An Affective, Formative and Data-Driven Feedback Intervention in Teacher Education

Eric J. Mendelson[1] & Jody S. Piro[1,*]

[1]Western Connecticut State University, USA

*Correspondence: Western Connecticut State University, USA. E-mail: piroj@wcsu.edu

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Abstract

Educators and researchers have long contemplated the most effective ways to provide feedback to students, to build sustainable feedback practices, and to establish feedback literacy. While a considerable amount of research, theory, and practical approaches exist to support the effect of formative feedback practices, less research exists on the impact of affective elements related to feedback. This study set out to explore pre-service teachers' perceptions of a feedback intervention that included affective, formative, and data-driven aspects. A mixed-reality simulation environment was selected as the context for the study, and eight pre-service teachers performing in the simulation were selected as participants. This qualitative multicase study included three rounds of simulation observations, a feedback intervention, and interviews. Data were analyzed using a thematic analysis framework. Findings showed that the application of confirmation, empathy, and reciprocity in the feedback intervention prompted the development of helping relationships that promoted personal growth. Humanism became a useful framework for these emergent findings. In addition, findings included participants' preferences for formative feedback over data-feedback, particularly formative feedback that introduced engaging language, purposeful organization, and details and examples. Lastly, findings revealed participants' perceived personal growth in feedback literacy, especially in managing emotions and committing to the feedback process.

Keywords: feedback, feedback literacy, simulations

1. Introduction

This study centers on the well-researched conclusion that feedback has a powerful effect on student learning (Hattie 2009; Hattie & Clarke, 2019; Hattie & Timperley, 2007; Wisniewski, Zierer, & Hattie, 2020). While feedback has been shown to impact student learning and performance, there remains a wealth of unanswered questions when it comes to the impact of feedback practices. Hattie, Fisher & Frey (2016) offered that "getting teachers to provide feedback is relatively easy," but "getting students to receive that feedback is complicated" (p. 17). In fact, educators and students have dramatically different views on feedback given and received with teachers making assumptions about the impact of their feedback and students left confused about the specifics and intentions of feedback (Agbayahoun, 2016; Carless, 2006; Mulliner & Tucker, 2017; Murtagh, 2014; Robinson et al., 2013; Zhan, 2016). Moreover, students have reported significant dissatisfaction with the feedback they have been provided (Agbayahoun, 2016; Mulliner & Tucker, 2017; Nicol, 2010; Price et al., 2010). Frameworks exist to help guide effective feedback processes. An example of such a framework is Hattie's (2012) three feedback questions, which are as follows: (a) Where is the student going?; (b) How is the student going?; and (c) Where is the student going next? Hattie's framework is intended to focus on aspects of feedback including task, process, self-regulation, and self as a person (Hattie & Timperley, 2007). Recently, feedback practice has been explored to improve feedback literacy, or the capacity to seek feedback, process feedback, and act upon feedback. Molloy, Boud, and Henderson (2020) presented a framework for feedback literacy that includes commitment to feedback as a means for improvement, appreciation of feedback as an active process, seeking of feedback to improve learning, managing emotion in feedback, and acknowledging feedback as a reciprocal process.

In preparing prospective teachers for the classroom, some universities are taking advantage of mixed-reality simulations to provide simulated classroom experiences. These mixed-reality simulations provide an opportunity for pre-service teachers to practice classroom strategies outside of an actual classroom. In the simulation, a small group

of students, presented as avatars on screen and controlled by a virtual reality platform called Mursion™, interact with the pre-service teacher. The pre-service teacher can lead a lesson and the avatars will respond and engage as would real-world students. The course professor provides a scenario to Mursion™ that will guide the session, and the pre-service teacher is informed of the expectations. It has been argued that mixed-reality simulations have "the potential to bridge the theory-to-practice divide" and "provide a safe place to practice and to provide corrective advice" (Piro & O'Callaghan, 2019, p. 11). It has also been found that prospective teachers who engage in and are coached through mixed-reality simulations have improved in their performance (Cohen, et al, 2020). As well, these teachers are more likely to be engaged in teaching practices (Hartle & Kaczorowski, 2019), have increased their self-efficacy (Gundel et al, 2019; Gundel & Piro, 2021), and developed on their journey towards a professional identity (Piro & O'Callaghan, 2019).

Mixed-reality simulations provide a suitable avenue for exploring feedback practices, feedback literacy, and student perceptions of feedback processes. In addition to student dissatisfaction with feedback (Agbayahoun, 2016; Mulliner & Tucker, 2017; Nicol, 2010; Price et al., 2010) and divergent perspectives between teachers and students on feedback practices (Agbayahoun, 2016; Carless, 2006; Mulliner & Tucker, 2017; Murtagh, 2014; Robinson et al., 2013; Zhan, 2016), researchers have acknowledged the importance of emotions as a driver of feedback receptivity (Carless, 2006; Harris & Brown, 2013; Murtagh, 2014; Pitt & Norton, 2017). Pitt and Norton (2017) determined that emotional reactions play a critical role in determining how students will act on the feedback they receive, while Dowden, et al, (2013) found that "students' perceptions of written feedback are strongly mediated by their emotions and that the degree of support in the teaching and learning context influences their perceptions" (p. 357). Lastly, Carless (2006) noted that an awareness of the psychology of giving and receiving feedback is as important as the content of feedback itself.

Acknowledging the role that emotions play in the reception of and engagement with feedback, it is important to consider the ways in which educators care for students, particularly in feedback environments. Noddings (1984, 1988, 1994, 1995, 2005, 2012a, 2012b) provided a framework for care between teachers and students in her career-long exploration of care ethics. Care ethics provided a lens through which to view the role of emotions in feedback processes, particularly through the constructs of confirmation, empathy, and reciprocity. This study, therefore, set out to explore pre-service teachers' perceptions of multiple categories of feedback including data-driven, formative, and affective feedback within a mixed reality learning environment.

1.1 Theoretical Framework

In a synthesis of over 900 meta-analyses on the effect of feedback, Hattie (2012) determined that feedback has "one of the highest effects on student learning" (p. 18). Over time, scholars have studied and developed effective frameworks for delivering feedback (Brookhart, 2008; Burke & Pieterick, 2010; Hattie & Clarke, 2019). Less understood are student perceptions of specific feedback types and processes (Akkuzu, 2014; Dekker et al., 2013; Irwin, 2017; Mulliner & Tucker, 2017; Price et al., 2010), though it is established that teacher and student perceptions of feedback are significantly misaligned (Agbayahoun, 2016; Carless, 2006; Mulliner & Tucker, 2017; Murtagh, 2014; Robinson et al., 2013; Zhan, 2016). In addition, there is much to learn in the development of feedback literacy skills (Carless & Baud, 2018; Higgins & Hartley, 2002; Molloy, Boud, & Henderson, 2020; Nicol & Macfarlane-Dick, 2006; Sutton, 2012; Winstone, Mathlin, & Nash, 2019). Researchers (Carless & Baud, 2018; Molloy, Boud, & Henderson, 2020; Sutton, 2012) have touched on the affective, emotional, and ontological aspects of feedback, yet there is much to be explored in how students' emotions impact the uptake and effectiveness of feedback. While there is considerable evidence that feedback is effective in terms of improving student performance (Hattie, 2012; Wisniewski, Zierer, & Hattie, 2020), much is left unknown about student perceptions of various types of feedback (such as data-driven, formative, and affective feedback), the ways that affect and emotion impact feedback processing, and the ways that feedback literacy is developed. This theoretical framework addresses effective feedback, including feedback literacy, care ethics, and humanism as they intersect with the study in the context of mixed reality simulations in teacher education.

1.2 Effective Feedback as a Theoretical Foundation

Hattie (2007) proposed an effective feedback framework that includes three guiding questions as follows: (a) "Where is the student going?"; (b) "How is the student going?"; and (c) "Where is the student going next?" Asking *where the student is going* helps establish the student's particular goals for the task at hand. Asking *how is the student going* addresses the student's progress towards that goal and any adjustments to be made or strategies to be applied. Asking *where the student is going next* clarifies actions the student can take to improve in the future. Hattie and Timperley (2012) also addressed various types of feedback, including task feedback, process feedback, self-regulation feedback,

and self as a person feedback. Task feedback includes specific actions that a student can take to improve his or her performance (Hattie & Timperley, 2012). Process feedback provides strategies that students might use regarding how to go about improving (Hattie & Timperley, 2012). Self-regulation feedback includes feedback that helps improve the student's capacity to seek and process feedback and to self-assess (Hattie & Timperley, 2012). Finally, self as a person feedback, according to Hattie and Timperley (2012), includes praise and other comments regarding the student as an individual. Hattie's work has provided a solid foundation for an effective feedback process where educators support students as they consider the goals of a task, the strategies to succeed, and adjustments to be made for improvement in the future. For this study, an effective feedback framework also included feedback literacy. Feedback literacy is defined as "the understandings, capacities and dispositions needed to make sense of information and use it to enhance work or learning strategies" (Carless & Boud, 2018, p. 1316). Molloy, Boud, and Henderson (2020) provided a useful framework for developing feedback literacy that includes the following features: (a) commitment to feedback as improvement; (b) appreciation of feedback as an active process; (c) eliciting of information to improve learning; (d) processing of feedback information; (e) acknowledgement of and working with emotions; (f) acknowledgment of feedback as a reciprocal process; and (g) enacting outcomes of processing feedback information. In addition, Sutton (2012) conceived of three dimensions of feedback literacy. Those dimensions included the epistemological dimension of acquiring academic knowledge, the ontological dimension of learned identity, and the practice dimension of acting on feedback.

1.3 Care Ethics as a Theoretical Foundation

Noddings (1988, 1998, 1992) provided a comprehensive theory of care ethics which described caring relations as two parties in relation, both the carer and the cared for. The carer, according to Noddings, listens and observes and is receptive to the needs of the cared for (Noddings, 2005). The cared for simply receives this care, but Noddings (2012b) explained that without reciprocity or acknowledgement of care, the caring relation is not complete.

1.4 Humanism as a Theoretical Foundation

Rogers, founder of the Humanistic approach to psychology, conceived of a person-centered approach to therapy. Rogers (1951, 1961) described the conditions necessary to create a helping relationship that opens the possibilities for behavioral, cognitive, and emotional change. Rogers (1951) described a helping relationship as a confluence of the following conditions: (a) two persons are in contact; (b) the client is in a state of incongruence; (c) the therapist is congruent in the relationship; (d) the therapist experiences unconditional positive regard towards the client; (e) the therapist experiences an empathic understanding of the client's internal frame of reference; and (f) the client perceives conditions d and e. A state of incongruency implies that there is a discrepancy developed between the self as perceived and the actual experience of the organism (Rogers, 1951). On the other hand, the state of congruence refers to an individual's ability to revise his or her concept of self, bringing into congruence an accurate symbolization of experience and self-concept (Rogers, 1951). Rogers (1951, 1961) argued that a well-established helping relationship, one defined by trust, realness, empathy, and positivity can lead to the client's personal growth, which Rogers defined as a process of becoming, where the client replaces defensiveness or rigidity with openness to experience (Rogers 1951, 1961). Personal growth, Rogers (1951, 1961) articulated, includes being better able to experience feelings and manage emotions, increased acceptance of others, and an ability to self-actualize.

2. Methodology

2.1 Research Design

The research design was guided by Stake's (2006) framework. Stake (2006) presented a framework for qualitative multicase research studies that centers around an object or phenomenon to be studied called the quintain. The phenomenon of interest (or quintain) for this particular study was perceptions of an affective, formative, and data-driven feedback intervention in response to mixed-reality simulations. According to Stake (2006), the researcher seeks to understand each case that makes up the quintain. Individual cases have the following attributes: (a) cases are a noun, a thing, (b) cases are similar in some ways, (c) cases are studied in situations or conditions (Stake, 2006). In this study, the case was pre-service teachers. The situation or condition in common was that all pre-service teachers took part in mixed-reality simulations with a feedback intervention. In the qualitative multicase design framework, "the multicase research director starts with the quintain, arranges to study cases in terms of their own situational issues, interprets patterns within each case, and then analyzes cross-case findings to make assertions about the binding" (Stake, 2006, p. 10). There is a tension that often exists when moving between each single case and the quintain, where the single case and the quintain each vie for attention. Stake (2006) acknowledged this tension and called it the case-quintain dilemma (Stake, 2006). To address the case-quintain dilemma, an understanding of the

complexity and uniqueness of each individual case is consistently balanced with an understanding of the larger collection of cases (the quintain). This study aimed to understand what is similar and different about the individual cases to make substantive discoveries about the quintain (Stake, 2006).

2.2 Research Questions

The research questions were as follows:

1. What are pre-service teachers' perceptions of a feedback intervention containing affective, formative, and data-driven components in response to mixed-reality simulations?

2. How do pre-service teachers understand feedback literacy before and after mixed reality simulations that include a feedback intervention?

2.3 Description of the Setting and Participants

The setting for this study was a state university in a southern New England town in the United States. The university's population was 5,631, with 4,982 undergraduate students and 649 graduate students. Undergraduate students in the university's pre-service teacher preparatory program served as the population for this study. The pre-service teachers at this university studied to teach at various levels from elementary to secondary and participated in a variety of majors such as Music, Biology, and Elementary Education. The participants for this study were selected from a group of students enrolled in an intermediate-level education course where a mixed-reality simulation was featured as a teaching and learning tool. There were approximately 50 students enrolled in the course across three separate sections. Over the course of the semester, students participated in three simulation exercises in the Mursion™ simulation environment. Each Mursion™ mixed-reality session prompted pre-service teachers to build higher order thinking questions into lessons and student exchanges.

2.4 Sampling

To use purposeful sampling with the population (n=50), an intensity sampling strategy was applied to determine which participants might provide "information-rich cases that manifest the phenomenon of interest intensely (but not extremely)" (Patton, 1990. p. 171). A number of questions in the Pre-Sampling Questionnaire were intended to gauge interest and information rich cases. One question asked potential participants to gauge their interest in the study. Of the 14 sample cases selected in phase one, seven were "Very interested" and seven were "Somewhat interested." In addition, the Pre-Sampling Questionnaire posed three open-response questions that were used to gauge interest and "information rich cases." The first question asked each potential case to provide themselves with feedback regarding their previous Mursion™ simulation. The second question asked potential cases to describe experience receiving feedback in response to previous simulations (all potential cases had participated in the simulation in one or more previous education courses). The third question prompted potential cases to reflect on the role that school plays in their lives and goals regarding education. Reflective responses with specific examples were considered an ideal response and indicated interest and richness of information. Candidates who were very interested in the study and that provided comprehensive answers to the prompts were selected. While seven candidates responded "very interested," only six were selected as finalists, as one candidate did not provide robust answers to the two questions. Two candidates who marked "somewhat interested" were selected as those candidates provided quite comprehensive and detailed responses to the questions. A full review of the three questions served to further narrow down the population to the final sample ($n = 8$). A small n was intentionally chosen for this study as the small n allowed for a comprehensive intervention, detailed data collection, and in-depth data analysis, striking an ideal balance between breadth and depth. The final set of final participants can be found in Table 1.

Table 1. Sampling Phase Two Results

Respondent	Gender	Major	Grade Level	Interest
1	F	Science	Junior	Somewhat
2	F	Elementary Ed	Sophomore	Very
3	M	History	Sophomore	Very
4	F	Media	Sophomore	Very
5	F	Elementary Ed	Sophomore	Somewhat
6	F	Music	Sophomore	Very
7	F	History	Junior	Very
8	F	Elementary Ed	Sophomore	Very

2.5 Feedback Intervention—Purpose, Fidelity, and Content

The purpose of the feedback intervention was to deliver affective, formative, and data-driven feedback to participants. Over the course of the study, there were two opportunities to issue the Feedback Intervention, after the first simulation and after the second simulation. The Simulation Feedback Interventions were crafted using information gathered from a couple of instruments. The first intervention made use of Participant Insight and Pre-Simulation Questionnaire #1 and the Observational Protocol. The second intervention utilized Pre-Simulation Questionnaire #2 as well as the Observational Protocol.

Aligning with the research questions, the intervention was organized into three categories: data-driven feedback, formative feedback, and affective feedback. To achieve treatment fidelity, how well the treatment conditions conform to the researcher's specifications and goals (Gall, Gall, & Borg, 2003), the interventions were crafted using explicit components (Lane, et al, 2004). Those explicit components are discussed and illustrated below.

The data-driven feedback component pertained to the quantity and level of higher-order thinking questions. Participants were shown if a question asked in the simulation was considered higher-order, as indicated by a Yes or No. Next, participants were informed as to which level of Bloom's Taxonomy the question corresponded. Finally, participants were provided with a direct quotation from the simulation to provide evidence. Table 2 below shows an example of data-driven feedback as applied in the instructional intervention.

Table 2. Example of Data-Driven Feedback

HOT?	Bloom's Level	Evidence from Simulation
No	Level 1: Remember	"So today we are going to learn about non-reliable sources vs. reliable sources. Have you ever heard of that before?"
Yes	Level 5: Evaluate	"Yeah, can anyone tell me what parts make something reliable vs. not reliable?"
No	Level 2: Remember	"Have you ever heard of the website Wikipedia?'
Yes	Level: 5 Evaluate	Do you know why it's important to know the difference between the two (reliable vs. not reliable sources)?
	*Note: HOT refers to a higher-order thinking question that was or was not posed	

Regarding formative feedback, treatment fidelity was achieved by using a rubric to inform explicit categories. The rubric was adapted from the course syllabus, which contains a detailed rubric for the simulation assignment. The formative feedback intervention, based on the rubric, was organized into the following categories: (a) Opening, (b) Creates a Positive Environment, (c) Implements a Learning Task, (d) Elicits Student Responses, (e) Models Strategies, (f) Uses Formative Data, (g) Manages Flow, (h) Closure, (i) Classroom Management. In each category, participants were provided with detailed commentary on the topic as well as corresponding evidence from the simulation. Table 3 shows an example of one category of formative feedback.

Table 3. Example of Formative Feedback Category

Rubric Category	Feedback and Evidence from Simulation
OPENING: Candidate sets the purpose of the lesson with students.	"Good morning class. Today we are going to be talking about English. We're going to be talking about a story. Raise your hand if you know the story about Goldilocks and the Three Bears." At the opening of your lesson, be sure to set the purpose. You mention you will be talking about a story, but what are the students going to learn? What skills, etc.? Consider starting the lesson by quickly stating the purpose and goals. "Our goal today is to …"

Regarding affective feedback, treatment fidelity was achieved by limiting comments to those that fit the constructs of empathy and confirmation. Each participant was provided with 2-3 empathetic comments and 2-3 confirming comments. Table 4 illustrates the nature of the affective feedback as provided to participants. It is important to note that participants were not informed of any feedback being affective in nature, nor were they informed that the comments were based on the constructs of empathy and confirmation. Participants were only told that there were three different categories of feedback.

Table 4. Example of Affective Feedback

Type of Affective Feedback (researcher facing only)	Feedback and Evidence from Simulation (presented to participant)
Empathic	I performed in the simulation for my graduate courses at "The University" and I was so nervous and insecure about going in. It is hard to know what to expect, how the students are going to act and respond, what it will be like working with avatars, how to plan for a meaningful experience, and how to execute in a high-pressure situation in a limited time frame. I still have nightmares about the angry parent I had to work with as an administrator in the simulation. While I love school and working as a teacher, I also struggle with managing my stress. We have a lot in common in how we manage stress as we both look to music as a way to distract and soothe.
Confirming	If you were nervous or anxious, it didn't show. You came across as nothing but confident and in control. You have a true natural ability to be in front of students and obviously care deeply about the craft of teaching. I can tell that you want to teach children how to navigate the world as intelligent consumers of information, and that is so important. I really admire your choice of topic and your desire to teach children to be better citizens. It says a great deal about your reasons for being a teacher which seem to be about community and helping others. It makes me excited knowing that passionate teachers like you will be entering the field!

2.6 Instrumentation and Procedures

Instruments used in this study fall into two categories: Intervention-Related Instruments and Data Collection Instruments. Intervention-Related Instruments were used to collect information that would be applied in the feedback intervention. Data Collection Instruments collected data to be analyzed for results. Table 5 demonstrates the purpose and constructs for each instrument:

Table 5. Instrument Overview

Instrument Category	Intervention Instruments			Data Collection Instruments	
Instrument Name:	Participant Insight and Pre-Simulation Questionnaire #1	Pre-Simulation Questionnaire #2	Observational Protocol	Feedback Intervention Interview	Exit Interview
Instrument Type:	Questionnaire	Questionnaire	Observational Protocol	Interview Protocol	Interview Protocol
Constructs / Purpose	Effective Feedback Confirmation Empathy Caring Relations	Effective Feedback Confirmation Empathy Caring Relations	Effective Feedback Confirmation Empathy	Effective Feedback Confirmation Empathy Reciprocity Caring Relations Feedback Literacy	Effective Feedback Confirmation Empathy Reciprocity Caring Relations Feedback Literacy

Table 5. Instrument Overview(Continued)

Instrument Category	Intervention Instruments			Data Collection Instruments	
Purpose:	To gain insight into the personality, work and feedback habits, extracurricular life, challenges, and interests of each participant. To gain insight into the participant's understanding of the assignment, strategies to prepare, challenges, and conceptions of success.	To gain insight into the participant's understanding of the assignment, strategies to prepare, challenges, and conceptions of success. To gain insight into participant's response to previous feedback.	To take detailed descriptive and reflective notes on participant's simulation performance in relation to assignment; to inform feedback intervention	To gain insight into student perception of three categories of feedback, data, formative, and caring. To gain insight into participants' understanding of feedback literacy.	To reflect upon the entirety of the feedback process and experience in its totality. To reflect on previous feedback experiences in comparison to current feedback experience. To reflect on perceived development of feedback literacy.

2.7 Intervention-Related Procedure and Instruments

2.7.1 Participant Insight and Pre-Simulation Questionnaire 1The Participant Insight and Pre-Simulation Questionnaire #1 was issued to participants before the first simulation and served multiple purposes as follows:

1. Provide insight into the personality, feedback experiences, extracurricular life, challenges, and interests of each participant.
2. Provide insight into each participant's understanding of the simulation assignment, how they were preparing, as well as any anticipated concerns or challenges.
3. Prompt participants to reflect on their ability to self-assess or provide themselves with feedback.

2.7.2 Pre-Simulation Questionnaire 2

Pre-Simulation Questionnaire #2 sought information that would feed into both the formative and affective elements of the second feedback intervention. With the constructs of care ethics in mind, the Pre-Simulation Questionnaire #2 aimed to gather information that could be applied to the confirmation and empathy aspects of the feedback intervention. A sample question seeking this type of information included the following: What is going on in your life that may be presenting a challenge to your performance in the simulation or your school work in general? The Pre-Simulation Questionnaire #2 also aimed to gather information that could be applied to formative feedback based on Hattie's (2012) three feedback questions, Where is the student going?, How is the student going?, and Where is the student going next? An example of a question with this aim was, What have you been doing / have you done / will you be doing to prepare for simulation #2?

2.7.3 Observational Protocol

An observational protocol was used to gather data while reviewing participant simulations. The observational protocol included sections for affective, formative, and data feedback as orchestrated by the research questions. Affective feedback included comments in line with the care ethics constructs of confirmation and empathy. The formative feedback section was based on the assignment rubric which contained categories for features/expectations of the simulation exercise such as Opening, Implements a Learning Task, and Models Strategy. While the rubric played a significant role in the crafting of the observational protocol, the content entered into the protocol was guided by Van Solen's (2016) Crafting the Feedback Teachers Need and Deserve. Van Solen (2016) presented a framework for providing teachers with feedback that includes feedback that is highly descriptive and rich, that uses conditional language, and focuses primarily on actions and not assumptions. Table 6 provides an overview of all

interventions-related instruments, how they were disseminated and relevant dates.

Table 6. Procedures and Timeline for Intervention-Related Instruments

Instrument	Medium	Method to Disseminate	Date
Participant Insight and Pre-Simulation Questionnaire #1	Google Form	Link via email	February, 2021
Observational Protocol	Google Doc	Presented to participant during interview	February, 2021
Pre-Simulation Questionnaire #2	Google Form	Link via email	March, 2021
Observational Protocol	Google Doc	Presented to participant during interview	March, 2021

2.8 Data Collection Instruments

2.8.1 Feedback Intervention Interview ProtocolThe Feedback Intervention Interview Protocol was designed under the guidance of both Creswell (2013) and Rubin and Rubin (2012). Creswell (2013) recommended posing questions that are related to the study's research questions. Therefore, the interview questions for this study revolved around the three categories of feedback—affective, formative, and data-driven—as well as the student's own feedback literacy or ability to self-assess in a sustainable way. Rubin and Rubin (2012) encouraged interviewers to structure interviews by combining main questions, follow-up questions, and probes to achieve "depth and detail, vivid and nuanced answers, rich with thematic material" (p. 129). The purpose of the Feedback Intervention Interview Protocol was to gain insight into each participant's experience with, perceptions of, and application of the feedback intervention. The Feedback Intervention Interview Protocol was used after the first and second simulation sessions. After a short rapport building session, participants watched a recording of their simulation. They then provided themselves with some feedback. Subsequently, the researcher and participant reviewed the feedback intervention via a shared Google document. After the feedback review, the participant was asked a number of questions. Sample questions included the following:

1. What does this feedback tell you about your performance in the simulation? (c)
2. What does this feedback tell you about yourself as a person/student/teacher?
3. How useful is this feedback to you and why?
4. How does this feedback make you feel?
5. How will you specifically use this feedback moving forward?

At the end of the interview, participants were offered an opportunity to respond to the researcher/interviewer. This process, called reciprocity, was guided by Noddings' construct of reciprocity which she described as "the mutual recognition and appreciation of response" Noddings, 2012b, p. 53). At this time in the interview, participants were able to respond to the researcher, offering their opinions of the process, their appreciation, and their future goals.

2.8.2 Exit Interview

Table 7. Procedures and Timeline for Data Collection Instruments

Instrument	Medium	Method to Disseminate	Date
Feedback Intervention Interview Protocol	Video Conference	Verbal	February, 2021 March, 2021
Exit Interview	Video Conference	Google Slides/Verbal	April, 2021

The purpose of the Exit Interview was to gain a summative and reflective understanding of each participant's experience receiving the feedback interventions throughout the semester/simulation process. Again, the constructs of formative feedback and care ethics grounded the interview questions. In this final interview, the questions probed to discover which category of feedback (data, formative, affective) were most meaningful to the participant. Participants were also informed about the definition of feedback literacy as well as specific feedback literacy skill; they then reflected on their own feedback literacy growth throughout the process. In addition, participants were asked to describe their views on feedback (as both a student/learner and as a prospective teacher) and how those views may have changed throughout the process. Participants were also asked to describe the attributes of feedback

that worked best or appealed most to them. Lastly, participants had a chance, as they did after the first two interviews, to respond to the researcher through the action of reciprocity. As a final note, participants were asked to describe, in their view, the value of the opportunity for reciprocity. Table 7 describes an overview of the data collection instruments, how they were disseminated and relevant dates.

2.9 Data Analysis

Braun and Clarke (2006) suggest a 6-phase step-by-step structure for organizing and completing thematic analysis that was used for this study. For this study, phase one began immediately after the first round of interviews which took place in the first two weeks of February, 2021. All interviews took place via Zoom video conferencing and were recorded via the Zoom interface. A web-based transcription program, Ottr.ai, was then used to transcribe each interview. After each interview was transcribed by the software, the researcher simultaneously played back the interview recordings and reviewed the transcripts for accuracy. The same process took place for all interviews—Interview #2 in March of 2021, and Interview #3 in April of 2021. All interviews were preliminarily transcribed by the Ottr.ai application and checked for accuracy.

According to Braun and Clarke (2006), phase two of thematic analysis features generating initial codes. Here, the researcher codes interesting features in a systematic fashion across the entire data set (Braun & Clarke, 2006). In Phase Two, the transcripts and initial notes from Phase One were reviewed and organized into a list of initial codes. A total of 34 potential codes emerged through this review.

In Phase Three, codes were collated into potential themes, gathering all data relevant to each potential theme (Braun & Clarke, 2006), such as self-assessment, data feedback, formative feedback affective feedback past feedback. To organize potential themes and relevant data, a Google spreadsheet was used. In Phase Four, themes were checked in relation to coded extracts and the entire data set; as well, a thematic map of the analysis was generated (Braun & Clarke, 2006). In this phase, codes, themes, and extracts were reviewed for accuracy, redundancies, and for relevancy. Themes were also aligned to research questions.

In Phase Five, an analysis was performed to refine the specifics of each theme and the overall story the analysis tells; themes were clearly named and defined (Braun & Clarke, 2006). Phase Four themes were revisited and further combined and refined to better match methodology and research highlighted in the study. Aspects of Humanism, as described by Rogers (1951, 1961, Care Ethics as described by Noddings (1988, 1995, Effective Feedback as described by Hattie (2012, 2019), and Feedback Literacy as described by Molloy, et al, (2020) were applied as a means to organize, refine, and define themes. In Phase Six, compelling extracts were selected to represent each of the refined themes and related finding statements. A Google document was used to collect the most relevant, rich, and revealing excerpts and align them with research questions and finding statements.

3. Findings

Four major findings emerged: 1) Participants perceived that affective feedback fostered a helping relationship that led to personal growth, including improved self-concept and emotional state. 2) Participants preferred formative feedback over data feedback and had a strong preference for formative feedback strategies that include engaging language, purposeful organization, and details and examples. 3) Participants noted that while data-driven feedback served to validate essential tasks and skills, there were few opportunities for significant reflection using data-driven feedback alone. 4) Participants perceived personal growth in feedback literacy, particularly in managing emotions and committing to the feedback process.

3.1 Affective Feedback

Participants perceived that affective feedback fostered a helping relationship that led to personal growth, including improved self-concept and emotional state. The feedback interventions applied affective feedback strategies such as personal connections, empathy, and confirmation to generate an environment of realness as posed by Rogers (1961). In many cases, participants commented on and shared appreciation for the personal anecdotes included in the feedback intervention. The feedback intervention often included personal anecdotes about experiences in the simulation environment, experiences with learning challenges, and struggles balancing work and life obligations. Per the tenets of confirmation, the feedback intervention also included mention of participants' strengths in relation to their talent for teaching. Participants reported that the affective components included in the feedback intervention promoted and nurtured a connection that went beyond academic assistance and towards a helping relationship.

For instance, Bianca, a 19-year-old Elementary Education major, noted that the feedback intervention went beyond simple academic and career assistance and developed into a "lasting connection" (I-1). She explained: "[The

feedback intervention] helped me with my work, and my career, but [it] also created a lasting connection" (I-1). "And I think that is the takeaway of feedback," continued Bianca, "the connection." (I-1). Bianca found that the affective feedback "humanized" the feedback process because the intervention "took into account what's going on in our lives" (I-2). Bianca felt that the feedback illustrated "care" and that the process went beyond "I want you to improve" to being "fully supportive" (I-3).

Camila, a 19-year-old Elementary Education major, noted that taking courses during a pandemic was difficult, especially because "for college students right now, we don't have a lot of teachers cheering us on" (I-3). Since classes were all online due to the Covid-19 pandemic, Camila found that feedback had been limited to "Okay, you got a 9 out of 10, no comments or anything like that" (I-3). Camila explained that the comments in the feedback intervention made her feel as if she had a "cheerleader" or "someone in [her] corner" (I-3). "It is important when you're a teacher" she discovered, "to show your students you're human, too, because then you share a different connection with your students" where they are "not afraid of you or to tell you something" (I-3).

Melissa, a prospective elementary special education teacher, articulated the importance of empathy in the helping relationship when she discussed her experiences with ADHD in the classroom. "Most of my teachers don't really understand the whole anxiety and ADHD package; knowing that you have gone through similar things helps because you knew how to word certain things so I could understand" (I-1). Melissa, age 20, went on to describe the feedback intervention as "supportive and "caring" in nature, declaring, "I love that. It is so important" (I-3). Melissa, stressed the importance of empathy in the feedback process, noting that being able to relate helps foster a caring relationship.

In addition, participants perceived that affective feedback led to personal growth, including improved self-concept and emotional state. Personal growth includes tapping internal resources for altering self-concept, basic attitudes, and self-directed behaviors (Rogers, 1980).

For Steve, a History major and intended high school teacher, an affective feedback comment provided within the intervention (*You have a natural relatability as a teacher*) prompted him to recall a former teacher that he "wanted to be like" because that teacher was so "relatable" (I-2). Steve, age 19, followed this statement with a Star Wars allusion. He noted that the feedback given made him feel like Luke Skywalker. He felt "chosen" for this profession but recognized, like Luke Skywalker, that he needed to hone his skills: "If we wanted to talk in terms of Star Wars, it's like saying you have a lot of talent, but you got to get to really tuning it, understanding it, you know" (I-1).

Maggie commented that the confirming aspects of the affective feedback made her feel "more confident" and helped her recognize that she has "natural" talents as an educator. "The third category of feedback [affective feedback] made me realize that I was not as bad as I thought I was and that I have the qualities to be a teacher" (I-1). Maggie announced that the confirming feedback "definitely made [her] feel like [she] is in the right major now" (I-1).

Participants also perceived that the empathic elements of affective feedback positively impacted emotional state. As an example, Abbey acknowledged that the feedback intervention helped make her realize that much of her stress is "in [her] head" and that she is "harder on [herself] than [she] should be" (I-1), an excellent example of being in a state of incongruity. Abbey perceived the affective feedback as "helpful advice" that helped her "calm down" (I-2). The feedback reminded Abbey, "let's pull back and remember that you're a human; you're not perfect; none of us are perfect. We've all been here and it's okay" (I-1).

Camila responded to the affective feedback stating, "I was so nervous and insecure going in [to the simulation]" (I-2). When asked what she learned about herself through the affective feedback, Camila declared, "I am too nervous and need to relax and not doubt myself so much" (I-2). Camila found the affective feedback "useful" because it "makes you feel better about yourself, that [people] can be understanding and relate to you" (I-2). The affective feedback caused Camila to feel "acknowledged," and "proud for overcoming and persevering" (I-2).

Zoey went into the simulations quite worried that her stress, anxiety, and a physical ailment that prevented her from sleeping well would cause her to "lose herself, and lose control of the situation" (I-2). While she felt flustered in the simulation, the affective nature of the feedback intervention helped her realize that she "didn't really show it too much" (I-2). In fact, Zoey pointed out her realization that "everyone goes through something that throws them off" and "it's kind of encouraging because if everyone [goes though these things], I can do it too. It's fine" (I-2).

Participants reported that the affective nature of the feedback intervention helped to manage emotional states. Whereas all participants remarked that the simulations caused at least some anxiety and stress, each participant noted that the affective feedback helped to foster a helping relationship that improved self-concept, particularly participants' identities as developing teachers, and emotional state, quelling anxiety and boosting confidence.

3.2 Formative Feedback

Participants preferred formative feedback over data feedback and had a strong preference for formative feedback strategies that include engaging language, purposeful organization, and details and examples. Interview data suggested that feedback in the form of suggestions included offering the student potential options and ideas for improvement. In regard to suggestions as feedback, Sofie noted the power of words used in the feedback intervention such as *consider* or *think about*. As an example, Sofie shared, "[The feedback mentioned to] consider giving the students a 30-second warning rather than a hard end. I liked that because it makes me think about what would happen if you gave them a 30-second warning. Instead of just saying 'Next time do this,' it actually makes you think, oh, okay if I did that then the instructions would be more clear and specific" (I-2). Similarly, Camila offered the following: "I think suggestions are more appealing because it's not like I have to do exactly this; it's just a suggestion. It leaves room for me to change it and it's not as much pressure" (I-3). Finally, Zoey summed up her preference for suggestions, arguing, "It's like someone was saying, 'I wonder if you did this, what would happen,' instead of 'You should have done this,' which is not going to lead to success" (I-2).

Feedback in the intervention took the form of questions. Providing feedback in the form of questions prompted participants to take more ownership of the feedback as a means for improvement. Maggie contributed, "I like the questions. I feel like they get me thinking more about what I could do" (I-1). Abbey declared confidently, "I think questions really work in feedback. I feel like having questions in the feedback is like, 'Okay, I can see where you're going, but can you give me a little more" (I-1). "I really think the questions helped me to improve" Abbey mentioned (I-1). "[Questions] make you think back, to go back and say, 'Let me answer those questions now'" (I-1). Camila offered a fitting statement to sum up the impact of feedback in the form of questions: "[Questions] make you think about things that you wouldn't have without that question being there. So I find it really useful" (I-1).

Participants also displayed a clear preference for feedback that is conversational. When asked for their top three strategies for effective feedback, participants universally picked up on the conversational tone of the feedback. As a ground rule, Melissa asserted that she did not "like when people used big words" in feedback commentary as "they confused [her] sometimes" (I-2). Instead, Melissa preferred the conversational style of feedback used in the feedback intervention: "It's like having a conversation on paper," she said. "It's easy to understand" (I-2). Like all participants, Sofie found positivity to be an integral part of conversational language. "I think, right off the bat, no matter what, [the feedback was] very positive, even with constructive criticism. Camila found the conversational language "encouraging" because "it's balanced" (I-1). "It's important to have the good and the bad. It's like, 'Okay, you did this poorly, but you did a great job at this.' It's not all negative; it's constructive while still being encouraging" (I-1).

Participants maintained a strong preference for formative feedback that was purposefully organized. Purposeful organization of formative feedback, in this particular case, included feedback parsed into predetermined categories based on the simulation assignment rubric. For example, formative feedback was organized into categories like *Opening*, *Creates a Positive Environment*, *Manages Flow*, and *Closure*. All participants responded positively in one way or another to the organization of the feedback intervention.

When asked for three terms that described quality/effective feedback, participants universally discussed organization as a critical factor. For example, Bianca "liked how [the feedback] was broken up into bits and sectioned out by topics. It wasn't just one huge chunk, so it was more organized that way" (I-1). "It was kind of laid out like the pattern of the simulation."

Steve valued the "structured" organization of the feedback and how "each of [the categories] fed into the next" (I-3). Steve compared this organized approach to previous experiences with feedback where the feedback was often "jumbled around," where as a student he was "connecting the dots, which made it much harder" to process and act upon the feedback

3.3 Data Driven Feedback

Participants noted that while data-driven feedback served to validate essential tasks and skills, there were few opportunities for significant reflection using data-driven feedback alone.

The interview data showed that data-driven feedback did not fulfil participants' universal desire for in-depth feedback, though the information provided still had its benefits and usefulness. Validation of essential tasks and skills refers to participant perceptions of concrete evidence of academic performance. In this case, participants received feedback on the quantity and types of higher-order thinking questions posed during the simulation, a key component of the simulation exercise. The pre-service teachers interviewed for this study appreciated the evidence presented in the data-driven feedback as a reminder of the assignment's main task, which was to generate and ask

multiple higher-order thinking questions to facilitate student discussion. For example, Melissa pointed out that she "didn't write down" and "just ended up forgetting" many of the questions she posed in the simulation (I-1). The data-driven feedback provided a means to re-examine the higher-order thinking questions posed during the simulation. Sofie noted that data-driven feedback "is useful to me, because sometimes when you're in the moment, you kind of forget what actually happened. I forgot about some of the things that I actually did that I strategized" (I-1). "Once it's on paper," Sofie continued, "it really helps. Even though it's such little information, it kind of takes me back to remembering what I did" (I-1). Bianca articulated that data-driven feedback is "useful because it actually points out the evidence that I said it, whereas just saying, oh, you hit it, checkmark. But it actually guides me to where I did that, so I can ensure that I do it again" (I-1). While Bianca "didn't particularly like [data-driven feedback]," she found the information presented to be a useful "baseline" of "what [she] did" in the simulation regarding the key elements of Bloom's questioning (I-1). Participants also found that data-driven feedback validated that they are "doing the right thing.

Participants' perceptions of data-driven feedback were largely critical, pointing out a lack of opportunity for constructive reflection. Sofie, for example, described data-driven feedback as "bland" and continued, "It doesn't tell me what I did wrong. It doesn't help me think, why did I do that or what could I have done better?" (I-1). Maggie found data-driven feedback to be least useful, acknowledging that while the information provided is "to the point," the data-driven feedback did not include "any examples or more detailed information" such as suggestions for improvement (I-1). Like all of the participants, Bianca preferred "feedback where it's in depth" (I-1). Not being a "fan of rubrics, where they give you like a one through five and it doesn't really tell you why," Bianca pointed out that the data-driven feedback, like a rubric, was too "reliant on numbers" (I-1). When asked what she preferred, Bianca replied, "I prefer to hear, 'Okay, you did this right, you did this wrong, you could have done this.' That's how I learn, so not having the 'You could have done this'" made the data-driven feedback "too simple … not providing alternative things I could have done" (I-1). "I'm more of an in-depth learner," Bianca pointed out, echoing other participants (I-1). Overall, participants criticized data-driven feedback for lacking opportunities for constructive reflection, likening it, as Bianca shared, to "how someone would grade you on a quiz … just like, here are the facts. That's it. No feedback, no improvements" (I-2). Participants showed a clear desire for in-depth feedback that allowed for reflective opportunities for growth.

3.4 Feedback Literacy

Participants perceived personal growth in feedback literacy, particularly in managing emotions and committing to the feedback process. Feedback literacy includes processing and taking action in response to feedback. It also includes a person's ability to manage emotions in relation to feedback and commit to the feedback process (Molloy, Boud, and Henderson, 2020). Participants reported improved feedback literacy in two key areas, which are described in two the themes below: managing emotions in response to feedback and commitment to feedback as a process.

Participants universally reported feeling anxiety, stress, and fear in past feedback experiences. For example, Camila expressed that "previously, feedback was a scary thing," that revealed "everything you did wrong" (I-3). For Camila, much of the feedback she had received in the past was "negative" and "There was no way to really know where to improve" (I-3). "When it feels like you are being yelled at or doing something wrong," Camila shared, "nothing actually settles into your brain" (I-3). In this case, Camila makes an important point: if you are fearful of feedback, there is a good chance the feedback will have less impact.

Sofie announced, "I don't think I have ever gotten proper feedback until I started college" (I-3). Sofie revisited a period of time when, as a music student, she received "horrible feedback" that was "insulting." For Sofie, past feedback read as follows: "You did this wrong. I don't know what else to tell you. You just did it wrong. It was just criticism" (I-3). For Abbey, feedback can be "condescending" and "confusing" (I-1). "When I think back to rubrics and feedback from middle and high school, I'm like, what does this even mean?" (I-2). Melissa also found feedback to be "confusing," noting that "sometimes when [she] gets feedback, [teachers] use really big words and [she] just doesn't get it" (I-2). Melissa followed this statement up, recognizing that she felt intimidated to approach teachers about the feedback she received and often did not have a chance to clarify with teachers.

With these frustrations and stressors in mind, participants commented on how their ability to manage emotions in response to feedback has been altered through the feedback intervention process, particularly through affective feedback. For Sofie, the "empathetic and encouraging aspects in the feedback process … "let [her] know that, yes, [she] does have things to fix, but be happy about the positive things [she] accomplished" (I-3). When asked how participating in the feedback intervention impacted her feelings around feedback, Sofie declared:

> The main point I am trying to get at is that I was always very hard on myself. That is a hard habit to break,

> especially with feedback because you want to be perfect. You want to be the best you can be in hearing from people, but it's not only the way the feedback is said, it is how you interpret it. Typically, I would take a critical comment straight to negativity, but being able to include myself in feedback, and reflecting upon feedback, I think feedback is an important tool to have. Getting feedback in this way, I think it's more healthy in terms of your state-of-mind, your mental health. (I-3)

Camila gave advice to teachers in her response: "If you're in a situation where you are providing feedback, you need to point out what [the student] did that was good or great. That would be a big part in breaking the fear behind feedback" (I-3). Engaging in the feedback process helped Camila realize that "Not all feedback is negative," "It's not a bad thing" (I-3). "So, I feel like what [the feedback intervention] taught me is that when I become a teacher feedback should be more of a conversation, not just writing on a piece of paper" (I-3).

Melissa noted a significant decrease in anxiety when it comes to feedback. In her final interview, Melissa noted how she "gets really anxious" when receiving feedback and therefore "can't focus" (I-3). After the feedback interventions, Melissa recognized that using this particular feedback experience as a "guide," she "will not be as anxious as she was before" when receiving feedback (I-3).

Participants perceived an increase in commitment to the feedback process and described a renewed appreciation for what feedback has to offer. For instance, when asked how her experience with feedback has changed because of the feedback interventions, Abbey explained that her "appreciation for feedback has grown" (I-3). She continued, pointing out a new mindset when it comes to feedback, noticing that "Right after [she] finished the [simulation] session," she found herself automatically asking more self-reflective questions like "What could I have done differently?" Similarly, Camila noticed how her commitment to feedback went beyond the classroom: "[The feedback] is really useful because I am also able to use it outside the simulations, which is really beneficial because we can use it in other classes or like when we have an interview or something we are preparing for" (I-2). Maggie revealed that her "commitment to feedback is changed now" because now she knows feedback can be more than "a few words on a piece of paper," but "engaging and beneficial" so that "it will help [her] in the future" (I-3).

4. Discussion

There are several implications for theory and recommendations for practice. If helping relationships can lead to personal growth, researchers and theorists may consider looking more deeply into how helping relationships can be developed via coaching and feedback interventions. Researchers may explore, more exclusively and specifically, the types of affective feedback that are most impactful in building relationships and improving self-concept and emotional state. Researchers and theorists may consider determining the most effective ways for teachers to develop the skills to provide impactful affective/humanistic feedback.

In a turn towards Humanism, educators and pre-service teachers may emphasize the potential for feedback to impact students' personal growth in addition to academic growth. Teacher preparation programs may consider explicitly training pre-service teachers in the value/practice of affective feedback in the development of all students. Educators might also consider the role that affective feedback can play in developing relationships with students, potentially learning to improved student self-concept and emotional state.

Noddings (1998) contended that caring teachers are, most importantly, "interested in the development of fully moral persons" (p. 222). Confirmation, empathy and reciprocity play a key role in developing caring relationships (Noddings, 1998). If caring teachers are, most importantly, interested in the development of fully moral persons, an area of theory that needs development is to explore what factors play into teachers' and pre-service teachers' willingness or capacity to include aspects of confirmation, empathy, and reciprocity into feedback and instruction. Educators may want to apply the constructs of empathy, confirmation, and reciprocity to their practices via feedback and other classroom strategies. Teacher preparation programs may help pre-service teachers develop their capacities for confirmation, empathy, and reciprocity.

The current study lends to a body of work that is exploring the discrepancies between teacher and student perceptions of feedback practices. Theorists may use these findings to improve formative feedback practice. If the three questions—where is the student going?, how is the student going?, and where is the student is going next?—need to be answered in order to provide effective feedback, the field may want to consider a fourth question in order to provide caring feedback—How is the student feeling? Teacher educators may consider applying the strategies outlined in this study (engaging language, purposeful organization, and conversational language) to improve feedback to students. Teacher educators may consider infusing a fourth question—How is the student

feeling?—into their practice, particularly through feedback interventions.

If participants perceived improved feedback literacy in some elements of Molloy, Boud, and Henderson's (2020) framework (commitment, appreciation, and working with emotions), researchers and theorists may want to explore means for students to improve in all aspects of the framework. Focusing on the ontological dimensions of feedback, researchers and theorists may consider the role that providing a caring/affective feedback treatment plays in the development of an educator's professional identity. If teacher education programs use the Molloy et al. framework to help pre-service teachers develop their awareness of feedback literacy, pre-service teachers would then be able to master this framework and apply the framework for their own students. Lastly, teacher preparation programs might consider the explicit development of affective feedback skills to promote the development of pre-service teachers' professional identities.

A consistent thread runs through each of the findings, implications, and recommendations. That thread is the affective dimensions of feedback and how these dimensions impact pre-service teachers. With increased focus on data as a means for improving student and teacher performance, a return to humanism may be called for, where pre-service teachers are educated in the skills of building feedback literacy through affective elements, educators include affective components in their feedback interactions with students, and students gain access to increased self-concept and improved emotional state though engagement with affective feedback.

5. Limitations of the Study

Limitations of the study include two key factors. First, the study was site-specific, taking place at a single university in a program for preservice teachers. Second, the study made specific use of mixed-reality simulations to engage with participants in their learning and provide feedback. With those factors established, it is important to note that the study results were not generalizable. While participants were aware that they were being observed, it is possible that participants perceived events differently because of being observed. As another limitation, participants may have perceived improvement in either simulation performance or feedback literacy as a result of participating in the process repeatedly and taking part in the act of the feedback intervention. While forming a helping relationship was a natural consequence of the feedback process, a limitation could be that the participants were not as forthcoming or truthful since they may not have wanted to damage a positive relationship.

6. Conclusion

The present study was a qualitative multicase study (Stake, 2006) that explored participants' perceptions of affective, formative, and data-driven feedback and feedback literacy in response to mixed-reality simulations. Participants engaged in three cycles of mixed-reality simulations with corresponding feedback interventions. The feedback interventions focused on affective, formative, and data-driven components. Affective components included confirmation, empathy, and reciprocity. Formative components were guided by two main sources, Hattie's (2009) conception of three foundational feedback questions (Where is the student going? How is the student going? Where is the student going next?) as well as the organizational rubric that supplemented the simulation exercise and assignment in the intermediate-level teacher education course where the study took place. A total of three interviews took place and data were analyzed using procedures described by Braun and Clarke (2006). Four major findings emerged; each finding corresponded to implications and recommendations. First, participants perceived that affective feedback fostered a helping relationship that led to personal growth, including improved self-concept and emotional state. We recommend that teacher educators and pre-service teachers are explicitly trained in the value and practice of affective feedback. Second, participants preferred formative feedback over data feedback and had a strong preference for formative feedback strategies that included engaging language, purposeful organization, and details and examples. While it is useful to encourage teacher educators to include in their feedback engaging language, purposeful organization, as well as details and examples, it may be more valuable to consider a more affective feedback approach. Engaging language, purposeful organization, and details/example help facilitate Hattie's (2009) three feedback questions (Where is the student going? How is the student going? Where is the student going next?). Not included in these formative feedback questions is a potential fourth question that addresses the affective nature of feedback: How is the student feeling? We recommend that teacher educators and pre-service teachers include this fourth question in their feedback and classroom practice repertoire. Third, while data-driven feedback served to validate essential tasks and skills, participants noted few opportunities for significant reflection using data-driven feedback alone. We recommend that teacher educators consider the value of adding affective and reflective components to data-driven feedback. Last, participants perceived personal growth in feedback literacy, particularly

in managing emotions and committing to the feedback process. Teacher education programs might consider using various frameworks to develop their teacher educator's awareness of and capacity to teach feedback literacy. In addition, teacher preparatory programs might consider the explicit development of affective feedback skills to promote the development of pre-service teachers' professional identities. In summary, findings encourage teacher educators, teacher preparatory programs, and pre-service teachers, especially those working with mixed-reality simulations, to consider the value of affective approaches to feedback.

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