Formative Assessment Activities That Engage Students and Support Success

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As we navigate past the pandemic, enhancing student learning through innovative methods is crucial. Literature has shared that focusing on innovative ways to include formative assessment, is one way to address student learning and success (Barkley, 2010). This article explores classroom assessments: summative and formative assessments. Summative assessments are periodically administered throughout a course to gauge students' learning progress within a set timeframe. However, this paper's primary focus is on formative assessments, which encompass low-stakes assignments that engage students and provide valuable feedback to both instructors and students, identifying comprehensive challenges for adaptive teaching. Research suggests that students can work towards their learning objectives through in-class practice and low-stakes assignments, fostering motivation and enhancing engagement in a stress-free environment (Garrison, 2007). This article delves into formative assessment activities, such as flipped assignments, interactive engagement tasks, test reviews, and student reflections. These activities offer constructive feedback to instructors and students while fostering engagement. The positive feedback received from participating students underscores their effectiveness.

Keywords: formative assessment, student engagement, classroom activities, student motivation, student learning

INTRODUCTION

With the changes that have resulted in learning and education since the onset of the pandemic, there has been a growing need to address new and creative approaches to improve student learning. Many first-year students, who spent their last years of high school learning in an isolated and remote setting, are not prepared to take on the challenges of college and find themselves struggling to succeed academically. This dilemma continues for the next several years (Sanchez, 2022). One way to address the challenge of student engagement and success is by focusing on assessment, particularly formative assessment. Both summative and formative assessments provide instructors with information about student learning, not only at the end of a unit but also throughout the learning process. As a result, students are better equipped to achieve their ultimate learning objectives (Bhat, 2019). Summative assessments are typically known to be conducted in increments throughout a course. They aim to determine what students have learned within a specific instructional timeframe and are typically a significant part of the grading process. These assessments may include end-of-unit tests, mid-term exams, or final exams (Garrison, 2007). Formative assessments, however, are ongoing assessments that monitor student learning. They are designed to be implemented as low-stakes assignments that engage students in a low to no stress environment (Baleni, 2015). For the instructor, it may be used to determine how well students grasp content and concepts and identify any gaps

or misunderstandings. Additionally, the results may help instructors adjust teaching progress and process at any time to support student learning. For students, formative assessments can assist them in progressing toward their learning goals by providing valuable feedback through practice (Bhat, 2019).

FORMATIVE ASSESSMENT TECHNIQUES

Flip Assignments

One way to address formative assessment is to incorporate flip assignments as a low-stakes grade component and a meaningful and helpful teaching tool. This pedagogical approach flips the mode of instruction. Students complete relevant assignments, such as reading text or viewing a video, on a related topic or problem before class in their own learning space. The goal of this process is to cultivate prepared and engaged students, thereby maximizing learning in the classroom. Research has shown that this format can help strengthen students' understanding of the material and provide positive learning outcomes (Supiano, 2022). A benefit of incorporating flip assignments is that it offer students a flexible format to learn new content outside of class, at their own pace, and in their own time. Additionally, students can review the concepts as needed, often using technology. Finally, the inclusion of flip assignments frees up time in the classroom to implement thoughtful and meaningful activities that support a positive learning environment where active learning can take place and, in turn, foster creativity, problem-solving, and critical thinking (Shahrokni, 2022).

Several low tech venues may be used to facilitate a low-stakes flip assignment. These might include submitted assignments or short in-class quizzes on topics that will soon be presented. For this instructor's Algebra and Its Applications course, the flip assignment course component is worth only a small portion (5%) of the student's final grade to maintain a low stress environment. Students follow instructions on the online learning platform (Blackboard) for each flip assignment and view several videos of problem presentations related to an upcoming math topic covered in the next class. As students view the process, they record the presented problems and steps on paper. Next, they use their phone to scan their work and upload the completed assignment to Blackboard. At the beginning of the topic explanation class, students are asked to share questions or concerns about the problems. With this preliminary topic assignment, students start the learning process by engaging in the content before class, allowing me as the instructor to build on the problems introduced in the flip assignment and solidify the concepts in a mini lecture. Students are graded on the completeness of their work. If they submit each problem with the correct steps shown, students earn a 100%. For work that is incomplete or turned in late, students receive a grade of 80%. For an assignment that is not submitted, students receive a grade that reflects 0%. This is a low stakes assignment, and requires little time to grade because it is a completion grade. A benefit for students is that because the problems are housed on the learning platform, the assignments are accessible and available to reference when seeking support for upcoming assignments and test preparation.

Instructors may also integrate flip assignments into courses through a game-based platform that is designed to engage students through interactive quizzes or polls. This instructor implements Kahoot (Kahoot.com), but there are other classroom polling response platforms available, like Poll Everywhere (polleverywhere.com) and Slido (slido.com). To complete flip assignments in this instructor's mathematics topics course, students review the lecture notes on an upcoming topic on the course's learning platform (Blackboard) and complete a flip worksheet of related questions. Students are encouraged to review the questions and search for answers by reading through the lecture notes before class. The worksheet is not graded. Instead, an online Kahoot quiz is projected on the classroom screen at the beginning of the topic explanation class. To participate in a Kahoot quiz, students sign into the browser on their phone, tablet, or laptop and enter "Kahoot.it," along with the game pin. Using the free version, a Kahoot quiz can be created at Kahoot.com, saved, and reused for future classes. The quizzes contain multiple-choice questions that reference questions on the flip worksheet that reflect the topic for the day. Students earn points for correct answers, with additional points awarded based on the speed at which each question is answered. The three top podium winners are announced at the end of the game. Instructors may award these students with extra points if desired. This instructor rewards each podium winner with a piece of candy from the jar. Kahoot

also offers a report of participants' scores to the creator. To incorporate Kahoot as a formative assessment and low stakes grade, instructors are encouraged to either include this activity as a 'participation only' grade or assign full credit to students who earn a passing score. This approach allows students to focus on practicing and solidifying the concepts without the stress of negatively affecting their grades while promoting engagement in this game-based activity. Students have responded positively to this flip assignment when asked, "In what ways did you find Kahoot helpful in your Learning?" Their responses have included:

- *Kahoot not only lets us know where we are (in math), but also lets us to know what we need to work on outside of class.*
- *When getting a question wrong I instantly got feedback and it could help me figure out where I went wrong.*
- *Kahoot helped me make sure my answers were correct, while providing a fun resource to study material.*
- *It helped refresh my memory about the material and helped me get more comfortable with completing the problems.*
- *The Kahoot quiz helped me apply what I have learned in class to a more "quiz-like" activity, which helped prepare me for the material and setup of the test.*

Student Engagement Participation Activities

Another way to implement formative assessment is to include a "student engagement" grade component in addition to, or in place of, an attendance grade. To create a low-stress environment and support a low-stakes grading system, instructors should consider assigning this grade component a minimum percentage of the final grade. Student engagement has been defined as the place where students' emotional and reflective thoughts come together in their learning through participation in activities that foster both student motivation and active learning. This results in a classroom filled not only with eager students but also with those who are actively processing concepts and absorbing information (Barkley, 2010). Implementing a low stakes grade component that focuses on student engagement is intended to support students as they practice new concepts with the instructor's guidance and group members' assistance.

Many different strategies engage students and support their learning. In many cases, instructors may find that working through problems during class can help students solidify concepts through practice or group discussions. A low-tech student engagement activity that could be included is the classic "Think, Pair and Share" classroom activity, which supports students' understanding of concepts. Students first think through the presented problem on their own. Next, students pair with other students to share their thoughts and discuss the problem. This process helps students reflect on a concept, individually and collaboratively, and meaningfully (Barkley, 2010).

Another low tech way to incorporate practice in class is to supply each student, or a pair of students, with an individual whiteboard to work on problems. Answers can easily be shared with the instructor and/or other students to provide feedback. This process also presents the instructor with the opportunity to get a sense of how well students are learning the concepts. The instructor may walk around the room to check student progress or ask students to raise their boards to gain feedback.

In addition to low-tech options, there are online tools that can be beneficial inclusions in an online class. As illustrated in Figures 1 and 2, virtual document annotation and markup tools, like Kami (kamiapp.com), may be a good fit for instructors who are comfortable with technology. Alternative electronic annotation applications include Chalk (chalk.com), Markup (markup.io), and Bounce App (bounceapp.com). An annotation application can be a helpful venue for students to practice problems, while offering feedback. Using this tool, students can access the document simultaneously through a shared link that contains practice problems. Because the document is accessible to each student on their device during class, the instructor can check students' work, whether they are working individually or in groups, to answer questions and provide feedback. (See Figures 1 and 2).

FIGURE 1
EXAMPLE OF STUDENTS COMPLETING PRACTICE PROBLEMS ON AN ONLINE ANNOTATION APPLICATION

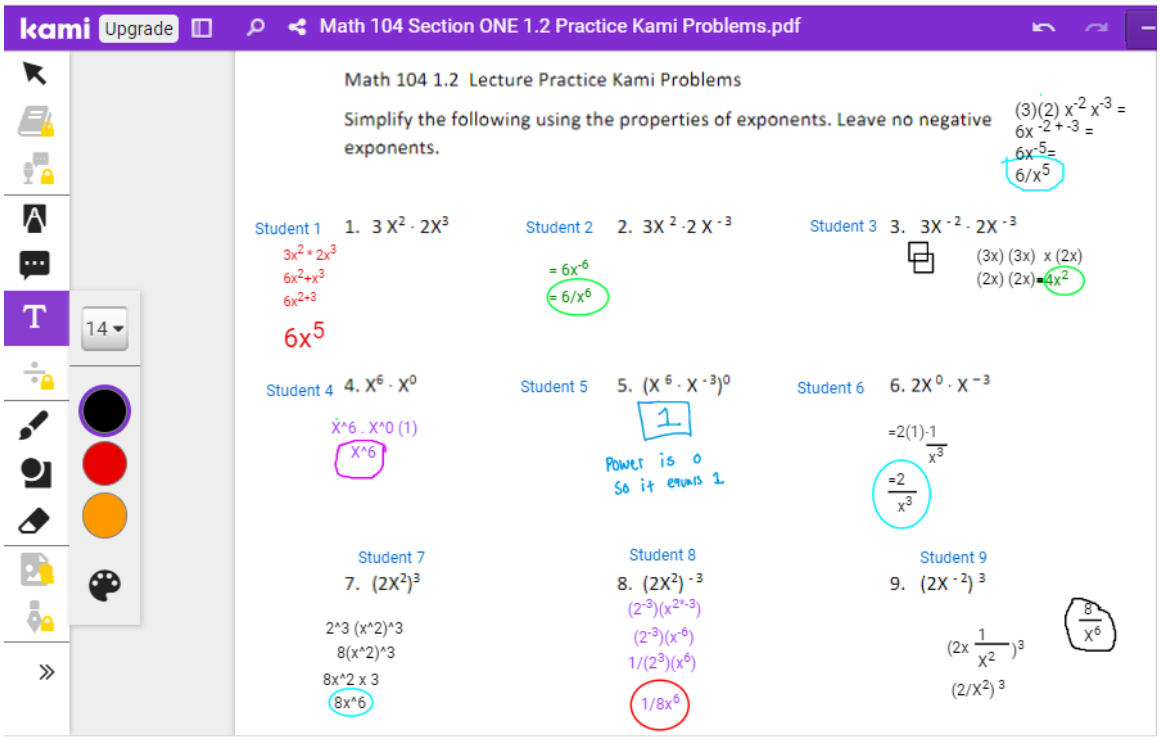
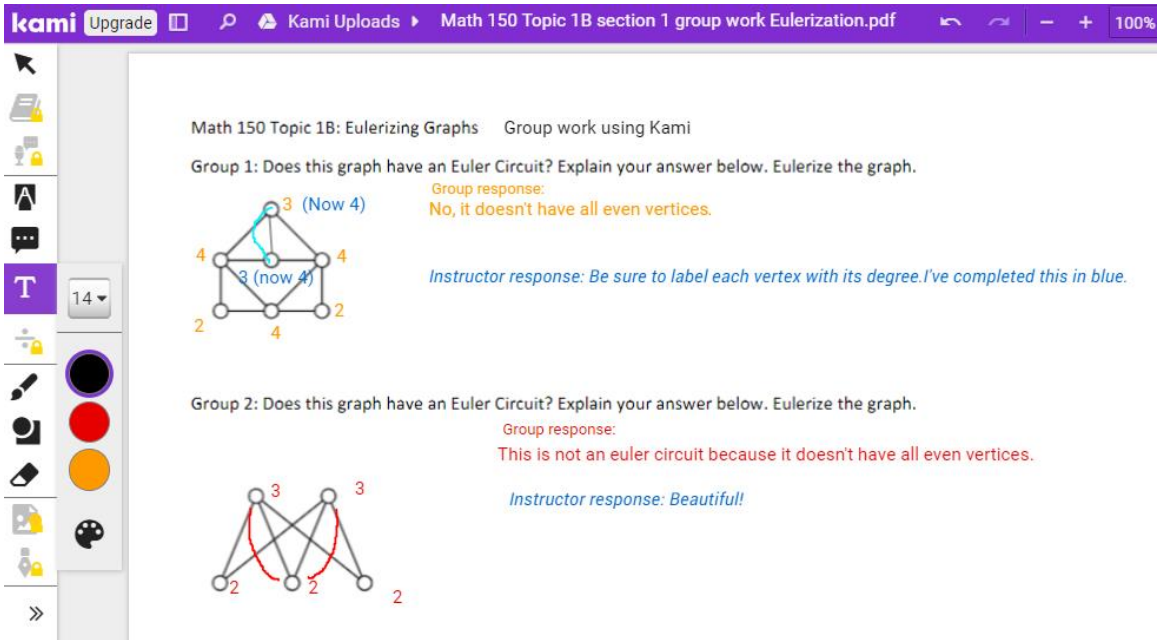


FIGURE 2
EXAMPLE OF STUDENT GROUPS COMPLETING PRACTICE PROBLEMS WITH INSTRUCTOR FEEDBACK ON AN ONLINE ANNOTATION APPLICATION



An annotation application tool, like Kami, may also be used by the instructor to present lecture notes in class. Due to its accessibility to the entire class, this venue allows students to view notes as they are being created and modified in real-time. Additionally, information on content may be referenced at any time. This instructor has received positive feedback from students when asked to share the benefits of the annotation application Kami. Comments have included:

- *A benefit of using Kami in class is that students can look back on the work done in class to help them with their homework.*
- *Kami is also beneficial when it comes to reviewing for the test; we all get to work together and we know it is right because we go over it after, and it can help for extra studies.*
- *A benefit of kami is that we work together well because we get in groups and have to talk about the problem and who is going to solve which one.*
- *Kami allows us to all work together while learning and are given individual feedback.*

Test Reviews

Test review sessions can be helpful formative assessment tools. Students need to practice retrieving information, reviewing the material, and making connections with the topics in the unit to help them remember and understand the information. This continued process can support student learning and improve performance on upcoming tests, a form of summative assessment (Weimer, 2017). A beneficial way to implement this process is to devote a class hour or portion of a class to a test preparation and review session. The goal is to create an engaging and positive environment for students to work on a set of problems or questions that will help them prepare for an upcoming test. As discussed earlier in this paper, chalkboards, individual whiteboards, online annotation tools, and online gaming platforms are effective tools for supporting test review practice and should include carefully selected, relevant problems.

An additional test review venue that students may find helpful but also engaging, is a digital Escape Room class activity. An Escape Room is a theme-based game played live by a team and incorporates clues, puzzles, challenges, and props to reach a goal in a limited amount of time. The possible transferable skills that may be developed when students participate in an escape room include working as a team, experimental learning, communication, collaboration, creativity, and critical thinking (Ho, 2018). An adaptive approach has been to design an escape room that is easily accessible for students using a digital platform. Scenarios may be developed using various learning platforms, including Google Forms, online videos, and/or Google Slides (Iannicelli, 2020). The creation of digital escape rooms has become less arduous and intimidating with the use of Google Slides. Instructors may create a themed slide like “Finding Blackbeard’s Treasure” or “Escaping to the Beach,” which includes images that can easily be linked to another slide on the presentation slideshow. The linked slides present problems related to the test content, each linked to a slide representing the correct answer slide or an incorrect answer slide. Through the process of completing questions and correct solutions, students collect solution code letters. These letters spell out a final word or phrase that can be submitted to the professor on paper, on the course’s learning platform, or through Google Forms. Instructors can motivate students by offering bonus points for students who upload the correct code, along with the correct answers and work for each problem. There is an abundance of information that may be found online to provide a starting point for instructors who may be interested in creating a digital escape room. This instructor has received positive feedback on the benefits of participating in a digital escape room for her students. Comments when asked “In what ways did you find the Escape Room helpful?” included:

- *The escape room allowed me to ask a classmate for help to get a better understanding of the problem.*
- *It had some questions I did not know, and my group helped me understand.*
- *The Escape room helped me review some older work that I hadn’t done in a while and so I felt prepared for the test.*
- *The Blackbeard's Treasure was helpful by reviewing some of the more difficult topics in a fun way.*

- *I found it very helpful because not only did the problems help me prepare, but I gained more motivation through the game setting.*

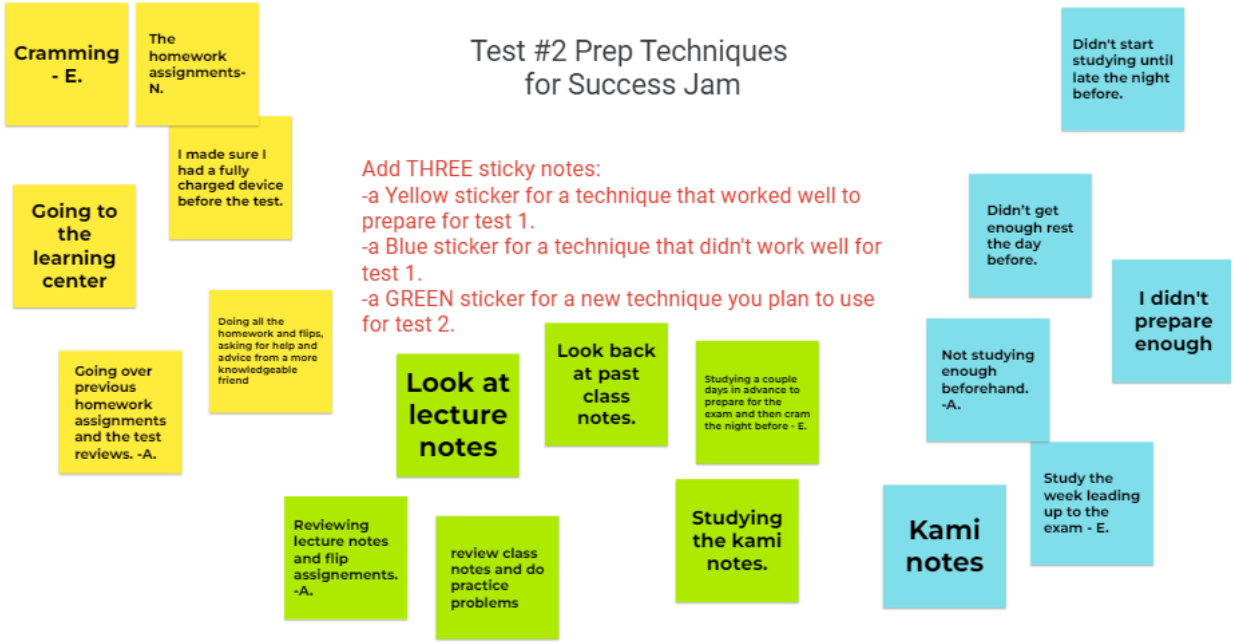
Student Reflections

Student reflections can serve as useful formative assessment activities. For this assignment, students revisit and reflect on specified content they have learned. They must think critically to make important connections and deepen their understanding of the material in the process. In addition, they are able to identify areas that may need further attention. Reflection can also be integrated as a shared format in class to help students connect with other students and bring different views and thoughts together. To ensure that students feel they are in a safe environment to answer questions honestly, researchers suggest that reflection assignments serve as a low to no stakes grade (Chang, 2019). Various formats may be used to incorporate student reflections into courses. Assigning students to keep a journal (either on paper or electronically) offers a low tech option. However, with the ease of virtual venues, online discussion boards may be a good option. Using guided discussions as a student reflection grade component allows students to reflect on their understanding of course content and provides a venue for communication. Implementing guided discussion posts could include guided questions that ask students to share relevant and helpful information on learning techniques. For example, questions could include asking students to share resources they have found helpful to better understand challenging topics, time management concerns and/or advice, techniques that worked well when preparing for a past test; and, new techniques they plan to use to prepare for upcoming tests.

In addition to a journal and guided discussion post on the course learning platform, an electronic whiteboard application is another helpful and simple way to share reflection posts. This instructor uses Jamboard (jamboard.google.com), a Google interactive whiteboard, to provide reflection and feedback for both students and instructors. It can be used on a recent topic covered, upcoming material, or as a test review. Alternative electronic whiteboard applications, such as Miro (miro.com), Clickup (clickup.com), and Padlet (padlet.com), are also available. For each class day's Opening Jam activity, students are asked to record two problems on the electronic whiteboard at the beginning of class on a topic that was covered the previous class day. The first recorded problem should be one that students understood well, while the second recorded problem should be one that was least understood. This could include questions on an upcoming homework assignment. At the end of class, students participate in the Closing Jam activity and are asked to record two problems on another electronic whiteboard page related to the topic covered that day. One recorded problem should reflect a problem or concept understood well, while the second recording should seem confusing. This process allows the instructor to learn which topics students may be confident in and which must be reviewed. Additionally, students are able to learn about their classmates' struggles with course content and, in turn, the activity supports class engagement.

Student reflections on electronic whiteboards may also be a helpful activity to engage students with reflection on test review topics. This instructor asks students to reflect on and record their test preparation techniques at the end of a test review class, as demonstrated in Figure 3 below. Students are asked to complete three recordings. For the first recording, students are asked to share a test preparation technique that worked well when preparing for Test #1. Some responses have included: completing practice problems, attending the learning center, and, working through the test review. In the second recording, students are asked to reflect on a test preparation technique that didn't work. Responses have included: "I didn't get a good night's sleep," "I didn't study until late the night before," and "I didn't study at all." The third and final recording includes students' reflections on a new technique they plan to use for Test #2. With this process, students cannot only reflect on what worked and what didn't work when preparing for the last test, but also hopefully help them discover shared alternative techniques from their peers and learn that they are not alone. (See Figure 3.)

FIGURE 3
EXAMPLE OF STUDENT SUBMISSIONS OF SHARED TEST PREPARATION TECHNIQUES ON AN ONLINE WHITEBOARD APPLICATION



Student comments when asked to discuss the benefits of using Jamboard, the electronic whiteboard, included:

- *Jamboard helped us understand what we were learning.*
- *It helped us to see what the class needs to work on.*
- *Jamboard helped us get to know each other better and it helps us share our ideas with each other easily and all at the same time.*
- *A benefit of the use of Jamboard in our class was to learn from others.*
- *It was helpful to show how we can improve from what we may need more work on.*

CONCLUSION

Formative assessment, an ongoing assessment that monitors student learning, is an important component when creating a course that fosters student success. Several categories of engaging formative assessment activities may be included in any course, such as flip assignments, student engagement participation activities, test reviews, and student reflections. By offering students low or no stakes assignments that facilitate practice and enhance understanding of course content in a stress-free environment, student learning can be enriched, and learning goals can be more attainable. Simultaneously, instructors can gain valuable insights into the concepts students have mastered and those that continue to pose challenges and remain unclear. With this knowledge, instructors are better equipped to address student needs and, when necessary, modify their teaching to enhance student learning (Durga, 2020).

REFERENCES

Baleni, Z.G. (2015). Online formative assessment in higher education: Its pros and cons. *Electronic Journal of E-Learning*, *13*(4), 228–236.

Barkley, E.F. (2010). *Student engagement techniques: A handbook for college faculty.* San Francisco, CA: Jossey-Bass.

Bhat, B.A., & Bhat, G.J. (2019). Formative and summative evaluation techniques for improvement of learning process. *European Journal of Business & Social Sciences*, *7*(5), 776–785.

Chang, B. (2019, March 5). Reflection in learning. *Online Learning*, *23*(1), 95–110. doi:10.24059/olj.v23i1.1447

Durga, M.V., & Kumar, M.C.B. (2020). Formative and Summative Assessment for Learning: A Review. *Journal of Research in School and Professional English Language Teaching*, *20*, 2456–8104.

Garrison, C., & Ehringhaus, M. (2007). *Formative and summative assessments in the classroom*. Retrieved from http://www.amle.org/Publications/WebExclusive/Assessment/tabid/1120/Default.aspx

Ho, A.M. (2018). Unlocking ideas: Using escape room puzzles in a cryptography classroom. *Primus*, *28*(9), 835–847.

Iannicelli, C. (2020). Teaching Information Literacy and Digital Literacy through Escape Rooms. *Library Publications and Presentations*.

Sanchez, O. (2022, April 6). After the pandemic disrupted their high school educations, students are arriving at college unprepared. *The Hechinger Report*.

Shahrokni, S.A., & Reis, M. (2022, January 10). Flipping Back to Campus. *Faculty Focus: Higher Ed Teaching Strategies*.

Supiano, B. (2022, November 10). Teaching: Flipping a Class Helps – But Not for the Reason You'd Think. *Chronicle of Higher Education*.

Weimer, M. (2017, January 18). Interleaving: An Evidence-Based Study Strategy. *Faculty Focus: Higher Ed Teaching*.