

From audiovisual projection to personal reflection: Can films really stimulate students' problem-solving abilities?

ABSTRACT

This study explores the potential of films to stimulate problem-solving abilities, based on a case study with students aged 10 to 22 in the Azores Archipelago, Portugal. It investigates whether exposure to audiovisual projections, such as films, can encourage personal reflection and introspection and ultimately contribute to improving individual problem-solving abilities, a key aspect in contemporary education. A mixed-methods empirical research approach was used, applying a questionnaire to a diverse sample of students (N = 591). The study design consisted of exposing participants to a sequence of carefully selected animated short films, representative of the main youth issues, followed by debates. Then, the students were invited to complete an anonymous online questionnaire to observe their cognitive and emotional reactions. The results indicate a positive correlation between exposure to films and the construction of hypothetical problem-solving scenarios, with participants reporting new insights into handling potential future difficult situations in their own lives.

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1. INTRODUCTION

The integration of films into educational practices is recognized as an inventive approach to captivate and inspire students, particularly on the topics that are present in their school programs. The relationship between physical and mental engagement in film provides a vehicle for teachers to effectively disseminate and implement knowledge in the classroom environment (Costa, 2017). Through this physical involvement, students don't just passively watch the films but also interact in a practical and reflective way, which enhances deeper and more meaningful learning. According to Carrol (2008),

moviegoing, often portrayed as solitary, is actually a social activity integral to contemporary life, fostering discussions and cultural expression. This interaction not only shapes social development but also engages cognitive and psychological processes, influencing personal and cultural perspectives. The cinematic language is well known for its unique capacity to combine visual, auditory, and narrative aspects, serving as an influential medium for expressing complex ideas and eliciting emotion (Tan, 2013, p. 231). This study does not focus on the analysis of the audiovisual experience as an instrument of transmitting pedagogical knowledge. Instead, it explores its emotive facets, associating them primarily with the well-being domain of students and the psychological elements that promote harmonious interactions and personal development (Blasco et al., 2015) in the educational environment. Bordwell (2013) suggests that the experience of watching a film is an interactive dance between the viewer and the film, where the viewer is not only affected by the film but also actively involved in the construction of meaning and emotional response. Therefore, this study aims to examine whether films, harnessing their inherent audiovisual transmission power, can stimulate personal reflection in students, thereby enhancing their problem-solving skills in daily life. Problem-solving is the process of finding effective solutions to challenges or issues by analyzing options and selecting the best course of action. This concept aligns with the findings of Mangot and Murthy (2017), who emphasize that the concept of personal reflection is crucial in problem-solving, helping individuals identify and overcome potential obstacles to effective solutions. It also intends to evaluate whether this practice, in the field of education, can contribute to conflict prevention in educational contexts, by improving intrapersonal mediating skills. Intrapersonal mediating skills involve managing one's thoughts, emotions, and behaviors during internal and external conflicts. According to Goleman (1995), these skills, including self-awareness, emotional regulation, and effective decision-making, are essential for personal growth, resilience, and effective interpersonal relationships. They help individuals handle conflicts constructively, promoting healthier relationships and well-being. It also intends to evaluate whether this practice, in the field of education, can contribute to conflict prevention in educational contexts, by improving intrapersonal mediating skills, as explored in the study by O'Toole and Burton (2002) on the effects of drama on conflict management in schools.

In its common definition, conflict mediation is a voluntary process in which a neutral mediator assists conflicting parties to reach a mutual agreement (Torrego Seijo, 2003). Throughout this article, the role of neutral mediator will be embodied by the films themselves, with their narrative choices reflecting the viewpoints of their respective authors. By presenting compelling narratives and intricate characters, films can lead students to examine their personal beliefs and values (Brown, 2011, p. 241). Furthermore, films can cultivate empathy by providing insights into the lives of characters faced with various challenges and experiences. The fundamental components of communication – sender, receiver, message, and feedback (Griffin et al., 2018, pp. 65-67; McQuail, 2010) – are inherently present in any medium, including cinema. Cinema, particularly through its emotional narratives and visual and sound poetics, effectively puts emotions in the foreground. Unlike a direct interaction in which viewers can alter the materiality of the film, the

communication process in film is unidirectional. However, it becomes an active process due to the interpretative involvement of the viewer, influencing the individual and collective understanding of the media message and subsequent actions (Castells, 2010, p. 358). By mastering these communication elements, films can enhance learning experiences and stimulate meaningful discussions among young students. The unattainability of flawless communication, free from interference, owing to human imperfection, mandates that effective communication requires the individual's active participation in self-reflection for its realization (Cardoso, 2023, p. 60). Despite the potential benefits, empirical research examining the relationship between film consumption and the promotion of personal reflection remains limited, particularly in the educational sphere. Our study aims to expand on the realm of personal reflection, a process that allows individuals not only to gain a deeper understanding of themselves (self-knowledge) but also to foster an awareness of their current emotional and cognitive state (self-awareness). According to the UNESCO report *Education for sustainable development goals: Learning objectives* (2017), self-awareness competency involves the ability to reflect on one's role within the local community and (global) society, continually assess and enhance one's actions, and manage one's emotions and aspirations effectively. Self-knowledge represents the foundational step in this journey, yet it is more tangible and readily attainable compared to higher levels of self-awareness and personal development.

By exploring the communicational role of films in stimulating such reflection processes, we aim to contribute to the limited body of empirical research in these domains. These types of intra-personal skills are considered to have a significant influence on the success of the educational process today (Libertson, 2023). The results of this study are intended to have significant implications in the fields of the triad shaped by the sciences of communication, education, and school psychology, always with students at the center of the focus. In this way, the study will seek to provide valuable guidance for educators and policy makers in designing programs that use films to target the emotional, cognitive and social needs of students. Ultimately, this investigation aims to combine theory and practice, clearing the way for an effective and informed use of films while attempting to answer the main research question: Can films really stimulate students' problem-solving abilities?

1.1. LITERATURE REVIEW

The growing interest in the use of film as an educational tool has given rise to a body of research examining its ability to promote learning and transformative experiences among various groups of learners. The following literature review analyzes the results of various studies on the ability of films to promote personal reflections and their impact on students, looking at the subject from various angles, and attempting to provide solid support for subsequent research. One of the major topics in the literature concerns the potential of films to facilitate self-identification and identity construction among viewers.

Zheltukhina et al. (2023, p. 14) emphasized how films can represent a character's journey of self-discovery and identity formation, using various analytical methods to examine the character's interactions and social discourses. A key tactic identified is the representation of various problem-solving strategies and their outcomes in the film narrative. This fact is also reinforced by Cohen (2018, p. 251) and Szita (2019, p. 113), who underlined both the significance of identification with media characters and the generation of self-reflexive private time and stimuli when watching films. These studies suggest that films can play an essential role in guiding viewers through a journey of self-discovery and personal growth. The emotional aspect of films is another crucial subject that emerges in the literature review especially the various categories it covers, as the understanding of films is in fact influenced by our evolutionary history and cognitive-emotional systems, as well as by biocultural nature and demographic factors such as age and gender, which shape our film preferences (Grodal, 2017).

Hanich (2021, p. 97) and Morris et al. (2019) pointed out that films frequently contain dense concentrations of emotion-eliciting events, which can profoundly influence viewers' cognitive, emotional, and physiological responses. This insight improves our understanding of how narrative structure influences engagement with a certain problem through emotional arousal. In this context, Appel and Richter (2010) discovered that an individual's need for affection moderated the persuasive effects of fictional narratives. This suggests that the magnitude of a person's emotional engagement with a film, along with the influence of the story's message, can shape their response to the content and potentially promote personal growth. Several studies have explored the potential of film, especially as a pedagogical tool in various educational contexts, which may also be important for our overall analysis. Esmail and Matthews-Roper (2022) argued that films are an effective and engaging tool for online course delivery when combined with viewer-response activities, ensuring that the audience actively processes the material presented in the film. Utomo and Maratus (2021, p. 59) claim that educational cinema techniques increased students' self-confidence, while Boydell and Croguennec (2022) discovered that short animated films could foster empathy and understanding towards marginalized groups, such as refugees and individuals with mental health challenges. The use of films in these educational settings highlights the versatility and impact of this medium as a catalyst for personal development.

Despite the positive findings of these studies, some research suggests that films alone may not be sufficient for engaging students' cognitive and emotional awareness or promoting transformative learning (Esmail & Matthews-Roper, 2022, p. 14). This underscores the importance of considering additional factors and integrating complementary strategies when using films as pedagogical tools. For example, Akram et al. (2009) and Gutiérrez Moar et al. (2006, pp. 232-236) emphasized the significance of emotional literacy and empathy when utilizing films in education, which can contribute to a more profound learning experience and promote self-knowledge. Emotional literacy, enhanced by films, involves the identification and interpretation of emotions, their control, and the development of social skills that promote

communication, clarification, and conflict resolution. A variety of authors have investigated specific strategies for incorporating films into educational scenarios. Brown (2011) discussed the benefits of using films to develop critical thinking and consciousness among adult educators. The author explores how feature films used in graduate courses can stimulate critical thinking and awareness of important social issues among adult educators. The collective group viewing experience, coupled with a focused approach to viewing and questioning, promotes a unique learning environment that enhances interpretive skills for further film-based discussions. Likewise, Blasco et al. (2015; 2011) highlighted the role of films in fostering reflection, providing a forum for discussion, and a consequent complementary way to improve communication. The main goal of cinematic teaching is not to demonstrate how to adopt a specific attitude but to encourage reflection and dialogue among the audience, based on the idea that "learners have the opportunity to translate life stories from movies into their own lives" (Blasco et al., 2015, p. 3). However, films generally contain a more concentrated amount of events and actions than everyday life, and emotions are often short and change quickly (Hanich, 2021, p. 100). Oh and Steefel (2016, p. 354) found that nursing students who participated in a film-based educational program called "Cinenurducation" showed significant improvements in their perception of nursing, satisfaction with their major, and professional nursing values. This study suggests that the incorporation of films and other educational materials can enhance nursing education and promote self-knowledge.

Furthermore, Goodwin et al. (2019) and Petkari (2017) demonstrated the potential of using film-based interventions to address social issues and promote positive change. Goodwin et al. (2019) examined the Bullying Prevention Session (BPS), an interactive theater-based workshop designed to develop strategies for addressing school bullying. In this approach, students viewed a one-act scripted performance based on a bullying incident and then participated in a workshop to devise strategies to prevent bullying in their schools. Similarly, Petkari (2017) investigated the effectiveness of a 10-week film-based intervention in changing stigmatizing attitudes among psychology students. Although no general attitudinal change was observed, students reported improvements in agency, compassion, and proximity, suggesting that film-based interventions can be beneficial for specific groups of learners. The work by Sipsock and Storey (2019) explores the potential of using films to discuss psychiatric topics in a more open and accepting environment for children, adolescents, and parents. By incorporating films into mental health discussions, the authors found that challenging and painful topics could be addressed more effectively. This use of films as a medium of communication underlines their potential to facilitate self-knowledge and personal growth. In summary, the literature on the use of films as educational tools demonstrates their capacity to foster self-identification, identity construction, and emotional engagement among viewers. Films have been found to be effective in various educational contexts. In addition, film-based interventions have been shown to address social issues and facilitate discussions on sensitive topics. It is also explicit in a variety of studies that educators should consider

integrating complementary strategies and addressing emotional literacy and empathy when using films. By doing so, films can serve as a powerful catalyst for stimulating personal growth in students on a multitude of levels, something the present study intends to test.

2. METHODS

2.1. DESIGN AND PROCEDURE

In this mixed-methods empirical study, our aim was to scrutinize the potential of animated short films to stimulate students' problem-solving abilities. A crucial aspect to note is the universality of the films screened, which guarantees the authenticity of the results. In other words, the same methodology could be replicated in various social and cultural scenarios, thus reinforcing the consistency of the findings. Our research was conducted across various locations within the Azores, Portugal, namely São Miguel Island, Terceira Island, and Pico Island. The data collection process was carried out over nine days, beginning on September 29, 2022, and concluding on October 7, 2022. We centered our study on a curation of 12 animated short films, all available at Cinema Sem Conflitos website (Cinema Sem Conflitos, 2022a). These 12 films addressed issues of crucial importance to contemporary youth, such as environmental concerns, love and sexuality, bullying, social dilemmas, drug issues, emotional struggles, family dynamics, gender, racism, interpersonal relationships, religion and culture, and violence. Synopses and additional information is available in the Screening Program - Mostra Cinema Sem Conflitos 2022 (Cinema Sem Conflitos, 2022b). The film selection process follows strict criteria to ensure the quality and relevance of the content presented, with each selected film required to meet all five criteria simultaneously. Accessibility is essential — films must be available on free online platforms, include public screening permissions from the director or producer, and be listed on MCSC's official website to guarantee ongoing classroom discussion and accessibility for all students. Preference is given to short films under 10 minutes in length, ensuring they are practical for educational use. The films must also convey clear and easily understandable messages appropriate for the target audience. Artistic quality is carefully considered, focusing on the film's conceptual design and animation techniques. Lastly, universality is prioritized, favoring films with minimal dialogue that reflect diverse sociocultural contexts, promoting inclusion and encouraging reflection from multiple perspectives.

All 12 films were screened in each session, totaling 14 screenings. The screenings, with a cumulative duration of 60 minutes, were conducted in conventional movie theaters, specifically at Teatro Micaelense, Auditório da Universidade dos Açores, Auditório do Ramo Grande, Centro Cultural de Congressos de Angra do Heroísmo, Auditório da Escola Básica e Secundária Tomás de Borba, and Auditório da Madalena. Complete information about the

project can be found in the article From conception to implementation: How the 'Mostra Cinema Sem Conflitos' inspired change in Azorean schools (Silva et al., 2023).

Figure 1

Interior (left) and exterior (right) perspectives of Teatro Micaelense on São Miguel Island, Azores, captured during the documented experience



Source: Fernando Resendes (Photographer).

This approach aimed to provide an optimal viewing experience by taking advantage of large screens, high-quality sound systems, and the surrounding environment of a dark room, relegating to a perfect cinematic experience atmosphere. Immediately after the film sessions, participants were asked to complete an online questionnaire accessible via QR code. The questionnaire, essentially quantitative, aimed to assess various aspects, including the viewing experience, overall satisfaction, visual and sound quality, immersion, and engagement. Most importantly, it sought to assess the films' ability to stimulate new thoughts and encourage personal reflection on the presented issues. Data collected from the questionnaires were anonymized to safeguard the privacy of participants, and all identifying information, such as IP addresses, was deleted. An initial decomposed view of the data was made possible by Microsoft Power BI, and the subsequent data analysis and statistical tests were performed using Jamovi. The final section of the questionnaire included an open-ended question, allowing participants to freely express their thoughts and opinions beyond preset response choices, thereby enriching our understanding of the impacts. These qualitative responses were categorized and analyzed with the help of MAXQDA, thus allowing us to interpret the students' personal opinions in a more holistic way. It is worth mentioning that the entire study was designed with rigorous ethical considerations in mind, which have been properly approved.

2.2. SAMPLE

In this study, a convenience sampling method was used. The sample consisted of 591 students selected from a larger audience of more than 2500 film spec-

tators. These participants were chosen based on their accessibility and their willingness to fully engage in the study by accepting to participate and effectively completing the questionnaire. The average time to complete the questionnaire was approximately four minutes and 15 seconds. The ages of the student participants ranged from ten to 22 years old, residing in São Miguel Island, Terceira Island, and Pico Island in the Azores, Portugal. The age range corresponds to the third cycle, secondary school, and licentiate degree stages in the Portuguese educational system. This convenience sample effectively mirrors the target student population. All educational institutions across these three islands, which include public and private entities, were invited to participate in the film sessions and, therefore, in the study. In the 2021-2022 academic year, the last year in which information is available, the overall student population across these islands amounted to 14 940 within the defined age spectrum. The sample was stratified based on different age groups to facilitate a more comprehensive analysis.

Table 1
Age distribution

Group	Ages (years old)	<i>n</i>	%
1st	10-14	212	35.86
2nd	15-17	297	50.25
3rd	18-22	82	13.87

Note: Own elaboration.

The sample was divided into three distinct age groups, as presented in Table 1. Participants aged between ten and 14 years old constitute the first group, representing approximately 35.86% of the total sample, with a total of 212 individuals. The second group consists of individuals between the ages of 15 and 17, making up the largest segment of the sample at 50.25%, with a total of 297 participants. The third and smallest group includes individuals between the ages of 18 and 22, representing 13.87% of the sample, with 82 participants. The research uses this age distribution to investigate trends and patterns in different age groups, facilitating a detailed analysis of the topic. In this study, age-stratified sampling provides a better representation of various school ages (Cohen et al., 2007, pp. 100-118), allows for the detection of age-specific trends in student achievement and improves the validity of the results. This approach is particularly crucial in the educational sciences, where understanding developmental differences is a key point.

Table 2
Gender identity distribution

Gender Identity	<i>n</i>	%
Female students	354	59.86
Male students	214	36.21
Other / Students who preferred not to answer	23	3.89

Note: Own elaboration.

The gender distribution of the sample size (N = 591) is detailed in Table 2. Most of the respondents identified themselves as female students, representing approximately 59.86% (n = 354) of the total of the participants. The male students represented 36.21% (n = 214) of the sample size. A smaller proportion of the respondents, 3.89% (n = 23), identified themselves as other or preferred not to answer that question. This diverse representation of gender identities in the sample strengthens the study's inclusivity.

2.3. MARGIN OF ERROR

The margin of error was approximately 4.03%, with a confidence level of 95%. This means that we can say with 95% certainty that if we had surveyed all 14 940 students, our results would be within 4.03% of what we obtained with our sample of 591 students. The distribution of responses was 50%, which means a balanced sample. It is important to note that these calculations are based on the assumption that our sample is representative of the total population and that the distribution of responses is relatively normal. Given the size of our sample, the margin of error is quite small, suggesting a high degree of accuracy of the results obtained.

2.4. INSTRUMENT

Data were collected using a structured questionnaire distributed through the secure and reliable platform of Microsoft Forms. Participants were given access to the questionnaire via a QR code projected at the end of each film session. The design of the questionnaire was carefully considered to suit the age range of the target audience, incorporating a mix of multiple-choice questions, both single and multiple response, and scaled queries. It is important to note that the questionnaire ended with an open question, allowing participants to freely express their ideas. We classified these answers by "feedback type" and "word count" to comprehensively assess the impact of the films. This method highlights the aspects that elicited the strongest reactions, showing deep involvement and appreciation. It also reveals the participants' reflections and suggestions, validating the effectiveness of films in educational contexts for conflict prevention and mediation. This methodology aims to give

an important qualitative dimension to the study of the phenomenon in question (Bauer & Gaskell, 2015). The questionnaire was available for a limited period, approximately one hour after each screening, providing an efficient and effective method of data collection.

3. RESULTS

In this section, we examine the results derived from the questionnaire, exploring the extent to which the film-viewing experience has stimulated personal reflection and problem-solving abilities among the young participants. These outcomes, encapsulated in a series of clear and insightful tables, directly address the research question by correlating the cinematic experience with the participants' daily attitudes and values.

Table 3
Attitudes taken while watching the films

Attitude taken	1st Group (10-14)	2nd Group (15-17)	3rd Group (18-22)
	%	%	%
"I paid attention to stories"	85.38	78.11	86.59
"I thought about personal questions"	7.55	5.72	7.32
"I observed people's reactions"	2.83	5.39	2.44
"I was not paying attention"	1.89	5.39	2.44
"I thought about other subjects"	0.94	3.03	0.00
"None of the given options"	1.42	2.36	1.22

Note: Own elaboration.

Table 3 provides an overview of the attitudes of the students self-reported during film screenings. Most students across all age groups (85.38% in the 10-14 age group, 78.11% in the 15-17 age group, and 86.59% in the 18-22 age group) indicated that they paid attention to the stories presented in the films. A smaller but significant proportion of students reported introspective experiences, having thought about personal issues while watching the films (7.55% in the 10-14 age group, 5.72% in the 15-17 age group, and 7.32% in the 18-22 age group). A minimal percentage of the students reported being distracted or not paying attention during the film screenings. This suggests that the films were successful in capturing and sustaining the students' attention. In all three groups, a minimal percentage of students chose options that indicated disinterest, such as not paying attention or thinking about other subjects. The main finding drawn from this data reveals that films, specifically animated shorts, effectively engage a majority of students across all age groups, fostering reflective thinking. This is in line with the broader educational

emphasis on media experiences that promote engagement through stories and stimulation through identification with characters. Additionally, the data also show a slight increase in introspective thinking with age, suggesting that older students may be more inclined to reflect on personal issues during film screenings. This could be due to their greater life experience and cognitive development, enabling them to relate the film content to their own lives more effectively.

Table 4

The approach when faced with a problem

Approach taken	1st Group (10-14)	2nd Group (15-17)	3rd Group (18-22)
	%	%	%
"I try to find a solution"	40.09	47.47	45.12
"I can't stop thinking about it"	28.77	27.27	21.95
"I avoid thinking about it"	22.17	14.48	21.95
"I solve it immediately"	4.72	7.41	6.10
"None of the given options"	4.25	3.37	4.88

Note: Own elaboration.

Table 4 reveals information on the problem-solving approaches of students across three age groups: 10-14, 15-17, and 18-22. Across all groups, the most common approach is actively trying to find a solution: 40.09%, 47.47%, and 45.12%, respectively. The second most prevalent approach is the inability to stop thinking about the problem, observed by 28.77%, 27.27%, and 21.95% of each respective age group. In particular, the tendency to avoid thinking about the problem decreases in a specific age group (15-17 with 14.48%), in contrast to the youngest group, which reports a higher rate (22.17%), and also in the oldest group (21.95%). Immediate problem-solving is less common in all groups (4.72%, 7.41%, 6.10%), and a small percentage of each group did not identify with any given options (4.25%, 3.37%, 4.88%). These findings underscore the progression of problem-solving strategies in various developmental stages. A significant percentage of participants from all age groups demonstrated an attempt to find solutions to problems presented in the films. This active involvement implies an immersive viewing experience that stimulates problem-solving and critical-thinking skills that are adaptable to different contexts.

Table 5
Films' capacity to provoke new thoughts

Did one or more films make me think about something I had never thought about before?	1st Group (10-14)	2nd Group (15-17)	3rd Group (18-22)
	%	%	%
"I agree"	58.02	59.26	68.29
"I disagree"	13.21	16.84	14.63
"I'm not sure"	28.77	23.91	17.07

Note: Own elaboration.

The data in Table 5 provides insight into whether films screened during the study sparked new thoughts in the students involved. A majority in each group, 58.02%, 59.26%, and 68.29%, respectively, agreed that the films did induce novel thoughts. It becomes very interesting to note that the agreement seems to increase with age. On the other hand, disagreement was relatively consistent between groups at 13.21%, 16.84%, and 14.63%. Uncertainty about whether the films provoked new thoughts was expressed by 28.77%, 23.91%, and 17.07% of the groups, respectively, demonstrating a decline with increasing age. Therefore, an important finding of this study is that a substantial number of participants from all age groups agreed that the films prompted them to consider ideas that they had not previously considered. This trend becomes more pronounced as the age group increases, suggesting that films have an increasing capacity to introduce new perspectives and stimulate intellectual curiosity as viewers become more mature.

Table 6
Films as problem-solving tool

Can the films help me solve the problems?	1st Group (10-14)	2nd Group (15-17)	3rd Group (18-22)
	%	%	%
"I agree"	50.47	49.49	51.22
"I disagree"	16.51	12.79	18.29
"I'm not sure"	33.02	37.71	30.49

Note: Own elaboration.

Table 6 examines the perception of films as tools for problem-solving in three age groups. A slight majority in each group, comprising 50.47%, 49.49%, and 51.22%, respectively, believed that films could indeed help in problem-solving. This indicates a somewhat shared perception of the usefulness of films in this regard, no matter the age. Those who disagreed constituted 16.51%, 12.79%, and 18.29% of the groups, which represents a relatively low ratio. A sizable portion of the respondents, 33.02%, 37.71%, and 30.49%, respectively, were unsure about the films' problem-solving capacity.

Consequently, the analysis of these data suggests that a significant number of participants perceive films as a tool that can aid in problem-solving, underlining the value of filmic narratives. Also, this finding is in harmony with the results from Table 4, where a substantial proportion of participants demonstrated proactive problem-solving strategies when confronted with problems.

Table 7

Emotions felt while watching the films

While watching the films I felt mostly:	1st Group (10-14)	2nd Group (15-17)	3rd Group (18-22)
	%	%	%
"Sadness"	19.30	21.38	22.78
"Happiness"	13.35	12.63	14.44
"Surprise"	12.53	12.48	11.11
"Calm"	8.62	8.90	9.44
"Anxiety"	8.42	9.33	10.00
"Joy"	11.09	7.46	6.67
"I don't know / I haven't felt"	7.60	10.47	8.89
"Anger"	5.95	5.31	5.56
"Excitement"	5.13	4.02	2.78
"Boredom"	4.31	4.16	1.67
"Fear"	3.29	2.73	5.56
"Envy"	0.42	1.15	1.11

Note: Own elaboration.

One of the most important aspects of data analysis is the pattern of emotional reactions in three distinct age groups: 10-14, 15-17, and 18-22, during their involvement with the films. Feelings of sadness are found to dominate all three age groups, with a gradual escalation with advancing age. Joy and surprise were also frequent emotional reactions, although with small fluctuations in the different age groups; an increase in feelings of joy was observed with age, while surprise decreased slightly. Somewhat expected and in line with the stages of adolescent development, feelings of anxiety increased consistently with age, while feelings of joy showed a contrasting and decreasing trend. A curious trend emerged with reports of boredom decreasing considerably with age. The highest fluctuation was recorded for boredom, which went from 4.31% among younger participants to 1.67% among the older ones. In summary, the consistency of the results emphasizes the universal potential of films to stimulate thought processes among the participants in the study. The emotions elicited were fairly consistent across all age groups, indicating a similar shared interpretation among young participants. This is a valuable piece of information for educators who want to replicate this practice. The findings in Table 7 support the idea that films, as a

medium, can elicit a wide spectrum of emotional responses, subtly influenced by the age of the viewer. This supports the idea that films can be a powerful tool for promoting personal reflection, a key component of students' self-knowledge and personal development.

Table 8
Responses categorized by feedback type and word count

Category	Comments (with total)	Word Count (with total)
Films' Emotional and Cognitive Impact	40	234
Gratitude and Positive Feedback	29	134
Themes Addressed and Societal Issues	22	120
Suggestions for Enhancement and Additional Topics	12	57
Miscellaneous Remarks	9	27
	112	572

Note: Own elaboration.

Table 8 categorizes the responses according to the type of feedback and word count. The most common feedback, as indicated by 40 comments and 234 words, is related to the "Films' Emotional and Cognitive Impact", suggesting the profound influence that the films had on participants' feelings and thinking. The next frequent feedback, with 29 comments and 134 words, is "Gratitude and Positive Feedback", indicating the participants' appreciation of the films. Meanwhile, 22 comments and 120 words are dedicated to "Themes Addressed and Societal Issues", reflecting the films' ability to engage viewers in societal discourse. "Suggestions for Enhancement and Additional Topics" collected 12 comments and 57 words, showing active participant engagement and interest in future content. Lastly, "Miscellaneous Remarks" gathered nine comments and 27 words, which included varied responses. The analysis of feedback type and word count sheds light on the nature of viewers' engagement with films. Most of the comments relate to the emotional and cognitive impact of films, suggesting a deep level of engagement. This is further supported by the volume of gratitude and positive feedback, pointing towards the overall positive reception of the films.

4. DISCUSSION

This study is fundamentally guided by the question of whether films can effectively stimulate problem-solving skills in students. The findings derived from the questionnaire responses of the young participants provide a comprehen-

sive answer to this question, revealing the notorious impact of films on this subject. Most of the young participants reported paying close attention to the stories presented in the films. This finding confirms that the films effectively engage the majority of students in all age groups. The ability of films to capture and maintain the attention of young viewers is a testament to their potential as an educational tool. This is in line with the broader educational emphasis on media experiences that promote engagement through stories and stimulation through identification with characters. Furthermore, a significant proportion of students reported introspective experiences, having thought about personal issues while watching the selection of animated short films. This indicates that the films not only engaged the students but also stimulated personal reflections. Personal reflection is a critical component of problem-solving, as it helps identify and adjust potential barriers to effective solutions. The increase in introspective thinking with age suggests that older students may be more inclined to reflect on personal issues during film screenings, possibly due to their greater life experience and cognitive development. The findings also reveal insights into the problem-solving approaches of students across different age groups. A significant percentage of participants in all age groups agree with the notion that they could find solutions based on the resolutions presented in the storylines. This active involvement implies an immersive viewing experience that can stimulate problem-solving abilities capable of adapting to different real-world contexts. In terms of the film's capacity to provoke new thoughts, a substantial number of participants from all age groups agreed that films prompted them to consider ideas they had not previously considered. This trend becomes more pronounced as the age group increases, suggesting that films have an increasing capacity to induct new perspectives and stimulate intellectual curiosity as viewers become more mature. The emotional reactions elicited by the films were consistent between all age groups, indicating a similar shared interpretation among young participants. Lastly, most of the comments from the participants relate to the emotional and cognitive impact of the films, suggesting a deep level of involvement. This is further supported by the volume of gratitude and positive feedback, pointing towards the overall positive reception of the films. It should be mentioned that the questionnaire comprised the perspectives of 80 teachers, school psychologists, and other professionals who accompanied classes of students to the sessions. Two-thirds of these professionals echoed the positive feedback given by the students, attesting to the beneficial impact this type of experience can have on their groups of students.

4.1. LIMITATIONS AND FUTURE RESEARCH

One limitation identified was the lack of data and means to assess the level of understanding of the films' narratives. This issue could be resolved by including interpretation questions for all the films in the session questionnaire. However, this method would make the questionnaire excessively long and

time-consuming for the target audience. It is, therefore, essential to bear in mind that different films may elicit different reactions from viewers. Future studies should take these differences into account in order to comprehensively understand the impact of different films on participants. It will be essential to strike a balance between collecting sufficient data and ensuring an adequate response rate. The present study also acknowledges the limitations related to factors such as genre, age, cultural background, cognitive development, and emotional maturity, which may influence the effectiveness of audiovisual stimuli for some participants, knowing in advance that the human capacity to recognize oneself during introspective processes may be limited (Grodal, 2006).

5. CONCLUSION

The study provides a spectrum of possibilities about the different strategies and responses that students can employ in difficult scenarios encountered in their daily interactions. This valuable understanding aids in predicting student behavior and facilitating the creation of effective strategies to preemptively address conflicts. Films, in this study, are recognized as an effective method of understanding because they can engage the audience in a way that traditional methods cannot. They can simplify complex and challenging topics, making them more relatable and understandable to a wider audience. When we have a better understanding of complex issues, we can empathize more with those affected by them, which can motivate us to act for change. Thus, films can serve as a powerful tool to increase our understanding of issues and inspire us to take action to address them. Table 4 convincingly illustrates how the participants in the study proactively seek to confront and solve problems they encounter in their lived experiences, evidencing immediate action. This activity fundamentally represents the transfer of scenarios and lessons learned in cinematic contexts to practical, real-world situations. The results of this study reveal that these types of animated short films can truly promote personal development, effective communication, and conflict management in educational settings. In conclusion, the findings of this study reveal that films can effectively engage a majority of students across all age groups, fostering personal reflections and, consequently, problem-solving abilities development. Taking into account all these arguments, educators should recognize the potential benefits of integrating films into their educational strategies, bearing in mind that, in some cases, it can help in preventing or solving common problems in their daily school lives. These findings also benefit school mediation departments, where interpersonal problems and conflicts between peers are a constant. The insights gained from this study bring substantial contributions to the wide-ranging interdisciplinary realm connecting the sciences of communication and education.

AUTHORSHIP OF THE ARTICLE

Conceptualization: R.B.S.; Methodology: R.B.S., P.M.M.; Validation: P.M.M.; Formal analysis: R.B.S.; Research: R.B.S.; Data curation: R.B.S.; Writing of original draft: R.B.S.; Writing of revisions and corrections: R.B.S., P.M.M.; Supervision: P.M.M.; Project administration: R.B.S. All authors have read and agreed to the published version of the manuscript.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

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Da projeção audiovisual à reflexão pessoal:odem os filmes realmente estimular a capacidade de resolução de problemas dos alunos?

RESUMO

Este estudo explora o potencial dos filmes para estimular a capacidade de resolução de problemas, com base num estudo de caso com alunos dos 10 aos 22 anos no Arquipélago dos Açores, Portugal. Investiga se a exposição a projeções audiovisuais, como filmes, podem incentivar a reflexão pessoal, a introspeção e, em última análise, contribuir para melhorar a capacidade individual de resolução de problemas, um aspeto fundamental na educação contemporânea. Foi utilizada uma abordagem de investigação empírica de métodos mistos, aplicando um questionário a uma amostra diversificada de estudantes (N = 591). A conceção do estudo consistiu em expor os participantes a uma sequência de curtas-metragens de animação cuidadosamente selecionadas, representativas de algumas questões fundamentais para os jovens, seguidas de debates. Em seguida, os estudantes foram convidados a preencher um questionário anónimo online para observar as suas reações cognitivas e emocionais. Os resultados indicam uma correlação positiva entre a exposição aos filmes e a construção de cenários hipotéticos para a resolução de problemas, com os participantes a referirem novas perspetivas para lidar com potenciais situações difíceis futuras nas suas próprias vidas.

Palavras-chave: Filmes; Estudantes; Resolução de problemas; Educação.

De la proyección audiovisual a la reflexión personal: ¿Pueden las películas estimular realmente la capacidad de resolución de problemas de los alumnos?

RESUMEN

Este estudio explora el potencial de las películas para estimular la capacidad de resolución de problemas, a partir de un estudio de caso con estudiantes de entre 10 y 22 años del archipiélago de las Azores (Portugal). Investiga si la exposición a proyecciones audiovisuales, como las películas, puede fomentar la reflexión personal, la introspección y, en última instancia, contribuir a mejorar las capacidades individuales de resolución de problemas, un aspecto clave en la educación contemporánea. Se utilizó un enfoque de investigación empírica de métodos mixtos, aplicando un cuestionario a una muestra diversa de estudiantes (N = 591). El diseño del estudio consistió en exponer a los participantes a una secuencia de cortometrajes de animación cuidadosamente seleccionados, representativos de algunas cuestiones fundamentales para los jóvenes, seguidos de debates. A continuación, se invitó a los estudiantes a rellenar un cuestionario anónimo online para observar sus reacciones cognitivas y emocionales. Los resultados indican una correlación positiva entre la exposición a las películas y la construcción de escenarios hipotéticos de resolución de problemas, y los participantes informan de nuevas percepciones para manejar posibles situaciones difíciles futuras en sus propias vidas.

Palabras clave: Películas; Estudiantes; Resolución de problemas; Educación.