The Journal of Creative Behavior

ORIGINAL ARTICLE OPEN ACCESS

A Longitudinal Teacher Case Study on the Development of Creative Self-Regulation and Agency

Ross C. Anderson

Creative Engagement Lab, Eugene, Oregon, USA

Correspondence: Ross C. Anderson (ross@creativeengagementlab.com)

Received: 26 October 2023 | **Revised:** 18 December 2024 | **Accepted:** 21 December 2024

Funding: This work was supported by Office of Elementary and Secondary Education, U351D210002.

Keywords: case study | creative agency | creative learning | creative self-regulation | creative teaching | teacher professional development

ABSTRACT

Creative self-regulation (CSR) is important in facing the challenges and uncertainty of creative teaching and learning. Our understanding for how teachers develop creative self-regulation skills and knowledge for the classroom remains limited. This longitudinal case study begins to fill this gap with an in-depth investigation of one U.S. high school teachers' development and application of CSR in relationship to her creative agency in teaching. This study incorporated a variety of data sources to document and understand CSR development for the distinct challenges of creative teaching and facilitation of creative learning. Results indicated the teacher began with a more rigid and dysregulated CSR approach, which developed across 2 years of professional development into a flexible and experimental approach. The teacher demonstrated a strong creative agency and trust in her intuition by the end of the 2 years. Findings suggested the key CSR skills that catalyzed her approach included withholding judgment and releasing control to students. Future research on teachers' creative development and CSR for the classroom can investigate these characteristics further. Results also reinforced the important connection between CSR development and the beliefs, values, and attitudes that formed the teachers' creative agency—another area for future research.

Scholars have determined the important role that creative self-regulation (CSR) plays in how individuals turn creative ideas into creative action and outcomes (Rubenstein et al. 2019; Zielińska et al. 2022, 2024), building from decades of work on self-regulation in the educational psychology field (Panadero 2017; Zimmerman 2000). This recent work demonstrated how the different phases of CSR can be important mediators between the latent creative potential of both students and teachers and their execution of creative work. In this way, CSR can play a catalytic and agentic role in individuals' creative development. To date, our understanding of how teachers develop their CSR across time is limited. Greater understanding about this development can help shape training experiences and work environments that nurture creative teaching and learning. This study aims to begin to fill that gap through the case study of one teachers' experience.

This study applies a longitudinal case study design using a variety of data sources and inductive and deductive techniques to reveal new insights. In this study, I identified components of the teachers' early self-regulatory approach in creative teaching and learning from professional development (PD) course submissions and surveys, then mapped her self-regulatory development across 2 years of PD using a retrospective teacher interview. I applied thematic qualitative analysis to learn how CSR knowledge, skill, and action manifest in the high school classroom context and how that CSR contributed to her development of creative agency in teaching. I distinguished between CSR in the teachers' efforts toward creative teaching and her skilled facilitation of creative learning for students. That distinction aimed to separate the intrapersonal aspects and outcomes of CSR from the interpersonal outcome of students' engagement in creative learning. I incorporated student reflections from focus groups

to triangulate and further validate the teachers' perceptions and reflections. In the paragraphs below, I introduce (a) the central CSR framework with important findings from past research, (b) the different role CSR may play in creative teaching versus facilitation of creative learning, and (c) the overarching importance of doubt and uncertainty in studying the CSR development.

1.1 | Creative Self-Regulation in Teaching

CSR is the set of self-regulatory knowledge and skills enacted across three phases, the forethought phase, the performance phase, and the self-reflection phase, to enable the creative process. According to past work on this CSR model (Rubenstein et al. 2019; Zielińska et al. 2022, 2024), each of these phases contains several components. The forethought phase includes how an individual expects obstacles and frustration and the degree to which an individual accepts the uncertainty inherent in the creative process. During the performance phase, an individual activates creative self-regulation through adjusting their approach, managing and reframing ambiguous goals, and emotional regulation to deal with obstacles and challenges. During the self-reflection phase, an individual reflects on if and how they can improve the approach and their readiness to share their creative work with others. These phases can be cyclical within moments of a creative process, such as integrating a new technique, or they can encompass an entire creative endeavor, such as prototyping an instructional aid (Zielińska et al. 2024).

1.1.1 | Different Creative Self-Regulation Profiles of Teachers

Past research found that teachers CSR approach to these phases of the creative process fit three different contrasting profiles using latent profile analysis (Zielińska et al. 2024). The first profile, *dysregulated approach*, included 27% of the sample and was low on all self-regulatory factors except for obstacles expectation. These teachers expected challenges in the process without the self-regulatory knowledge and skills to manage them. The second profile, *plan-execute approach*, included 33% of the sample and was high on some factors and lower on others. That group did not expect obstacles nor consider unpredictable uncertainty in the process. They adjusted their approach and sustained motivation through emotion regulation while keeping their goals stable. Upon reflection, they were ready to share their work, but they did not feel the need for improvement, illustrating a lack of flexibility in their creative process. The third group, *the draft-revise approach*, represented 40% of the sample and were high on all self-regulatory factors. When comparing these groups, both the draft-revise and plan-and-execute groups demonstrated higher creative self-beliefs than the dysregulated approach group and the draft-revise group had higher project creativity results than the dysregulated group.

That compelling research provides important validity evidence for the CSR model for teachers in their own creative process, specifically. It also suggests that teachers' may experience different stages of development in self-regulatory skills, knowledge, and action for their creative work as educators. For instance, Zielińska et al. (2024) found CSR became more complex when the creative process was in collaboration with students. This current study builds from that profile analysis to understand the development of one teacher's self-regulatory approach across a long-term professional development experience focused on both the internal creative process and the external facilitation of creative learning.

1.2 | The Role of Creative Self-Regulation in Creative Teaching and Learning

To understand how teachers' CSR functions and develops for classroom teaching, it can be helpful to differentiate the skills needed for creative teaching versus facilitation of creative learning (Jeffrey and Craft 2004). Importantly, not all creative teaching will result in creative learning for students. On the other hand, the facilitation of creative learning does not always necessitate creative actions from the teacher. For instance, when a teacher turns over control to students to choose what modality, such as visual or gestural, they will use to demonstrate their understanding, the creative process is undertaken by the student, not the teacher. Additionally, a teacher may need to take a traditionally didactic and non-creative approach to elucidating parts of the creative process for students when preparing them for their own CSR. These points highlight the importance of distinguishing between creative teaching and facilitating creative learning for students.

1.2.1 | Creative Teaching and Creative Agency

When teachers engage in a new creative teaching approach, they confront an audience of students. By definition, a creative teaching approach will be new and unfamiliar so the results, including the response of students, will be uncertain and unpredictable. For instance, a math teacher may try to integrate embodied choreography into their instruction on the coordinate grid for the first time. Students will likely be nervous, and the teacher may fumble their way through their first demonstrations of the idea awkwardly. The teacher will need a strong sense of agency to remain open, curious, and adaptable as they face the vulnerability of being a beginner at the technique in front of their students. In this way, creative teaching includes being imaginative and risk-taking with new possibilities in teaching and learning, while also managing anxiety and uncertainty with openness and reflectiveness (Anderson et al. 2022b). Wading into the unknown of creative teaching with a sense of creative agency depends on strong self-beliefs, values, and attitudes toward creativity (Anderson et al. 2022b; Karwowski and Beghetto 2018). Table 1 describes these dimensions of creative agency for teaching and illustrates their connections to specific aspects of creative teaching in action.

When teachers feel creative agency, they are more inclined to apply and model creative strategies, recognize and respond to students' creative strengths, and self-regulate toward creative outcomes (Zielińska et al. 2024). Moreover, teachers' awareness about their self-beliefs and values related to creativity shapes their subsequent self-regulation. For instance, when the math teacher integrates choreography into linear algebra for the first time and many students avoid participation, she may feel

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

Note: Table adapted from (Author 2022).

anxious to continue, but a strong self-efficacy can help her regulate her emotions and persist. In this way, teachers' creative agency and CSR are closely connected (Zielińska et al. 2024). The uncertainty for how things will turn out draws on CSR at all three phases—planning and anticipation, monitoring and adjusting, and self-reflection. This experience can include specific creativity anxiety about needing to think on the fly and come up with something new (Daker et al. 2019) and test teachers' tolerance for ambiguity and need for closure and control (Kruglanski et al. 2013). This case study aims to identify specific CSR mediators that may bridge these beliefs and attitudes to teachers' creative action in the classroom.

1.2.2 | Facilitation of Creative Learning Through the Arts

Teachers' facilitation of creative learning entails its own set of self-regulatory knowledge, strategies, and skills that teachers must understand, intuit, and respond to in the classroom. Fundamentally, the design of creative learning should promote opportunities for students to make, share, and build on new meaning about what they learn (Beghetto 2016). Creative learning should also make the underlying cognitive and affective aspects of the creative process explicit for students through routine practice within a culture of risk-taking, mistakes, and non-conformity (Anderson et al. 2020; Gajda, Beghetto, and Karwowski 2017). Creative learning values differences and self-expression with multiple solutions and pathways possible (Catterall and Peppler 2007; Estabrooks and Couch 2018; Glaveanu and Beghetto 2017; Anderson 2018).

Though creative learning can take place across domains, this study focuses on creative learning through the integration of different artistic modalities. Arts integration can engage students' cultural forms of creativity across the curriculum in different modalities, such as movement, dramatic enactment, and 2D and 3D visual representation, among others (Burnaford et al. 2007). When a math teacher creatively integrates choreography into learning about the coordinate grid, her students engage in creative learning when they are allowed to generate their own choreography solutions to the teachers' challenge and share them with each other. This kind of classroom facilitation presents numerous opportunities for CSR for teachers. The teacher will draw on her CSR skills when her students follow their own artistic interpretations and creative ideas that will likely differ significantly from what the teacher originally expected. The teacher may not be experienced with choreography and will need to prepare for and manage the discomfort of working with a new medium. The teacher will need to be reflective to identify how to continuously improve the experience for students. A commonality for CSR in creative teaching and creative learning is the need to embrace uncertainty, experience doubt, and engage students as active and agentic contributors.

1.3 | The Central Role of Doubt and Uncertainty

In this study, doubt and uncertainty will be primary themes for analysis and insight. When creative openings inevitably occur in the micro-moments of a classroom due to an obscure comment by a student or arriving to a topic or modality for which

the teacher has little or no background, teachers can model risk-taking by letting the classroom explore those possibilities (Gajda, Beghetto, and Karwowski 2017). When teachers integrate the creative process through regular classroom routines that foster these moments in a structured way, they relinquish some power over the direction of classroom discourse and can enhance students' comfort with creative learning (Jónsdóttir 2017). They set conditions for creative engagement that welcome students' creativity (Anderson et al. 2020). Moreover, when students have greater talent and skill in some creative modalities, such as 2D drawing or movement, teachers must face doubt and uncertainty about giving up their pedagogical authority. These are vulnerable moments for teachers, as past research has illustrated in their own words (Anderson et al. 2022a, 2022b). Reinforcing this point, Zielińska et al. (2024) found, in a sample of 173 K-12 teachers in Poland, that teachers' acceptance of uncertainty was the strongest predictor in the forethought phase of CSR of creative outcomes, and teachers' adjusting approach was the strongest predictor in the performance phase. This current study drew on the openness, vulnerability, and insights of a veteran teacher—focused for 2 years on professional development for creative growth—to help understand her development and application of CSR in creative teaching and learning.

1.4 | Case Study Selection

I chose a case study approach for this research purpose because the selected case demonstrated the potential to be revelatory (Yin 2014) due to the exceptional effort, development, and openness she showed in creative teaching across 2 years of PD. She made this growth and development visible across those 2 years through detailed self-reflective sharing in course forums, live virtual PD engagements, and in the final retrospective interview transcript, which serves as the primary data source for this case study analysis. That level of self-awareness and her willingness to share her experiences and thinking openly are essential for quality case study design (Stake 1995) and offered an important opportunity to extend understanding in this area. In addition to the case being critical and revelatory for this purpose, the case study was also longitudinal, providing an understanding of the teachers' approach prior to thinking critically about and experimenting with creativity in her teaching and classroom learning. I include a variety of data sources to first describe this teacher across the early phase of her PD experience, then use the in-depth interview to understand the metacognitive knowledge and skills through her experience and perspective. I conclude with analysis of three focus groups with some of her students.

1.5 | Research Questions

1. What are the characteristics of the teacher's CSR approach early in her development?
2. What are the characteristics of the teacher's CSR approach specific to creative teaching midway and later in her development?
3. What are the characteristics of the teachers' CSR approach specific to facilitating creative learning for students midway and later in her development?
4. To what degree do students' reflections on their creative learning experience with the case study teacher triangulate and validate her perceptions?

1 | Method

The approach outlined below follows best practices in case study methods for analytical generalizability (Stake 1995; Yin 2014) with the aim of developing greater precision and depth within current theoretical frameworks on CSR, specific to the context of creative teaching and learning at the secondary school level. We used thematic analysis (Braun and Clarke 2006) working flexibly between deductive and inductive coding.

1.1 | Participant

This study is part of a larger study on teacher professional development (PD) for creative teaching for arts integrated learning. The case study teacher, Angela (a pseudonym to protect her anonymity), volunteered to participate in the program during the summer of 2020. The program moved to an entirely virtual format in response to the pandemic, which allowed rural educators, like Angela, to engage. Across the 2020–21 and 2021–22 school years, Angela participated with more than 80 other educators in the makeSPACE program.[1] She was one of the only teachers to complete all five courses offered, amounting to more 100 h of self-paced PD, with an additional 2-day virtual summer institute in 2021. The sections below will further describe Angela's engagement in the PD program. The first part of the results provides quantitative and qualitative descriptors of the teachers' creative self, more details about her setting, and some understanding of her initial creative development in the program. Given her motivation to develop creative teaching practices, her time and effort in the PD program, and her extensive experimentation with creative methods in the classroom, she serves as an ideal case study to understand the different dimensions of creative self-regulatory skills and knowledge important for teachers.

The case study teacher identified as white and middle class. She worked in a rural and remote district in the Pacific Northwest of the U.S. and had been working as a teacher there for the past 25–30 years prior to engaging in the professional development program. She completed courses during the 2020–21 and 2021–22 school years. The final interview and student focus groups took place in June 2022. I use the pseudonym of Angela to identify the case study teacher and preserve her anonymity. Thirteen of her high school seniors were willing to participate in one of three student focus groups, led by a trained research assistant. Descriptive data about the students were not collected.

1.2 | Procedures

The teacher completed the online Foundation Course, which included 12 modules and took approximately 16 h to complete. The course was designed to support teachers with useful mental models, language, examples, and classroom routines for exploring the creative process in teaching and learning. For instance,

teachers explored their own personal *creative resources* from a multidimensional perspective on creativity (Anderson 2020; Lubart, Zenasni, and Barbot 2013) in a metaphoric *creative avatar* collage shared with others. She experimented with key concepts and practices, such as structured uncertainty, metaphorical thinking, divergent and associative thinking, and active reflection and integrated them into her teaching. She completed three 14-h strategy courses focused on three different approaches to arts integration in music and media, the visual arts, and theater for embodied learning. Additionally, she completed a 30-h action research course twice, where she carefully theorized about her creative teaching design, gathered data about her students' creative learning experience, reflected throughout, and reported on her findings. The overarching context for this study was how she developed CSR while facing the creative challenge to integrate creative thinking routines and artistic practices into her regular high school English teaching consistently across two school years.

1.3 | Materials and Measures

The case study teacher completed a survey early in her training that included a variety of surveys and assessments (see Appendix S1 for whole protocol), which were part of a larger study. The teacher responded to three divergent thinking prompts in the *alternate uses task* (see Anderson et al. 2023 for more details). Two raters scored teachers for their fluency (number of ideas generated), flexibility (number of different conceptual categories among the ideas), and originality (the novelty and uncommonness of the ideas generated as an ideational pool) following the approach in past research (Reiter-Palmon et al. 2019). Reliability was good for each factor across the two raters and three items: (a) Fluency $\propto = 0.83$; (b) Flexibility $\propto = 0.80$; and (c) Originality $\propto = 0.82$. Additionally, teachers completed a metaphor generation task, which two raters scored following the approach of Silvia and Beaty (2012) and Chiappe and Chiappe (2007) on multiple criteria: remoteness, novelty, cleverness, aptness, and creativity (see Anderson et al. 2023 for more details on method). All responses were scored on a 1–5 point scale (1 = low; 5 = high) and the creativity score reached a reliability of $\propto = 0.86$.

The survey included a measure for fixed creative mindset, using four items from a revised version of an extant instrument used with a similar population to ensure greater reliability and alignment to mindset theory (Hass et al. 2016; Anderson et al. 2022b). A sample item was *I have a certain amount of creative potential, and I can't really do much to change it* and the Cronbach's alpha was $\propto = 0.88$. We used the Creative Self-Efficacy in Teaching scale and the Self-efficacy for Arts Integration scale from past research with similar samples (e.g., Anderson et al. 2021). Teachers' empathy of creative risk-taking adapted nine items from the cognitive empathy dimension of the Basic Empathy Scale for Adults (Carré et al. 2013). Creativity anxiety was measured with four items from the Creativity Anxiety Scale (Daker et al. 2019) on a 1–5 frequency scale. All survey measure reliabilities exceeded $\propto = 0.80$.

The student focus group was conducted following an IRB approved protocol for human subject's research. The protocol is included in the Appendix S1 and followed a process from asking students general questions about their thoughts, feelings, and values about creativity to questions about their experience with the case study teacher. One research assistant conducted the focus groups through Zoom videoconferencing software.

1.4 | Case Study Analysis

To address the first research question, I drew from self-reported survey data at the beginning and end of the first phase of the PD experience. I incorporated reflective excerpts from discussion forum threads across the teacher's course experience, which captured the early development of her creative self-beliefs and CSR approach to creative teaching and learning. The aim of that analysis was purely descriptive using both survey scale means about her self-beliefs and perceptions and reflective excerpts that portrayed her thinking and affect early in the experience. Next, I coded the teachers' post-program interview data to address Research Questions 2 and 3. My coding process followed several steps informed by both deductive thematic coding (Braun and Clarke 2006) and inductive grounded theory (Charmaz 2014). First, I coded data by self-regulation phase adapting the approach used by Zielińska et al. (2024) with three CSR phases as parent codes and the pre-existing factors (e.g., adjusting approach) as child codes within each. I coded for creative agency when the teacher referenced her creative self-beliefs, mindsets, or values related to creative teaching and learning. While coding, I used memoing and line-by-line coding, following the grounded theory tradition (Charmaz 2014), when new potential factors and codes emerged related to the teacher's development of CSR and creative agency in teaching. After completing a first coding of the data, I completed a second review of the transcript and coded excerpts to identify anything that may have been missed. Next, I further grouped the coded data within those CSR parent and child codes by the two overarching themes of creative teaching or creative learning. In this way, I developed the case study narrative based on those coded data in two parts: (a) creative teaching and (b) facilitation of creative learning.

There was no second researcher to check the objectivity of my analyses. Instead, I sent the teacher a draft of the results for member checking, and she had no concerns to share. In writing the analytic narrative, I employed the principle of thick description (Ryle 1949), following the MIRACLE narrative framework (Younas et al. 2023). I generated a meaningful and authentic narrative of the phenomena through the direct understanding and emotions expressed by the case study teacher with carefully selected excerpts alongside an interpretative narrative through the CSR lens. I aimed to reveal the underlying meaning and experience of the teacher. My coding of the student focus group transcript data followed a similar procedure. I coded for aspects of students' creative agency and CSR in both their self-reflections and their reflections on their teachers' approach. I aimed to provide a relational and contextualized narrative given the important influence that students exerted on the teachers' development.

1.5 | Reflexivity Statement

As the sole author on this study, I identify as a White, cisgender, and male scholar-practitioner with a European familial and

cultural heritage born in the United States. I contributed to the design, implementation, evaluation, and iterative refinement of the PD program provided to the case study teacher at the heart of this research. I served as the principal investigator of the federal grant that funded that project and have studied the teacher experience from different perspectives, publishing numerous peer-reviewed studies, representing the experiences of more than 200 teachers. The theoretical perspectives that guide my work have been Bandura's (2018) social-cognitive framework on human agency, Glăveanu's (2011) sociocultural approach to creativity (Glaveanu et al. 2019), and the model of creative behavior as agentic action (Karwowski and Beghetto 2018). These perspectives and my intimacy with the evolution of the PD program required diligence in presenting a carefully interpreted and authentic narrative of this case study and caution to not overgeneralize results or interpret results with overly positive evaluations of the program. To remain vigilant over this reflexivity, I included in-depth and complete quotations from the teacher, input from her students, and a variety of complementary data sources in my reporting, and I avoided presenting this research as evaluative of the program.

2 | Results

I present the results below in the sequence of the research questions, beginning first by characterizing the teachers' early development in creative self-beliefs and CSR from different data sources. Next, I describe her CSR development midway and late into the PD experience first regarding creative teaching and next regarding her facilitation of creative learning. The first theme focused on her CSR in her own creative process for creative teaching, including her self-beliefs and self-doubt, awareness of challenges and strategies, and if and how she monitored and adjusted her approach. The second theme focused on her CSR for facilitating the creative learning experiences for her students, including awareness of the student experience and their responses to creative learning opportunities, understanding different ways students engage and express understanding, barriers to students' creative engagement, and theorizing and observations of student action inside and outside her classroom. I conclude by integrating her students' perspectives to help validate her perspective and perceptions of the student experience.

2.1 | Characteristics of the Case Study Teachers' Early Development

I interpreted Angela's pre-program survey data, illustrated in Table 2, using the sample means as a comparison for each survey scale published in Anderson et al. (2021) and for divergent thinking and metaphor creativity published in Anderson et al. (2023)—these comparisons were not tests of statistical significance. Results indicated she began with below average self-efficacy and familiarity with creative teaching and arts integration. She started with an average level of cognitive empathy for students' creative risk-taking. She began with below average creative fixed mindset about her creative potential (i.e., strong beliefs she can grow her creativity) and average levels of creativity anxiety. She began with above-average ratings in the creativity of her generated metaphors and average levels of divergent thinking fluency, flexibility, and originality compared to her peers in the cohort of 52 teachers. She generated a collage with a written description in Figure 1 that illustrates her self-awareness as a traditionalist who tries to find her own way of doing things. She also showed willingness to share her internal processing with other teachers in the excerpt below, which reflects both her creativity anxiety and empathy for her students evident in the pre-program survey.

TABLE 2 | Descriptive data from pre- and post-course survey completion for case study teacher.

Descriptors	Pre-program	Post-foundation course
1. Familiarity with arts integration and creative teaching	2.67	4.67
2. Self-efficacy for creative teaching	3.83	4.83
3. Cognitive empathy for students' creative risk-taking	4.78	5.78
4. Creative fixed mindset (about self)	1.00	2.75
5. Self-efficacy for arts integration	3.00	5.00
6. Creativity anxiety	2.00	1.25
7. Metaphor creativity	3.25	3.69
8. Divergent thinking fluency (verbal)	5.33	7.67
9. Divergent thinking flexibility (verbal)	2.50	3.67
10. Divergent thinking originality (verbal)	2.83	4.17

Note: Responses to survey scales 1–6 are on a 6-point Likert scale. Creativity anxiety was on a 1–5 frequency scale. Creative metaphor generation and divergent thinking originality were scored by two raters. Divergent thinking fluency was the mean number of ideas produced across tasks and flexibility was the number of categories produced—also judged by two raters. Raters produced high levels of interrater reliability (see Anderson et al. 2023). All scales demonstrated strong reliability with the full sample in past research (see Anderson et al. 2021, 2022a).

> I have engaged in the Many Uses game many times...it always gives me a good deal of anxiety...here are some of the thoughts I had in the [uses for a] tire round: 'Oh-uh here comes this activity again. I can't think of a thing. I've seen them used as planters...I should think of some of my own. Can tires float? I should look it up online...Of course they don't float...Geez, I'm an idiot! Uh-oh, none of my ideas are wacky? None of them are all that practical either, really. They are just boring...By the time I got to the round where I selected my own item in the room, my negative thoughts continued, but began to morph: "I should pick something I can think of uses for right away...

> Just start with that portable keyboard you use to type on your iPad. Okay, try to think wacky and practical. (Around #8): Maybe I should give up...' I remember going through this same feeling of sitting with the thought of giving up...followed by the generation of a few more ideas...

This excerpt, alongside her self-perceptions captured in the survey, provide some important insights into her CSR approach and her creative agency in her own creative work early in her development. First, she had lower levels of self-efficacy for creative teaching, and, in this creative thinking task, she expected obstacles and challenges, faced considerable negative self-talk, and appeared to accept uncertainty, to a degree, but still felt rather hopeless. She showed some willingness to modify her goals when she searched for her own object for divergent thinking but did not appear to know how to adjust her approach in an effective way. Still, she did not give up. She struggled to effectively regulate her emotions but still maintained her persistence showing some awareness that a good idea may arise on the other side of the frustration. Moreover, her creative effort resulted in average creativity scores for her divergent thinking. These characteristics are represented in the "Early" column in Table 3. In her reflection, she also considered how her experience related to her efforts to teach for creativity and facilitate creative learning experiences for students.

> I need to remind my students often that the step past almost giving up is often progress...And I did end up with a few ideas I kind of like...The Many Uses game would make a great warm-up to get kids into divergent and associative thinking. And if it is a struggle for some, I can feel their pain and do the warm-up alongside them. Maybe our confidence will grow together. Still, having to post my answers is embarrassing. Oh well, I will at least be doing the service of making others feel good about their answers...

This excerpt illustrates how she wanted to support her students to develop their own CSR to anticipate challenges and manage the struggle and emotions she experienced. She showed willingness to model persistence and a willingness to share that experience, even when she felt reluctant and embarrassed.

Angela's self-perceptions and self-beliefs related to creative agency appeared to shift based on her post-Course survey results.[2] Angela's perceived familiarity with and self-efficacy for arts integration and creative teaching increased substantially with her mean responses for those scales moving from disagreement or neutral to full agreement. Empathy for students' creative risk-taking appeared to increase somewhat, while creativity anxiety decreased somewhat. Fixed mindset beliefs about her own creativity appeared to increase slightly across this initial phase, while her divergent thinking scores and metaphor creativity appeared to increase as well. In sum, these early descriptive results, reflected in the "Early" and "Midway" columns of Table 3, illustrate some important shifts in Angela's creative agency and CSR for creative teaching.

2.2 | Creative Self-Regulation Development for Creative Teaching

In the first section below, I drew out themes from Angela's post-program interview focused on creative teaching using CSR codes as well as inductive coding to identify aspects that may not yet be represented in the CSR framework. Table 4 organizes these insights.

2.2.1 | Expecting Uncertainty, Facing Obstacles, and Adjusting Approach: "When I'm Not Really a Step Ahead of Anyone"

Early in Angela's classroom implementation of creative teaching, she remembered feeling doubtful about her ability to model

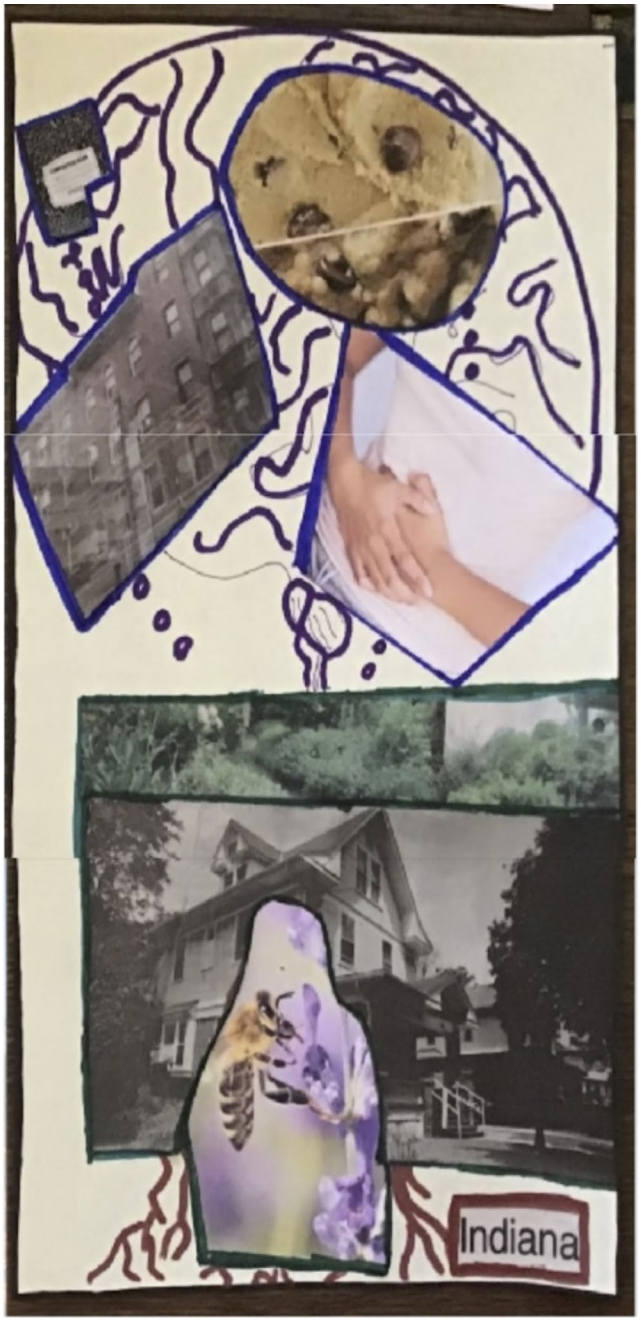

FIGURE 1 | Legend on next page.

FIGURE 1 | My creative avatar shows that my creativity is rooted in my Indiana home where, like a bee who gathers nectar to make honey, I gathered all kinds of skills, interests, and ideas from my family and my Midwest upbringing in developing my own sweet creativity. Next, I moved to other states, flying with Indiana pollen still stuck to my feet so that I could share a piece of Indiana with the next places I went. Above the photo of the bee and the Indiana home, which both ground me and provide my roots, is a photo of plants growing, representing the growth my creativity takes every time I get into nature. Above the solid foundation of Indiana home and family roots and the importance of nature in my creative development is a drawing of my brain showing that health issues, travel, and writing all added to my personal creative growth. Finally, the photo of the cookie dough and baked cookie represent the fact that all of my experiences—along with my personality—have resulted in a person who is a rule-following traditionalist in many ways (I love the same cookies everyone else does), but who is also willing to risk rebelling productively and doing things my own way (things like eating the cookie dough rather than baking it into cookies, and probably eating it in place of dinner rather than at the end of the meal).

high-quality visual arts examples for students when she first began implementing some of these creative routines in her class, explained below.

> I think the very first times I tried the three block comic strips and selfies and doing actual drawings, I went to some of the Lynda Barry stuff and I showed videos and got kids into it, and they did great the first time. And then pretty soon started just looking like stick figures. And I'm still playing around with how do I make that go when I draw one example on the board, and I'm not really a step ahead of anybody?

The question of "not being a step ahead" of students reflects both her acceptance of uncertainty and obstacle expectation alongside her goals to provide new opportunities for student expression. Her self-doubt reflects her continued efforts at emotion regulation when facing the potential embarrassment of not being able to model high-quality creative work for her students and a continued reluctance in her readiness to share. Her sentiments also reflect her willingness to be a novice in creative modalities and model a beginner attitude and growth mindset for students. Table 3 reflects these CSR descriptors in the "Midway" column.

Angela expressed a second area of doubt and set of challenges in the excerpt below considering how to fit daily creative learning experiences within the pressure of other curricular demands.

> I attempted to do a daily something creative...for example, if we were in a part of the book where they were just getting to know some of the different characters, they might draw one of the characters, and then have other students guess which person it was...we did [theater-based] tableaux of scenes. We did some poetry...We did some metaphor cards...Every day, I tried to throw something... And I'm working on figuring out next year right now...this [new district] curriculum highly recommends the 10 minutes of what would normally be attendance prompt or warmup time as independent silent reading...

TABLE 3 | The development of creative self-beliefs, affect, and creative self-regulation (CSR) for the case study teacher.

	Early	Midway	Late
CSR phases and factors			
Creative self-efficacy	↓	↑	↑
Creative fixed mindset	↓	→	—
Creativity anxiety	↑	↓	—
Empathy for student creative risk-taking	→	↑	—
Forethought phase			
Obstacle expectations	↑	↑	↑
Uncertainty acceptance	→	↑	↑
Performance phase			
Adjusting approach	↓	→	↑
Managing and reframing goals	→	↑	↑
Emotional regulation and dealing with obstacles	↓	→	↑
Self-reflection phase			
Improving approach	↑	↑	↑
Readiness to share	↓	↓	↑
Creative metaphor generation	→	↑	—
Creative divergent thinking	→	↑	—

Note: ↑ The upward arrow denotes evidence of higher levels of the factor from survey, course reflections, or interview data. ↓ The downward arrow denotes lower levels and the → sideways arrow denotes neutral, average, or uncertain levels based on the available data.

Angela expressed the goal "...to have students demonstrate proficiency in different things like understanding of character or understanding of theme or main idea in a creative way." This excerpt revealed that during that first year of implementing new creative teaching ideas, Angela began to adjust her approach as she progressed and became more comfortable and familiar with the strategies. She also demonstrated her desire to adjust her approach as she found what creative strategies integrated best with which academic tasks. Her framing in the excerpt below represented her management and adjusting of ambiguous goals working to balance the prioritizing of students' creative and academic development in tandem, especially to improve engagement for students who avoided difficult academic work, such as writing.

TABLE 4 | Driving questions and descriptions undergirding teachers' creative self-regulation for creative teaching.

Underlying doubt & question	Creative self-regulation for creative teaching
Forethought phase	
What happens if I am not really a step ahead of students?	Self-awareness of own limits with creative and artistic skills and recognizing potential opportunities to give authority to students to model for others
Within the time constraints of instructional demands, how do I fit creative strategies into my classes?	Sufficient knowledge of and practice with creative teaching strategies coupled with (a) a readiness to disrupt existing instructional practices and (b) an alertness to opportunities to replace current approach with creative strategies that can enhance learning process and outcomes
Performance phase	
Should I follow my prescribed plan or make adjustments in the moment to what seems like a better fit?	Willingness and flexibility to adjust; knowledge of when to let go of structured plan and follow intuition to let creative teaching emerge "organically" in the classroom and be responsive to students. Emotion regulation of anxiety or embarrassment when facing challenges or original plan doesn't work out
Self-reflection phase	
How do I find a balance between creative learning and development and more traditional academic skills?	Interest to improve approach; acknowledging evidence or lack of evidence of effectiveness of practices to develop student skill; motivation to balance emphasis on traditional academic skills (e.g., writing) with other skills (e.g., 2D drawing and 3D modeling) to process content and represent understanding creatively and accurately
I don't know if this approach worked as a whole, but what did work and for whom?	Capacity to evaluate outcomes of new creative teaching efforts at (a) the immediate level of individual students and experiences, (b) the intermediate level of long-term learning outcomes, and (c) the macro-level context of student development beyond the classroom

> What does it look like as a language arts teacher to have students writing enough to improve those skills, but also having room for students who are not the natural writers to be able to demonstrate proficiency in different ways...and to introduce the creative things because it does improve writing...

Angela showed a deepened understanding about students' needs for sensemaking, alternative forms to show their understanding, and opportunities for personal expression, creating a diverse set of teaching tools to use to respond to those needs. Her reflection showed a growing comfort with the uncertainty inherent to creative teaching and learning.

2.2.2 | Managing and Reframing Goals: "My Original Goal Didn't Work"

In the later stage of development, Angela exhibited a reframing of goals and improving approach that required her to withhold judgment and allowed her to find different outcomes than expected in creative teaching. Angela expressed this perspective in the excerpt below.

> By the end [of action research], it was like, I don't know if this worked. But if I don't think of that as the end and think of some of the specific times along the way, students were always asking to do tableaux [vivants][3], or when are we going to get the Play-Doh out again? There were a couple of students that don't always do assignments who always did the creative assignments. And there were some where visual arts is their forte. Some of those students felt recognized in a way that they actually verbalized...So, there were definitely positive things.

Angela was flexible in taking multiple perspectives to make a multidimensional evaluation of the effectiveness of her approach, revealing different individual student experiences. She began with a narrow goal on student academic improvement but was able to reframe that goal and shift her perspective along the way as she relates in the excerpt below.

> ...I think my original goal of they'll get a better handle of analyzing text, that didn't work. I don't know whether it will never work...but like I said, the biggest

> takeaway is that it feels like students all around the school feel like they have permission to touch their creative sides. So, that's definitely worth it regardless.

This last observation illustrates a substantial shift for Angela after 2 years of PD and consistent effort in both the adjusting approach and managing and reframing goals from narrowly focused on academic skill to more broadly focused on creative development.

2.2.3 | Becoming More Flexible in Later Development: "Playing Around With Ideas"

Angela reflected on an important step in her self-regulatory development for creative teaching through her action research experience in the PD program. She followed a methodical process to integrate creative teaching strategies (which restricted her from adjusting her approach), collected data about the student experience, and learned how consistent creative learning experiences contributed to students' written analysis of texts. In the excerpt below she shared how this structured experience propelled a more experimental, flexible, and intuitive approach in both the forethought and performance phases of CSR. Her approach reflects a greater ease with uncertainty acceptance, a propensity to adjust her approach on the fly, and a lighter demand for emotional regulation.

> I think, ironically, maybe it's surprising that doing the action research was a catalyst for me using creativity more organically in the classroom...But I don't know that I would've gotten there if I hadn't done it that way...I'll be teaching something, and even in the middle of it, and realize, 'oh, I should actually just have them draw this one because that'd be easier to do that as an exit ticket.' I'll be in the middle of something and change my direction from what I had written as far as what the product is just because, as I'm saying something out loud, I realize this is one that would work really well as a metaphor. So, I guess that's surprising how natural that's becoming.

Whereas doubt and discomfort early on indicated less ease with CSR and greater effort at emotional regulation, her surprise in the fluidity of her approach in this later stage potentially marked an achievement in CSR development—a level that drew on subconscious intuition. Angela felt more fluid, responsive, and improvisational, indicating self-regulation required less conscious effort in creative teaching. This development seemed to coincide with greater self-efficacy and adaptability to change plans and adjust as needed. In this way, the affordances of creative teaching tools that can become routine, such as drawing prompts or theater-based enactment, may have become a natural extension of her self-regulation in teaching more generally and increased her flexibility in response to instructional shifts and student needs.

According to her instructional notes, included in the Appendix S1, Angela planned out the integration of creative routines and arts integration for how students would process the characters and plot development of the novel they were reading for every chapter. She planned to ask students to act out scenes, draw characters, build metaphors about events in the book, sculpt scenes in 3D, and create their own poetic interpretations across the semester. That level of consistency and depth in her later stage of development coincided with her shift from a more dysregulated and rigid plan-execute CSR approach to a flexible draft-revise approach illustrated in the "Later" column of Table 3. In sum, these results describe the development of multiple aspects of CSR for creative teaching, which grew alongside aspects of creative agency. Her experimentation with new techniques, rigidity in planning and expectations, and active emotional regulation became easeful, flexible, and intuitive as a natural part of her instructional repertoire.

2.3 | Creative Self-Regulation for Students' Creative Learning

This section drew from the case study teachers' own words in the post-program interview to identify how specific components of the case study teachers' CSR related to students' creative learning. Table 4 organizes these insights.

2.3.1 | Modeling Uncertainty Acceptance and Emotional Regulation: "Rebel Productively"

Angela hoped to equip students with their own self-regulation skills to manage discomfort encountered in learning. Angela's developed CSR to manage her own discomfort grew out of anticipating and experiencing the discomfort herself, empathizing with students, and messaging and modeling strategies to help students persist. Expressed in the excerpt below, this discomfort for her included giving agency to students to find their own way in learning (Table 5).

> ...we talk a lot about [the psychology of learning], and about being comfortable...being uncomfortable, I guess. So, to just add that creativity on top of it just goes with what we already do. I mean, my favorite phrase in my classroom is rebel productively. And so students know that anytime I assign something, if they have another idea for how it might be done, that still lets me know that they get whatever the goal is. I'd rather them do it that way.

This capacity to turn authority over to students may be a key aspect of CSR, specific to facilitating creative learning, and related most to accepting uncertainty, adjusting approach, and emotional regulation.

2.3.2 | Adjusting and Regulating When Students Struggle: "Staying in the Learning Pit"

Angela reflected on the challenge of witnessing student frustration and struggle in open-ended and uncertain creative challenges. It prompted doubt in herself and her approach and forced her to decide to intervene and adjust or not. Questions arose.

Is student frustration problematic and an indicator of failure in the creative teaching approach? Or is this experience necessary and valuable in creative learning and good practice? These questions related to how she either maintained or reframed goals and adjusted her approach in response to student struggle. Angela related one experience from later in her development in the excerpt below.

> We did a project...where students had to go out and find anywhere in the school something that symbolizes love, something that symbolizes evil. There were like eight things they had to find. And then I said, "Now put them together any way." And it was frustrating for them. You could see that they were in the learning pit for a while, but they came out the other end with completely different things. One group did put all their items in a skit. Another group made a sculpture with them. Two groups, I think, did poems. There were some that did slideshows. So, the amount of creativity that I'm seeing in the school as a whole has just blossomed.

Angela shared her intention in creative teaching and learning to provide students a sense for "...what it feels like to do something outside of your comfort zone, what it feels like to stay with something that's hard." This later stage goal for creative learning evolved from the beginning stages and reflected her increased self-efficacy to increase the level of challenge for students. In sum, students' own struggle with uncertainty and struggle in creative learning may generate one of the strongest sources of uncertainty for teachers and biggest demands on CSR in forethought, performance, and self-reflection phases.

2.3.3 | Different Depths of Self-Reflection: "Legitimizing Creativity"

Angela demonstrated readiness to share and a desire to improve her approach with the self-reflection phase of CSR. Importantly, her self-reflection went deeper than just those two levels, regarding the role of creative learning in student development, indicating that deeper purpose may be connected to her CSR. She reflected on the way creative learning experiences offered students different modalities to engage with content and concepts, particularly effective for some students.

> ...so the first year [of the PD program], probably my big surprise was that when I gave students a new way to demonstrate proficiency, some of the kids that normally hid came out of the woodwork. And it's like, oh, this kid really does understand character development. He just didn't know how to write about it.

In suggesting that some students "hid" reflects their hesitation to engage in an academic skill, such as writing (where considerable research suggests many students carry anxiety[4]). Considering students' avoidant behaviors is a nuanced piece of CSR in all three phases, but especially in expecting obstacles, accepting uncertainty, and adjusting approach to see what if any creative learning experience may draw reluctant students from "hiding." Angela shared a surprising insight she found after her second year in the program from looking beyond the immediate goals of creative teaching efforts and reframing based on careful and patient observation. She showed a readiness to share her work and celebrated her students' own readiness to share their creative work as well.

> ...I teach a senior seminar class, students have to do a 20-hour senior project. And typically they do things like job shadowing...auto mechanics, construction kind of job things. That's just kind of in the culture in the community we are in. And this year...nine out of my 30 students did a senior project that was in a traditional creative field. For example, I had one student put on an art show...We have no art, we have no drama, we have no band, we have no choir. And yet there were 100 students who wanted to put something in the art show...one of the seniors did a talent show...I've actually tried to get somebody to do a talent show for 1,000 years...One of the senior projects was to write and record his own song with guitar and vocals. One of the girls learned to use animation software...another one did photography and editing. Another student created the Bonanza, a TV channel. One student was in a play...Two students worked together to paint signs for the fairgrounds. And one student did dog grooming and dog shows. I mean, that's nine out of 30 students did a creative senior project, and that's when they get to pick what they do.

This insight illustrates the teacher's curiosity and growing awareness for the diversity of students' creative identities and unique expressions and reflects a long-view on the outcomes of her facilitation of routine creative learning. Angela reflected on the importance of different creative outlets for students—such as the senior projects or leadership class—to create the conditions for student creativity to flourish outside of academics.

> I think that doing creative routines...has legitimized creativity in a way that it's been there, it's just been hiding. And now we need to do something like that with academics too. Because we also have that problem where nobody wants to be the smart kid. That's not cool. And creativity, it was not cool to say you sing or you play an instrument or whatever.

Angela recognized the pressures and conformity students need to resist to take ownership of their creative strengths. Knowing these barriers is important in understanding the source of student hesitation and in reinforcing conditions for creativity, diversity, and personal expression in everyday creative learning. Angela illustrated how that effort requires CSR in creative

TABLE 5 | Driving questions and descriptions undergirding teachers' creative self-regulation for facilitating creative learning.

Underlying doubt & question	Creative self-regulation for facilitation of creative learning
Forethought phase	
Why do some students avoid participating or engaging in class? How can I engage those learners with creative learning?	Awareness about the different avoidant behaviors students enact due to anxiety, social pressure, or other triggers (e.g., stereotype threat) and awareness of the obstacles and acceptance of the uncertainty they present for creative learning. Knowledge about the personal histories and motivation systems of individual students and about preferences students have for ways to engage with content and express their ideas
How can different creative modalities reveal student understanding and insight?	Knowledge about how different creative learning experiences can provide multiple angles on what students know and think, how to offer those opportunities, and how to evaluate those alternative modalities of representation
Performance phase	
What does the learning pit (e.g., discomfort, frustration, etc.) look, sound, and feel like for students in the creative learning process? How do I respond as a teacher?	Monitoring and regulation of emotions and desire for control in response to student frustration. Awareness of tendency to want to help students get through challenging moments in learning. Tolerating ambiguity about what student frustration will produce. Active and explicit sharing of empathy for difficult emotions that accompany uncertainty and modeling strategies. Use of metaphor (e.g., the learning pit) to help students visualize, contextualize, and distance somewhat from what they are experiencing
How can I encourage students to rebel productively within the constraints that I need them to observe and respect? What does that flexibility and student autonomy require from me?	Awareness for one's boundaries for when and how students can deviate from teacher directions in learning tasks and assignments appropriately. Capacity to model and message how to find creative alternative pathways within assignments, even if they don't work out as expected. Self-knowledge about the cognitive and emotional impact of giving up this authority—recognizing one's prescribed approach may not be optimal for some or all students. Willingness to adjust approach and options for students based on their requests
Self-reflection phase	
How do students' express their creative selves outside of the classroom or beyond school?	When understanding the effects of creative teaching on student development and the role of students' creative skills and interests outside of school, taking time to observe and learn about what's happening in students' lives outside of one's own class and the school
What is needed in my classroom and school culture to welcome student non-conformity and identity with their creative selves?	Ongoing deepening of awareness about how different aspects of classroom and school culture (e.g., assignments, grading, praise, routines) cultivates student development of and identity with creative strengths and outlets. Awareness for when to show students creative work publicly for constructive critique and validation in a way that avoids embarrassment or emphasizes competition

teaching and learning. In the earlier stage of development, Angela expressed doubt about having the creative and artistic skill to introduce and facilitate basic routines. In the later stage, that doubt developed into a sophisticated understanding about the effect of those experiences on students at different depths from everyday learning to long-term creative development. In sum, different aspects of CSR, including emotion regulation, adjusting approach, reframing goals, and self-reflection, played a unique role in the teachers' skill development to facilitate creative learning.

2.4 | Triangulating With the Student Perspective

Student focus group analysis from 13 students aimed to reinforce the accuracy and robustness of the teachers' self-perceptions and reflections. One theme that emerged was relational trust and connection. Two students felt socially isolated for lots of high school because they were different—"... we're always on the outskirts just watching it happen." That student shared "...because of these [creative] exercises and because of having our art, or whatever our teacher made us do, put on display...and all the attention is on us, [other students] got to know us a lot better and it's helped me work with them." The other student shared "I'm a lesbian in a country town... they don't like it," and "this year has been a lot better with the creative...everything." Students in one focus group shared creating theatrical scenes from books was challenging but also very enjoyable. That point reflects Angela's effort to help students become comfortable with discomfort and uncertainty of "staying in the learning pit."

One student's perspective illustrated Angela's emphasis to *rebel productively*. They confirmed doing creative exercises for the first 5 min of class continuously across the year. One student shared, that in their senior seminar class, they "had full creative control over and choice over the subject we're on usually." Another student in that focus group shared that the most successful and enjoyable exercises were "the ones where I didn't follow the directions." These reflections reinforce the autonomy Angela strived to give her students in contrast to their typical high school experience and the CSR she developed to offer this flexibility to a whole class of high school students.

Most students shared memories of the different creative learning Angela facilitated. One student explained, "When we were reading a book and she had us sculpt a certain character or something, that was something that really was like, 'Wow, you got to really get creative with it and really imagine what this person looks like.'" Another student shared "I feel that it is important that teachers use [creativity and the arts] because with me I'm really dyslexic and I can't read very well, and so a lot of the learning I get and understand is from visual learning and hands-on learning." Those sentiments reflect Angela's drive to understand students' needs and to become flexible to adjust modalities in different learning situations based on their preferences.

Several students felt they suppressed their creative potential throughout high school, which Angela had observed and shared in her interview. One student shared: "I think being in [Angela's] class, I finally realize... Being a senior also, you have to be creative with anything you do. [As a] freshman, I was pretty boring and I was most definitely not creative, so I definitely know now for the future that I'm going to have to be a creative person and think outside the box." Another student shared, "I knew myself was creative, but because most of my teachers and just being at my old school pushed that to the side, I stayed simple. I stayed in a shell we could say... But in this class, she broke my shell open a bit." Another student shared that the creative work in Angela's class helped bring "a creative mindset" to other classes. These perspectives reinforce the creative agency Angela was developing and witnessing in her students.

Several students shared they got to know different parts of Angela through both her efforts at creative teaching and her engagement in creative activities with them outside of school.

> ...She's shown a different part of herself. We really like the creativeness. I actually went to watch plays with her a few times this year and it was really fun to know her when she's not a teacher...when we would go and watch plays or theater or music, we'd go do something artsy and creative. She would always turn to me and be like, "Hey, wasn't that funny", or "That's a good song, I love this song", or, "Doesn't that remind you of this and that?" I'm like, "Yeah, it does."

Two students agreed Angela "...had improved her own teaching methods as far as creativity," and was "...coming to the understanding of kids aren't necessarily just taught anymore...they have to be actually walked through the process and have their own way per student, essentially." Those perspectives suggest deepened relational trust and a willingness to be vulnerable modeled by Angela and recognized by students—two important outcomes from the teachers' CSR.

Students noticed the shift in her approach to teaching and her creative development. One student shared, "I think she's always tried to help us out as best as she can, but this year with the whole new-opportunities-type thing, the new thing, it showed us better and I think she also learned from it too, that it was so much better to learn this way versus pencil and paper..." Another student shared, "...she's definitely opened the door of being creative with students." In sum, students' reflections complemented many of Angela's reflections on her development in CSR and creative agency in teaching and learning and illustrated ways that her development nurtured their own.

3 | Discussion

This case study sought to contribute new understanding about how CSR develops for teachers in the context of teaching and learning in a high school classroom. In my coding and analysis, I drew out all relevant factors for CSR, building on the existing CSR framework deductively and adding to it inductively. Results illustrate the case study teachers' development from a more rigid and dysregulated CSR profile to a flexible draft-revise approach found to be optimal for teachers in past research (Zielińska et al. 2024). New insights from these findings also suggest additional features of CSR, discussed below, may be important to include in future research in the context of creative teaching, facilitation of creative learning, and teacher CSR development. Finally, these findings suggest specific roles for CSR factors in how beliefs, values, and attitudes, related to creative agency, may result in classroom practices for creative teaching and learning.

3.1 | Transitions Across Creative Self-Regulation Profiles

As Table 3 illustrates, our findings in this case study illustrate a developmental transition for the teacher's creative self-regulation approach. Early on, her approach somewhat fits the dysregulated approach found by Zielińska et al. (2024) with some irregularities. She expected obstacles but demonstrated some acceptance for uncertainty. She appeared to be uncertain how to effectively adjust her approach but expressed openness to try. She showed some interest to reframe goals but struggled to regulate her strong emotions. Still, she persisted and demonstrated a desire to improve her approach and not give up. At this stage, she felt embarrassment to share, but also knew that she could model that vulnerability for other teachers and for her students. This profile could be described as *dysregulated-persistent*. Toward the middle of her development she was beginning to demonstrate the flexibility of the draft-revise approach, but was still working on certain components, such as adjusting approach, emotional regulation, and willingness to share. After 2 years of focused PD and committed effort, her reflections illustrate a draft-revise approach with development across all CSR components.

These findings from the case study suggest that other teachers may be able to develop out of dysregulated CSR profiles (Zielińska et al. 2024), but several factors may be necessary, such as a baseline of sufficient self-efficacy for creative teaching. Additionally, as Zielińska et al. found, sufficient uncertainty acceptance and emotion regulation may be crucial to resist quitting due to the embarrassment of early failures or challenges. Similarly, this case study suggests that other teachers may be able to develop from the more rigid plan-execute approach to a flexible draft-revise approach. These teachers may need support to (a) identify obstacles early on, (b) recognize potential adjustments that may be needed in the approach, (c) recognize the potential need to modify ambiguous goals, and (d) feel encouragement to be open to improve their approach. Future research can help shed light on how these different transitions work for teachers in different contexts.

3.2 | Extending Theory and Practice in Creative Self-Regulation in the Classroom

Results from this case study contribute to theory and practice on teachers' CSR in the classroom context in several ways. First, the results illustrate the unique CSR factors that may activate agentic beliefs, values, attitudes, and understanding about creativity into actual classroom practice for creativity. Second, results suggest additional components to teachers' CSR for creative teaching and CSR for facilitation of creative learning. These future directions are discussed below.

As Table 6 describes the agentic beliefs, values, attitudes, and understanding about creativity related to classroom teaching and learning—drawn from past research (Anderson et al. 2022b)—appeared to relate to different CSR factors in the experience of the case study teacher. For instance, holding and showing a growth mindset related to all factors, except, perhaps, managing and reframing ambiguous goals. The overarching importance of creative growth mindset reflects past research with teachers early in their creative development (Anderson et al. 2022b; Paek and Sumners 2017). Another important connection was with tolerance for ambiguity in the uncertainty of creative teaching and understanding of the importance of structuring uncertainty in creative learning for students. Both had direct links to the forethought and performance phases, linking to creative action through emotion regulation for oneself and in teachers' modeling and messaging emotion regulation for students. Structuring uncertainty in a scaffolded process has been promoted in recent years as an essential component for creative teaching and learning (Beghetto 2019). Teachers' capacity to enact and model emotion regulation in creative risk-taking is likely essential in the *affective scaffolding* that Henriksen et al. (2021) found was crucial for how teachers supported students through the discomfort of open-ended creative learning in six international contexts. This current study suggests teachers' affective scaffolding for creative risk-taking may be enhanced with explicit CSR strategies.

Relatedly, as past research found (Anderson et al. 2022c) teacher development of empathy for creative risk-taking develops with teachers' own experience of the vulnerability of the creative process in a social setting, such as a PD course or the middle school classroom. As the case study teacher demonstrated that firsthand experience, such as in divergent thinking and sharing of ideas, connects to the development of teacher understanding about the personal nature of creative expression. Respecting the vulnerability generated and autonomy needed connects closely with the acceptance of uncertainty and need to adjust along the way while regulating emotions. When that CSR is in place, the case study teacher demonstrated the modeling and flexibility that can arise to meet students as diverse individuals with different creative possibilities in learning. These proposed connections warrant future research with a larger sample before being generalized much beyond this case study.

Results from this case study suggest additional factors to CSR deserve consideration in the context of creative teaching. Regarding creative teaching, the readiness to model and participate in creative risk-taking, including the vulnerability of early drafts of ideas and failures, are components of CSR in the forethought phase specific to the sociocultural context of classroom teaching. Relatedly, teachers' ability to withhold judgment in the performance phase relates to emotion regulation and dealing with obstacles but may warrant its own identification in the CSR model for this context. In terms of facilitation of creative learning for students, additional CSR components in the performance phase relate to the adjusting approach and reframing ambiguous goals factors, including (a) capacity to give up control to students, (b) capacity to allow students to make choices that may create challenges for the teacher, and (c) capacity to grant students the authority of greater skill and talent in creative domains, such as the arts, that the teacher attempts to integrate into their teaching.

3.3 | Intuition in Teachers' Development of Creative Self-Regulation

Angela shared how the methodical approach dictated by her action research contrasted with the "organic" approach that followed. This contrast highlights the difference between

TABLE 6 | The relationship between different factors of teachers' creative agency, their creative self-regulation, and classroom practice for creativity.

	Beliefs and understanding about creativity		Creative self-regulation		Classroom practice for creativity
1	Holding a growth mindset about creative potential in both self and students	➡	OE; UA; AA; ER; IA; RS	➡	Praising and emphasizing effort and process (e.g., multiple drafts) rather than talent and final product; modeling mistakes and failure
2	Creative self-efficacy in teaching	➡	UA; AA; IA	➡	Willingness to take creative risks and try out and adjust creative teaching approaches
3	Valuing creativity for students in school and acknowledging the importance of non-conformity	➡	UA; AA; RS	➡	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	➡	OE; UA; ER	➡	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 to express needs	➡	UA; AA; MG; IA	➡	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	➡	OE; UA; ER; RS	➡	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	➡	AA; MG; IA	➡	Integrating creative and artistic routines, modalities, and resources into instruction and curriculum, regularly
8	Understanding that uncertainty must be structured into the learning process to foster creative learning	➡	UA; AA; MG; IA	➡	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

Note: Table adapted from (Anderson et al. 2022b).
Abbreviations: AA, adjusting approach; ER, emotion regulation and dealing with obstacles; IA, improving approach; MG, managing and reframing ambiguous goals; OE, obstacle expectations; RS, readiness for sharing; UA, uncertainty acceptance.

rational-logical and intuitive approaches individuals integrate into decision-making in the creative process (Policastro 1995). These points suggest intuition was at play in her creative teaching actions and facilitation toward creative learning, especially regarding decision-making based on partial information. Though intuition has been considered a creative resource individuals employ in the creative process (Lubart, Zenasni, and Barbot 2013; Policastro 1995), the relationship between intuition, CSR, and creative production may be an area for future research. Past conceptualizations of intuition as a perceptual process triggered by an ambiguous context may be key to understand the developmental stages of teachers' creative teaching and CSR in the classroom. For instance, Isenberg (1991) suggested intuition is at work when synthesizing pieces of information into a whole; Shirley and Langan-Fox (1996) proposed intuitive feelings result from the mind organizing experiences, information, and connections into coherent patterns, and Bowers et al. (1990) identified intuition as the unconscious perception of coherence. At times, Angela's reflections suggest an intuitive rather than deliberate self-regulated response.

Both types of intuition (Raidl and Lubart 2001)—affective and cognitive—appear highly relevant to the creative teaching context. First, socioaffective intuition relates to Angela's creative empathy for her students' creative risk-taking, her understanding of students' motivational needs, and the choices she made to engage students with uncertainty and support them through the creative learning process. Second, applied intuition relates to her problem-focused solutions, such as how to fit creative work into a high school English class daily. She made choices through explicit self-regulatory monitoring and control, such as inviting students to "rebel productively" or asking them to stay in "learning pit." Other choices seem to have less deliberate control, reflecting a more "organic," subconscious process.

Another connection between the case study teachers' intuition and creative teaching emerges from the metaphors the teacher shared. Kolańczyk (1989) proposed that metaphors may be one of the most effective ways to activate intuitions by connecting concepts to experiences, emotions, and memories, often through subconscious associations. Recent research demonstrated teachers' creative meaning-making through metaphor about creative teaching and learning and use of metaphor for emotional processing through challenges, such as distance learning (Anderson et al. 2023). Angela used a variety of metaphors that express dimensions of her intuitive and self-regulatory approach, including: (a) using creativity "organically" as a metaphor for being less planned and structured; (b) for students to stay in the "learning pit" as a metaphor for the experience of frustration, ambiguity, and challenge; (c) encouraging students to "rebel productively" in their learning as a metaphor to diverge from her prescribed pathway to find their own, as long as it was purposeful; and (d) "unleashing creativity," "releasing it from the closet," or "[creativity] has just been hiding" as metaphors for drawing out students' latent creative potential. That last metaphor mirrors the metaphor used by one student—"she broke my shell open"—to describe the effects of the teachers' creative teaching. Integrating intuition into our understanding of teachers' CSR development presents an important future direction. Drawing from adult learning theory (Dreyfus and Dreyfus 1980), intuition may represent the strategic and emerging expert levels of CM on a novice-to-expert continuum, as past frameworks proposed for creativity (Lench et al. 2015).

These connections between intuition and CSR reflect the ongoing discourse in education on the nature of teacher agency (Cong-Lem 2021). Even when a teacher has developed the level of self-beliefs, CSR, and intuition for creative teaching and learning exhibited by Angela in this case study, her creative agency is dictated by cultural, structural, and material influences (Biesta, Priestley, and Robinson 2015), such as new curricular expectations forced by her district that cut into her time for creative teaching and learning. Findings from this study align to the multidimensional approach to teacher agency proposed by Biesta, Priestley, and Robinson (2015), where her agency was influenced at (a) the *iterational* level reactivating personal histories and experiences, (b) the *projective* level that considers possible futures of action, and (c) the *practical-evaluative* level to choose among possible actions in response to the complexities and ambiguities of a diverse classroom of adolescents. Even though her agency for creative teaching and learning faced barriers in students' hesitations and insecurities, she was able to successfully draw all of her students into the creative learning process. Future work should find guidance in models of teacher agency.

3.4 | Limitations

Generalizing from this case study to other contexts should be done with caution; readers might consider identifying components of this teachers' individual development that can be studied with other samples and contexts. A relevant area that was not considered in this study but warrants future development is how teachers' CSR in the classroom is connected to teachers' pedagogical content knowledge—both for their particular domain, such as English language arts, and for the domain of creativity. I chose to distinguish the role and development of CSR in the more intrapersonal side of creative teaching from the interpersonal side of facilitation of creative learning for students. Other researchers might consider additional ways to theorize and study CSR in the classroom and gather data sources that can reflect that process of CSR in action.

4 | Conclusion

Results from this case study help to validate and extend the CSR framework and CSR teacher profiles, developed in past research (Zielińska et al. 2024), within the context of long-term teacher development for creativity in the classroom. It is possible for teachers to transition from dysregulated to flexible approaches with sufficient support, training, and practice. Some level of CSR alongside some sense of agency may be essential for the risk-taking that creative teaching and facilitation of creative learning demands. Embracing a creative growth mindset as a beginner, accepting uncertainty, and preparing for the emotional vulnerability to not "really be a step ahead" of students may be key components for teachers to take these early steps. As this case study demonstrated, those early steps may lead to highly developed and intuitive approaches and have profound effects on unleashing student creativity inside and outside the classroom.

Acknowledgments

This research was supported by a grant from the U.S. Department of Education (U351D140063-17). All research followed human subjects research protocol and ethics, which was approved by an Institutional Review Board. There was no conflict of interest in this research for the author. Data will be made available to other researchers by the author upon request.

Conflicts of Interest

The author declares no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Endnotes

[1] See www.makespaceproject.org for more details about the program.

[2] As a case study, I did not conduct tests of statistical significance so these results are observed patterns only.

[3] Tableaux vivants means "living picture" and is a form of process theater where actors form a scene on stage through one or more frames that are silent and still (Anderson and Beard 2018).

[4] See research on writing anxiety across recent decades (Barwick, 1995).

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.