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The Nonverbal Expression of Emotions Project

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Abstract

In settings where dialogue may be limited, the use of nonverbal cues is important to convey emotions. This is especially the case in the classroom. Research suggests that nonverbal expressions of emotion between educators and students impact the classroom environment and correlate with positive learning outcomes. This study aims to examine how nonverbal expressions of emotion affect the self-esteem of those in the classroom setting through use of adjustable social battery lapel pins. These pins display a range of emotion options and users are instructed to select the option that most closely represents their emotional state. Though previous research links emotional intelligence to classroom proficiency, few studies have explored the impact of using tools to express nonverbal emotions. We hypothesized that using the adjustable lapel pin would improve students' self-esteem and confidence, as well as increase emotional recognition interpersonally and among peers. The study also explored if emotional awareness and classroom confidence can be affected by use of the pins. Following a mixed-methods approach, we utilized an explanatory sequential design. For the quantitative strand of the study, pre- and post-tests were conducted to measure emotional intelligence (Schutte Self Report Emotional Intelligence Test), self-esteem (Rosenberg Self-Esteem Scale), and classroom confidence. For the qualitative strand, participants engaged in focus groups and one-on-one interviews to share their experiences with the lapel pins. The results from this research suggest that instructional modality matters, with students in conversation-based classrooms feeling more of an impact on self-esteem and emotional recognition, compared to those in more traditional lectured-based classrooms. Student-professor relationships were also shown to be positively influenced by the pins. Overall, these findings suggest that the use of physical tools to represent emotional states, benefit both students and educators.

Introduction

Nonverbal Emotional Expression

Social interactions and emotional regulation are closely tied to the ability to perceive and interpret emotional expressions. Emotional intelligence (EI), defined as the ability to identify, understand, and regulate one's own emotions as well as the emotions of others, plays a critical role in this process. Emotional intelligence (EI) has emerged as a central concept in psychology, leadership, and organizational behavior. Emmerling et al. (2008) introduced a term referred to as "academic emotions"—emotions directly related to academic learning, achievements, and classroom-based instruction (Emmerling et al. 2008). Terms such as 'academic emotions' help reinforce the idea that students experience a wide range of emotions in the classroom.

Nonverbal cues are essential when conveying emotion, especially in settings where dialogue isn't always possible (Wahyuni, 2018). One such setting is the classroom. Nonverbal expression, in simple terms, is *"everything but words"* (Hall et al., 2019). Nonverbal cues are encoded and decoded. Encoded behavior is displayed by the sender and is then decoded by the receiver. Nonverbal emotional expression heavily relies on how the message is perceived and decoded by the receiver (Hall et al., 2019). Interpretation of nonverbal cues often happens quickly, unconsciously, and is not always accurate (Hall et al., 2019). Because of the unconscious nature of decoding, it can be difficult to accurately portray and receive nonverbal expressions of emotion. This study focuses on nonverbal emotional expression in the classroom and aims to examine the impact of emotional expression tools on the classroom experience.

The Classroom Experience

The classroom setting and both students' and instructors' experiences in the classroom impact well-being (Ahmad et al., 2017). Previous literature has shown the importance of the classroom experience. Fostering an environment of openness and acceptance is crucial for students' well-being, both personally and academically, as evidenced in a 2017 study by Ahmad et al. This study found that students' commitment to learning was significantly correlated with learning comfort, highlighting the impact of classroom environment on students' academic outcomes (Ahmad et al., 2017). An important aspect of the classroom experience is the student-instructor relationship. Students are more likely to interact with teachers who have positive traits (Komarraju et al., 2010). When interactions with faculty were positive, students found learning to be more enjoyable. They also experienced positive learning outcomes, including confidence in their academic skills, and showed both intrinsic and extrinsic motivation in the classroom (Komarraju et al., 2010). Nonverbal expressions of emotion can heavily influence the classroom environment, especially because cues are quickly interpreted, which leaves them prone to misinterpretation (Hall et al., 2019).

Students who are among others from the same cultural contexts can more accurately perceive one another's emotions than those from other cultures, giving them an *"in-*

*group advantage" (*Emmerling et al. 2008). This supports the notion that the perception of emotion, especially non-verbal expressions, to the best accuracy is not universal to all members of a classroom. Research has long explored the relationship between emotional intelligence and other aspects of social cognition, particularly the interpretation of nonverbal emotional cues such as body language and facial expressions. Although the connection between emotional intelligence, personality, and nonverbal emotion perception is still under investigation, studies have indicated that personality traits influence emotional awareness and interpretation. A notable contribution in this area comes from Edgar et al. (2012), who examined how personality traits like extraversion and openness, alongside emotional intelligence, impact an individual's ability to interpret nonverbal emotional cues. The study involved a diverse sample of undergraduate students, postgraduate students, and working professionals. Emotional intelligence was evaluated using a modified version of the Schutte Self-Report Emotional Intelligence Scale (SSREI), consisting of 41 items rated on a 5-point Likert scale. The research design included "encoders," who expressed emotions, and "decoders," who observed and rated the emotional expressions. Decoders evaluated the emotional stimulus clips using naturalistic stimuli and a computer-based trace tool to assess the intensity of the emotions in real time. The findings revealed a gender difference in emotional decoding, with females demonstrating greater accuracy in interpreting emotional expressions compared to males.

The expression of emotions, when true, typically occurs after the said emotion is experienced. However, in an academic setting, those emotions hold complexity and variability. As a result, Reinhard Pekrun (2006) introduces the *control-value theory of achievement emotions* as an analysis framework for the predecessors and effects of the emotions experienced in academic settings. Pekrun (2006) defines *achievement emotions* as emotions that are directly related to achievement outcomes and activities. These emotions can be seen as momentary and situational to a specific point in time, or they can be habitual, as these emotions are recurring concerning individual experiences with their academic activities and their outcomes. Both positive and negative emotions can drain cognitive resources by directing attention toward the emotional stimulus, which suggests that they may deplete the resources required for task-related activities and hinder cognitive performance that depends on those resources. Pekrun further suggests how research on emotion is important for educational reform. It is implied through the control-value theory that emotions can affect a student's academic achievement and personality development. Therefore, because emotions are crucial in psychological well-being, they should be deemed educational outcomes as they stand.

Student-Instructor Interaction

The interaction between students and instructors sets the tone for the classroom experience and the well-being of both parties (Ahmad et al., 2017). Instructors provide a mentor-style relationship to students, and students often seek support from faculty mentors (Komarraju et al., 2010). Emotion plays an important role in the way students and instructors interact and is crucial in developing a relationship between them. During instruction, there can be very few opportunities for students and instructors to interact and communicate emotion verbally; therefore, nonverbal emotional expression is

essential (Wang et al., 2018). Approachability and mutual respect are important aspects of the student-instructor relationship. A 2016 study by Hagenauer et al. found that when interpersonal relationships between students and instructors were strong, students felt that instructors were approachable, and positive emotions were displayed more intensely by instructors (Hagenauer et al., 2016). As mentioned earlier, students have better outcomes when exposed to positive emotions rather than negative ones. There is also a strong relationship between the use of nonverbal communication and student success. When instructors display nonverbal expressions of emotions, student motivation and academic performance are positively impacted (Bambaeero & Shokrpour, 2017). The benefits of strong student-instructor relationships are undeniable, and nonverbal communication is essential in creating and strengthening these relationships.

Purpose

The purpose of this study was to examine the relationship between nonverbal expressions of emotion and self-esteem in the classroom setting. We also aimed to examine the relationship between the use of the social battery pins (see Figure 2) and emotional awareness and recognition. We had several hypotheses in relation to the anticipated effects of the social battery pins:

H1: Use of the social battery pin will influence the self-esteem of those in the classroom setting.
H2: Use of the social battery pin will increase emotional awareness in respondents.
H3: Use of the social battery pin will increase emotional recognition of others.
H4: Use of the social battery pin will increase classroom confidence in respondents.

Per the university guidelines involving research with human subjects, the study fits the criteria for IRB exemption.

Methodology

Quantitative Procedures

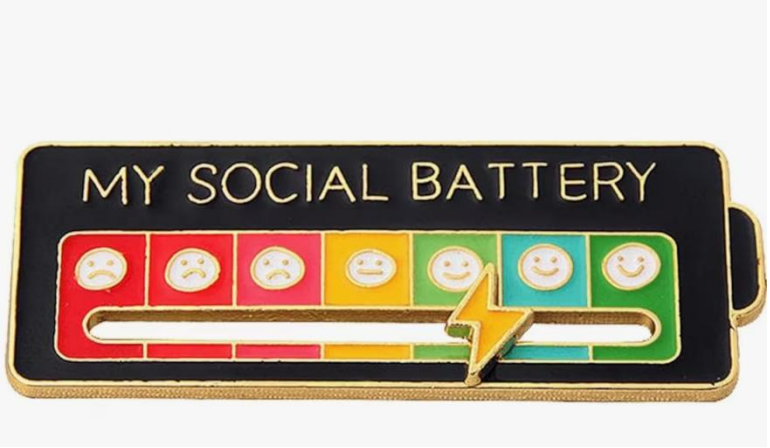
This was a mixed-methods study. The quantitative strand of this study followed a pre-experimental design using a one-group pretest-posttest design, illustrated in Figure 1 below. Pre-experimental study designs such as this one use elements of experimental design but don't include all elements of quasi-experimental or experimental designs. This study did not include randomization and the use of a control group. The qualitative strand of this study followed a focus group and one-on-one interview design. Participants in *Health Psychology* and *Health Science Research Methods* at the University of North Carolina at Asheville were asked to complete a pretest, which included the *Schutte Self-Report Emotional Intelligence Questionnaire* (SSEIT), the *Rosenberg Self-Esteem Questionnaire* (RSE), and additional questions about classroom confidence. After completing the pre-test, students were asked to wear the social battery pins on a visible part of their clothing during class time for two weeks. Classes were held twice per week for 100 minutes each. Immediately following the final class session of the treatment, participants were asked to complete a post-test, which was a slightly modified version of the initially administered survey. The instructors of

each class also wore the social battery pin on their clothing but did not complete the pretest and posttest. Students were then invited to participate in focus groups and in-depth one-on-one interviews at a later date. One instructor participated in an interview after the two-week intervention.

Figure 1: Pre-experimental study design

Group (R)	**Pretest (O)** *Schutte Self-Report Emotional Intelligence Test* (SSEIT) and *Rosenberg Self-Esteem Questionnaire* (RSE)	**Treatment (X)**	**Posttest (O)** *Schutte Self-Report Emotional Intelligence Test* (SSEIT) and *Rosenberg Self-Esteem Questionnaire* (RSE)

Figure 2: Adjustable Social Battery Lapel Pin



Quantitative Strand Participant Profiles

A total of 34 undergraduate students in a spring semester *Health Psychology* course and *Health Science Research Methods* course at the University of North Carolina at Asheville participated in this study.

Quantitative Instruments

Several instruments were utilized in the quantitative strand of this study. The pretest included several demographic questions: gender identity, race/ethnicity, and academic standing. We incorporated the *Schutte Self-Report Emotional Intelligence Test* (SSEIT) and the *Rosenberg Self-Esteem Scale* (RSE). The Schutte Scale utilizes 33 questions and measures emotional intelligence in four categories: perceiving emotions, managing emotions, facilitating emotions, and understanding emotions. The questions follow a Likert Scale ranging from 1 to 5, with larger numbers representing higher emotional intelligence. The SSEIT has a Cronbach's alpha score of 0.87 (Schutte et al., 1998). This score indicates good internal validity. The Rosenberg Scale measures self-esteem with 10 questions. The questions follow a Likert scale ranging from 1 to 4, with larger numbers representing higher self-esteem. The RSE has a Cronbach's alpha score of 0.83, which represents good internal validity (Rosenberg, 1965). Additionally, we included our questions about classroom confidence to gauge students' feelings of

comfort and confidence in the classroom setting. After the two-week intervention, we administered a slightly altered version of the pretest. If participants answered yes to the classroom confidence questions, a drop-down question appeared, asking if they felt this outcome was a result of wearing the social battery pin.

Qualitative Procedures

A total of three focus groups were conducted, engaging students in a semi-structured facilitator-guided discussion. The purpose of this discussion was to gain insight into participants' understanding of emotions and non-verbal emotional expression, while also opening the floor to participants allowing them to share their experience with wearing the social battery pins as students in a classroom setting. To conduct these sessions, the facilitator administered 13 open-ended questions to the participants. Allowing them to elaborate on their understanding and experiences of the concept.

One-on-one interviews were also conducted in person, using the same 13 questions that were used in the focus groups, allowing the participant to share their individualized experiences with wearing the social battery pins, as well as their understanding of emotions and non-verbal expressions of emotions.

Before all focus groups and interviews began, participants were asked to sign a consent form. All participants were informed that there would be voice recordings for note-taking purposes and that the data collected would be kept anonymous and secure. All focus groups and one-on-one interviews were recorded using a physical recording device; this audio data was then transcribed using *NVivo* software and printed into physical copies for researcher use. Data triangulation was used for one-on-one interviews and focus groups with the implementation of one facilitator and one observer. The observer was positioned in another room with a two-way mirror that participants were not made aware of to reduce bias. This method allowed the observers to take notes based on movements, expressions, and anything else not collected by the recording device. Both the facilitator and the observer utilized the physical recording device so that notes made by the observer would have time stamps that would match the audio data collected by the facilitator.

Qualitative Strand Participants

We gathered qualitative data through focus groups and one-on-one interviews with participants. A total of 28 students across two classes at the University of North Carolina at Asheville participated in focus groups and one-on-one interviews. Three focus groups and three one-on-one interviews were conducted. Students in *Health Psychology* classes participated voluntarily, and students from *Health Science Research Methods* participated as part of an experiential learning activity.

Qualitative Instruments

The qualitative strand of this study utilized a semi-structured interview approach, with a set of questions designed by the researchers to encourage students to share their unique experiences with the social battery pins. Students were asked a set of 13 questions but were heavily encouraged to delve into their own perspectives. Several examples of questions from the 13-question guide are shown below:

1. “What words come to mind when you think about expressing emotions?”
2. “What has been your experience when it comes to expressing emotions? Is it something you find easy to do, or do you feel safe?”
3. “When expressing emotions, are you more comfortable verbalizing them, or do you prefer nonverbal expression?”
4. “What was your experience with wearing the social battery pin? How did you feel? What feelings emerged?”

a. “Did you find the slider to be a useful tool?”

b. “Were there any instances where you found yourself adjusting the slider throughout class?”

5. “How did your recognition of your own emotions change when wearing the social battery pin?”
6. “How was your confidence in the classroom affected while wearing the social battery pin?”

The purpose of this guide was for the facilitator to ask open-ended questions that would encourage the participants to share their honest experiences and thoughts on using the social battery pins and the non-verbal expression of emotion. Utilizing focus groups and one-on-one interviews allowed us to gather the qualitative data needed to expand on the quantitative data collected from the pre- and post-tests, therefore allowing us to better interpret the data.

Discussion and Results

Demographic Profile of Quantitative Findings

Table 1: **Pretest** Participant Demographics

Gender Identity	N%
Woman	17 (50%
Man	14 (41.2%)
Non-binary	2 (5.9%)
Prefer to describe	0 (0%)
Prefer not to say	1 (2.9%)
Total	**34**

Race/Ethnicity	N%
American Indian, Alaska native, or First Nations	1 (2.9%)
Asian	2 (5.9%)
Black or African American	8 (23.5%)
Hispanic or Latinx	4 (11.8%)
Native Hawaiian or Pacific Islander	0 (0%)
Middle Eastern or North African	0 (0%)
White	24 (70.6%)
Prefer to describe	0 (0%)
Prefer not to say	1 (2.9%)
Total	**34**

Academic Standing	N%
Underclassman	15 (44.1%)
Upperclassman	19 (55.9%)
Total	**34**

Table 2: **Posttest** Participant Demographics

Gender Identity	N%
Woman	14
Man	(58.3%)
Non-binary	8 (33.3%)
Prefer to describe	2 (8.3%)
Prefer not to say	0 (0%)
	0 (0%)
Total	**24**

Race/Ethnicity	N%
American Indian, Alaska native, or First Nations	2 (8.3%)
Asian	0 (0%)
Black or African American	6 (25%)
Hispanic or Latinx	3 (12.5%)
Native Hawaiian or Pacific Islander	0 (0%)
Middle Eastern or North African	0 (0%)
White	18 (75%)
Prefer to describe	0 (0%)
Prefer not to say	0 (0%)
Total	**24**

Academic Standing	N%
Underclassman	8 (33.3%)
Upperclassman	16 (66.6%)
Total	**24**

Table 3: Mean, SD, Range for SSEIT Pretest

Question	Mean	SD	Range
Perceiving emotions	**3.607**		
C5: I find it hard to understand the nonverbal messages of other people. *	2.38	0.91	1.0-5.0
C9: I am aware of my emotions as I experience them.	4.12	0.72	1.0-5.0
C15: I am aware of the nonverbal messages I send to others.	3.74	0.82	1.0-5.0
C18: by looking at their facial expressions, I recognize the emotions people Are experiencing.	4.24	0.77	1.0-5.0
C19: I know why my emotions change.	3.65	0.80	1.0-5.0
C22: I easily recognize my emotions as I experience them.	3.79	0.72	1.0-5.0
C25: I am aware of the nonverbal messages other people send.	4.29	0.67	1.0-5.0
C29: I know what other people are feeling just by looking at them.			
C32: I can tell how people are feeling by listening to the tone of their voice.	4.12	0.76	1.0-5.0
C33: It is difficult for me to understand why people feel the way they do. *	2.09	0.85	1.0-5.0
Managing emotions	**3.617**		
C2: When I am faced with obstacles, I remember times I faced similar obstacles And overcame them.	3.94	0.87	1.0-5.0
C3: I expect that I will do well on most things I try.	3.71	0.86	1.0-5.0
C10: I expect good things to happen.	3.59	0.83	1.0-5.0
C12: When I experience a positive emotion, i know how to make it last.	3.44	0.85	1.0-5.0
C14: I seek out activities that make me happy.	4.24	0.73	1.0-5.0
C21: I have control over my emotions.	3.56	0.81	1.0-5.0
C23: I motivate myself by imagining a good outcome to tasks I take on.	3.91	0.78	1.0-5.0
C28: When I am faced with a challenge, I give up because I believe I will fail. *	2.26	1.04	1.0-5.0
C31: I use good moods to help myself keep trying in the face of obstacles.	3.91	0.70	1.0-5.0
Facilitating emotions	**3.788**		
C1: I know when to speak about my personal problems to others.	3.76	0.88	1.0-5.0
C4: other people find it easy to confide in me.	4.29	0.62	1.0-5.0
C11: I like to share my emotions with others.	3.15	1.26	1.0-5.0
C13: I arrange events others enjoy.	3.50	0.78	1.0-5.0
C16: I present myself in a way that makes a good impression on others.	3.91	0.57	1.0-5.0
C24: I compliment others when they have done something well.	4.26	0.74	1.0-5.0
C26: when another person tells me about an important event in his or her life, I almost feel as though I have experienced the event myself.	3.38	1.06	1.0-5.0
C30: I help other people feel better when they are down.	4.06	0.64	1.0-5.0
Understanding emotions	**3.995**		
C6: some of the major events of my life have led me to re-evaluate what is important And not important.	4.53	0.50	1.0-5.0
C7: When my mood changes, I see new possibilities.	3.79	0.83	1.0-5.0
C8: Emotions are some of the things that make my life worth living.	3.88	0.76	1.0-5.0
C17: When I am in a positive mood, solving problems is easy for me.	4.21	0.58	1.0-5.0
C20: When I am in a positive mood, I am able to come up with new ideas.	4.06	0.54	1.0-5.0
C27: When I feel a change in emotions, I tend to come up with new ideas.	3.50	0.85	1.0-5.0

Total respondents: N=34
*notes that the item is reverse-coded

Table 4: Mean, SD, and Range for SSEIT Posttest

Question	Mean	SD	Range
Perceiving emotions	**3.676**		
C5: I find it hard to understand the nonverbal messages of other people. *	2.46	1.08	1.0-5.0
C9: I am aware of my emotions as I experience them.	4.08	0.81	1.0-5.0
C15: I am aware of the nonverbal messages I send to others.	3.92	0.81	1.0-5.0
C18: by looking at their facial expressions, I recognize the emotions people Are experiencing.	4.21	0.64	1.0-5.0
C19: I know why my emotions change.	3.67	0.90	1.0-5.0
C22: I easily recognize my emotions as I experience them.	3.79	0.87	1.0-5.0
C25: I am aware of the nonverbal messages other people send.	4.21	0.71	1.0-5.0
C29: I know what other people are feeling just by looking at them.	3.71	0.93	
C32: I can tell how people are feeling by listening to the tone of their voice.	4.25	0.60	1.0-5.0
C33: It is difficult for me to understand why people feel the way they do. *	2.46	1.29	1.0-5.0
Managing emotions	**3.74**		
C2: When I am faced with obstacles, I remember times I faced similar obstacles And overcame them.	4.08	0.70	1.0-5.0
C3: I expect that I will do well on most things I try.	3.71	0.73	1.0-5.0
C10: I expect good things to happen.	3.83	0.85	1.0-5.0
C12: When I experience a positive emotion, i know how to make it last.	3.63	0.81	1.0-5.0
C14: I seek out activities that make me happy.	4.46	0.50	1.0-5.0
C21: I have control over my emotions.	3.79	0.87	1.0-5.0
C23: I motivate myself by imagining a good outcome to tasks I take on.	3.79	0.96	1.0-5.0
C28: When I am faced with a challenge, I give up because I believe I will fail. *	2.29	1.17	1.0-5.0
C31: I use good moods to help myself keep trying in the face of obstacles.	4.08	0.76	1.0-5.0
Facilitating emotions	**3.90**		
C1: I know when to speak about my personal problems to others.	4.08	0.70	1.0-5.0
C4: other people find it easy to confide in me.	4.17	0.62	1.0-5.0
C11: I like to share my emotions with others.	3.21	1.08	1.0-5.0
C13: I arrange events others enjoy.	3.83	0.90	1.0-5.0
C16: I present myself in a way that makes a good impression on others.	4.04	0.61	1.0-5.0
C24: I compliment others when they have done something well.	4.29	0.61	1.0-5.0
C26: when another person tells me about an important event in his or her life, I almost feel as though I have experienced the event myself.	3.46	0.87	1.0-5.0
C30: I help other people feel better when they are down.	4.13	0.60	1.0-5.0
Understanding emotions	**4.0**		
C6: some of the major events of my life have led me to re-evaluate what is important And not important.	4.33	0.75	1.0-5.0
C7: When my mood changes, I see new possibilities.	3.75	0.88	1.0-5.0
C8: Emotions are some of the things that make my life worth living.	4.17	0.90	1.0-5.0
C17: When I am in a positive mood, solving problems is easy for me.	4.21	0.58	1.0-5.0
C20: When I am in a positive mood, I am able to come up with new ideas.	4.08	0.70	1.0-5.0
C27: When I feel a change in emotions, I tend to come up with new ideas.	3.46	0.96	1.0-5.0

Total respondents: N=24
*notes the item is reverse-coded

Table 5: Mean, SD, and Range for RSE Pretest

Question	*Mean*	*Standard Deviation*	*Range*
RSES 1 (P): On the whole, I am satisfied with myself	3.03	0.62	1.0-4.0
RSES 2 (P): I feel that I have a number of good qualities	3.21	0.47	1.0-4.0
RSES 3 (P): I am able to do things as well as most people	3.00	0.59	1.0-4.0
RSES 4 (P): I feel that I am a person of worth	3.15	0.55	1.0-4.0
RSES 5 (P): I take a positive attitude toward myself	3.06	0.68	1.0-4.0
RSES 6 (N): I certainly feel useless at times.*	2.53	0.74	1.0-4.0
RSES 7 (N): At times I think I am no good at all.	2.41	0.81	1.0-4.0
RSES 8 (N): I wish I could have more respect for myself.*	2.47	0.92	1.0-4.0
RSES 9 (N): All in all, I am inclined to think that I am a failure.*	1.79	0.80	1.0-4.0
RSES 10 (N): I feel I do not have much to be proud of. *	1.88	0.87	1.0-4.0

N=34
*notes that the item is reverse-coded

Table 6: Mean, SD, and Range for RSE Posttest

Question	*Mean*	*Standard Deviation*	*Range*
RSES 1 (P): On the whole, I am satisfied with myself	3.17	0.55	1.0-4.0
RSES 2 (P): I feel that I have a number of good qualities	3.21	0.58	1.0-4.0
RSES 3 (P): I am able to do things as well as most people	3.13	0.60	1.0-4.0
RSES 4 (P): I feel that I am a person of worth	3.29	0.61	1.0-4.0
RSES 5 (P): I take a positive attitude toward myself	3.04	0.68	1.0-4.0
RSES 6 (N): I certainly feel useless at times.*	2.42	0.81	1.0-4.0
RSES 7 (N): At times I think I am no good at all.*	2.46	0.87	1.0-4.0
RSES 8 (N): I wish I could have more respect for myself.*	2.25	0.72	1.0-4.0
RSES 9 (N): All in all, I am inclined to think that I am a failure.*	1.88	0.83	1.0-4.0
RSES 10 (N): I feel I do not have much to be proud of. *	1.83	0.80	1.0-4.0

N=24

*notes the item is reverse-coded

Discussion of Quantitative Findings

Table 3 (pretest) and Table 4 (posttest) display the mean scores for the *Schutte Self-Report Emotional Intelligence Test* (SSEIT). Pretest-posttest comparison of mean values can be found in Table 11 in the appendix. The mean scores reflect that participants had moderately high emotional intelligence. Participants viewed themselves as very capable of understanding emotions, and slightly less capable of perceiving, managing, and facilitating emotions. In both the pre and posttest, the 'understanding emotions' category yielded the highest mean score, while the 'perceiving emotions' category yielded the lowest mean score. This result is unexpected, as perceiving emotions is viewed as the most basic of the four categories (Schutte et al., 1998). In each category (perceiving, managing, facilitating, and understanding) there was an increase in the mean scores between the pretest and the posttest. The 'perceiving emotions' category increased from 3.607 to 3.676. The 'managing emotions' category increased from 3.617 to 3.74. The 'facilitating emotions' category increased from 3.768 to 3.90. Lastly, the 'understanding emotions' category increased from 3.995 to 4.0. This suggests that students' self-reported levels of emotional intelligence increased during the two-week social battery pin intervention. Based on these findings, *H2: Use of the social battery pin will increase emotional awareness in respondents* and *H3: Use of the social battery pin will increase emotional recognition of others were supported*.

Table 5 (pretest) and Table 6 (posttest) display the mean scores for the *Rosenberg Self-Esteem Scale* (RSE). Pretest-posttest comparison of mean values can be found in Table 12 in the appendix. The mean scores reflect moderately high levels of self-reported self-esteem in participants. There was an increase in mean scores between the pretest and the posttest, with participants responding more positively to eight out of ten questions on the scale. This suggests that participants' self-esteem increased in the two-week social battery pin intervention. Based on this finding, *H1: Use of the social battery pin will influence self-esteem of those in the classroom setting* is supported.

However, when asked on the posttest and in focus groups and one-on-one interviews if differences in classroom confidence and self-esteem were a result of the social battery pins, a majority of participants did not attribute their classroom confidence and feelings of value to the pins. This raises an interesting question about the impact of the social battery pins and presents opportunities for future research.

Demographic Profile of Qualitative Findings

Table 7: Focus Group and One-On-One Interview Demographics

Gender	N%
Woman	14 (50%)
Man	12 (42.9%)
Non-binary	2 (7.1%)
Prefer to describe	0 (0%)
Prefer not to say	0 (0%)
Total	**28**

Race/Ethnicity	N%
American Indian, Alaska native, or First Nations	1 (3.6%)
Asian	0 (0%)
Black or African American	8 (28.6%)
Hispanic or Latinx	3 (10.7%)
Native Hawaiian or Pacific Islander	0 (0%)
Middle eastern or North African	0 (0%)
White	21 (75%)
Prefer to describe	0 (0%)
Prefer not to say	0 (0%)
Total	**28**

Academic standing	N%
Underclassman	13 (46.4%)
Upperclassman	15 (53.6%)
Total	**28**

Coding and Analyses

We analyzed the data by searching for themes within participant responses. Direct quotes from participants were used to support these themes.

Focus Group Themes

Several themes emerged during the semi-structured focus groups. The most prominent theme amongst participants was that their expression of emotions depends on the situation and context that they find themselves in. Students noted that the level of comfort they feel around an individual or group impacts how they display emotions. The more comfortable they are, the more expressive they become. One participant stated, *"...if I know you better, then probably I'm going to be more expressive. But if I don't*

know you, then I'll wait until I know someone, and then I'll be expressive towards them." This speaks to the vulnerability of emotions and how certain settings, such as a classroom, don't necessarily allow for comfort in verbalizing emotions. Classroom environments should foster openness and participation in order to allow students to feel comfortable in expressing emotions in the classroom (Ahmad et al., 2017).

Another theme brought up in the focus groups is the lack of change in classroom confidence. Students didn't feel as though the use of the social battery pins impacted how they felt in the classroom. This supports our findings from the post-test that was administered after the intervention. Participants who responded 'yes' to classroom confidence-related questions were then asked if their affirmative answer was a result of wearing the social battery pins. A significant number of students answered that their classroom confidence and feelings of belonging and value were not a result of wearing the social battery pins. Based on these findings, H4 (use of the social battery pin will increase classroom confidence in respondents) was not supported. Perhaps confidence in the classroom is impacted by factors other than emotional expression.

Focus group participants also stated that they did not pay attention to their classmates' social battery pins during class time. If they did view their peers' pins, it was in a small group setting when classroom instruction involved small group work separate from whole class discussion. One student said, *"I feel like I don't really notice anyone else's pins either…if I did, it was more of 'okay, we're sitting in a group, and it's right in front of my face."* Many participants mentioned how the size of the pin impacted if and when they viewed their classmates' pins. Others said they didn't want to draw attention to other students' social battery pins because of the personal nature of emotions.

Lastly, participants conveyed that they viewed the social battery pins as an opportunity for an *"emotional check-in"* at the beginning of class time. Even if they didn't find themselves moving the slider throughout the class period, many students mentioned that the initial act of attaching the pin to their clothing helped them recognize how they were feeling at that moment in time. One student said that the pins aided in *"...mindfulness at the beginning of class."* Students also stated that it was significantly easier to adjust the slider on the pin at the beginning of the class period, and they often forgot about the pin as class progressed. The nature of the class also had an impact on whether and when the slider was moved.

Nature of the Class

Another common theme taken from the focus groups was that participants believed that the modality of the class mattered when utilizing the social battery pins. Participants described the *Health Science Research Methods* class as being lecture-based, whereas the *Health Psychology* class was described as a conversation-based class. Participants found that while nonverbal expressions are most used in a lecture-based classroom, the social battery pins would be easier to implement in a conversation-based class where students are actively engaged with one another often. Sadiq (2022) states, "Teaching and learning are processes that generate a wide range of emotions in both students and lecturers, which are often kept private and not expressed in the classroom." He

continues by stating that while verbal feedback may be warranted, the communication or expression of the emotional experience is not typically discussed. This supports the theme amongst focus group participants that the nature of the classroom plays a role in students ability to properly utilize physical tools for nonverbal emotional expression.

Table 8: Focus Group Themes

Factor	Description	Example Quote	Example Quote
Expression of emotion depends on the situation	Participants discussed how they feel about their experience when it comes to expressing emotions, as prompted by the facilitator. Inferring that student's feel more comfortable expressing their emotions when they are around people they know.	"I just feel like it definitely has to do with who I'm around. So, like, if I know you better then probably I'm going to be more expressive. But if I don't know you, then I'll wait until I know someone and then I'll be expressive towards them."	"...I'd say from my personal experience of, like, being on a sports team here, like, I feel like I can be really expressive around my teammates and whatnot. And if I'm in a classroom setting, I tend to not as much."
Class modality matters	Participants shared that the nature of the class changed their experience with the social battery pins. Participants in a lecture-based classroom setting felt that the pins would be more useful in a conversation-based class. Those in a conversation-based setting felt that the pins worked well with their classroom culture.	"But yeah, I think it's just the culture in the classroom already."	"I think I feel more comfortable with nonverbal in a classroom setting, especially in a lecture class."
No change in classroom confidence	Although students had other opinions on the use of a social battery pin, they seemed to come to a consensus that confidence was not a factor affected by the pin.	"I don't think it changed my confidence, but I do think it motivated me to like, to just be. I mean, I guess because I have kids and my life is more chaotic, like it's helpful to just put myself there because my kids benefit from it. So I just saw it as motivating from that."	"No. Not really… I feel like it could be more useful in, like, more of a social setting."

Didn't pay attention to classmates' pins	When prompted by the facilitator, students claimed that they did not experience an increase in their confidence as a result of wearing the social battery pins.	"...I don't think I was, kind of because I also felt like it was like a personal thing to me, and I didn't want to, like, look or make anyone feel like, "oh, they're looking at my thing," or possibly someone feel like shame if they weren't feeling like happy or they were having a rough start to their day."	"Yeah, I feel like I don't really notice anyone else's pins either. And like, if I did like, like you said, like it was more of like, okay, like we're sitting in a group and like, it's right in front of my face."
Pins helped as an "emotional check-in"	Even if students preferred verbalizing their emotions, the social battery pins were a helpful tool for students to think about how they are feeling in that moment in order to put it on the pin.	" I think, when I first go to put it on, yes. And then like as class progressed, I'd kind of either forget it was there or I'd recognize like one other time. So like at the beginning it was easier. But then as time passed, not as much."	"I think it's nice to have it like putting it on to assess yourself a little bit. I think that would probably be the most valuable version of this for me. It's just a great way to think about how I'm feeling mindfulness at the beginning of class."

One-On-One Interview Themes

A common theme was that participants claimed to experience an increase in awareness during their time utilizing the social battery pins. They showed greater attentiveness to their classmates out of curiosity about who was wearing the pins and the reasons they may have chosen the emotion that they presented on the clothespin.

Another common theme that arose is that participants preferred to express their emotions verbally; however, they found that a tool such as the social battery pin was helpful for them to be able to think more about how they feel and to visualize it. In the same context, it was also revealed that the situation in which the emotions are expressed does change these opinions. Participants found that it added a sense of control for them in settings like these; they were allowed to express emotions differently, or they could express their emotions in a place that they prior did not think about.

Participants noted that their relationship with their professor was positively influenced during the implementation of the social battery pins. They found that it was helpful to use during long class periods when emotions can change either for the good or the bad

during that time. Participants also found that they felt more connected to their professors, especially during the times that their professors were participating as well. However, it is important to note that some of the participants believed that the length of the experiment was not long enough. Perhaps their thoughts about utilizing the social battery pins would have been different if they were able to participate for longer than two weeks.

Table 9: One-On-One Interview Themes

Factor	Description	Example Quote	Example Quote
Awareness	The facilitator asked participants if they found themselves paying attention to their classmates' social battery pins. More often than not, students found themselves looking around to see how their classmates were feeling at least once.	"So, yeah, I paid attention to who put them on. And then just kind of keeping my eyes on the room and the flow, the energy of the room."	"You're sitting there and he's talking, and I'm like, just looking around, and you wonder, like, what made them put it there?"
Strengthened relationship with professor	With the conversation-based class, students reported that while their professor already prioritizes emotional well-being, the social battery pin was a beneficial tool in that context. Whereas the lecture-based class, because there is less conversation, the student felt that while a connection was not being made verbally, it was internalized by seeing the pin.	"I think she was very open to it, as you know. Professor is incredible; I think it gives her a tool to also know how to engage, like who to be gentle with and things like that…definitely a relationship-building tool."	"It made me feel more equal to him… I think it made everyone equal in a way, because we were all participating."
Comfort/ease in verbalizing emotions, but depends on the situation	Multiple statements made by the participants stated that they think being able to openly express emotions depends on	"Definitely verbalizing. And I think that's based on my life experience of being misunderstood and things like that. I think words for me	"I like to think that I feel comfortable verbally expressing things, but in terms of a classroom setting or something, before this

	where they are and who they are around.	make me feel a little bit more in control of the narrative… I want to be understood."	experiment I didn't really think to express my emotions in any way, verbally or nonverbally.
Length of experiment	Due to the length of the experiment being only two weeks long, which is four total class sessions per class. Students found that there was not enough time to form proper opinions.	"I wish we could have done it for longer, but I know the hurricane affected that."	"In my personal experience it went really fast…"

Professor Interview Themes

A few notable themes emerged when understanding one of the participating professors' points of view. They noted several flaws with the tool. Most importantly, the participant claimed that the social battery pins are too small to be seen, especially from the students in the back of the classroom. The participant also stated that because the social battery has two fasteners to the clothing, it feels too "intense" to do every single class. However, the participant stated that because tools like this are important, something larger that sits on the student's desk could be easier.

Although flaws were a theme, another common theme was that the social battery pin became a conversation starter for the class, as it caused a buzz among students as they were collecting their pins to use. The participant also noted that it was a helpful tool to pause and ask students to reflect on how they are feeling currently and have the space to describe those feelings.

Table 10: Professor Interview Themes

Theme	Description	Example Quote	Example Quote
Conversation starter	The participant described the classroom atmosphere after the social battery pins were passed out. They described the pins as being a conversation starter and a way for students and instructors to check in with themselves.	"...there seemed to be kind of like an interesting buzz when they first picked it up, you know, because it's kind of a conversation starter in a way, or it gets you thinking, and it kind of gets you in the, in the room and in the moment. You have to pause and be like, Where am I?"	"...it was a nice moment because it's like pausing as I ask my students to do, pausing and checking in and describing where they're at."

Pin Faults	The participant made these statements after the facilitator asked for their experience with the pins. It was common to hear that students had issues with the structure of the social battery pin.	"It was hard to see them because they were small, especially if someone was in the back of the room."	"Um, it was a little intense with the two stickies, but I noticed that, like, the little slider moved on its own."

Limitations

This pre-experimental research study is subject to multiple limitations. The first and most important limitation is the length of the experiment. Due to the damage caused by Hurricane Helene, our research was set back from the length of an academic year to the length of an academic semester. Therefore, we were unable to conduct a pilot study to address potential issues before the study was conducted on a larger scale. Another limitation is the duration of the intervention. The intervention was conducted over two weeks, with each class meeting four times. Students who were absent on any of those days had less time with the social battery pins and may have had a different experience had they participated in the full intervention. Furthermore, there is a potential volunteer bias, as some participants in the focus groups and one-on-one interviews chose to participate voluntarily to provide qualitative feedback; others who participated did not decide to sign up voluntarily yet used class time to do so. Moreover, there was limited transferability of qualitative findings due to the specificity of this study's context, as the sample size was relatively small and only taken from two classes in total. Therefore, the data used is not a representative sample of college students as a whole or representative of the entire student population from the University. Additionally, since focus groups were conducted, there is a potential for social desirability bias. Moreover, there was a recognizable attrition bias (participant dropout), as the pre-test had a response rate of 34, whereas the post-test had a response rate of 24. In order to maintain confidentiality, we were unable to identify which students took either one test or the other, or both; so, there is the risk of skewing the data in respect to the loss of respondents.

Threats to Internal and External Validity

One threat to internal validity is attrition bias (participant dropout). Ten participants filled out the pretest but not the posttest, dropping our population from 34 to 24. Another possible threat to internal validity is testing, as the same questions were asked on the pre-test and the post-test; the quantitative outcomes could be influenced by the familiarity of the testing procedure. Lastly, selection bias is a possible threat to internal validity. One of the classes that participated in the study was a *Health* Psychology course. Students in this class may be more attuned to emotional recognition, which

could skew results. Due to the pre-experimental nature of this study, the threats to external validity can involve the possible limitation of the generalizability of quantitative data and the transferability of qualitative data. In this case, the threats could occur through the risk of sampling bias that can happen when the population being tested may not be an accurate representation of a larger scale due to specificity. Time-related factors, such as the approach of spring break, may influence the motivation of participants.

Conclusion

Our findings suggest that the use of a physical tool to non-verbally express emotions in the classroom setting can be a valuable tool for students and instructors. A tool of this nature has the potential to increase the quality of student-instructor relationships, which have been shown to be crucial regarding wellbeing (Bambaeero & Shokrpour, 2017). This tool can aid in removing the confusion and inaccuracies that come with decoding and encoding of nonverbal emotional expression (Hall et al., 2019). The social battery pins provide a bridge between verbal and nonverbal forms of emotional expression. They also encourage openness in the classroom setting, which contributes to comfort in the classroom. Comfort has been shown to correlate to learning commitment in students (Ahmad et al., 2017). The qualitative and quantitative data support several of our hypotheses. While classroom confidence may not have increased as we hypothesized, self-esteem, emotional awareness, and emotional recognition were positively impacted through the use of the social battery pins. Given the moderate success of the social battery pins in such a short amount of time, this study provides possibilities for future research.

Directions for Future Research

Given the limitations, there are several potential directions for future research. We found that technological advancements should be considered and implemented for future research to best fit the needs of the students and the professors participating. For example, as stated by a participant in a one-on-one interview, the nonverbal emotional expression tool should preferably be larger and perhaps placed on the participants' desks. Future research should include a larger and more diverse sample size to produce feedback on a larger scale. Furthermore, based on feedback from participants, a direction for future research could be to examine the relationship between nonverbal emotional expression and class modality, e.g., lecture-based classes and conversation-based ones. Lastly, this study only employed a pre-experimental design, which has several limitations. Future research should employ a fully experimental design to combat these limitations.

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Appendix

Table 11: SSEIT Pretest-Posttest Comparison

Category	Pretest Mean	Posttest Mean
Perceiving Emotions Items	3.607	3.676
Managing Emotions Items	3.617	3.74
Facilitating Emotions Items	3.768	3.90
Understanding Emotions Items	3.995	4.0
Total Scores	127.32	129.21
N	**34**	**24**

Table 12: RSE Pretest-Posttest Comparison

Question	Pretest Mean	Posttest Mean
RSES 1 (P): On the whole, I am satisfied with myself	3.03	3.17
RSES 2 (P): I feel that I have a number of good qualities	3.21	3.21
RSES 3 (P): I am able to do things as well as most people	3.00	3.13
RSES 4 (P): I feel that I am a person of worth	3.15	3.29
RSES 5 (P): I take a positive attitude toward myself	3.06	3.04
RSES 6 (N): I certainly feel useless at times.*	2.53	2.42
RSES 7 (N): At times I think I am no good at all.	2.41	2.46
RSES 8 (N): I wish I could have more respect for myself.*	2.47	2.25
RSES 9 (N): All in all, I am inclined to think that I am a failure.*	1.79	1.88
RSES 10 (N): I feel I do not have much to be proud of. *	1.88	1.83
Total Scores	19.35	20
N	**34**	**24**

*notes that the item is reverse-coded

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