



A Perspective on the Educational Psychological Value of *Jurassic Park* and Similar Films for Bioethics Discussions

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This paper, with recommendations for teachers and teacher educators, discusses the *Jurassic Park* science-fiction series with a parallel mention of the *Night at the Museum* trilogy addressing the educational value of this subgenre of film for bioethics discussion in social studies classes. These film series were selected for analysis because of their long-standing popularity, especially *Jurassic Park* that has continued as a series for over three decades. As such, this paper posits that representations of anthropology, archaeozoology, and related fields in popular entertainments films can be motivational for students to explore these careers for themselves or at least develop and interest in studying bioethics as an important discussion in social studies and science.

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INTRODUCTION

Entertainment films have been a way to prompt discussion among the general public and students about various social studies issues (Considine and Baker, 2006; Smithikrai, 2016; Russell and Waters, 2017). The subgenre of genetic engineering adventure can be a useful starting point for bioethics discussions in classrooms (Rich, 2015). One such issue is bioethics, which is addressed by anthropologists, scientists, and psychologists, among others. Sometimes, films might be the only prompt for some members of the general public to discuss issues with each other and address these issues with policy makers. Films can also prompt scientists and professional associations to address an issue, focus more on a specific issue, or think differently about an issue. This paper discusses the *Jurassic Park* science-fiction series with a comparison commentary on the *Night at the Museum* trilogy addressing their educational value for teachers and teacher educators to use for bioethics discussion and how to encourage exploration in careers that are represented in these films.

LITERATURE REVIEW

The subgenre of genetic engineering adventure films can be useful for engaging interdisciplinary curricula across social studies and science secondary classrooms. Bioethics discussions appear to currently be a rare topic in secondary schools, but such discussions can generate student interest in studying these topics and going into science, technology, engineering, and mathematics (STEM) fields with greater interest in both STEM and bioethics so that the two remain connected (Kim, 2018). This analysis is relevant as education itself goes more digital and interdisciplinary

conversations become more acknowledged as important in a high-technology society. As Clinton et al. (2013) noted of “digital literacies,” it is important for teachers to teach students to find ways to “work across that divide. . . they needed to know how to connect their contemporary experiences to a much older tradition” (p. 5). This perspective is taken to this case study of the usefulness of the bioengineering adventure subgenre of film.

The *Jurassic Park* series is selected for analysis because of its substantial material and long-standing popularity, as evidenced by its longevity and influence in the popular consciousness in the United States. It has been evaluated for its bioethics discussion potential by Rich (2015), but that discussion did not focus on the K-12 context or teacher educators but, rather, a general conceptual discussion within the scientific community. Bioethics discussion have become increasingly important, but there is a gap in the literature on the topic for K-12 discussion, especially as it relates to popular movies (Russell and Waters, 2017; Simonson, 2002).

Calls for more work in bioethics discussions were also made by Pavarini et al. (2021), positing a research framework for such discussion within the scientific community. This current discussion addresses this for the K-12 teacher educator context in which movies are way to generate student engagement for bioethics discussion. The *Jurassic Park* series has six films spanning 3 decades. Such popularity and longevity in popular consciousness makes them ideal as a starting point for teachers to use as common foundation for lessons in interdisciplinary bioethics discussions across social studies and science curricula. The *Night at the Museum* trilogy was selected specifically for its reference to dinosaurs—carrying forward the theme of popular interest in dinosaur “reanimation.”

Designing a curriculum that has various levels of questioning will engage students in how to evaluate bioethics and discuss informed opinions on common texts and films (Dillon, 1982; Agarwal, 2019). Discussion-based teaching and learning has interdisciplinary value across content areas (Griswold et al., 2017). Bioethics is an increasingly important topic as technology for new therapies are promoted. Reddy (2007) discussed the bioethics of genetic engineering from community perspectives. Addison and Lassen (2017) study discussed genetic therapy and the balance between individual and community consent. As such, this paper posits that representations of anthropology, archaeozoology, and their relationship to the psychology of popular entertainment films in how they can engage students in exploring bioethics and related careers.

THE JURASSIC PARK SERIES AND BIOETHICS IMPLICATIONS IN A FILM SUBGENRE

There has been a fascination in American popular culture with biotechnology and prehistory and how such combinations can be modified in present society. This can be seen in the popularity of several major media franchises such as Michael Crichton (1990) *Jurassic Park* novel that started a major film franchise. Steven

Spielberg adapted Crichton’s fiction novel into a major science-fiction film of the same title, *Jurassic Park* (Spielberg, 1993). This was followed by two sequel films: *The Lost World: Jurassic Park* (Spielberg, 1997), and *Jurassic Park III* (Johnston, 2001). This later led to another set of films: *Jurassic World* (Trevorrow, 2015), *Jurassic World: Fallen Kingdom* (Bayona 2018), and the planned *Jurassic World: Dominion* (expected 2022). Central to the storylines of these screenplays and stories are concepts of cloning, entertainment, business, and the modification of contemporary and ancient DNA with gene splicing and other experimental, scientific processes. With the two *Jurassic Park* trilogies from the 1990s and the twenty-first century—focusing on the same topic of dinosaurs, cloning, and genetic engineering—there has been substantial interest in these topics.

The symbolism used in these science-fiction adventure films is of interest for examination because of how dinosaurs are presented within the setting of a theme park. The theme park, *Jurassic Park*, is run by a corporation called InGen that generates revenue from tourists who visit the park which is an entire small island, though it seemed to initially be a research venture that morphed into a theme park business. The business side of the enterprise also seems to have external investors, as InGen was a bioengineering start-up in the first film, though this is hinted at rather than confirmed. The main pavilion in *Jurassic Park* is a modern facility with computer-controlled door locks and a centrally administrated computer system for the doors, windows, heating and cooling, and the laboratories, as well as the electric perimeter fences and the various dinosaur enclosures. As seen in the film, these processes break down because of some of the employees’ choices and technical glitches. Technical faults occurred several times to the point that it seemed to be a subtle comment by the screenwriters about the dangers of overreliance on technology. The dinosaurs themselves are portrayed as intelligent and mostly dangerous. However, the herbivorous dinosaurs, such as the the Brontosaurus and Ankylosaurus, were peaceful and portrayed as non-threatening. This juxtaposition with the other dinosaurs is important for discussion. One of the characters in the first film, for example, was portrayed as unethical and an antagonist to both the other employees and to the dinosaurs. The genetically modified velociraptor—in the film, either a genetically modified *Velociraptor mongoliensis* or *Velociraptor osmolskae* (Godefroit et al., 2008; National Geographic, 2008)—was portrayed as intelligent and particularly ferocious in its reaction to certain employees of the Park.

At first, it may not be apparent that the fictional tale of *Jurassic Park* is a critical bioethics commentary, and yet the symbolism in conjunction with the story itself—and the characters actions—suggest otherwise. *Jurassic Park*’s logo is a *tyrannosaurus rex* skeleton in silhouette towering over what appears to be a forest with “*Jurassic Park*” spelled out in capital letters between the silhouette and the forest below. Red and yellow are the dominant colors of the logo. These would seem to suggest a sunset. Applying concepts from the psychology of color theory (Elliot and Maier, 2014), the red and yellow infer “stop” and “warning” like a traffic control light in the United States for when to stop and yield. The symbolism

could be multifold in which the Sun set on the dinosaurs and now it would set on Jurassic Park. The logo could be interpreted as having ominous symbolism, which would seem to be confirmed when watching the film. After watching the film, interpreting the logo as ominous and as a warning would appear to be supported. The red in the logo also seems to suggest “danger” and “warning ahead.” When considering the apparent lack of bioethical considerations from the characters in the film who reanimated the ancient DNA and engineered new dinosaurs with gene splicing out of curiosity as much as for business or entertainment would lead to unpleasant consequences.

Had there been a robust bioethics discussion and evaluation before moving forward with the theme park, perhaps restraint would have prevailed to further study the potential ramifications of reanimating ancient DNA and conducting genetic engineering. The InGen personnel, in other words, did not conduct what Pavarini et al. (2021) called a “design bioethics” approach to “consider how designed tools can enact their own theoretical commitments and also respond to practical considerations. The approach invites critical, reflexive and creative design of empirical tools, attending to theoretical, epistemological and practical considerations” (p. 9). A bioethics discussion in a social studies or science classroom could evaluate what the scientists could have done differently in *Jurassic Park* had they applied a design bioethics approach to consider the implications of their genetic engineering experiments, especially in the context of InGen apparently operating on a for-profit basis.

The presentation of scientific processes with mythical or pseudoscientific explanations of how or why a scientist and businessperson would commercialize a dinosaur’s ancient DNA or proteins—as is the case in the *Jurassic Park* book and film series—poses ethical conundrums across an array of issues. *Jurassic Park* begins with several of the characters engaged in an archaeozoological exploration that quickly encounters ethical questions. It is a premise that gained substantial attention in part because of recent discoveries in the fossil record and advances in biotechnology. The film then centers on the business of a theme park that used genetic engineering for a dinosaur zoo. Some reviewers of the *Jurassic Park* franchise raised the issue of bioethics: “Ethical questions abound in ‘Jurassic World’ and they are about more than science. Tampering with nature has its limits, and the people running Jurassic World have not learned from their own history” (Pacatte, 2015, para. 13). In a scholarly editorial published in the journal *Bioethical Inquiry*, Rich (2015) argued for the importance of asking critical questions about the current and potential use of high technology when it “becomes involved, and—in Crichton-like *Jurassic Park* (1990) fashion—does our focus on the ‘how can we’ tend to overshadow the ‘whether we should’” (p. 532). In other words, the issue of reanimating the recovered DNA of an extinct species—such as dinosaurs—is a bioethics question that is tacitly implied in these films. Related to the question of whether something should be done because the technology exists, Simonson (2002) noted in an article published in the *Hastings Center Report*, that “scholars in bioethics have often been uneasy with the [media] coverage and worried about its inadequacies” (p. 32). The *Jurassic Park* film

series tangentially addresses bioethics through some of the characters’ discussions, but films portray the “how can we” mentality more than an exploration of the “whether we should” mentality.

The *Jurassic Park* series portrays Jurassic Park as an entertainment theme park using reanimated ancient DNA of dinosaurs that has also been genetically spliced to make various dinosaur hybrids. The fictional presentation of this theoretical science has its roots in current biotechnology. During the time these movies were made, several scholarly publications addressed these issues. In their book on the ethics of genetic engineering, Reiss and Straughan (1996) noted that genetic engineering had already made substantial advances opening more potential scenarios. In 1997, researchers reported the first successful cloning of an animal, “Dolly” the sheep, that also prompted a new discussion in the ethics of bioengineering (Kolata, 1997; Thompson, 1997). By 2010, according to Ormandy et al. (2011), genetic engineering of animals had increased as biotechnology had steadily advanced. Anthropologists addressed this issue from a cultural as well as scientific perspective. In an ethnographic study of a community’s perceptions of genetic engineering in the United States, Reddy (2007) discussed some of the nuanced complexities of how bioethics intersected with the perceived utility of genetic engineering. Likewise, but from the perspective of medical practitioners, Addison and Lassen (2017) study suggested the nuanced perspectives toward genetic therapy.

The popularity of these film series is seen in the sales figures for each trilogy. As seen in **Table 1**, sales increased from the first film in the *Jurassic Park* series in 1993 to the fifth film in 2018. Three of the films surpassed one billion dollars worldwide in box office sales, according to data available from Box Office Mojo (www.boxofficemojo.com). The trend line looks like a parabola in which the third film, in the five films so far as of 2020, was the lowest grossing film in movie theater box office sales. Fourteen years after the third film, the fourth film was released and set a record for the *Jurassic Park* film franchise.

The first two films had more of an emphasis on the characters who were paleontologists and seemed to have more dialogue about archaeozoology and the implications of genetic engineering. The next three films in the series suggested that the characters did not learn much from either their own experiences or those of their predecessors from either InGen or the other protagonists, as they tended to make many of the same mistakes. The broken cycle of not adequately addressing ethics issues provides a basis for audiences to discuss what the characters could have done differently to proactively prevent the problems portrayed in the film. As seen in **Table 2**, the synopsis for each of the five *Jurassic Park* films, so far, suggest the narrative emphasis in each of the films. The overarching storyline would seem to suggest that there is a bioethics commentary being made by the films’ writers that they are communicating through the characters and scenarios in the film. The synopsis for the second film, *The Lost World: Jurassic Park*, specifically mentions “research team,” so the series is trying to be a science researcher adventure subgenre within the larger science-fiction genre.

TABLE 1 | Comparing sales figures across films (dollar amounts are from www.boxofficemojo.com).

Film (Year)	Domestic	International	Worldwide
Jurassic Park (1993)	≈ \$404 M	≈629 M	≈ \$1.03 B
The Lost World: Jurassic Park (1997)	≈ \$229 M	≈ \$389 M	≈ \$618 M
Jurassic Park III (2001)	≈ \$181 M	≈ \$187 M	≈ \$368 M
Jurassic World (2015)	≈ \$652 M	≈ \$1.01 B	≈ \$1.67 B
Jurassic World: Fallen Kingdom (2018)	≈ \$417 M	≈ \$892 M	≈ \$1.31 B
Jurassic World: Dominion (2022)	?	?	?

Table Abbreviations: M is million, B is billion in U.S. dollars. All dollar amounts are from data collected by www.boxofficemojo.com (as of October 2020).

TABLE 2 | Synopsis for each *Jurassic Park* film from www.boxofficemojo.com.

Film (Year)	Synopsis (from www.boxofficemojo.com)
Jurassic Park (1993)	"A pragmatic paleontologist visiting an almost complete theme park is tasked with protecting a couple of kids after a power failure causes the park's cloned dinosaurs to run loose." (https://www.boxofficemojo.com/title/tt0107290/)
The Lost World: Jurassic Park (1997)	"A research team is sent to the Jurassic Park Site B island to study the dinosaurs there, while an InGen team approaches with another agenda." (Kenneth Chisholm, IMDB, https://www.imdb.com/title/tt0119567/plotsummary and https://www.boxofficemojo.com/title/tt0119567/)
Jurassic Park III (2001)	"A decidedly odd couple with ulterior motives convince Dr. Grant to go to Isla Sorna for a holiday, but their unexpected landing startles the island's new inhabitants." (Keith Simanton, IMDB, https://www.imdb.com/title/tt0163025/plotsummary and https://www.boxofficemojo.com/release/r13210577409/)
Jurassic World (2015)	"A new theme park, built on the original site of Jurassic Park, creates a genetically modified hybrid dinosaur, the Indominus Rex, which escapes containment and goes on a killing spree." (https://www.boxofficemojo.com/title/tt0369610/)
Jurassic World: Fallen Kingdom (2018)	"When the island's dormant volcano begins roaring to life, Owen and Claire mount a campaign to rescue the remaining dinosaurs from this extinction-level event." (https://www.boxofficemojo.com/title/tt4881806/)

In a different approach to the portrayal of physical anthropology and the portrayal of dinosaurs, is the inter-genre comedy and fiction-fantasy *Night at the Museum* film trilogy. The films are set in a fictionalized museum of natural history that seems to take its design cues from the Smithsonian National Museum of Natural History. Genetic engineering is inferred with the *tyrannosaurus rex* skeleton as it reanimates, which could be interpreted as an echo to Jurassic Park. In *Night at the Museum* (Levy, 2006), the main character—a security guard at the museum—interacts with the various historical figures and archeological and paleontological items as they “reanimate.” The theme of reanimation, though different in its tone from the serious *Jurassic Park* film series, carried through to all its sequels. As seen in *Night at the Museum: Battle of the Smithsonian* (Levy, 2009) and *Night at the Museum: Secret of the Tomb* (Levy, 2014), the reanimation of the prehistoric, ancient, or recent historical figures or paleontological fossils leads to a “battle” and hints at a potential bioethics discussion without actually addressing it.

While physical anthropology is symbolized by the fun and whimsical museum in the *Night at the Museum* film trilogy, it can be interpreted as a tacit signal toward the serious question of bioethics that is at the nexus between physical anthropology and

genetic engineering. Or, perhaps, the tacit implication in some of the situations in the film is more precisely called a simulacrum. The fictional museum in *Night at the Museum* looks just like a real museum, but the heavy overlay of fantasy reanimation of the historical figures, mummies, and dinosaur skeleton did little to address any of the questions that a curatorial summary might address in real-life museums.

The whimsical representation of a large, natural history museum can be motivational to its audience to study the topics presented in the film. These topics range from the field of anthropology to specific historical figures, fossils, and art. This can encourage people to study anthropology and consider careers in this field. The setting of this trilogy is important because it is showing museums as interactive and alive.

RECOMMENDATIONS

The *Jurassic Park* series and the *Night at the Museum* trilogy, while different, address issues of reanimation and bioethics in ways that can prompt educational discussions and encourage anthropological study in social studies classes. Guiding questions could include: 1) What are the dangers of genetic engineering on

animals and how can a process be established to determine when genetic modification should or should not be allowed? 2) What are ethical considerations of genetic engineering and how should genetic technologies be regulated? See the prize-winning essay written by high school student Soo Hyun Kim (2018) for the Carnegie Council for Ethics in International Affairs' essay contest. Also, 3) How should scientists in *Jurassic Park* have addressed bioethics before beginning genetic engineering experiments? Discussion seminars are a primary way to foster student learning about bioethics as an interdisciplinary process of understanding. The Socratic method is one of the more established approaches to accomplish this, and it is founded on the psychological principles of questioning. Dillon (1982) noted that posing multiple levels of questioning were crucial in providing enough stimuli for students to actively engage and learn the given content. Students also need some factual knowledge before engaging in higher order learning (Agarwal, 2019). The *Jurassic Park* films can be a part of accomplishing both basic knowledge as well as higher order learning process when combined with materials on the history of science. An interdisciplinary Socratic seminar discussion format could be used to have students prepare and engage in discussion of the bioethics seen or not seen in the *Jurassic Park* series.

The Socratic format in social studies is generally a five-step process: Select common texts (or, this case, films), give a preparation assignment, develop a rubric for seminar discussion conduct, structure the seminar to allow for all students to participate, and reflect as a class on what was learned at the end of the seminar (see *Facing History and Ourselves*, 2017). The Socratic method has gained more attention from the sciences, as explained by Griswold et al. (2017). They explain a similar discussion process for students in science classes as in humanities and social studies classes to engage in dialogue about how to apply the scientific method and discuss findings from their laboratory journals. Griswold et al. (2017) explain the Socratic seminar as having four main steps: Establish discussion norms, arrange the classroom for discussion, use multiple levels of questioning, and reflect as a class in a debriefing session. These align very closely with the Socratic method in social studies. Based on the guiding questions, students should be prompted to discuss what apparent motivations of the scientists in each of the movies, going sequential from the first through the last film. Use the summaries of each film to establish each seminar theme (see **Table 2**). There could be three seminars in which the first seminar addresses the first two films, the second seminar addresses the third and fourth films, and the third seminar addresses the fifth and sixth films as well as the portrayal of dinosaurs in *Night at the Museum*. The connection prompt could be: Why does the reanimation of dinosaurs seem to be a common theme across films? Where is the interest in dinosaur reanimation coming from and why?

Research teams and paleontology are specifically mentioned in one or more of the *Jurassic Park* film summaries (see **Table 2**). This indicates that the screenwriters are writing within the science-fiction genre. The films are in what could be called the bioengineering adventure subgenre, and the *Jurassic Park* series

elevated this subgenre to major popularity. For the first film, students can be prompted with the following questions or prompts in order of levels of questioning: What dinosaurs did the paleontologists and experimental geneticists first discover and what types of gene splicing did they engage in to create what new hybrid dinosaurs? Did the scientists engage in a bioethics discussion? What potential conflicts of interest, if any, were there in the way InGen was structured? What seems to motivate each of the main characters? Evaluate how a different approach to bioethics might have resulted in a different outcome based on a "design bioethics" approach (Pavarini et al., 2021).

For the second film, students can be prompted with the following questions or prompts: Analyze the results of the scientists' decisions from the first film in comparison to the second film. How did they approach bioethics? How did they learn from the experiments from the first film? Create a bioethics policy plan that employees of *Jurassic Park* could have used to avoid the problems identified.

For the third through sixth films, a similar approach to the levels of questioning and prompting can be developed to integrate interdisciplinary factual knowledge with higher order questions to evaluate and create bioethics solutions. The goal is to encourage students to develop proactive skills in interdisciplinary discussion that is informed by both scientific principles and ethics constructs from the humanities. As students finish the third seminar, students can write an essay based on one or more of the guiding questions. For an example of a similar type of essay by a high school student, see Kim (2018) bioethics essay.

CONCLUSION

Entertainment films, especially the subgenre of bioengineering adventure, can be an important component of educational discussions in social studies classes about bioethics. These films can be a part of a formal curriculum in schools or an informal discussion group among peers. High school students should be encouraged to discuss these interdisciplinary connections between scholarly and popular media sources. Youth engagement with anthropological topics is important for generating continuing discussion of these issues that shift with the further development of biotechnology. As Kim (2018) stated in her award-winning essay, written when she was a high school student, for the Carnegie Council for Ethics in International Affairs: "Out of 192 countries, 133 nations were reported to lack any sort of regulation relating to genetic modification technologies according to a 2009 UN report" (para. 8). The popularity of *Jurassic Park* and *Night at the Museum* provide a way to start some of these conversations in an interdisciplinary classroom conversation.

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The author confirms being the sole contributor of this work and has approved it for publication.

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