

Flip It and Break It

Using Flipped Lessons and Breakouts to Energize Learning

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Flipping the classroom using instructional videos and creating escape room style breakout activities are instructional strategies that can enliven classroom learning experiences. Combined they can enhance the one-shot information literacy session by increasing instructional time and engaging learners in a hands-on activity that promotes critical thinking skills, knowledge application, collaboration, and research resiliency. This article follows the continuing evolution of an experiment with using breakout style lessons in face to face and flipped classes.

Introduction

Over the last few years, I began experimenting with breakouts (similar in concept to escape rooms) in database demonstration lessons in a children's literature course in an effort to make them more engaging for my university students. The effort proved to be successful and the feedback on student evaluations was positive. As with every one-shot lesson, time proved to be an issue as there is always more material that needs to be covered than the class period allows. While the students were enjoying the breakout games as review for the material, the instruction piece was becoming too rushed and bare bones. The natural response to this problem was clearly flipping the instruction. This article examines the initial experimentation with a breakout in library orientation subsequently followed by the process of developing a breakout game for a children's literature course which eventually evolved from face-to-face instruction to incorporating the flipped model, and lessons learned from the instructional experiment.

Literature Review

Escape rooms, live action games that involve teams of four to ten people solving puzzles to break out of a locked room, have gained worldwide popularity beginning around 2007 (Rouse, 2017). The escape room format evolved into an educational form of the game called "breakouts" that can be played in classrooms with whole group or small team participation. This format can involve physical, digital, or a combination of clues and puzzles. The

research on escape rooms reviewed by Fotaris and Mastoras (2019) demonstrates a growth in popularity of this instructional method in an educational setting as the number of publications included in their study steadily increased from one published in 2009 to 15 in 2017 and 24 by April 2019 with a projected 72 by the end of that year (p. 238). The medical field has adopted this simulation experience in pharmacology, surgical, and nursing courses (Brown et al., 2019; Cain, 2019; Edwards et al., 2019; Kinio et al., 2019). While most of the locations for the escape games were in classrooms (78.9%), libraries were the second most popular location (Fotaris & Mastoras, 2019, p. 239). This correlates with the growing amount of literature discussing the use of breakout lessons by librarians in information literacy instruction (Detwiler et al., 2018; Lewallen, 2019).

Breakouts are useful tools for working with students on developing inquiry skills that will be needed in higher education classrooms (Detwiler et al., 2018). They have to be persistent and think outside the box to solve the clues in the puzzle. Research is not a linear checklist that students can follow. They often follow a trail in one direction as far as it can go and then have to try another solution to find the answers they are looking for. Breakouts can mimic that “emotional cycle and inquiry mindset connected to the research process” (Detwiler et al., 2018, p. 65). These games require critical thinking, collaboration, patience, and resiliency (Rouse, 2017). The fact that the game is timed adds a level of urgency and excitement to the class period (Nicholson, 2018). The game can be intended as an introduction to a new unit or a review before an exam (Lewallen, 2019). While allowing the students to work through the process on their own with minimal hints from the instructor is the goal, a final debriefing for the group is critical when using these games in a classroom setting so that they fully understand the lesson that took place (Rouse, 2017).

Creating the games can be a time-consuming process. There are many tools to design games, from the free (Google products) to the paid (BreakoutEDU.com). While free games can be found online, finding one pre-made related to the topic of the day in an academic information literacy lesson, especially requiring the exploration of a specific database, is going to be more difficult, if not highly unlikely. If possible, collaborating with colleagues on the game creation and testing the game ahead of time is important to designing a game (Rouse, 2017). The game’s story is important for engaging the participants (Nicholson, 2018). The games also need to be tested to ensure they can be completed during the class period. Games typically last between 30-50 minutes or 60 minutes (the commercial escape room model) with about five players per team (Fotaris & Mastoras, 2019).

Flipping the classroom is an instructional practice that involves using audio or video to provide the instruction or lecture portion of the lesson allowing for more time for hands on activities during the class period. It began in K-12, particularly middle schools, and is increasingly being adopted into higher education classes (Arnold-Garza, 2014). Librarians have been taking advantage of the flipped format to enhance instruction in one-shot lessons (Berg, 2018; Brooks, 2014). By having some or all of the instruction of the lesson occur prior to the students’ arrival, the librarian can recoup some of the time lost to too much material to cover, the course instructor discussing assignments or reviewing material, or student tardiness (Berg, 2018). Another advantage is that through pre-class activities the students can acquire basic research skills and move on to more advanced strategies in the information literacy session (Cohen, 2016). It gives the class a baseline of understanding of the material that will make the one-shot lesson more effective overall.

There are some disadvantages to the method as the librarian is not the instructor for the course and therefore cannot make the pre-class assignments mandatory. Reliance on the instructor to remind the students to watch any videos and complete any corresponding activities prior to the library instruction session is necessary unless the librarian is given a class list or access to the learning management system used for the course. Assignments that are not graded are often a low priority for students so clear communication between the course instructor and the librarian regarding the expectations for the pre-class and in-class activities are critical for the lesson to be successful. Clearly expressed ties between the information literacy curriculum and standards and the course objectives will only serve to engage both the instructor and the students in the importance of the library lesson.

Orientation Breakout Experiment

I first experimented with using breakouts during an instruction session with a group of rising college freshman enrolled in a summer bridge program at our university in June 2018. I was asked to provide an opportunity for the students to explore the university library and learn about what an academic setting offers. While looking for alternatives to a tour and discussion that the students would find to be more interesting, I remembered breakouts were on my list of teaching strategies to explore.

After doing some quick research I found there are many ways to do the breakout games for free or through programs like BreakoutEDU. I decided to experiment with a free version to see how it went before purchasing a kit and digital program from a vendor. I purchased a small plastic toolbox and reprogrammable lock to hold the prizes while using Google Forms to create the game.

I wanted to use the breakout to highlight different areas of the library's physical space as well as the online resources. Many breakouts follow some type of story, but I did not have time to explore that format. Instead I opted for 14 rhyming clues that would have the teams explore the library website and physical building.

Library website question sample:

- Sometimes you need a little aid, and in the library, you've got it made. The pros are here to find the resource that you have in mind. Call, consult, and email, too, but the fourth is the most popular to do. (*chat*)
- It won't be long till you've ADVANCED in the LIBRARY to do a SEARCH on your own. Finding books on HAMILTON AND HISTORY; perhaps something graphic by this author to unravel the mystery? (*Hennessey*)
- Sometimes we are missing what you desire, and an interlibrary loan REQUEST is what you require. It is EASY for your submission to BORROW from another collection to be seen, just click on this animal that is green. (*squirrel*)
- Some of our collections are quite SPECIAL, showing how campus life used to be; take a look and find the scanned book of rules that end in 1999. (*student handbook*)
- When you do RESEARCH sometimes you need a GUIDE for the answers you seek are right inside. Subjects, courses, all topics, too, it's quite a collection of resources old and new. MAGAZINES and NEWSPAPERS galore; there's even a collection from this major war. (*Civil War*)

Library building question sample:

- Creating something new is fun, and this space is open to everyone. Innovation is lots of fun in this room where iMovie, Photoshop and 3D printing are done. (*Digital Learning Studio*)
- This place is full of such cheer some professors have their office hours here. Sit back, relax, and have a cup of joe cause sometimes you just need to take it slow. (*Starbucks*)
- APA, MLA, thesis statements, too; this room has the right assistance just for you. (*Writing Center*)
- When you need to get together with a buddy, how many rooms are there on the fifth floor to study? (*seven*)

On the day of the campers visit I briefly discussed how an academic library differs from a high school library and that it is essentially just a larger version with extra features (study rooms, technology available for checkout, multiple libraries, etc.). I also covered how to find books, where to find help in the building, the difference between Library of Congress cataloging and Dewey, and the building layout. There was a whiteboard available where they could post questions at any time about academic libraries or universities in general. I explained what a breakout was

(similar to an escape room) and split the group into four teams with the following rules being established before they were set free to begin answering the questions:

- One laptop per group
- Do not ask the on-call librarian for help
- Answers are found around the building and on the website
- Submit the Google Form with the correct answers to get the code to unlock the box and learn the secret to a successful research project.

I wanted the students to work in groups since this instructional method is designed to promote collaboration. Each group was given one laptop so they had to work together since the clues were set up in a Google Form that could be answered in any order. As a team they were able to discuss the clues and find the answers. Two teams finished the task and received the “Congratulations! The lock code is READ” message. The first group that reached the locked box and opened it found a note about the early researcher getting the worm along with bags of gummy worms.

After the breakout was completed, we regrouped and discussed the answers to the breakout clues. The students then had time to ask any questions they had about academic libraries or universities in general and I shared information on other services (health center, computer labs, writing center, counseling, disabilities, academic support) and general advice to enhance their experience in higher education (join extracurriculars, take part in events, act like a professional). I did not do a formal assessment for this experimental lesson, but rather relied on observations while the students solved the breakout and our post-game discussion.

Lessons Learned

With any instructional session or individual assignment you do not know how it will go until the first time you teach it, which is why I figured this was a low stakes opportunity to experiment with this type of activity before dedicating a collaborative lesson to a similar practice. One issue that became evident quickly was that breakouts required some type of background knowledge. I had provided instruction on features of the library website, but using the breakout to replace the tour completely proved to be a challenge. I tried to avoid answering questions so one group did not have an unfair advantage over another but ended up having to provide clues (albeit as vague as I possibly could) to help the students move through the game. Another issue for short answer questions was how students enter the answers into the game makes a difference as spelling, capitalization, spelling out words versus writing numerals, plural versus singular, etc., all count in getting the answer correct, especially in digital breakouts. They might have the right answer but entered it wrong and did not realize they should try another format (such as seven instead of 7). After trialing the breakout with the library orientation, I knew I wanted to try it with a class. With the knowledge of how it might go and some of the roadblocks that might occur, I felt more comfortable using it in an information literacy lesson.

Instructional Session Breakouts

Transferring a lesson like this into the classroom required a collaboration that would give me the time and flexibility to make it work. Many of my instructional sessions were part of a class period or were not guaranteed to repeat every semester so I was not sure that I could modify and continue to improve on a project that would take an investment to set up. I found the right collaboration with ERCH 435: Literature for the Young Child. I typically saw two to three sections with the same instructor each semester, so that provided consistency, and I had the whole class period for the lesson. Another benefit was that when I work with pre-service teachers, I like to model techniques that they can use in the field. This would be an opportunity to make the lesson more interesting, while at the same time demonstrating a teaching strategy that is relatively new and the students may not have encountered before outside of a commercial escape room.

The ERCH 435 lesson previously had consisted of a demonstration of the library resources and about 20-30 minutes of book selection for their portfolio projects and other class assignments. As with every lesson I would quickly remind the students about key features of the library website (hours, on call assistance, etc.) before moving on to the appropriate research guide and the library resources for the course or specific project. I demonstrated where to find the Juvenile Literature Research Guide (library.millersville.edu/childrensliterature) and how to use the university physical materials catalog and the public library catalog that are linked on there to locate books and the book records. The students were then shown how to use the *Children's Literature Comprehensive Database* and *Academic Search Ultimate* to locate book reviews. The class ended in the juvenile collection on the fourth floor where the students had time to learn how the collection was arranged and select titles with assistance from myself and the course instructor.

In the fall 2018 semester I tried teaching using a breakout for the first time with this course. Rather than just doing a free version, I decided to invest in a kit from Breakout EDU and explore how a vendor product worked. I purchased a Single Breakout EDU kit for \$150 which consisted of a one year access to the platform, small and large boxes, and an assortment of reprogrammable locks, cards, pens, and other game pieces (Breakout, Inc., 2019). I was initially wary of making this investment because I do not teach courses consistently where I could make more use of the digital platform. Plus, if I decided not to renew for \$100 every year, any games I had created would be lost. I ultimately decided it was worth the gamble to see if the product might have applications in the library beyond course instruction and to be able to compare it firsthand with the free version. Plus, I would still have the physical kits that could be used outside of the Breakout EDU program if I decided not to renew the digital portion.

The features in the Breakout EDU digital games made creating a variety of clues easier than in Google Forms. There are also quite a few games (1500+) for pre-Kindergarten to adult audiences already in the system (Breakout, Inc., 2019), but a lesson of this specificity in subject matter and audience meant I was going to have to make it from scratch. There are a lot of options in the digital platform and the program takes you through step by step with filling out the questions, story, end of game reveal, etc. The process means making a number of decisions based on how you want the game to go and how much time you have to play. The game could include a single lock or a series of clues in non-sequential or sequential format. Virtual locks are available with answers based on text, color, directional arrows, numbers, and shapes. There is also the ability to combine virtual and physical games or do them separately.

Ideally, the game should have a story, some kind of mystery that you are trying to solve. I did not do this, but rather created clues to get the students thinking creatively about the answers and ensure I covered all of the elements of the lesson from how to search the two types of library catalogs (local public and university) and how to locate book reviews, specific titles, and awards. I chose the sequential game so the teams would have to work together to get through the game rather than dividing up the questions and not practicing using all of the tools from the instruction session. The questions used a variety of digital locks to keep it interesting.

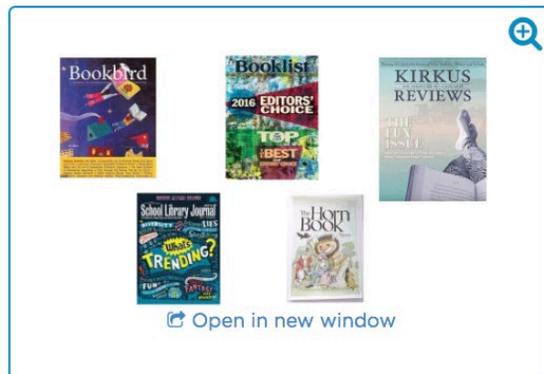
Breakout question sample:

- Text Clues
 - You have a student with reading difficulties in your class. His mother is looking for quality options on audiobook for him. You know there is an award given each year for audiobooks. When did it start? (2008)
 - Besides book awards, there are a number of *(lists)* with recommended titles that are available from foundations and professional associations to guide you in selecting titles.
- Directional Arrow Clue
 - To find a book in the juvenile section, look *(up)* the title, author, or subject. Use the filters on the *(left)* side to limit your search to the *(right)* floor, date ranges, etc. within the library collection.

Select the *(right)* record from the results list. Scroll *(down)* the record to locate the call number, summary, and other information about the book.

- Picture Clue

These professional journals contain what important resource to aid in book selection?



(Reviews)

- Color Clue

- Everyone loves a colorful tale like Lilly's *(Purple)* Plastic Purse, The Artist Who Painted a *(Blue)* Horse, Where is the *(Green)* Sheep, and Little *(Blue)* Truck.

The first time I did the lesson in fall 2018 I tried to fit the breakout into the class period by shortening the other parts of the lesson, spending less time on instruction while trying to protect the book selection time as much as possible. It worked out alright for the most part but felt rushed because we needed at least 30 minutes to do the breakout activity. I also found that questions that made sense to me tripped up the students and they needed some assistance with as subtle clues as I could give. If I observed multiple groups struggling with the same clue, I gave the entire class a reminder as to what databases they should be using. During each session, a group was able to work through the game and open the locked box within the allotted timeframe. Each member of the winning team was allowed to select a children's or young adult book from the prize box (duplicates of donated books to the library). After one group won, we went through the game reviewing the answer to each question and which catalog or database gave the correct answer. I then reviewed why I did the lesson in this particular manner, what I felt worked and what did not, and my first thoughts on how I would change the lesson going forward since I also intended this lesson to be a teaching model.

When I repeated the lesson in early spring 2019, I used the same game with a few tweaks. I figured out that I had to alter the wording of the clues in such a way that the answers HAD to come from one of the databases the class was supposed to be using and could not be found with a quick Google search. After doing this lesson with several sections in the fall I had a better sense of timing to get all of the content into the lesson. While I knew what I needed to cover and managed to get it done, one aspect of the lesson that I still struggled with was the sense of urgency to squeeze in a lot of content, an activity, and book selection. The remedy for this seemed to be flipping the classroom, which the instructor was on board with experimenting with in the following fall semester.

The flipped lessons were implemented in fall 2019. This semester the professor I usually worked with was on sabbatical, so I worked another member of the department and two adjuncts who covered the ERCH 435 course sections. I created a library module for the learning management system and copied it into all of the sections after the instructors gave me access to the course. The university uses Desire2Learn (D2L) as its course management system and

it was easy to create a module to add to the course sections prior to the library meeting to allow more time for review and game play during the allotted class time. The module consisted of a two minute video introducing myself as the Education Librarian and the lesson to the students, a page on how to schedule a research appointment with me, and a six minute video reviewing the Juvenile Literature Research Guide (library.millersville.edu/childrensliterature) with a link to the guide. Most of the videos were already on the research guide, but planning this assignment prompted me to revisit and update them. The last portion of the module consisted of instructions on the expectations of what the students were to do prior to class, including watching the tutorials on the research guide that explained how to search for books in the university library's physical catalog, the public library catalog, and reviews in the *Children's Literature Comprehensive Database* and *Academic Search Complete*.

When the classes arrived I did my usual quick introduction to features on the library homepage, a few highlights from the pre-class assignment on features they should really know (also conveniently clues for the upcoming game), offered a question and answer period, and introduced the breakout. A few additional questions were added to the game to review more of the material. The rest of the class session followed the same format as the previous lessons with the game, debrief, and adjournment to the fourth floor to select books.

The flipped lessons went well overall, but it was clear once the game began who did the pre-class assignment and who did not. Since the students were working in groups it balanced out but was not fair for the ones who did the work and had to carry the others. In the future since the instructors generally give me access to the D2L course page I will have to be proactive in sending the reminders myself rather than relying on the instructors (who, quite honestly, did their part in this task, but students will be students with ungraded work), checking click through statistics on the module, and working with the instructor to come up with a quiz or some piece of work the students need to complete to demonstrate that they have viewed the library module and are ready to move on.

Lessons Learned

One of the most important things to remember to do is to give yourself time to test the game. Try it out yourself to make sure it works properly and then have the instructor you are working with and students, if possible, test it for you for additional feedback. Sometimes clues that seem obvious to you just do not register with the game players. Other obstacles with clues also appear unexpectedly. Questions that included copyright dates frequently tripped up students because in many databases and library catalogs it may not be clear to the average patron what the difference in copyright is between first edition and reprint. Explicit instruction in finding this information still proved to be difficult for the students.

Be aware of any questions that may change from game to game. "How many Caldecott winner and honor books are in the university collection?" seemed like a good question to practice searching and applying filters to locate award winners in the library catalog. However, a collection related question containing a number that changes as titles move in and out of the collection through weeding, damages, loss by patrons, and new purchases will prove to be problematic, especially if you plan on reusing the game over time. This happened the second time I ran the breakouts during the spring 2019 semester and recycled the majority of the game for the new instruction sessions. I was able to correct the answer in the game after the first section discovered it on the final question and it became a teachable moment for the pre-service teachers on what not to do when setting up one of these games.

I have found that students with prior experience with classroom breakouts or escape rooms move through the experience much quicker than those who are figuring out the game and getting into the right frame of mind for the first time. It is a different mindset than most students are used to for in-class assignments and the clock adds extra pressure. I did not find that there were enough students with these experiences in any given class to necessitate spreading them out among the groups to keep the competition more even.

The free tool versus packaged program decision basically comes down to a few key areas – amount of use of breakouts, funding available, and desire for more bells and whistles. You can have successful games either way. As with every lesson plan, the important piece to remember is whether or not the learning objectives are being met. If you do purchase a paid program such as BreakoutEDU, be sure to get screenshots of your game before your subscription lapses if you choose not to renew it. You will not be able to access those games and may need that evidence for promotion and tenure paperwork, other scholarly work, or just your own records of lessons you have taught.

Before you begin to create a game think about how much time you will have for set up. If your breakout includes physical clues that will need to be set up between sessions, understand how much time you have in the classroom to take care of that if you have back to back classes or someone is in the room teaching a lesson before you. Purely digital games are typically just a matter of clicking on a link and might be a better option if you are frequently pressed for time before or after the teaching sessions. They are also transferrable to online classes if your institution is heavy in that class format or may be heading that way in the future.

Future Instructional Sessions

Using the breakouts in the children's literature course lessons was an enlightening learning experience as an instructor. In the library world getting enough of the same lessons to consistently tweak and refine can be rare, especially depending on the departments to which you typically serve as the liaison/subject librarian. In this instance I was able to work with one instructor over several semesters to develop the strategy and since the professor happened to be on sabbatical for the fall 2019 semester I was able to get a semi-refined version in front of three additional instructors to get feedback on the breakout. I learned many lessons each semester about how to make the game better and use the time I had with the students in the most productive manner while, most importantly, getting the content across.

Using question sets is a good format to get students to cover specific material, but this game requires more than that. Having a story with a mystery to solve makes the session more interesting and engaging for the students. This is probably the most time-consuming process and the reason I put the strategy on hold for the spring 2020 semester as I work on revising the breakout to the participatory storytelling format that most escape games are based on before bringing it back into the classroom for the fall 2020 ERCH 435 classes.

Assessment is another part of the lesson that will change going forward. Most of my assessment of this activity thus far has come from observing the students work, discussions with the course instructors, post activity class discussions, and comments made in my formal teaching evaluations from the students. At the time I felt that was giving me sufficient information on what aspects of the assignment needed to be improved or dropped. For the fall 2020 semester I will be developing an evaluation survey for the students to complete. This will be very important since the lesson will be entirely virtual as the majority of our university's courses have gone online due to the COVID-19 pandemic. As I will unlikely be able to work with all of the students in real time, I will need some type of formal feedback other than viewing D2L module stats and activity completion. The purely virtual version of the game will take the experience of administering this type of lesson across the spectrum from the first face-to-face orientation and class experiments to flipped class to completely online instruction.

Overall, it has been a positive learning experience for both me and the students in the classes. For any instructor who is looking for a new teaching strategy this is a great one to explore. It is time-consuming and can be a challenge to implement, but gamification of lessons will engage students and encourage active participation.

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