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Exploring the Cultural Influence of Science Fiction Blockbusters on Students' Understanding

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ABSTRACT

This study explores the cultural impact of science fiction films on students' comprehension of scientific and technological advancements. By analyzing survey data from 120 participants, the research provides valuable insights into how these films shape students' curiosity, perceptions, and attitudes toward science and technology. Participants were asked to reflect on their understanding of scientific concepts after watching science fiction films and how these movies influenced their views on emerging technologies, including artificial intelligence and space exploration. The findings suggest that science fiction movies significantly enhance awareness and appreciation of scientific progress while fostering critical thinking about societal values and technological developments. These films often present complex scientific ideas in an accessible manner, making them more relatable and easier to grasp for students. Movies such as Interstellar and The Martian have played a crucial role in sparking discussions about space travel and environmental sustainability, motivating students to explore real-world scientific issues further. By blending scientific accuracy with engaging storytelling, these films inspire young minds to consider careers in STEM fields and deepen their interest in scientific inquiry. However, a critical concern remains: the potential for misconceptions due to the fantasy-driven portrayal of certain scientific concepts. While science fiction serves as a powerful educational tool, some exaggerated or unrealistic elements may lead to misunderstandings about actual scientific principles. Overall, this research highlights the dual role of science fiction in education—as both an inspirational and cautionary tool. It demonstrates that while these films can ignite curiosity and promote scientific literacy, educators must guide students in distinguishing fact from fiction. By leveraging the strengths of science fiction movies while addressing their limitations, educators can enhance students' understanding of science and technology in a meaningful and engaging way.

Introduction

Science fiction films were utilised in both mandatory and voluntary non-major science courses as a pedagogical tool to enhance student engagement in science and to fortify critical thinking regarding scientific issues (Laprise & Winrich, 2010).Researchers who investigated the public understanding of science have argued that fictional cinema and television proved to be primarily effective at obscuring the distinction between fact and fiction. The reasoning for the study lies in the perception that teach science effectively, educators need to understand how contemporary culture influences the perception of students and their understanding of science (Barnett, Wagner, Gatling, Anderson, Houle, & Kafka, 2004).Brake and Thornton in their researches investigated that science fiction can be used as a thought provoking forum in order to focus on the relationship between science, culture and society (Brake & Thorton, 2004) The science fiction film scrutinises a highly enduring and favoured genre of Hollywood filmmaking, illustrating how it reflects attitudes towards science and technology as they have developed within American culture during the twentieth century. JP Telotte presents an overview of science fiction cinema criticism that emphasises humanist, psychological, ideological, feminist, and metamodern analyses. Telotte delineates the genre's historical trajectory from its initial literary expressions to contemporary iterations, while also contrasting it with pulp literature, early television science fiction, and Japanese anime (Telotte, & J.P., 2001) .Angela Ndalianis has written in her book that focuses on development taken place in science fiction media over the last two decades. The main focus is with technology, those special effects technology used to create the special effects in media including films and computer games; and the way the media examples themselves image and visualize the role of new technology within their description. The book is concerned especially with exploring the vast range of experiences that science fiction can offer its audience (Ndalianis, 2011). Science and Technology (S&T) represent a valuable resource for communicating the value of science in popular culture. Since its inception in 1939, the Marvel world has grown at an exponential rate, first penetrating the film industry and subsequently expanding its fanbase. There is cause for concern over the role of S&T in superhero storylines and the contentious impact they have on superhero characters when one takes a look at some of the well-known Marvel characters. In order to find out if comic books promote or hinder the spread of science and technology, and if they have a good or negative connotation in comics, this study examines the usage of science and technology in the Marvel world, focusing on 1632 recognized characters. In line with earlier studies, this one posits that the incorporation of science into comics can impact how both students and the general public view and accept new scientific findings (Musico, 2023). Moreover, Hollywood remains both lucrative and adept at captivating audiences with depictions of death and destruction in film storytelling. Tornadoes, earthquakes, tsunamis, and climate change are among the most recent threats shown in disaster films. The research aimed to systematically delineate and analyze physical, social, and temporal data from twelve disaster films to enhance previous studies on catastrophe examination. Findings reveal a distinct transition from those recognized in prior studies, with disaster myths such as the significance of death counts and the perception of technology as the sole solution becoming more prevalent (Haney & Mitchell, 2019).In addition, The opinion of science students were sought in order to determine their thoughts to the use of fiction based film in science courses. A questionnaire regarding students' attitudes towards STS course conducted to second grade students from Mersin University Science Teacher Education department as pre and posttest and open ended questions were conducted to analyze the opinion of the students. Students worked with groups that have 2-3 members and each group chose a science fiction film. They were supposed to critique selected films for the purpose of determining how science and technology was used and how in that film they affect society. Each group wrote a report and created a PowerPoint presentation in order to explain their findings. Both the qualitative

and quantitative data analysis was used for data analysis. The result of pre- and post-tests analysis found that application of science fiction films in STS courses changed the attitude of the students positively. Moreover, it was also determined that students' have positive thoughts about using these kinds of film in science courses (Surmeli, 2012) .Wandering Earth, which was released in 2019, is regarded as a remarkable film that unlocked the opportunity for Chinese science fiction movies. The Chinese story in the film has awakened the reverberations of domestic audiences, but they failed in order to get high achievement on foreign film review websites. On the contrary, in recent years, science fiction films in European and American countries are still loved by audiences at home and abroad including The Martian and Interstellar. The movie has both commercial and artistic values. It can be seen that the cultural communication of western science fiction movies is more successful than that of China. By taking the above works as examples, analyzing the final catastrophe scheme, the beauty of returning home and the role shaping of scientific women in science fiction movies from the perspective of the organic combination of "hard-core elements of science fiction" and "soft value in humanity", in an attempt to help the foreign cultural communication of domestic science fiction movies. As an attempt to facilitate the global development of Chinese science fiction, concludes that certain Chinese traditional cultural spirit needs further spreading, that Chinese science fiction and humanity should be combined in a more natural way, and in particular, female character need in depth and multi-dimensional interpretation (Ma Xinyi & Hua Jing, 2021). Biber and Kubas investigated how science fiction films affect 10th graders' geographical attitudes. For this study, 60 secondary school students participated. One group was taught using standard methods, whereas the other used science fiction films with relevant material during the research time. The eighth week experiment showed students 10 science fiction videos for "Natural Systems" and "Environment and Society" learning topics. The Güven and Uzman "Attitude Scale of Secondary School Geography Course" was used to collect research data. The research shows that science fiction films improve student attitudes towards geography studies (Biber & Kubas, 2017). The National Curriculum Standards" or Social Studies (NCSS, 2010) created by the National Council for the Social Studies includes 10 themes, one of which is titled science, technology, and society. The subheading for this theme suggests that "Social studies programs should include experiences provided for the study of relationships among science, technology, and society." NCSS gives the argument that students should have the opportunity for exploring the intersections of technological and social changes, which includes how technological changes affect the beliefs and attitudes in culture. The chapter articulates how to use science-fiction films to introduce and develop these ideas with students. Science fiction can be distinguished from other film genres by its "projections about the future" (Lance Mason, 2017).

Objective: To examine the influence of science fiction movies on the interest of the students and their understanding of scientific and technical innovations.

Literature Review

Brake &Thornton examined that sci-fiction films offer a "imagined scenario" that makes complex cultural narratives accessible to students. These films allowed them to engage with issues of technology, ethics, and human identity. The innovative aspect of science fiction enables students to think critically about the future implications of scientific advancements. For example, films like The Matrix provide a framework for discussing artificial intelligence and its ethical implications, while the film Gattaca highlights genetic engineering and its societal consequences (Brake & Thorton, 2003).Scientist like Laprise & Winrich discuss the knowledge-based value of using science fiction to teach scientific concepts. They find that sci-fi films act as a bridge between scientific theory and imaginations of the students, most probably when used as educational tools to introduce sciences like physics, biology, and other sciences. For example, concepts like wormholes

and time dilation, which are theoretically explained in physics, become more relatable when showcased in movies like Interstellar. However, while this approach can inspire curiosity, it also risks oversimplifying or misrepresenting scientific principles. The psychological Impact of sci-fi films on students includes both positive and negative effects (Laprise & Winrich, 2010). Biber and Kubas find that while sci-fi can promote critical thinking and interest, it may also strengthen stereotypes, especially on topics related to artificial intelligence and alien life. For instance, Robot portrays AI as both a blessing and a threat, which can either inspire interest in AI development or fear of its consequences. Similarly, alien involved movies often depicts as hostile, perpetuating stereotypes that may hinder open-minded exploration of possibilities beyond Earth (Biber & Kubas, 2017). Other scientists such as Musico further suggests that exposure to sci-fiction can make students more receptive to new ideas in the scientific and technical world, and this exposure motivate them to pursue these areas in more depth, especially when the portrayal is grounded in reality. However, the risk of misinterpretation remains high. Films like Jurassic Park, while showcasing cutting-edge technology in genetic engineering, may lead students to believe that cloning dinosaurs is achievable with current technology, creating unrealistic expectations (Muscio., 2020). Other scientists have shown that sci-fi films stimulate interest in scientific concepts by conceptualizing things that may be difficult to grasp theoretically. However, they also point out the risk of misconceptions due to the overstated portrayal of technologies, as seen in films like Jurassic Park or Interstellar (Laprise & Winrich, 2010). Barnett resurfaces these concerns, noticing while Sci-fiction can be a powerful tool to introduce complex scientific ideas, there is a need to help students differentiate between accurate science and theoretical fiction. While also necessitates guidance to help students differentiate between fact and fiction. Without this support, students may adopt misconceptions about scientific processes. For example, while The Martian shows realistic aspects of survival on Mars, it oversimplifies challenges, such as the ease of cultivating crops in Martian soil. Science fiction films can inspire students to explore alternative conceptions of scientific phenomena. These alternative conceptions may be generated by the movie itself or illuminated as part of broader cultural narratives (Barnett,M, 2010) . Science fiction films can inspire pupils to identify and explain alternative scientific theories. Sometimes the movie generates these other notions, but sometimes it just illuminates them from our culture. Since some questions were answered differently depending on the movie watched, there is some evidence that science fiction films can affect students' conceptions. The exact nature of the effect is hard to predict, but in at least some cases, they can generate or strengthen alternative conceptions, even if the science they portray is factually sound. When students see fictitious occurrences in the movie that contradict their mental models, they may rethink their views more deeply and effectively than if they were presented the conventional scientific position. Also observed a substantial correlation between science fiction interest and survey scores. Science fiction movie viewers seem to understand scientific processes and concepts better (Posner, et al., 1982). Jurassic Park is used as an example by Price to demonstrate how film makers create perceptually realistic images using digital technologies especially creation of dinosaurs. The realistic depiction of dinosaurs has captivated audiences, yet has also raised questions about the ethical implications of genetic engineering which is a topic that is often oversimplified for dramatic effects in the film (Prince & A., 1993).

RQ1: What effects do science fiction films have on perceptions of the students of cultural significance of scientific and technical advancements?

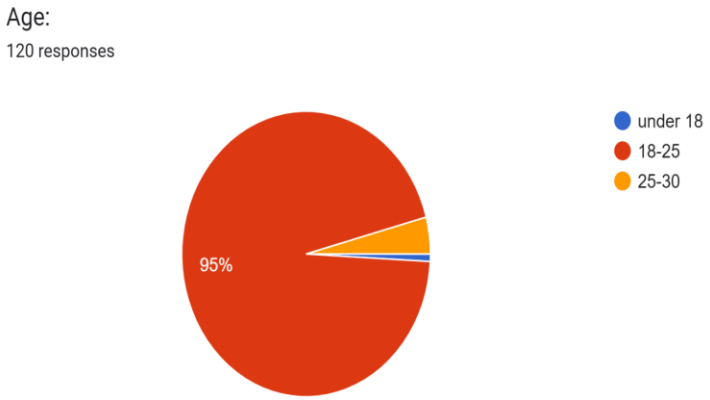
H1: Students that are exposed to science fiction movies may have misconceptions about scientific principles, as may be portrayals of technology and science fiction scenarios can lead to misunderstandings of real-world scientific processes.

Research Methodology

Many researchers have been on surveys so preferred to take surveys from students that are undergraduate. Researchers found that it is the best method to examine the understanding of students on complex topics like the cultural impact of science fiction in blockbuster movies This study includes an online survey method to collect data from the students. The survey was designed with a series of quantitative questions to explore the understanding of the students on analyzing the cultural impact of science fiction in blockbuster movies. The survey questions were carefully designed in order to assess various dimensions, that includes awareness of scientific concepts and attitudes toward technological advancements, and also the influence of science fiction on ethical views of students about the technology as well. We gathered quantitative responses from the participants. Data was collected from 120 participants over a short period of time ensuring their reliability and results were analyzed statistically.

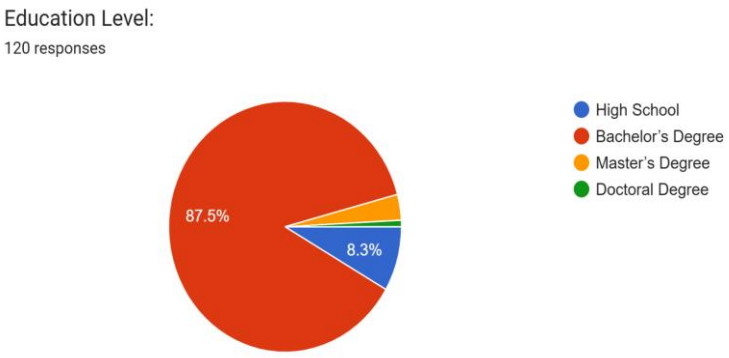
Data Analysis

Figure 1.1



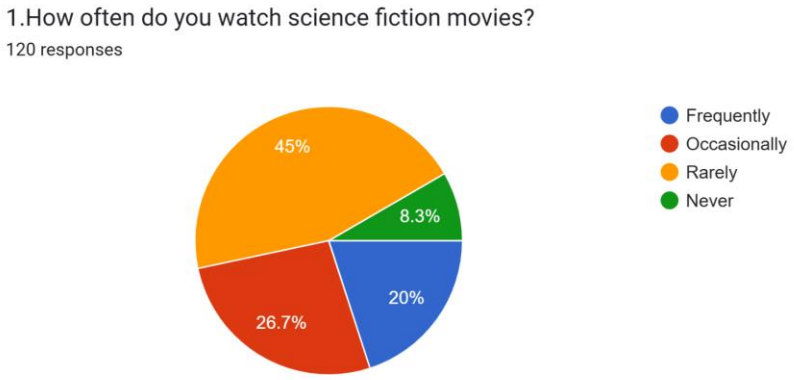
Out of 120 students 95% fall in the 18-25 age group with insignificant representation of other age groups.

Figure 1.2



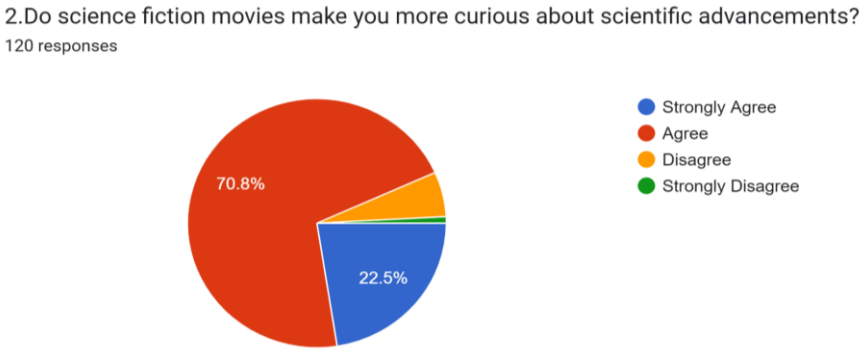
As shown above, out of 120 respondents,87.5% were holding a Bachelor's degree with minimal percentage representing other educational levels

Figure 1.3



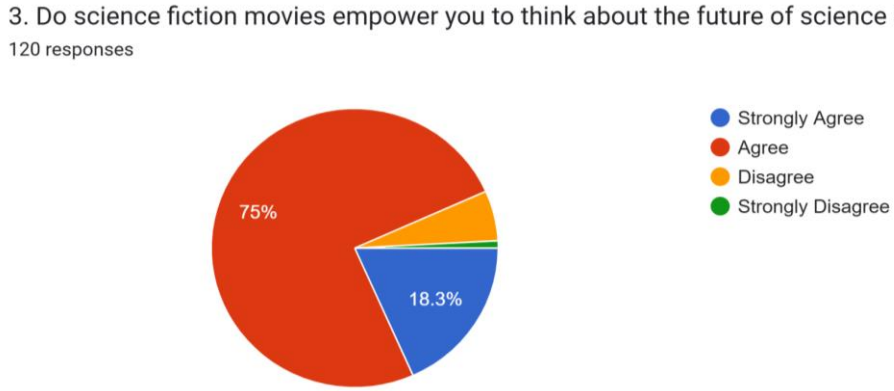
Out of 120 respondents,45% watch science fiction movies rarely,20% frequently watched, and 26.7% watched occasionally.

Figure 1.4



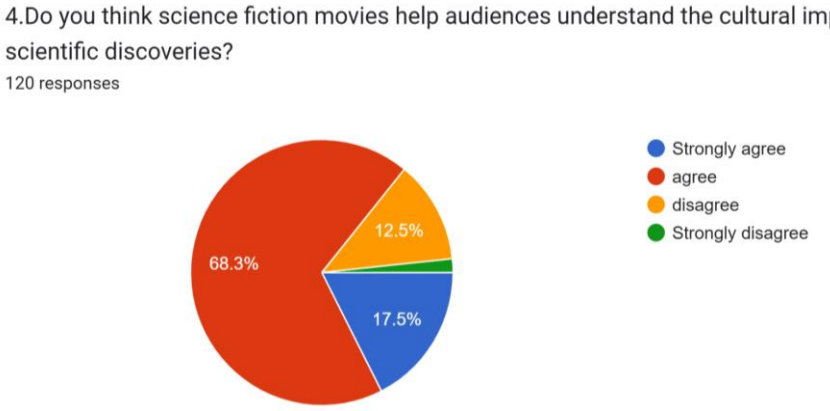
Based on the data in the graph,70.8%of respondents thinks that science fiction movies make them more curious about scientific advancements. And 22.5% were strongly agreed and a few were disagreed.

Figure 1.5



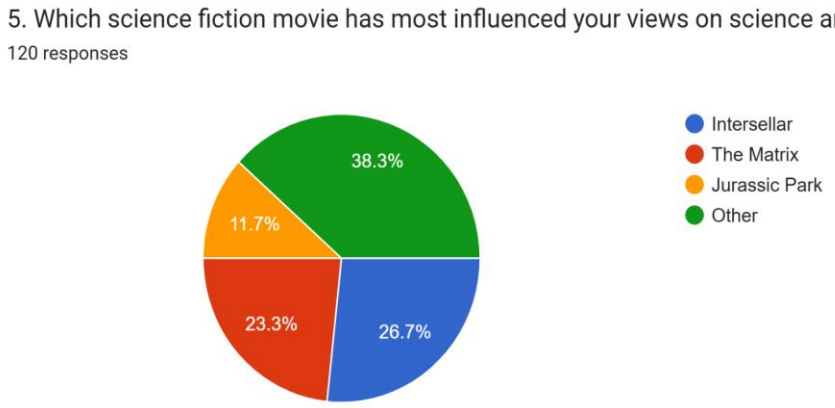
Results show that 75% of respondents agreed that science fiction movies empower them to think about the future of science and technology, however 18.3% strongly agreed and a few were opposed.

Figure 1.6



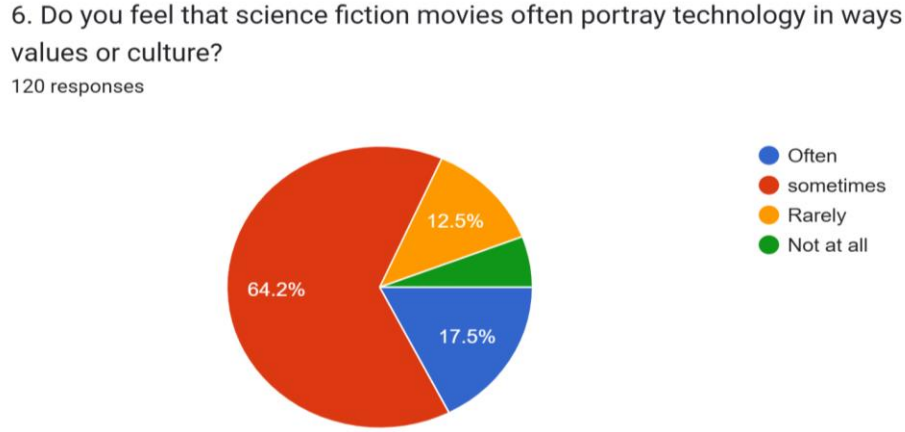
As shown above in the graph, out of 120, 68.3% of the respondents were agree that the science fiction movies help the audiences to understand the importance of scientific discoveries. And a few about 2% were strongly disagreed

Figure 1.7



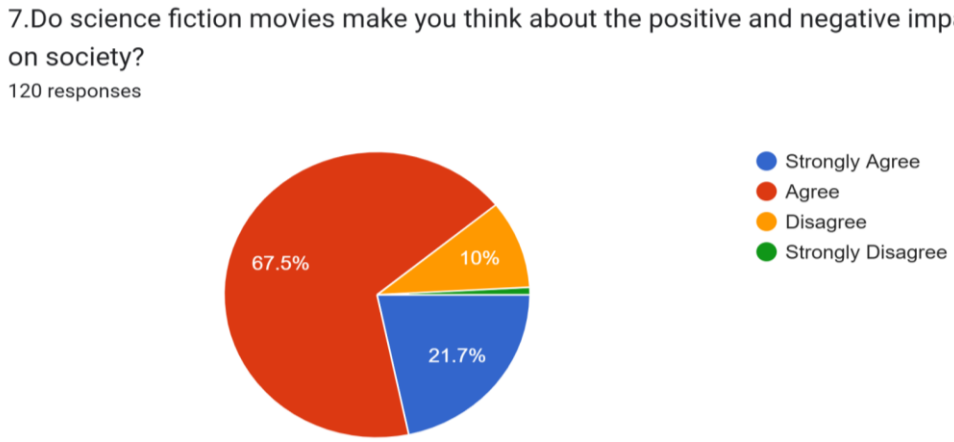
According to the graph above, Interstellar influenced 26.7% of the respondents and The Matrix influenced 23.3%of the respondents and Jurassic Park influenced about 11.7%.

Figure 1.8



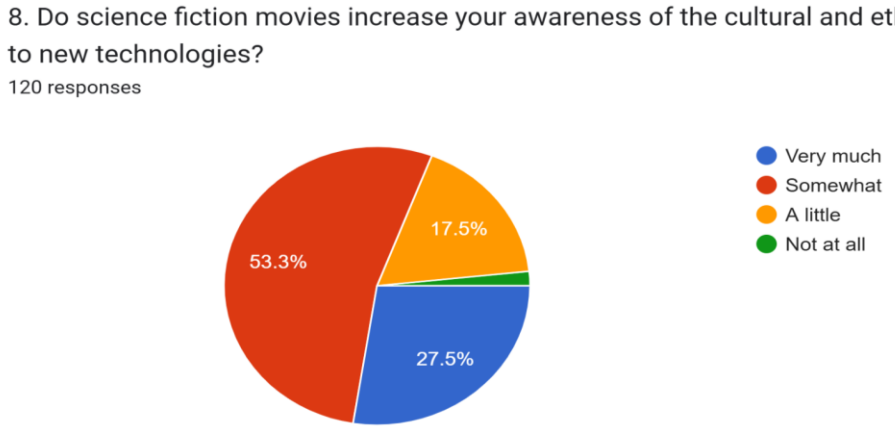
64.2% of the respondents said that science fiction movies often portray technology that influenced the values of the society,17% feel sometimes and about 12.5% feel rarely.

Figure 1.9



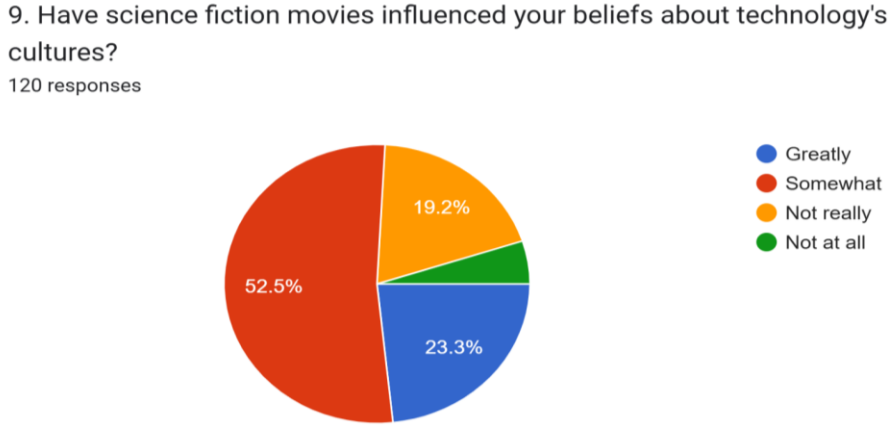
67.5% of the respondents out of 120 were agree that science fiction movies make them to think the impacts of technology on society. Out of which 21.75% were strongly agree and a few were disagreed.

Figure 1.10



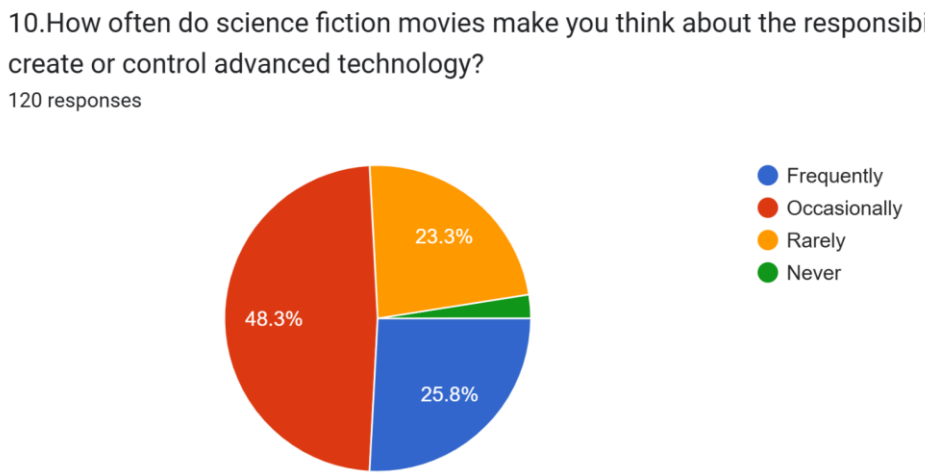
From the above graph, 53.3% respondents think that somewhat science fiction movies increase their awareness of challenges related to technology and 27.5% think it increases very much.

Figure 1.11



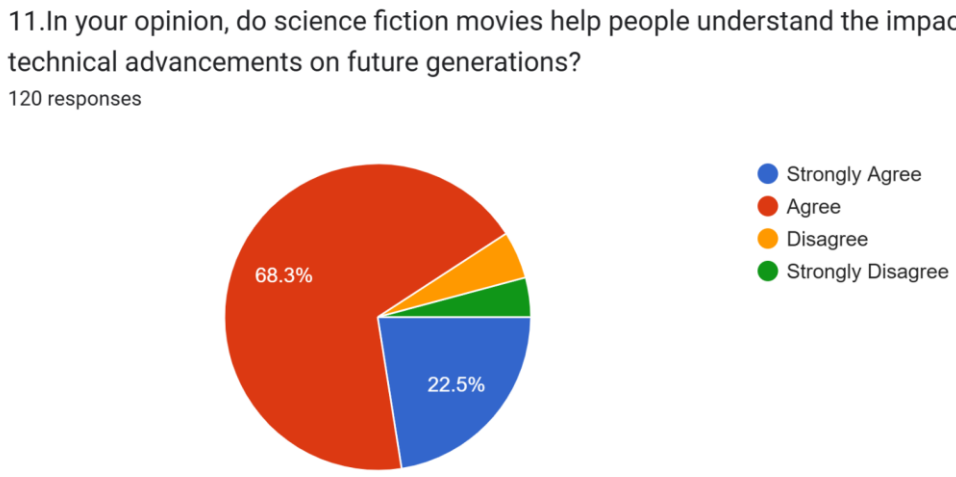
As shown in the figure, science fiction movies influenced the beliefs about technology impacts greatly to 23.3% out of 120 respondents and 52.5% somewhat.

Figure 1.12



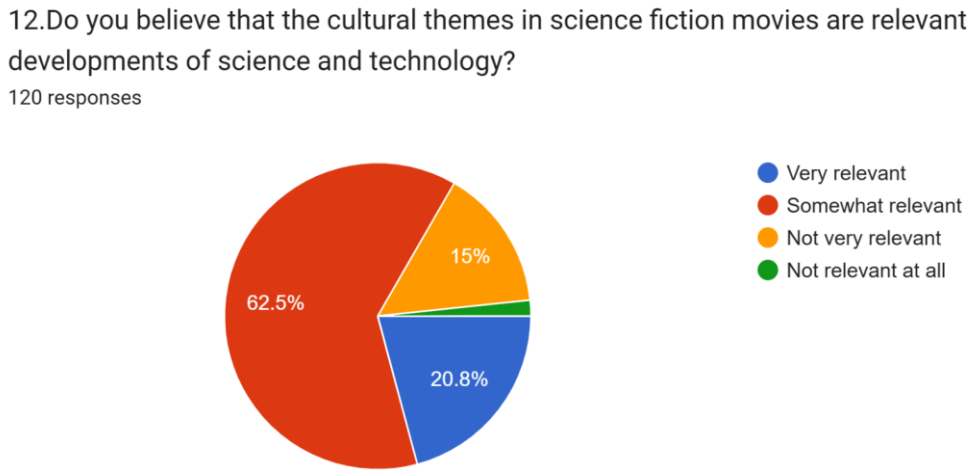
As shown in figure, 48.3% think occasionally science fiction movies make them think about the responsibilities to create advancements in technology 23.3% think rarely and 25% rarely.

Figure 1.13



68.3% out of 120 respondents think that science fiction movies help the people to understand the impact of scientific as well as technical advancements in the future. Out of which 22.5% strongly agreed and a few were opposed to it.

Figure 1.14



As shown above, 62.5% of the respondents believe that the cultural themes in science fiction movies are somewhat relevant and out of 120 20.8% believe that it is very relevant and 15% believe that not relevant

Discussions

The findings of this study highlight the transformative influence of science fiction movies on students' scientific curiosity and understanding. Over 70% of respondents acknowledged that such movies encourage their curiosity about scientific advancements and also inspire them to think about the future of science and technology. This indicates that science fiction films serve as effective tools for the students to involved them with scientific concepts in a more relatable context. The survey revealed that the students who are frequently exposed to science fiction movies are more likely to understand the importance of scientific discoveries of technology. This corresponds to the existing literature that highlights the role of science fiction in bridging the gap between theoretical knowledge and real-world applications. For example, films like Interstellar and The Matrix, which were noted by the respondents, significantly influences them, represents complex scientific theories while promoting critical reflection on societal values. The data also indicates certain challenges. Approximately 53.3% of respondents suggested that science fiction movies somewhat increase the awareness of challenges in the technology, while a significant increase is reported by a smaller portion. This highlighted the idea while these movies spark interest, they might not always provide a comprehensive understanding of the scientific complexities. In addition, as highlighted in the literature review, the potential of misconception remains a concern, with fictional depictions blur sometimes the lines between scientific fact and creative imagination. However, the cultural themes embedded in such films were thought relevant by the majority of participants, emphasizing their role about the technology in shaping cultural narratives as well as in ethical considerations. The portrayal of future societies and ethical dilemmas in movies like Jurassic Park indicates how science fiction can serve as a mirror for examining the current societal challenges. This finding encourages the argument that science fiction not only enriches educational experiences but also motivates the deeper exploration of relationship of humanity with science and technology.

Conclusion

From this study, we conclude that the science fiction movies significantly influence perceptions and understanding of students in advancement in science and technology. They serve as both an educational and motivational tool, encouraging the curiosity and critical thinking about the future of science and its implications. The involvement with complex scientific concepts through relatable narratives makes science fiction a powerful medium for learning. The findings also highlight the need of addressing the potential for misconceptions that is arising from fictional depictions while science fiction can inspire as well as educate, it is important to guide students to differentiate between real scientific principles and the artistic freedom often presented in these movies. This approach will help students to maintain a clear understanding of the real scientific world. Future educational practices could integrate science fiction films to enhance the involvement of the students with scientific concepts while providing guidance to differentiate real science from creative narratives. This dual strategy would maximize the encouraging power of science fiction while mitigating its drawbacks, thus strengthen the educational experience.

References

1. Barnett, M., Wagner, H., Gatling, A., Anderson, J., Houle, M., & Kafka, A. (2004). Journal of Science Education and Technology, 15,179-191.
2. Barnett,M. (2010). The Role of Science Fiction in Introducing Complex Scientific Ideas to Students. International Journal of Science Education, 32(3),304-319.
3. Biber & Kubas. (2017). HAYEF. Journal of Education, 14(2),176-183.
4. Brake, & Thorton. (2003). Science Fiction and cultural discussion:Technology,ethics,and human identity in films. Journal of Science Fiction Studies, 30(4),13-29.
5. Brake, M. &. (2003). Science Fiction and Cultural discussions:Technology,ethics ,human identityb.
6. Brake, M., & Thorton, R. (2004). Active Learning in Higher Education, 5(1),27-42.
7. Haney, J. J., & Mitchell, J. T. (2019). International Journal of Mass Emergencies & Disasters, 37(3)286-305.
8. Lance Mason. (2017). Cinematic social studies:a resource for teaching and learning social studies with film. 325-46.
9. Laprise, S., & Winrich, C. (2010). Journal of College Science Teaching, 40(2),45.
10. Ma Xinyi, & Hua Jing. (2021). International of Linguisticss,Literature and Translation, 4(1),210-214,.
11. Musico, A. (2023). Technical Forecasting and Social Change. 186,122149.
12. Ndalianis, A. (2011). New Academia Publishing,LLC.
13. Posner, G.J, Strike, K.A, Hewson, P.W., et al. (1982). Conceptual Change in Learning Science:Theoretical Perspectives and Practical Applications. Science Education, 66(3),399-414.
14. Prince, & A. (1993). Lifelike Dinausaurs:The Intersection of Technology and Imagination in Jurassic Park. Media Studies Journal, 15(2),50-62.
15. Surmeli, H. (2012). Procedia-Social and Behavior science, 47,1012-1016.
16. Telotte,, & J.P. (2001). Science Fiction Film Criticism:AHistorical and Ideological Survey. Journal of Film and Media Studies, 27(4),295-308.