# Flow, Fear, and Classroom Modality: Student Experiences in a University Environmental and Sustainability Film Course

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**Abstract**

When the words climate change, environment, and sustainability are used in conversations today, they typically elicit engaging dialogue among the current generation of university students. One common thread among these conversations is that students are looking to course faculty for answers as their fears are cause for concern. The purpose of this research was to determine if relationships existed between students in an environmental and sustainability film course through the modality in which they took the course, level of fear, and whether individuals exhibited flow experiences during the course. Fear and flow are socio-psychological constructs related to individuals having: (a) a level of fear or concern related to a specific instance or event in time, and (b) a perceived level of skill associated related to an activity and a level of challenge that individuals have that is associated with the same activity. Results indicate that occurrences of flow most often occurred in the online modality of learning by students. Additionally, students' fear levels corresponded to flow occurrences for the online modality of the learning by students. This case study supports previous research that fear, and flow can be positive experiences for students when considering pedagogical practices in teaching and learning.

**Keywords:** flow, fear, film, environmental, sustainability, modality

## 1. Introduction

The recent COVID-19 pandemic has provided an opportunity to consider how a university education can be delivered. These opportunities include considerations about the definition of a classroom, where classroom teaching and learning occurs, and in what settings students are most motivated to learn. Understanding learners and opportunities to improve pedagogical approaches has always and continues to be an evolving process. COVID-19 simply expedited these processes and the different ways in which we educate individuals (Everett et al., 2021). Use of film as a pedagogical approach is one unique way to deliver content and motivate students to learn. As such, it may also be a contributor to the elicitation of a broad scope of positive emotional responses by students. These emotional responses include having both perceived levels of fear and flow during educational experiences related to course content (Everett et al., 2023). According to Galbraith and Rodriguez (2018), utilization of film as an educational approach in course curriculum heightens students' sensitivity towards themes of course content while stimulating discussion about subject matter. Elicitation of experiences where fear is a consistent part of the film's message may be another way for students to achieve these flow experiences (Zupan & Eskritt, 2020) where flow is defined as "being in the zone" through the effortless action of an individual (Csikszentmihalyi, 1997). Concomitantly, satisfaction of cognitive needs may also be amplified with increased peak-experiences during moments of fear (Maslow, 1963) or antecedents related to positive flow experiences (Csikszentmihalyi, 1975). Literature indicates that unique instructional approaches such as film may have the ability to increase incidences of flow (Everett et al., 2023). According to Jang et al. (2020), elicitation of fear may be critical to learning course content associated with the worldwide grand challenges of climate change, food insecurity, alternative energy solutions, and the creation of sustainable energy systems (Everett et al., 2023). When used together, flow theory (Csikszentmihalyi, 1975) and the theory of fear in communication (Leventhal, 1970) have the potential to better understand and support student motivation when using film as a pedagogical approach to learning. If implemented with efficacy statements and problem-solution questions, these approaches have the potential to develop individuals and future leaders in their respective career pathways (Sprinkle et al., 2006).

### *1.1 Course Modality*

Course modality and how content is delivered has been a topic of recent discussion with the onset of the COVID-19 pandemic. Online, in-person, and hybrid modalities have all been proven valuable forms of instructional approaches during this worldwide change in education (Banks & Vergez, 2022). However, questions still exist as to what type of instruction is best for specific courses and delivery of course content from a learning perspective. In a recent study by Everett et al. (2021), students preferred in-person learning experiences over online learning as a function of flow experiences (e.g., "being in the zone") and being transported into the academic narrative (e.g., narrative transport) prior to moving course content to an online experience due to the pandemic. Research by Banks and Vergez (2022) support these results by indicating that there were student differences between achievement and perception based on course modality. This study also concluded that students preferred an in-person classroom setting in a STEM-based undergraduate course (Banks & Vergez, 2022).

### *1.2 Flow Theory*

Being in the zone! This catch phrase has been used in many contexts including participation in athletics (Orta et al., 2017), academics (Everett et al., 2023), and recreational activities (Everett & Gore, 2015). "Being in the zone" and related constructs of flow theory in the context of learning occurs when: (a) perceived skills and challenge meet the demands of the activity; (b) there are clear goals related to activities; and (c) immediate feedback is provided at the conclusion of the activity (Nakamura & Csikszentmihalyi, 2009). Csikszentmihalyi (1975) developed flow theory as a methodological approach in conjunction with the Experience Sampling Method (ESM) to better understand human behavior and when incidences of flow occur in everyday life. The ESM was developed to measure participant flow experiences during various activities (Hektner et al., 2007). Recent developments in published research by Everett and colleagues has indicated that "being in the zone" consistently occurred during specific themes of content when film was used as a pedagogical approach (Everett et al., 2020; Everett et al., 2021; Everett et al., 2023).

### *1.3 Fear in Communication Theory*

In today's society fear is a behavior that seems to be consistent with topics related to war (Kurapov et al., 2023), climate change (Ballet et al., 2023), or other dramatic and often contentious human-induced events (Boddez et al., 2021). As such, communicating fear is a critical aspect of information consumption and delivery of content today (Ahorsu et al., 2022; Lin et al., 2020; Montano & Carr, 2021). Recent examples include the fear of contracting COVID-19 made prominent in social media posts (Lin et al., 2020), natural disaster related fears (Montano & Carr, 2021), and fears related to films about the climate crisis and unsustainable energy production (Everett et al., 2023). As such, narratives and storylines using the medium of film have the potential to not only educate students through fear in communication, but also increase potential for flow experiences (Everett et al., 2023).

Film-related instructional experiences may have the potential to: (a) increase persuasion through fear arousing communication, (b) decrease coping ability of fear-induced situations, and (c) exasperate external factors associated with specific fears (Leventhal, 1970). Therefore, most fear communication research is associated with humanistic threats such as a description of the danger and associated avoidance of an event (Leventhal, 1970). According to Leventhal (1970), attitudinal items should measure beliefs related to the danger (e.g., specific tornadoes and hurricanes), evaluation of its magnitude (e.g., higher mean temperatures during a given year) and personal relevance (e.g., changing ecosystems and how this relates to ways of living) to support the effects of the information.

This study sought to utilize flow theory and fear in communication theory to determine relationships between in-person and online course modalities where film was the focused instructional approach used in a university undergraduate course. The study was guided by the following research questions.

(1) What modality of learning elicited flow experiences and levels of fear in students?

(2) What movie themes and modality of instruction produced experiences of flow and levels of fear in students?

(3) What relationships exist between student modality, flow, and fear in an undergraduate university environmental and sustainability course?

## 2. Methodology

Data for this population study were collected at Michigan State University in the fall semester of 2021 in a 200-level course offered within the Department of Community Sustainability in the College of Agriculture and Natural Resources. The course was taught using a multi-modality approach where students could participate either online asynchronously or in-person. The course was open to all undergraduates at the University as a programmatic elective. There were 172 undergraduates enrolled in the course and students voluntarily elected to participate in this research

study. The flow and fear research instrument for this study utilized a previously developed survey by Everett et al. (2023). The Michigan State University Institutional Review Board deemed this study exempt from human subject's protocols.

For this study, 172 students completed 295 flow and fear surveys, which amounted to a response rate of 11.4% (15 measured class sessions x 172 = 2580 total potential responses). On average, 19.7 responses were collected during each class session during the semester. Previous research by Everett et al. (2023) had a response rate of 20.6% for comparison in a course using a multi-modality teaching approach (e.g., students could attend in-person or online). Though this response rate was less than the Everett et al. (2023) study, this methodological approach and derived data was deemed reasonable for an online population survey response rate. As this study was voluntary to eliminate response bias, student respondents were encouraged, but not required to participate in this study. These response rates in voluntary ESM studies were also compared to previous research where incentivizing participation did not occur and results were deemed acceptable (Csikszentmihalyi & Larson, 2014; Hektner et al., 2007).

This study utilized an electronic survey platform for data collection of flow (Hektner et al., 2007) and fear (Everett et al., 2023). A Likert type scale interval (5-Point) survey was utilized to simplify options for filling out instrument questions. Scale options for each item ranged from 1 – Not Agree to 5 – Very Much Agree using an online survey platform. Three faculty from the Department of Community Sustainability reviewed the adapted ESM instrument (Hektner et al., 2007) for flow and fear (Everett et al., 2023) constructs to ensure appropriate categories and themes were based on course content subject matter. There were 9 items in the instrument where the value for Chronbach's Alpha for the survey was $\alpha = 0.87$. Previous research by Everett and colleagues supports this instruments' internal consistency (Everett et al., 2023).

Data were collected each week of the semester using an electronic survey platform system. An electronic event-contingent sampling approach was used as a means to collect ESM participant data (Hektner et al., 2007). At the first course session, student participants were provided with instructions prior to taking the first flow and fear survey (Table 1). At the conclusion of the first film, student participants were sent an electronic consent form and survey link and asked to fill out the items at the conclusion of each movie. All data were collected through the Qualtrics survey software system which provided an anonymous platform for data collection (Qualtrics$^{XM}$, Provo, UT). Survey data were categorized by film themes including: (a) climate systems, (b) food systems, (c) energy systems, (d) sustainability systems movies, and (e) student developed films (Table 2). During the three-student developed film class sessions, students viewed the top 20 videos as selected by the instructor and voted on the film they thought most appropriately represented the assigned theme for each of the three class sessions. The three film themes included a 1-minute film on personal sustainability beliefs, a 2- to 3-minute film about climate change, and a 3- to 5- minute film production about any of the four themes of the course (e.g., food, climate, energy, or sustainability). Examples of student films included energy consumption habits and reduction recommendations from home and how climate change occurred through the observational lens of being on the Michigan State University campus.

### *2.1 Data Analysis Procedure*

Dependent Variables. Flow was categorized into four-channels (e.g., anxiety, apathy, boredom, and flow) based on measurements of perceived student challenge and skill. The variable of flow was categorized into the measures of challenge and skill to determine the socio-psychological channel of respondents (Figure 1). Flow was calculated by the comparison of individual challenge to skill (Items 8-9) levels perceived by respondents with respect to the average challenge and skill levels by film or class session. As indicated in previous research (Everett et al., 2023), observation of anxiety occurred when individual challenge was greater than or equal to average challenge and individual skill was less than average skill. Observed apathy was defined when individual challenge was less than average challenge and skill ratings and were greater than or equal to average skill at the conclusion of the film. Observed boredom occurred when perceived individual challenge and skill was less than both average challenge and skill, and observed flow occurred when both individual challenge and skill were greater than or equal to both average challenge and skill at the end of the film. Appropriate individual experiences and associated channels (i.e., anxiety, apathy, boredom, and flow) were then categorized within the four-channel model (Csikszentmihalyi & Csikszentmihalyi, 1988, Figure 1). A chi-square test of association was used to determine relationships between flow constructs by film theme.

Table 1. Fear and Flow Instrument

| Item # | Flow and Fear Item Questions |
|---|---|
| While watching the movie(s) today I… | |
| 1 | I am most afraid of this movie topic. |
| 2 | It makes me uncomfortable to think about this movie topic. |
| 3 | My hands become clammy when I think about this movie topic. |
| 4 | I am afraid of losing my life because of this movie topic. |
| 5 | When I watch stories about this movie topic on social media, I become nervous or anxious. |
| 6 | I cannot sleep because I'm worrying about this movie topic. |
| 7 | My heart races or palpitates when I think about this movie topic. |
| 8 | I feel challenged by the content of the movie. |
| 9 | I feel as though I am skilled or competent in the content of the movie. |

Note. Items 1-7 measure the construct of fear in film and items 8-9 measure flow.

Table 2. Movie title and movie theme

| Class Session and Movie Title | Movie Theme |
|---|---|
| 1 - Rotten – Bitter Chocolate | Food |
| 2 - More Than Honey | Food |
| 3 - Just Eat It: A Food Waste | Food |
| 4 - The Island President | Climate |
| 5 - Racing Extinction | Climate |
| 6 - Student Produced Video #1 | Student Developed |
| 7 - The Last Mountain | Energy |
| 8 - The Boy Who Harnessed the Wind | Energy |
| 9 - Foreign Correspondent: How to Save the World | Climate |
| 10 - The True Cost | Energy |
| 11 - Student Produced Video #2 | Student Developed |
| 12 - A Plastic Ocean | Env/Sustainability |
| 13 - Minimalism | Env/Sustainability |
| 14 - Living the Change: Inspiring Stories for a Sustainable Future | Env/Sustainability |
| 15 - Student Produced Video #3 | Student Developed |

The dependent variable of fear was calculated by the summation of appropriate scale items (Items 1-7) where scores ranged from 7 to 35 (Table 1). A Pearson's R was used to determine if correlations existed between student perceived fear by class session and whether students identified as taking the course in an in-person or online modality.

Independent Variables. The independent variables for this analysis fall into two categories. The first category references class session. There were 15 class sessions over the course of the semester where movies were viewed, analyzed, and compared to content in the course literature (Table 2). The second category of independent variable measured was the modality in which students identified in the survey for each of the class sessions. Students could take the course online through the Michigan State University electronic learning platform Desire to Learn (D2L) or could attend the class in-person where course content and movies were presented each week of the semester. Data were analyzed using the SPSS 29.0 statistical software package. Descriptive statistics were used to determine fear and flow construct measures of central tendency.

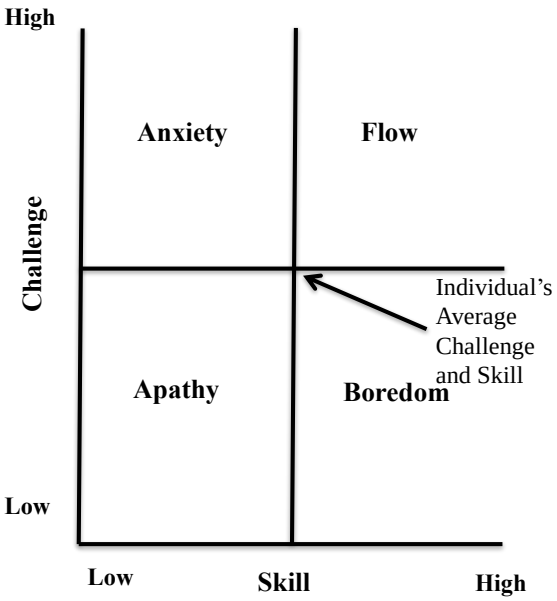


Figure 1. The four-channel flow model applied to Experience Sampling Method

The intersection of all channels is the average of the challenge and skill for a specific activity or event. (Adapted from Csikszentmihalyi and Csikszentmihalyi, 1988; Massimini & Carli, 1988)

## 3. Results

This study included students in the Exploring Environmental and Sustainability Issues and Policy Using Film course (n = 172). Of the students in the course there were 32 freshmen, 32, sophomores, 50, juniors, and 58 seniors. Sixty-eight percent of the students identified as females in the course. Fifty-five majors were represented in the course across nine Colleges at Michigan State University.

From a teaching modality perspective, students were more likely to be in a state of flow when taking the course online (Table 3). Of the course modality results, 32.2% of the student respondents were more likely to "be in the zone" or in flow than those students who participated in the course in-person (24%). A chi-square test of independence yielded no significant relationship between flow and modality $\chi^2$ (3, N = 295) = 3.51, p = 0.32 (Table 3). These descriptive results are consistent with a previous study by Everett et al. (2021) when the COVID-19 pandemic began, and learning switched from in-person to online. Interestingly, students were more anxious in an in-person learning setting (32.8%, Table 3). This may indicate that students felt added on-campus, in-person pressures that would have not otherwise occurred while students were participating in the online learning setting for the course. Finally, perceived fear levels by students were slightly higher with online students (M = 15.0, SD = 7.13) as compared to in-person students (M = 13.8 SD = 6.23). A Pearson correlation coefficient was computed to assess the linear relationship between in-person and online fear levels. There was no correlation between the two variables, r(293) = 0.09, p = 0.132. Therefore, only descriptive results suggest that online students had a slightly higher sense of fear after watching films that could not be mediated through problem-solutions and efficacy statements during an in-person class session as indicated by Sprinkle et al. (2006).

A descriptive analysis of flow and fear data by movie theme indicated that in-person learning was more likely to elicit flow in students during climate themed movies (47.8%) and sustainability movies (55.6%) (Table 4). A chi-square test of independence yielded a significant relationship between flow and in-person modality by movie themes $\chi^2$ (12, N = 295) = 20.32, p = 0.05 (Table 4). Online students exhibited more instances of flow in all movie themes as compared to the other three channels (e.g., anxiety, apathy, boredom). Descriptive results indicated that students were more likely to have flow experiences when watching movies outside of a formal classroom setting. A chi-square test of independence yielded no significant relationship between flow and online modality by various movie themes $\chi^2$ (12, N = 295) = 5.93, p = 0.92 (Table 4). Interestingly, student produced videos exhibited more instances of anxiety (44.4%) in an in-person setting. This result may indicate that students felt anxious when watching videos around other peers. Descriptive results by students indicated highest levels of perceived fear during climate themed movies during both in-person (M = 18.3, SD = 8.04) and online (M = 17.9, SD = 7.89) modalities. A Pearson correlation coefficient was computed to

assess the linear relationship between in-person and online fear levels by movie themes. There was no correlation between online modality and film theme variables, r(293) = 0.16, p = 0.060. However, there was a slight correlation between in-person modality and film theme variables, r(293) = 0.29, p = 0.001.

Table 3. Relationship between flow channels and fear by course modality in an Experience Sampling Method (ESM) study (n = 295)

| **Course Modality** | **Anxiety** | **Apathy** | **Boredom** | **Flow** | **Fear (M/SD)** |
|---|---|---|---|---|---|
| **In-Person Students** | 48 | 28 | 35 | 35 | 13.8 |
| | (32.8%) | (19.2%) | (24.0%) | (24.0%) | (6.23) |
| **Online Student** | 37 | 30 | 34 | 48 | 15.0 |
| **$\chi^2$ (3, N = 295) = 3.51, p = 0.32** | (24.9%) | (20.1%) | (22.8%) | (32.2%) | (7.13) |
| **Total f** | 85 | 58 | 69 | 83 | |
| | (28.8%) | (19.7%) | (23.4%) | (28.1%) | |

*$p$ < .05. **$p$ < .01.

## 4. Discussion

What educational settings are most conducive to perceived flow or "being in the zone" during learning experiences? Based on descriptive results, increasing frequencies of fear-inducing events (e.g., natural disasters, COVID-19) provide instructors a forum to discuss these and many other natural and life challenges to increase flow in students. Instruction where fear-inducing events occur on a consistent basis has proven to be a valuable source of information about student learning (Everett et al., 2023; Montano & Carr, 2021). According to descriptive results, inducing fear as a form of motivation in learning may be an approach underutilized in undergraduate classroom instruction. Classrooms should be venues where student flow and fear experiences can occur in ways that provide positive learning experiences for all students. This study sought to understand the relationships between student socio-psychological measurements of flow and fear in multi-modality class settings by film theme. The authors note that this research is not generalizable, and caution should be taken when applying these results across different classes and class settings.

Descriptive results suggest that students indicated being in flow more when taking the course in an online setting as opposed to the in-person modality class setting. Additionally, fear levels were slightly higher with students in the online modality. Similarly, student levels of anxiety were higher with students who took the course in an in-person modality course setting. Previous research by Everett et al. (2023) indicated similar results in relation to climate films. However, these same results were contradictory in terms of in-person modality for student-produced films where anxiety was the predominate channel as indicated by students.

Frequency of flow and fear levels of students in course films indicated that specific themes of films impacted students more than others as a function of course modality. High frequencies of flow and correspondingly high levels of perceived fear for climate films as opposed to other themes of movies were reflected in the data of this study. These descriptive results were contrary to previous research by Everett et al. (2023) by confirming that fear communication did impact students' perceived flow. Student levels of anxiety were most pronounced in student produced films related to the in-person modality of the study. However, the perceived fear levels were lowest during the in-person modality of learning. These descriptive results between anxiety and fear support the previous study by Everett et al. (2023), however did not indicate a statistical relationship between anxiety and fear.

Table 4. Relationship between flow channels and fear by class sessions when students participated in an in-person or online modality (n = 295)

| **Movie Theme** | **Anxiety** | **Apathy** | **Boredom** | **Flow** | **Fear** |
|---|---|---|---|---|---|
| | **f (%)** | **f (%)** | **f (%)** | **f (%)** | **M (S.D.)** |
| *In-Person* | | | | | |
| Food | 35 (37.6%) | 19 (20.4%) | 24 (25.8%) | 15 (16.1%) | 11.9 (4.30) |
| Climate | 5 (21.7%) | 3 (13.0%) | 4 (17.4%) | 11 (47.8%) | 18.3 (8.04) |
| Energy | 3 (25.0%) | 4 (33.3%) | 3 (25.0%) | 2 (16.7%) | 14.9 (6.19) |
| Sustainability | 1 (11.1%) | 0 (0.0%) | 3 (33.3%) | 5 (55.6%) | 17.6 (9.99) |
| Student Videos | 4 (44.4%) | 2 (22.2%) | 1 (11.1%) | 2 (22.2%) | 16.1 (6.09) |
| In-Person f | 48 (32.9%) | 28 (19.2%) | 35 (24.0%) | 35 (24.0%) | 13.8 (6.23) |
| $\chi^2$ (12, N = 295) = 20.32, p = 0.05* | | | | | |
| *Online* | | | | | |
| Food | 10 (20.4%) | 10 (20.4%) | 12 (24.5%) | 17 (34.7%) | 11.6 (4.89) |
| Climate | 12 (27.3%) | 11 (25.0%) | 8 (18.2%) | 13 (29.5%) | 17.9 (7.89) |
| Energy | 6 (17.3%) | 5 (22.7%) | 3 (13.6%) | 8 (36.4%) | 16.1 (7.46) |
| Sustainability | 4 (26.7%) | 2 (13.3%) | 4 (26.7%) | 5 (33.3%) | 14.8 (7.14) |
| Student Videos | 5 (26.3%) | 2 (10.5%) | 7 (36.8%) | 5 (26.3%) | 15.6 (6.81) |
| Online f | 37 (24.9%) | 30 (20.1%) | 34 (22.8%) | 48 (32.2%) | 15.0 (7.13) |
| $\chi^2$ (12, N = 295) = 5.93, p = 0.92 | | | | | |
| Total f | 85 (28.8%) | 58 (19.7%) | 69 (23.4%) | 83 (28.1%) | |

*$p < .05$. **$p < .01$.

Descriptive results indicated that climate themed movies when watched in-person elicited higher instances of flow and fear levels than other movies. As indicated in previous research some film themes were less likely to amplify flow (Csikszentmihalyi, 1975) and fear (Leventhal, 1970). The results of this study along with the work of Everett et al. (2023) suggest that flow and fear are attributes that may be able to complement learning in today's classrooms and should be studied further to determine if statistical relationships may exist. In certain descriptive instances, student produced films did yield higher frequencies of flow. As indicated in the study by Everett et al. (2023), and supported by the descriptive results of this study, the authors recommend the enrichment of learning through student produced films as a way to infuse the experiential learning process into undergraduate learning (Kolb & Kolb, 2017).

Limitations of this study included the potential for recall bias as related to students filling out surveys at the conclusion of each movie or class session and the decreased number of responses by students as the course continued over the semester. Additionally, caution should be taken in interpreting descriptive results given the relatively small number of responses in some of the class sessions.

The authors of this study recommend that future studies should measure flow and fear constructs in more fear-inducing climate themed movies. Results support a recent research study by Everett et al. (2023) where flow and fear in communication were important indicators of student learning when varying course modality. The authors also suggest that further consideration be given to flow and fear in comparison to other forms of content delivery. If the goal of teaching and learning in an undergraduate course setting is to create experiences of "being in the zone," then understanding the importance of how students succeed in different learning modalities should be a primary consideration.

## 5. Conclusion

What is the true definition of a classroom today? This research sought to better understand how course modality, flow experiences and perceived levels of fear play a role in determining where quality learning occurs and in what type of classroom setting. Interestingly, descriptive results indicated that online learning experiences were more likely to produce student flow or students "being in the zone." This context for learning also provided valuable information about how course modality relates to flow and fear (Leventhal, 1970) using film as a teaching approach. Research by Everett et al. (2023) indicated that use of film as an instructional approach provides significant benefit to classroom learning. This study further amplifies that research and adds that course modality is another variable to consider when determining an appropriate learning setting.

If the goal is to increase frequency of flow and levels of fear in students as a learning approach, this research encourages films where climate is the focus of the narrative. According to Banks and Vergez (2022), different course modalities can provide a range learning opportunities for students. If the goal of classroom learning is to increase moments of anxiety while maintaining high levels of fear in students (Everett et al., 2023; Zupan & Eskritt, 2020), then curriculum should include ample opportunity for students to develop artifacts and present those artifacts to peers in the learning setting. These opportunities may also support student learning by decreasing anxiety through repetition and allow for student creation of student-centered narratives.

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