

## Case Studies as Tabletop RPGs

**Abstract:** For many college educators, case studies provide a relatively easy form of active learning to implement. Students connect with them and can see the application and value. There are resources for published case studies available for free online and they can be applicable to almost any topic. However, frequently, case studies mostly involve research that can be divided up among group members with perhaps a few thinking and discussing questions at the end. In this article, I introduce a method of implementing case studies using a tabletop framework, allowing students the agency to make decisions that have impact within the world of the case study. Approaching the case study like a tabletop role-playing game (RPG) provides a more interactive and realistic feeling format. In a tabletop RPG, generally the players specialize. They have roles that only they can provide. Similarly, students can become “specialists” on their part of the case study and bring that expertise back. They may take on the role of particular stakeholders within the issue they are addressing. This structure allows students to teach each other and also discourages “slacking” in which a few people do all the work for the group. This method can also allow for a “role-playing” aspect, in which a student is considering the decisions that are relevant to their specialty from the specialist’s perspective. Also, in a tabletop RPG, there are many points at which the players need to make decisions that affect what happens to their characters in the follow-up. While there are many divided case studies, most of them do not change based on decisions made in prior parts. Due to the interactive nature and direct responses to student decisions, students can feel like their answers matter and get feedback about their choices. Depending on class size, length, and preparation, the results may come within a class session or between class sessions. Either way, their actions matter. These pieces together can give students a sense of ownership and agency over their work and improve understanding of complicated topics.

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### 1. INTRODUCTION

Case studies have been used in teaching for over one hundred years. They are particularly common in practical and advanced areas such as business, law, and medicine (Herreid 2011). In recent years, there has been an increased emphasis on interactive learning at the undergraduate level in a variety of disciplines, including science. Active learning has been repeatedly demonstrated to be more effective for student learning and retention (Freeman et al. 2014), but many instructors have struggled to implement it for a variety of reasons. Reasons given include a lack of familiarity; student resistance; lack of instructor time to modify courses and grade work; and institutional norms (Henderson and Dancy 2007). Case studies are a type of active learning that fits well into many science courses; they can focus very specifically on material that needs to be covered and they are frequently well-received by pre-health students, due to their perceived relevance (Cliff and Wright 1996; Herreid and Schiller 2018).

Case studies are all about teaching through telling a story (Herreid 2006). Most published case studies follow a format where the students first are introduced to a story. Then, they do some research and answer some questions. They may get more parts of the story along the way. At some point, they are asked to answer questions that involve opinions or decisions,

such as diagnosing and treating a patient or deciding on the ethical course of action in a complex situation (C. Herreid 2006; Cliff and Wright 1996). Some cases introduce a role-play component in which students take on particular roles within the case, but these have also generally followed the same basic structure (e.g. Roen 2010; Chen-Izu 2002; Harden et al. 2014).

Role-playing of various types has also been making inroads into the college classroom in recent years through larp, case studies, and online role-playing (DeNeve and Heppner 1997; Childress and Braswell 2006; Torner 2016; Vanek and Peterson 2016). Role-playing can be a very successful active learning method with high levels of retention and student engagement (DeNeve and Heppner 1997). These exercises also allow much higher levels of agency than activities based on prewritten worksheets, even ones in which students make important decisions. However, many of the larp-related approaches are hard to implement in a class focused around upper-level science. There are limited appropriate roles available for such scenarios. In addition, these classes require high levels of detail on very specific areas.

Tabletop RPGs occupy an area that can be somewhere in between these open-ended live-action experiences and the highly railroaded case studies. While there are certainly exceptions to this model, in most tabletop RPGs, players navigate a world that is

created or moderated by a game master (GM). They make decisions and take actions by communicating those actions to the game master. The game master either directly decides the outcomes of those actions or uses some form of mechanic to adjudicate the outcome. From there, the players can respond to this outcome with further actions (Delmas, Champagnat, and Augeraud 2009). Tabletop RPGs have been introduced to the classroom (Lopes 2015), but there are relatively few documented examples. In this article, I introduce a method of implementing case studies using a tabletop framework, allowing students the agency to make decisions that have impact within the world of the case study.

## 2. METHODOLOGY

Like other case studies, the ones discussed here start with a story (Herreid 2006). In order to get to the story, the students need an understanding of the relevant background. The examples used here come primarily from a medical physiology course taken by Masters students and upper level undergraduates. These examples mostly focus upon the diagnosis and treatment of disease. These case studies have also been used in a course on nutrition and food insecurity in America, where they primarily focused upon community level interventions. Relevant background reading is assigned ahead of time to prepare students for the case. After reading the material, students answer online discussion questions. The material is intended to provide a general background and framework, not to focus on the issues of the specific case. For example, students might read chapters on heart function before undertaking a case study about heart failure. When students arrive in class, I begin with a short lecture. The lecture focuses on the areas of the reading with which the students struggled or about which they asked questions in response to the online discussion board.

Once the lecture is over and students have had a chance to ask any additional questions, I introduce the case. The introduction to the case is a written document telling the story of what has happened so far and giving information for the students to pursue. From this initial story, the case lists a set of topics to research and explain. The students work in groups of four or five to approach the case. They maintain consistent groups throughout the semester, but have opportunities to change roles (Michaelsen, Knight, and Fink 2004). Students provide feedback to each other multiple times during the semester using CATME (Loughry, Ohland, and Woehr 2014). That feedback is eventually used to modify their grade, but with early feedback and support, very few students wind up receiving unsatisfactory feedback

from their peers in the end. Once all the students have read the case, they decide on specialties within their group. For some cases, the research topics are explicitly divided by specialty; for others, the students divide the topics as they see fit. Then, the students will do research independently and become “experts” in their area. Depending on the format of the class, research may be done during class time or outside of class.

Once the students have done their initial research, they come back together and share their information. After this, they work together to make initial decisions. In a diagnostic case study, these frequently include requesting tests. These decisions may also include whatever immediate care the patient requires. Once they have made this initial decision, they report it to me as a facilitator (or game master), and I provide them with the outcome of their decision. The case studies have prepared outcomes for the most common decisions, but the facilitator must create new ones for unexpected decisions. They then research this outcome, and use that information to make further decisions until they have reached a satisfactory outcome. In the case of diagnostic case studies, this would be their final diagnosis and treatment plan. At this point, they write up a summary of their final actions, decisions, and outcomes, as prompted by guiding questions. The final written portion, along with their research along the way, are the components that are graded for the class.

## 3. EXAMPLE CASE STUDY

An example of this method is one of the case studies on the digestive system used in the Medical Physiology class. Before the class, students read three chapters on secretion and absorption in the digestive system. This reading focuses on the roles of accessory organs like the liver, pancreas, and gall bladder that make or release enzymes and other substances necessary for the digestion of food. After reading these chapters, they answer discussion board questions online. These include a short essay question (similar to what one might find on an exam), a question about what they found particularly interesting in the chapter, and a question about what materials with which they struggled or found difficult (C. F. Herreid and Schiller 2013). I use the third question and any confusion from the essay question to construct a short lecture. This lecture gives a brief overview of the topics, but mostly focuses on the areas of student concern.

Once the lecture is over, the students receive the case study. The case study contains the following description:

A 36-year-old man was first seen in the emergency room at 6 PM on 4/27. He stated that at approximately 4:15 PM this afternoon he had felt a sharp, severe pain that increased in intensity for about 45 min and that had since remained constant. He had never before experienced pain of this type. He was sitting quite still in a chair, and when he moved to an examining table, he stated that the pain worsened. He looked pale, sweaty, and sick. His respirations were shallow, and he stated that deeper breathing was more painful. His blood pressure was 100/60 mm Hg (13.3/7.9 kPa); his pulse was 110 and regular; and his temperature was 37.5 C. Significant physical findings were limited to the abdomen, which was rigid to palpitation. There was tenderness (pain) when the epigastrium was firmly pressed; when the examiner's hand was suddenly removed, the pain was momentarily increased (rebound tenderness). Laboratory blood tests have been performed, and you are waiting on the results.

After this description, a number of specific topics from the above are called out for further research. Within their groups, students decide on the medical specialties that they will represent and divide the research among them appropriately. Once they have completed this research, students are asked to decide on the first test they want to run and asked how they would treat this patient while they are waiting for test results. After they turn in those answers, they receive blood work, the results of the test they ordered, and an update on the status of their patient. They research these outcomes according to their specialties and record those results. From there, they may choose to order additional tests and additional treatment until they reach a final diagnosis and a treatment plan. In this particular case, the patient has gallstones, which are causing pancreatitis. If they do not put the patient on IV fluids, with an order not to eat, the patient will develop more severe symptoms and may develop dehydration. In order to diagnose this patient, they will need to do some sort of imaging to see the gallstones and blood work in order to detect the pancreatic enzymes that are being released into his system due to pancreatitis. There are several possible options for treatment plans, but most will involve the removal of the gallbladder to get a satisfactory outcome.

#### 4. STUDENT RESPONSES

Overall, student response to these case studies has been extremely positive. Students are engaged both

with the research and in active discussion about what to do next. They frequently express excitement or nervousness about the outcomes of their decisions. On course evaluations, an average of 80% of students described the case studies as "very effective" (the highest rating), while another 8.5% described them as "effective." 74% of students said that the course using these case studies "helped them to think independently about the subject matter" more or much more than other courses.

Most of the student comments on the cases have been positive. Some representative comments include:

The case studies are extremely helpful in understanding the material better and making sense of body systems, while connecting different ones together.

I enjoyed this course a lot. Instead of hearing a lecture, I got to practice my skills in problem solving with my fellow students like I would be doing as a physician one day.

I really liked the case studies that were a part of the class because [they] really helped me to go step by step to diagnose our patients.

I felt like [the TV character] House!

There were some student concerns in the comments as well, but most of these related to the course structure, rather than the cases. The only complaint from the comments that directly related to the cases was "The case studies did get a little repetitive and class structure could have been switched up a little."

#### 5. CONCLUSIONS

Overall, this method has been successful in improving student engagement. However, there are certainly drawbacks to this method. The method is very teacher intensive, since the teacher is acting as a game master in response to team decisions. This method has been used with classes of 12 to 43 students. At the upper end of that range, student group progress was substantially slowed by waiting on the facilitator to receive and respond to their decisions. This probably could be alleviated with a teaching assistant who could provide students with the prepared responses, but the teacher would still need to be available to address unexpected responses, which frequently occur. In addition, the students need to be at a level where they are able to incorporate the material relatively independently. So far, I have only used this method in graduate and upper level undergraduate classes. While it could be adapted for lower-level undergraduate or high school classes, the students



would probably need a lot more guidance with the research component and might need additional support in coming up with appropriate decisions.

Despite these drawbacks, this method shows potential for improving engagement and student enthusiasm. This model can provide some of the advantages of classroom larp (Mochocki 2014), while fitting more easily into a science classroom setting. This provides a novel perspective for approaching interactivity, one that is different from both the available published case studies and from most role-playing activities currently available for the classroom. This method allows the intense and specific subject focus of case studies while providing some of the investment and interactivity of role-playing activities.

## REFERENCES

- Chen-Izu, Ye. 2002. "How a Cancer Trial Ended in Betrayal." *National Center for Case Study Teaching in Science*. Last accessed on December 20, 2018. [http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case\\_id=233&id=233](http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case_id=233&id=233).
- Childress, Marcus D., and Ray Braswell. 2006. "Using Massively Multiplayer Online Role-Playing Games for Online Learning." *Distance Education* 27 (2): 187–96. <https://doi.org/10.1080/01587910600789522>.
- Cliff, W. H., and A. W. Wright. 1996. "Directed Case Study Method for Teaching Human Anatomy and Physiology." *The American Journal of Physiology* 270 (6 Pt 3): S19–28. <https://doi.org/10.1152/advances.1996.270.6.S19>.
- Delmas, Guylain, Ronan Champagnat, and Michel Augeraud. 2009. "From Tabletop RPG to Interactive Storytelling: Definition of a Story Manager for Videogames." In *ICIDS 2009, LNCS 5915*, edited by Ido A. Iurgel, Nelson Zagalo, Paolo Petta, 121–26. Springer, Berlin, Heidelberg. [https://doi.org/10.1007/978-3-642-10643-9\\_16](https://doi.org/10.1007/978-3-642-10643-9_16).
- DeNeve, Kristina M., and Mary J. Heppner. 1997. "Role Play Simulations: The Assessment of an Active Learning Technique and Comparisons with Traditional Lectures." *Innovative Higher Education* 21 (3): 231–46. <https://doi.org/10.1007/BF01243718>.
- Freeman, Scott, Sarah L Eddy, Miles McDonough, Michelle K Smith, Nnadozie Okoroafor, Hannah Jordt, and Mary Pat Wenderoth. 2014. "Active Learning Increases Student Performance in Science, Engineering, and Mathematics." *Proceedings of the National Academy of Sciences of the United States of America* 111 (23): 8410–15. <https://doi.org/10.1073/pnas.1319030111>.
- Harden, Heather K. L., Michael L. Foley, A. Poon, Rachel, and Annie Prud'homme-Genereux. 2014. "The Modern Caveman's Dilemma." *National Center for Case Study Teaching in Science*. Last accessed December 20, 2018. [http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case\\_id=752&id=752](http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case_id=752&id=752).
- Henderson, Charles, and Melissa H. Dancy. 2007. "Barriers to the Use of Research-Based Instructional Strategies: The Influence of Both Individual and Situational Characteristics." *Physical Review Special Topics - Physics Education Research* 3 (2): 020102. <https://doi.org/10.1103/PhysRevSTPER.3.020102>.
- Herreid, Clyde. 2006. *Start with a Story: The Case Study Method of Teaching College Science*. Arlington, VA: National Science Teachers Association Press.
- . 2011. "Case Study Teaching." *New Directions for Teaching and Learning* 2011 (128): 31–40. <https://doi.org/10.1002/tl.466>.
- Herreid, Clyde Freeman, and Nancy A. Schiller. 2013. "Case Studies and the Flipped Classroom." *Journal of College Science Teaching* 42(5): 62–66. <https://doi.org/10.2307/43631584>.
- Lopes, Rui Pedro. 2015. "City of Dred – a Tabletop RPG Learning Experience." *7th International Conference on Education and New Learning Technologies (EDULEARN)*, 6987–95. <https://bibliotecadigital.ipb.pt/handle/10198/13796>.
- Loughry, Misty L., Matthew W. Ohland, and David J. Woehr. 2014. "Assessing Teamwork Skills for Assurance of Learning Using CATME Team Tools." *Journal of Marketing Education* 36 (1): 5–19. <https://doi.org/10.1177/0273475313499023>.
- Michaelsen, Larry K., Arletta Bauman. Knight, and L. Dee Fink. 2004. *Team-Based Learning: A Transformative Use of Small Groups in College Teaching*. Herndon, VA: Stylus Publishing.
- Mochocki, Michał. 2014. "Larping the Past: Research Report on High-School Edu-Larp." In *The Wyrd Con Companion Book 2014*, edited by Sarah Lynne Bowman, 132–49. Los Angeles, CA: Wyrd Con. <https://repozytorium.ukw.edu.pl/handle/item/1492>.

Roen, Keely. 2010. "Killing Coyote: A Film Analysis and Role-play Case." National Center for Case Study Teaching in Science. Last accessed December 20, 2018. [http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case\\_id=225&id=225](http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case_id=225&id=225).

Torner, Evan. 2016. "Teaching German Literature Through Larp: A Proposition." *International Journal of Role-Playing* 6: 55-59.

Vanek, Aaron, and Andrew Peterson. 2016. "Live Action Role-Playing (Larp): Insight Into an Underutilized Educational Tool." *Learning Education Games* 2: 219-40.

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