. Qualitative results illustrated teacher reflections about how and why shifts occurred and provided additional evidence that changes in beliefs, perceptions, and affect were a result of the PD and led to experimentation in practice. Though teachers' growth creative mindset about their students improved slightly, their fixed creative mindsets about themselves and their students decreased, substantially. Teachers' perceived value of creativity for students, self-efficacy for creative teaching, and benefits of creative learning in arts integration improved, substantially. Creative anxiety of teachers decreased, but their need for closure when facing ambiguity in teaching did not. Results support the general malleability of these foundational beliefs and emphasized the importance of shifting these beliefs to initiate change in classroom practice.

4.1. Phase 1 quantitative results

Table 4 details all quantitative results including Cronbach's alpha reliability for each factor, which shows that reliability was good at ∝ > 0.80 for all factors except Need for Closure which was adequate at ∝ > 0.70. In response to Research Question 1 about change in teachers' beliefs, we found that most pre- and post-survey analyses supported our theory of change. We report the *p*-value of statistical significance, using a *p* < .05 threshold, and

Cohen's *d* effect size to interpret the results. As Table 4 illustrates, we found that teachers' creative self-efficacy in teaching increased at a small-to-medium Cohen's *d* effect size, $F(1, 29) = 6.77$, $p < .05$, $d = 0.38$. Pre-training levels of desirability for creativity for teaching were high, and a positive small effect was not statistically significant $F(1, 29) = 0.87$, $p > .05$. Teachers' growth creative mindsets were already high. A positive small-to-medium effect size, $d = 0.35$, about their own growth potential $F(1, 29) = 2.27$, $p > .05$ and about their students growth potential $F(1, 29) = 3.05$, $p < .05$, $d = 0.43$, was not statistically significant. Teachers demonstrated a drastic reduction in their fixed creative mindset about themselves at a very large effect size, $F(1, 29) = 25.21$, $p < .05$, $d = 1.28$ and a very large effect size decrease in fixed creative mindset regarding their students' creative potential, $F(1, 29) = 56.01$, $p < .05$, $d = 1.81$. Already high at pre-training, teachers' perceived value of creativity for students still improved at a medium-to-large effect size, $F(1, 29) = 12.59$, $p < .05$, $d = 0.59$.

Teachers' self-efficacy for teaching arts integration, specifically, remained at moderate levels with a statistically non-significant positive small effect, $F(1, 29) = 1.06$, $p > .05$. Teachers' tolerance for ambiguity also remained neutral, $F(1, 29) = 0.50$, $p > .05$ with a statistically non-significant positive small effect. Teachers' creative anxiety decreased substantially at a large effect size, $F(1, 29) = 8.25$, $p < .01$, $d = 0.87$. Teachers' positive perceptions of arts integration for affective, behavioral, and cognitive student engagement increased at a large-to-very large effect, $F(1, 29) = 8.09$, $p < .01$, $d = 1.01$.

4.2. Phase 2 qualitative focus group results

In response to Research Question 2 regarding teachers' beliefs and implementation four months after the training, we analyzed focus group data targeting creative anxiety, creative mindsets, creative self-efficacy, and experimentation of new techniques in the classroom. Follow-up data supported Phase 1 findings, shedding light on the mechanisms of change in teacher beliefs and affect.

4.3. Reduction in creative anxiety

Teachers discussed ways their anxiety about being creative in their own learning and in their classroom teaching was reduced. Creative anxiety resulted from a pressure to perform as a creative teacher and perceived expectations for perfection. Being creative felt like a big risk and produced discomfort, and teachers were concerned about being judged as not creative. The online PD experience helped relieve this discomfort. One teacher commented that the shared experience of the course "may have opened our eyes and relaxed our thinking about students' potential." Teachers talked about how they had become more comfortable taking risks as a result of the manageable risks they took in the online course and summer institute. Some teachers also grew more comfortable acknowledging variations in students' "uniqueness" and creativity. Teachers described creativity as a part of their professional identity, revealing creative potential as a marker of growth and success. Prior to the blended PD experience, the idea of needing to be "perfect" clearly played a role in teachers' creative anxiety. After the course, teachers realized, "it's okay to not be perfect," and their creative potential develops with taking risks and learning.

The pressure to be fully developed as a creative person by a certain point in life was emphasized by several teachers. For instance, one teacher shared

> You read… all the mathematicians do their best work before the age of like 27 or something and so… I had this kind of… fear of

getting older and… having a fixed creativity and then you read about that stuff and you're like, "Okay, I have a fixed creativity and it's steadily going downward." Like, I must've peaked at like 24…

Another teacher came to realize that creativity was not just a given talent. The nature versus nurture question of creative potential was palpable in teacher discussions. For instance, one teacher shared, there is "this myth that creativity is like this sort of special gift that some people have, and doing the course actually was sort of like learning: 'Oh, this is what creativity is. Oh, okay. It's accessible to everyone'…"

The reduced creative anxiety reported by teachers seemed to be related to being less intimidated by engaging in simple artistic processes prompted by the blended PD experience. For example, one teacher exclaimed that at the beginning of the course "… I was scared and I was like, 'Okay, I need help.'" Once that teacher persisted through the course, projects became less daunting and less difficult. Teachers planned out ways to start with small ideas in their classroom. The transformation from perceiving creativity as solely a product and natural gift to understanding the accessibility of the creative process reduced teachers' creative anxiety. By helping to stimulate, acknowledge, and manage teachers' creative anxiety, the blended PD experience also generated more empathy in teachers for their students' experience taking risks, trying something new, and sharing ideas with others. As another teacher put it, "I didn't like the struggling part. I really hated it, actually, but then recognizing that I could struggle and resolve it and be happy with the results was surprising for me. I'm not used to struggling." That experience paved the way for important modeling in the classroom.

4.3.1. Challenging a fixed creative mindset

Development of a growth creative mindset surfaced in the focus groups. Many participants started the online PD experience with the idea that creativity was inborn, or fixed. For example, one teacher remarked, "… you can get better but only to a certain point. It's like you can get taller but only to your genetic potential, maybe." Some teachers discussed how they drew inspiration from their students to transform their mindset from fixed to growth. As teachers completed the training, they changed their thinking to adopt a mindset about creativity rooted firmly in the potential for malleable growth with practice and risk-taking. One teacher said:

> Creativity is not something that you're born with, it's something that you kind of develop, which was like a different way of thinking of it… I had always kind of thought as like there's people who have like talent and creativity and some people who don't…

This transition from fixed to growth creative mindset came with a feeling of "optimism" and "excitement," indicating a newfound interest in promoting creativity in students. Participants described their insight that creativity is naturally part of learning, even in highly analytical content areas, such as mathematics. In addition to recognizing the shift in one's own mindset (self-theory), participants also recognized this shift in each other, too (general theory). As one participant shared, teachers admitted skepticism about this shift:

> I did believe that creative growth was possible, but it was like I maybe believed that it was a much more difficult thing to achieve. And going through some of those practices made it seem like there was something… that I could do.

This point highlights one reason why before the training teachers held high levels of growth and fixed creative mindsets, simultaneously in contradiction. Participants compared the emphasis on growth mindsets about intelligence, elsewhere in the education field, to growth mindsets about creativity. Their schools' focus on growth mindsets prepared them to be open-minded about student creative potential and aware of the contrast between a fixed and growth mindset.

4.3.2. Increased creative self-efficacy

Participants described the increase in creative self-efficacy as learning new creative activities they could do in the classroom, growing more comfortable with their own creative potential, and a willingness to try out new arts integration and creative thinking activities. For example, one participant stated:

> Well, I wasn't that great of a drawer in class, but I tried, and I tried with my group and my group supported me, maybe I could try with my kids, even though I know I suck and just give it a whirl and maybe they'll help me make it better.

Modeling small artistic exercises was an important aspect of the online PD experience and Summer Institute. The *Selfie* drawing routine, sculpture activity, and various movement and theater activities were mentioned by participants as especially valuable. As most teachers did not see themselves as artists, these activities served as an important gateway into their own creative and artistic process. Teachers let go of the idea that they needed to be a professional artist in order to integrate creative and artistic processes into their teaching. Some participants realized they had been trying to incorporate creativity in teaching already. One teacher shared, "I feel like what I teach is creativity. I teach creativity all day long, but a lot of what I was doing was just telling kids to be creative …" Developing a deeper understanding of the creative process helped develop confidence and skill to teach for creativity more effectively. Making mistakes was a topic that several participants mentioned related to their self-efficacy, demonstrating the psychological adjustment to grant oneself permission to fail.

4.3.3. Integrating teaching for creativity in the classroom

In the focus groups, teachers reported an increase in teaching for creativity in their classroom curriculum. These increases manifested in three distinct shifts mentioned throughout the focus group data: (a) introducing new activities into the curriculum, (b) new understandings of creativity within existing curriculum, and (c) openness to creative risk-taking by teachers and their students. Several participants reported more than one of these shifts within their curriculum.

Teachers identified specific activities from the training they incorporated into curriculum. For instance, one teacher shared, "I did the clay civilization activity and I thought it would just be one day … I think we spent four or five days on it." Examples of activities and routines incorporated into the curriculum from the training included sculpture, drawing, making selfies, cartoons, gestural and theater exercises, and the "many uses game" creative thinking routine, among others. Inspired by their training, some participants invented new activities. For instance, one teacher shared

> In my U.S. history class, we really slowed things down around Japanese internment … We used artwork and all this different kind of materials to build a museum exhibit about Japanese internment.

Adding new creative learning activities was common across focus groups. "I did sculpture, I'd never done sculpture before." Participants also made general statements about incorporating creativity into their curriculum in new ways. For instance, one teacher shared, "[Last year] I feel like I was so focused on getting the kids ready (for) testing … this year I was like … we need to have those moments and those times where we are doing art and being creative." Focus group data illustrated evidence of creative growth within and outside of existing curriculum.

Teachers spoke about finding space for creative engagement in their curriculum and instruction. Teachers reflected an openness about creativity in their curriculum and related to how their students engaged with assignments. For instance, one teacher shared,

> I think for me, it was the realization that I wasn't really being asked to add on all these art projects that I didn't have time to do … (it) was more about thinking creatively and also coming to the realization that (its) a lot of what I already do … so how can I just do a little bit more…

That participant shared the realization that opportunities for creativity had always been present in her curriculum, she only needed to make adjustments to engage students more creatively. These excerpts show how participants taught for creativity in ways that broke free from traditional myths and assumptions about creativity (e.g., only the arts are creative). Another participant explained this point, sharing, "I came into this [PD experience] feeling it was going to be more of a visual arts thing, but … I feel it's been more open-ended, some creative thinking, but just eliciting student interaction and student voice." Initiating open-ended creative learning within their current curriculum related to teachers' recognition of taking creative risks.

Creative risk-taking, inside and outside curriculum, emerged as a sub-theme. Coded excerpts indicated a change in how curriculum was presented, fostering more student opportunities for creative risk and uncertainty.
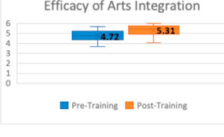
> I've noticed an effort to allow silence as part of that uncertainty … to not be afraid of those moments that are open-ended and kind of tense or awkward, and just let it happen and let students discover and say what they need to say and discover that moment.

Another teacher explained the growth of creative risk-taking within curriculum design as "I give myself permission to try different things and it's okay to take the time." Another teacher said, "I think for me, I've been trying to be more cognizant of helping students figure out things in a way that works for them." Excerpts suggest that the acceptance of more creative risk and uncertainty in teaching was a likely catalyst to greater integration of creative and artistic learning.

4.3.4. Phase 3 comparison of survey and focus group results

Table 5 illustrates connections across key findings in Phases 1 and 2. Qualitative findings supported and extended the quantitative results. Creative anxiety had been a real and present threat to teacher engagement in the creative process in their own professional learning and in their teaching. The blended PD experience reduced that anxiety for many. Prior to the PD, teachers had held both a fixed and growth creative mindset. Those beliefs appeared to stem from untested myths and assumptions that had been established by cultural and societal perceptions of creativity. Decreased fixed mindsets resulted from a deeper understanding about the

Table 5
Joint display of quantitative and qualitative results.

Quantitative Box Plots With Means	Qualitative Theme	Illustrative Quote	Mixed Methods Comparison
	Discomfort about peaking as a creative professional was eased and the sense of relief about pressure to teach for creativity alleviated.	*You read … all the mathematicians do their best work before the age of like 27 or something and so you have this, I had this … fear of getting older and like not being able to like having a fixed creativity and then you read about that stuff and you're like, "Okay, I have a fixed creativity and it's steadily going downward." Like I must've peaked at like 24 …*	Expansion: Understanding the importance of Big "C" eminent creativity as a professional orientation.
	Adopting a mindset about creativity rooted more firmly in the potential for malleable growth with practice and risk-taking.	*Creativity is not something that you're born with, it's something that you kind of develop, which was like a different way of thinking of it than I had previously thought of it. Because like I had always kind of thought as like there's people who have like talent and creativity and some people who don't have that talent.*	Explanation: Understanding the transformation of a fixed mindset to a growth mindset.
	Developing confidence and skill to teach for creativity.	*Well, I wasn't that great of a drawer in class, but I tried, and I tried with my group and my group supported me, maybe I could try with my kids, even though I know I suck and just give it a whirl and maybe they'll help me make it better.*	Explanation: Understanding teacher self-doubt about being creative and artistic can be a suppressor of motivation.
	Introducing new activities into the curriculum, new understandings of creativity within existing curriculum, and openness to creative risk-taking by teachers and their students.	*In my U.S. history class, we really slowed things down around Japanese internment … We used artwork and all this different kind of materials to build a museum exhibit about Japanese internment.*	Exemplification: Understanding examples of transforming regular curriculum into creative curriculum using arts integration.

concept of creativity, the role of creativity in learning, and the unique personal creative resources each person carries. Teachers expressed new creative self-efficacy in teaching through scaffolded practice in the blended PD experience. Decreased creative anxiety and fixed creative mindset and enhanced creative self-efficacy paved the way for classroom experimentation from three angles—trying out new techniques and curriculum, identifying new openings within existing curriculum, and developing an attitude for risk-taking as a teacher.

5. Discussion

The purpose of this explanatory sequential mixed methods study was to identify and describe how and why teachers experienced a shift in their system of beliefs, perceptions, and affect related to creativity in teaching and learning. Phase 1 quantitative results demonstrated positive effects on six factors for teachers and no statistically significant change on five other factors, though effect sizes for growth mindset were still small-to-medium. The follow-up Phase 2 focus group data explained the positive effects of teachers and extended understanding about teachers' early integration efforts. Teachers reported trying new techniques, identifying new opportunities for creative learning, and feeling more open to creative risks in teaching. Results provide some support for the theory of change behind the blended PD model for creativity and arts integration and suggest implications for research and practice that generalize outside of this study and approach.

5.1. Reshaping teachers' system of beliefs about creativity

In the online Foundation Course, teachers received a research-based description of creativity alongside a clear illustration about how the creative process relates to teaching, learning, and student motivation and engagement. Bereczki and Kárpáti (2018) found teachers' beliefs about creativity to be key to their actions and

choices in the classroom. Importantly, our results extend that literature to illustrate the malleability of these beliefs under the right conditions. A growth mindset about creativity actually generated excitement, enthusiasm, and optimism—creative growth felt like a new possibility. With more informed and adaptive beliefs and mindsets, teachers seemed to engage in the creative risk-taking required in both the online course and in-person institute. They seemed to gain a more strategic awareness about how the risks they took led to growth and new possibilities in their classroom. Their confidence seemed to grow and their perceptions about the value of creativity and arts integration to student learning, motivation, and engagement seemed to improve.

Those results support the social cognitive model proposed by Karwowski and Beghetto (2018) illustrating *creative behavior as agentic action,* and suggest that a model of creative agency for teachers may be an important direction for the field of teacher education. When teachers felt the agency for creative teaching and learning—self-efficacy, sense of control, intrinsic value, and metacognition (Anderson et al., 2021; Bandura, 2018)—they were ready to take risks for creative action in PD and then in the classroom. This sequence of change reflected Guskey's (2002) emphasis on how beliefs affect change in practice (or not) in the classroom. The promising findings align to extensive research on best practices for training across organizational types demonstrating that training should (a) promote a growth mindset to build self-efficacy and boost motivation, (b) provide opportunities to practice and experience mistakes, and (c) promote self-direction in the adult learner (Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012).

Though trending in the positive direction with small effect sizes, five of the measured factors in the theory of change did not demonstrate a statistically significant change. Teachers' desirability of creativity for teaching and growth creative mindsets of self and students were already high, which could be explained by their level of enthusiasm and interest as early adopters. Their need for closure in the face of ambiguity in teaching decreased slightly but not at a

statistically significant level. It is possible that because this factor appears to be generally stable for people, as opposed to anxiety, (Kruglanski et al., 2013), it may take more time, training, and practice to shift in a meaningful way. The small effect in teachers' self-efficacy for arts integration was likely the result of receiving only an introduction to arts integration.

5.1.1. Creative growth mindset for self and students

Results from this study emphasize that without deepening understanding through training, teachers often hold contradictory beliefs about how creative potential originates and develops. Additionally, beliefs about ones' own abilities may be different than beliefs about the abilities of others (De Castella & Byrne, 2015). In fact, the effect size decrease in fixed creative mindset was substantially higher for beliefs about students' ability compared to teachers' beliefs about their own ability. It is possible that teachers could see students, generally, as either holding creative potential or not, while believing that their own creative potential can grow. To become a creative teacher may require that teachers self-evaluate their beliefs about creative ability in order to identify the internalized barriers, myths, or biases they may carry, often unconsciously.

5.1.2. Implications for teacher practice

Outside of their professional work, teachers should engage in productive struggle as a learner, especially related to creative work, developing their ability to empathize with their students' experience and model emotional regulation. Teachers can reduce their creative anxiety by encouraging themselves and others to let go of ideas about perfection in their work, akin to developing a creativity mindset as Orr and Kukner (2015) describe. This process can begin by engaging in a commitment to doing "bad drafts," such as an initial drawing with their eyes closed. Teachers should reflect on their beliefs about the malleability versus fixedness of their creative potential and strengths, starting at the personal, "self-theory" level, then addressing beliefs about students. Teachers should start small and engage in simple, routine creative and artistic activities on their own or with colleagues, friends, or family, developing their confidence and insights to integrate the arts into their classroom. Teachers can also take time to observe and notice the seemingly small creative acts and ideas that students produce to begin recognizing the unique strengths each student carries. In this way, all teachers may begin developing their potential as a creative teacher. That journey begins by believing such growth is possible and the effort is valuable, then by making small steps with creative practice and teaching.

5.2. Implications for teacher PD

The blended PD approach presented builds on promising evidence for the use of online and in-person teacher training to cultivate understanding, shift beliefs, develop skill, and prepare teachers to bring new practices into their teaching. In-person training may be best-suited to build trusting relationships with colleagues, simulate practices, and experience failure and success with the support of specialists, but it is also resource-intensive and lacks opportunities for follow-up (Fishman et al., 2013). Conversely, though online training presents more challenges for trust-building, it can be designed to develop and sustain a sense of community and develop a new knowledge base, efficiently (Bates, Phalen, & Moran, 2016). Results suggest online PD can set the conditions for manageable risk-taking for teachers. Providers may consider using online training to deliver key ideas and instructional examples, prompt reflection, scaffold brief creative tasks, and encourage teachers to share their work and connect with others. The in-

person institute complemented the online course with hands-on, experiential applications of the key concepts and ideas, pushing teachers to take greater creative risks with their peers.

5.2.1. Future directions in research

Results suggest several immediate directions for future research. For instance, a larger sample is needed to evaluate the construct validity of the intertwined constructs measured in this study. The field of teacher education will need more descriptive research on how teachers' system of creative beliefs translate to actual implementation at different levels and in different content areas across K-12 education. Other possible directions are explored further.

5.2.2. Creative anxiety, structured uncertainty, and risk taking

Creativity research has focused on the affective dimension of creativity for decades (Hennessey & Amabile, 1987, 2010), but only recently have researchers (Daker et al., 2019) focused on the unique role that anxiety plays in facing the uncertainty and risk-taking required of creative demands. Negative emotions can be an important part of the creative process to build our alertness (De Dreu, Baas, & Nijstad, 2008), but they can also inhibit creative action, as teachers described in this study. Engaging in basic routine creative exercises may scaffold risk-taking for teachers to feel less creative anxiety. If teachers experience these emotional states in PD where risk-taking feels safe and structured, they may be able to scaffold risk-taking for their students. We propose this process in teachers represents the cultivation of *creative empathy for risk-taking*—building awareness and understanding of the cognitive, social, and emotional demands that creative challenges require. This construct may be an important mediator between shifts in teacher beliefs and practice and student creative development and should be studied.

5.2.3. Reflection and creative metacognition in teacher development

Teachers emphasized the importance of reflection throughout their training, indicating that developing the creative teacher may demand creative metacognitive development. Managing affective and cognitive processes in the face of creative challenges in order to unlock one's creative potential requires the development of *creative metacognition* (Anderson and Haney, 2021; Jia, Li, & Cao, 2019). For teachers, creative metacognition might include the (a) self-awareness of strengths and limitations (e.g., a creative routine you know well), (b) contextual knowledge (e.g., predicting how students may respond and adjusting expectations), (c) strategy selection (e.g., ideas for adapting on the fly), and (d) self-regulation (e.g., persisting to the end even if students struggle, awkwardly). Understanding more about creative metacognition in teaching is an important direction for the field. Given the important role creative metacognition has demonstrated for students (Anderson and Haney, 2021), teacher modeling of creative metacognition may be a powerful mechanism for their own growth and the growth of their students. Assessing that creative metacognition could be complemented by assessing teachers' creative thinking or creative production in future research on the kind of PD described in this study. Understanding how beliefs and affect that underlie teachers' creative agency relate to their creative thinking and production will be another important step.

5.3. Limitations

As mentioned previously, the sample of teachers in this study represents those who might have been interested in creativity and the arts, perhaps more than the average teacher. This mixed

method study did not include a comparison group; alternative explanations for increases detected in survey data could be possible. For instance, other related PD or personal development that teachers engaged in during the summer could have contributed to effects. Phase 2 focus group data helped to explain away some of those confounding explanations. This study represents a small sample pilot early in the development of this blended PD program. Understanding the generalizability of effectiveness for teachers who are less willing and enthusiastic to participate voluntarily will be important. This study focuses entirely on the internal beliefs of individual teachers within schools. As such, this study does not provide an understanding of how the school context contributes to teacher development and implementation. This study did not observe teacher practice and relies fully on teachers' own reflection to identify the effect of the experience on practice. To draw firmer conclusions would require other sources of evidence of behavioral and pedagogical change.

6. Conclusion

First, findings demonstrated that teachers' beliefs, values, and affect toward creativity and arts integration can likely change with reflection, training, and practice. These factors may be foundational to their development as a creative teacher. Second, results illustrated that with support and guidance teachers may be able to adopt new ideas about creativity, adapt teaching strategies, and begin taking creative risks in their classrooms. Third, the overarching blended design of the PD approach and this study's evidence of promise indicate that PD providers should consider using online pathways to enhance effectiveness and accessibility to reach isolated educators. In sum, to develop the creative teacher begins with reflection on their existing creative resources, deepening of their understanding about creativity, scaffolding of creative risk-taking, and the offering of creative routines that are easy to adapt and implement.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.tate.2021.103583.

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