

EXPLORING EMOTIONAL REGULATION AMONG YOUNG CHILDREN DURING CODING ACTIVITIES: A QUALITATIVE CLASSROOM OBSERVATION STUDY

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ABSTRACT

Early childhood is a critical stage of development during which children acquire fundamental skills, including the ability to regulate their emotions. Through daily interactions with teachers, peers, and family members, children gradually learn to recognize, express, and manage their emotions. However, young children may experience difficulties in managing their emotional responses when they encounter challenging or frustrating situations. This study aimed to explore how young children respond to and regulate frustration when encountering difficulties during coding activities. Data were collected through naturalistic observations over a two-week period in a coding classroom involving 14 children aged 4–8 years. The observational data were analyzed using thematic analysis to identify recurring patterns in children's emotional expressions and emotional regulation strategies. The findings indicated that frustration frequently occurred when children encountered difficulties during coding activities, particularly technical problems such as slow-loading websites and challenges in completing their coding projects. Children demonstrated various emotional expressions, including verbal expressions of frustration, impatience, rough movements, and withdrawal from the situation. They also demonstrated emotional regulation strategies such as seeking teacher assistance and returning to the activity after calming down. The findings highlight the role of teachers in supporting young children's emotional regulation through responsive guidance and supportive classroom practices.

Keywords: Early Childhood Education, Emotional Regulation, Frustration, Coding Activities, Classroom Observation, Qualitative Study.

INTRODUCTION

Early childhood is an important period for emotional development. At an early age, children undergo important development in character, basic skills, and cognitive, emotional, and social abilities, which provide a foundation for future learning (Atiasih et al., 2023). Children gradually learn to recognize, express, and manage their emotions while interacting with adults, peers, and their learning environment. Emotional regulation is particularly important because children frequently encounter situations that require them to manage frustration and continue participating in activities.

Emotional regulation refers to the ability to manage emotional responses in ways that support goal-directed behavior (Thompson, 2019). Brackett (2019) emphasizes that emotional regulation is a learned capacity that develops through guidance, modeling, and practice. Although children's temperament may influence their emotional reactivity, their ability to manage and recover from emotional responses develops over time. Supportive interactions with adults can therefore provide children with opportunities to develop and practice emotional regulation skills.

Emotion regulation and stress coping are closely related but conceptually distinct processes (Gross, 2009). Emotional regulation refers to the processes through which individuals influence the emotions they experience, including when emotions arise and how they are experienced and expressed (Gross, 1999, p. 275). Children's emotional expression develops in relation to their ability to regulate emotions and is strongly influenced by the support provided by caregivers.

Emotional expression refers to the observable ways children communicate or display their emotional states, such as verbal complaints, crying, facial expressions, or physical movements. In contrast, emotional regulation refers to how children manage or respond to their emotional experiences, such as waiting, seeking assistance, calming down, or returning to an activity after becoming frustrated. Distinguishing these concepts is important when observing children's responses to challenging situations.

Frustration is a natural part of everyday experiences, and learning to cope with it is an essential skill for children's development. According to Torres (2021), children's interactions with their environment affect how they manage frustration, with practical strategies that can be used at home and in the classroom. Reyes (2022) highlights the importance of children recognizing and expressing positive and negative emotions without suppressing negative feelings, emphasizing collaboration between home and school. Coding activities can create challenges, such as technical problems, slow-loading websites, or unexpected results, providing opportunities to observe children's frustration and emotional regulation.

Although children's emotional regulation has been examined through questionnaires and interviews, fewer studies have explored children's emotional responses and regulation through direct classroom observation, particularly during technology-based learning activities. Naturalistic observation can provide insight into how children express and manage frustration within their everyday learning environment. Therefore, this study explores how young children express and regulate their emotions when encountering frustration during coding activities.

RESEARCH METHODS

This study employed a qualitative research design using classroom observation as the primary method of data collection. Qualitative research is a methodology for scientific inquiry that emphasizes the depth and richness of context and participants' voices in understanding social phenomena. This approach is constructive and interpretive (Lim, 2023), aiming to explore the "what," "why," "when," "where," "who," and "how" (5W1H) underlying social behaviors and interactions rather than merely quantifying their occurrence. Qualitative methods help researchers understand human behaviors and interactions by exploring people's beliefs, perceptions, and actions. They provide a deeper understanding of the different characteristics and complexities of these behaviors and interactions (Lim et al., 2023). In this study, the teacher also served as the researcher and conducted classroom observations to gain an in-depth understanding of children's emotional responses and regulation strategies in the classroom.

RESULTS AND DISCUSSION

The researcher observed 14 children aged 4–8 years during regular coding activities over a two-week period. The observations showed that children experienced frustration when they encountered difficulties during coding activities. Two common situations that preceded frustration were technical difficulties, particularly slow-loading websites, and difficulties completing or running coding projects. The children's responses varied in how they expressed frustration and how they responded to the situation afterward.

The thematic analysis identified three main themes: (1) Frustration Triggered by Difficulties and Delays, (2) Emotional Expressions of Frustration, and (3) Regulation Responses to Frustration. The first theme describes the situations that triggered frustration, the second describes how children expressed frustration, and the third describes how children responded to or managed the situation following frustration.

Thematic Analysis Process

The observation data were analyzed using thematic analysis. First, the researcher repeatedly reviewed the observation notes to become familiar with the data. Second, meaningful segments describing children's emotional responses, triggers, behavioral expressions, regulation strategies, and interactions with the teacher were identified and assigned initial codes. Third, codes with similar meanings were grouped into categories. For example, codes such as “rough mouse movement” and “verbal complaint” were grouped under behavioral and verbal expressions of frustration, while “seeking teacher help” and “asking about waiting time” were grouped under help-seeking and teacher interaction. Fourth, related categories were compared and grouped into broader themes. The themes were then reviewed against the original observation notes to ensure that they represented recurring patterns in the data. Finally, each theme was defined and named according to its central meaning.

Observation	Initial Code	Category
The child moved the mouse roughly when the website was loading slowly.	Rough movement	Emotional expression
The child said, <i>“I don’t want to use this website.”</i>	Verbal complaint	Emotional expression
Some students asked, “How long do we have to wait for this website?”	Asking about waiting time	Emotional expression/communication
Students raised their hand when experiencing difficulty running the project.	Help-seeking	Regulation response

The student moved away from the activity and later returned after calming down.	Temporarily withdrew from the activity and later returned	Regulation response
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The coding process resulted in three main themes. The first theme, “Frustration Triggered by Difficulties and Delays,” was developed from observations in which technical problems and difficulties with coding projects preceded children's emotional responses. The second theme, “Different Emotional and Behavioral Responses,” emerged from recurring verbal, physical, and non-verbal expressions observed when children experienced frustration. The third theme, “Seeking Teacher Support as a Regulation Strategy,” was developed from observations in which children sought assistance or responded to teacher guidance and subsequently continued or returned to the activity.

Theme 1: Triggers of Frustration

- Slow-loading website
- Coding difficulties
- Project not working as expected

Frustration was observed when children encountered difficulties that interrupted or delayed their coding activities. Two main situations were identified: technical difficulties and difficulties with children's coding projects.

Technical difficulties, particularly slow-loading websites, were frequently observed as a source of frustration. Some children became impatient when the coding website took a long time to load. They repeatedly asked questions about the delay, such as, “How long do we have to wait for this website?” Some children also asked whether the poor Wi-Fi connection was causing the problem.

Frustration was also observed when children's coding projects did not produce the expected results. Difficulties in running or completing a project appeared to interrupt children's intended activities and contributed to expressions of frustration. Overall, the observations showed that frustration commonly occurred when children experienced delays, technical problems, or difficulties completing their coding tasks.

Theme 2: Emotional Expressions of Frustration

1. Verbal complaints
2. Rough movements
3. Crying
4. Distressed facial expressions
5. Withdrawal

Children expressed frustration in different observable ways. These expressions included verbal, physical, and non-verbal forms. Verbal expressions included complaints and statements indicating dissatisfaction with the situation. Examples included, “Why is this website taking so long to load?”, “Why is it stuck?”, “I don't want to use this website,” and “I don't like it.” These statements showed that children directly communicated their frustration with the technical difficulties or delays they encountered.

Physical expressions of frustration were also observed. Some children moved the mouse roughly when the website was loading slowly. Other children moved away from the activity or shifted their attention to other children. In some observations, children screamed or refused to enter the classroom when experiencing difficulty.

Non-verbal expressions included distressed facial expressions, staring, remaining quiet, and holding back tears. These observations demonstrate that children expressed frustration in different ways rather than through a single form of emotional expression.

These responses were categorized as emotional expressions because they represented observable ways in which children communicated or displayed frustration. They were not automatically considered evidence of emotional regulation. Regulation was considered separately based on what children did following the expression of frustration.

Theme 3: Regulation Responses to Frustration

1. Seeking teacher assistance
2. Waiting
3. Returning to the activity
4. Calming down
5. Trying again

Teacher support appeared to play an important role in helping children manage difficult emotional situations. The support provided was not identical across situations but included giving the child space, providing simple instructions, redirecting attention, and modifying an activity when necessary. Another pattern observed was children's use of teacher support when experiencing difficulties. Rather than continuing to struggle independently, some children sought assistance by raising their hands or verbally asking the teacher for help. This behavior appeared to help children manage their frustration and continue participating in the activity.

Type of teacher support

Teacher Support	Observed Child Response
Giving the child space	Child calmed and returned
Encouraging another attempt	Student tried again
Redirecting attention	Child remained engaged while waiting
Modifying the activity	Student continued participating

Teacher support also appeared to contribute to children's regulation responses. The teacher provided different forms of support, including giving children space, encouraging another attempt, redirecting attention, and modifying an activity when necessary. In several observations, these forms of support were followed by children calming down, trying again, continuing to participate, or returning to the activity.

Overall, the findings show that children expressed frustration in various observable ways and demonstrated different responses afterward. Emotional expression and emotional regulation were therefore treated as related but distinct aspects of the children's responses. Emotional expressions reflected how frustration was displayed, while regulation responses reflected how children attempted to manage the situation, seek support, remain engaged, or return to the activity.

CONCLUSION

The findings show that young children experienced frustration when they faced difficulties during coding activities. The most common situations were technical problems, such as slow-loading websites, and difficulties completing or running their coding projects. These situations sometimes resulted in verbal expressions of frustration, impatience, rough mouse movements, or temporary withdrawal from the activity. This finding suggests that challenging classroom situations can reveal how young children respond to and manage their emotions.

The children also demonstrated different ways of responding to frustration. Some children expressed their feelings verbally, while others sought help from the teacher, waited for the problem to be resolved, or temporarily moved away from the activity. These differences suggest that emotional regulation is still developing during early childhood. Emotional regulation does not mean that children do not experience frustration; rather, it involves how they express and manage their emotional responses. The findings therefore support the importance of observing children's emotional responses within the situations in which they occur.

Teacher support was also an important part of children's emotional regulation. Several children sought assistance when they experienced difficulties during coding activities. Asking the teacher for help provided children with an opportunity to communicate their needs and continue the activity. This finding highlights the role of teachers in supporting children's emotional regulation through responsive guidance. Instead of viewing frustration only as inappropriate behavior, teachers can use these moments to help children identify their difficulties, communicate their needs, and develop appropriate ways to respond.

The findings also have implications for early childhood classroom practices. Teachers can provide children with opportunities to experience manageable challenges while offering appropriate support when difficulties arise. In technology-based activities, teachers may also prepare alternative activities or explain technical problems to reduce children's frustration. Such practices may help children gradually develop strategies for managing emotions while remaining engaged in learning.

Overall, this study suggests that coding activities provide opportunities to observe children's developing emotional regulation. Frustration was commonly observed when children encountered difficulties, while seeking teacher support, verbal expression, waiting, and temporary withdrawal were among the responses observed. These findings emphasize the importance of supportive teacher-child interactions in helping young children manage emotional responses during challenging learning situations.

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