

## Development of a Social Networking Platform for Sri Lankan Families with Integrated Parental Controls and Movie Streaming

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### ABSTRACT

This study explores the increasing disconnect in Sri Lankan families due to unregulated digital media consumption, particularly through movie streaming. It aims to develop a family-oriented social networking platform that integrates movie streaming, fostering healthy discussions while ensuring safe digital engagement. Grounded in Sri Lankan family values, the platform's theoretical framework emphasises improved intrafamilial communication and responsible media usage, especially among younger users. A structured survey of Sri Lankan households assessed digital habits, family interactions, and parental concerns. Survey data were analyzed using regression and clustering techniques to identify core user needs and inform feature design. A bad-word detection module, implemented with Random Forest classifiers, achieved 95 percent accuracy in moderating English-language content; future enhancements will add Sinhala support for greater cultural relevance. Findings revealed strong demand for topic-based movie discussions and robust parental-control options—both of which the platform seamlessly integrates. This model offers an innovative solution to mitigate digital media's adverse effects on family dynamics and presents a scalable, culturally adaptable approach with implications for the film industry and policymakers seeking to promote safer media consumption practices.

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**Received:** April 21, 2025; **Accepted:** April 25, 2025; **Published:** May 26, 2025

**Keywords:** Sri Lankan Family, Movie Discussion, Parental Control, Localization, Chat System

### Introduction

The dynamics of global family life have undergone a profound transformation in response to the pervasive influence of digital media in contemporary society. A confluence of factors, including market forces, commercial competition, and the rise of consumerism, has driven this shift and contributed to the exponential increase in internet usage among families worldwide. These changes coincide with a notable rise in familial busyness, a complex phenomenon that intertwines economic, social, and psychological dimensions. This busyness is further exacerbated by the intensification of parental work schedules, coupled with escalating educational expectations for children [1].

As digital media continues to proliferate, it presents unique challenges to families. Parents, often overwhelmed by the demands of modern life, struggle to effectively manage their children's online activities, engage in meaningful conversations, or cultivate a deep understanding of contemporary cultural orientations. This disconnect has given rise to various negative outcomes, including a widening generation gap, increased miscommunication, failed socialization, and inadequate child guidance. These issues are symptomatic of a broader societal trend, where the digital age has outpaced traditional methods of family interaction and communication [2,3]. Existing platforms like Kinscape have begun addressing these concerns by providing safe, private social networks designed specifically for families, which underscores the growing demand for such solutions in today's digital landscape

[4]. Still, a lack of integration with entertainment services, limiting their engagement potential.

While these trends have been extensively documented in advanced economies since the advent of the internet era, it is increasingly evident that similar patterns are emerging in developing countries such as Sri Lanka. Despite the global impact of the internet, many within these communities remain unaware of the sociocultural shifts and challenges it engenders. The absence of effective, locally responsive interventions compounds this lack of awareness, failing to address these burgeoning issues. As Walker (2016) notes, integrating family and consumer sciences into the development of digital platforms can lead to more culturally appropriate solutions that cater to the specific needs of families in different regions [5]. Consequently, there is an urgent need for research that not only identifies the problems but also proposes culturally sensitive remedies tailored to the local context.

This study aims to bridge this gap by providing a clear analysis of the challenges posed by digital media to family dynamics and offering innovative solutions. Specifically, this research seeks to design a family-oriented social networking system integrated into movie and video streaming platforms. Such a system would catalyze healthier family engagements, heighten cultural awareness, and improve personal well-being. The implications of this work extend beyond individual families to society at large, encompassing social, cultural, and personal health dimensions. The objective of this study is to investigate these complex dynamics, propose viable solutions, and engage all relevant stakeholders in fostering a harmonious coexistence with digital media, ultimately

contributing to the creation of an enhanced familial landscape in Sri Lanka and potentially in other similar contexts.

### Theoretical Framework

Digital media has profoundly impacted family interactions, reshaping communication patterns and entertainment consumption. Unregulated exposure to digital content has been linked to increased social detachment within families, emphasizing the necessity for structured digital engagement solutions [6,7]. This issue is particularly relevant in Sri Lanka, where traditional family values prioritize collective discussions and shared experiences, yet research on digital media's role in altering these dynamics remains limited. A key concern is the generational divide in entertainment consumption, which has widened due to the rapid evolution of streaming platforms. This gap makes it challenging for parents to participate in their children's digital experiences, leading to decreased parental guidance [8]. Research suggests that structured parental involvement fosters healthier media consumption habits and mitigates negative behavioural influences [9]. However, existing parental control mechanisms are not sufficiently adapted to Sri Lankan cultural contexts, leaving a critical research gap [10]. This study is grounded in social learning theory, which posits that behaviour is influenced through observation and interaction [11]. Previous research has demonstrated that localised digital learning environments significantly enhance parent-child engagement and bridge digital literacy gaps [12].

Additionally, culturally adaptive content moderation is essential for ensuring digital safety, especially for younger users [13]. The integration of a machine learning-based bad word detection system, utilizing TF-IDF and Random Forest models, aligns with studies advocating for automated content filtering in family-friendly digital spaces [5].

By building upon these theoretical foundations, this research contributes to the development of a culturally responsive family-oriented networking platform that aligns with Sri Lankan societal values while addressing contemporary digital consumption challenges.

### Methodology

This research follows a structured methodology to develop a family-oriented social networking platform integrated with movie streaming, ensuring safe digital engagement for Sri Lankan households. The approach combines qualitative and quantitative data collection, statistical analysis, and machine learning-based content moderation

### Data Collection and Processing

#### Survey Design and Distribution

A comprehensive survey was developed to gather insights into the preferences and concerns of Sri Lankan families regarding social networking sites. The survey was distributed via social media platforms and email, targeting a broad demographic that included friends, cousins, doctors, housewives, students, and other professionals across various age groups. The survey was conducted in both Sinhala and English using Google Forms to ensure accessibility. The survey sought to capture a wide range of opinions by including questions on digital media usage, parental concerns, and desired features in a family-friendly platform. The diverse respondent pool included parents, students, professionals, and community members, ensuring that the sample was representative of the population.

### Survey Structure

**Demographic Information:** Age, gender, occupation, family structure, and geographic location.

**Parental Concerns:** Specific worries regarding children's online safety, exposure to inappropriate content, and communication gaps.

**Desired Features:** Preferences for parental controls, content moderation tools, and family-centric features on social networking platforms.

### Data Analysis

A stratified random sampling technique was used to ensure a representative dataset. The sample was categorised based on geographical background, family structure, age group, and socioeconomic status. The survey responses were analysed using statistical methods:

**Chi-Squared Tests:** Used to determine the relationships between categorical variables, such as parental concerns and preferences for platform features.

**Regression Analysis:** Applied to assess the impact of demographic factors on the demand for parental controls and social networking features.

**Clustering Analysis:** Employed to segment users based on their responses, helping tailor platform functionalities to distinguish family needs.

The sample size was determined using Cochran's formula, ensuring a 95% confidence level and a 5% margin of error. This method provided a robust foundation for generalizing findings to the wider Sri Lankan population.

$$n_0 = \frac{Z^2 \cdot p \cdot (1-p)}{e^2} \quad (1)$$

where:

$n_0$  = the sample size

$Z$  = Z-value

$p$  = estimated proportion of the population

$e$  = margin of error

### Data Privacy and Ethical Considerations

To ensure ethical research practices, all collected data was anonymized, and participants provided informed consent. The research adhered to privacy regulations, preventing unauthorized data access.

### Platform Development and Training of the Detection Model System Development and Feature Integration

The proposed system integrates topic-based discussions, parental controls, and machine learning-based content moderation. The platform's architecture was designed for scalability, ensuring a seamless user experience.

### Bad Word Detection Feature

One of the core parental control mechanisms is the bad word detection system, ensuring a safe digital environment for families. The feature was developed through the following steps:

**Dataset Collection and Enhancement:** A base dataset from Kaggle was enhanced with locally relevant slang and phrases to improve cultural adaptability.

**Preprocessing:** The text data underwent tokenization, lemmatization, and vectorization using TF-IDF (Term Frequency-Inverse Document Frequency) to convert text into numerical representations.

Data Augmentation: Techniques such as synonym replacement and sentence restructuring were applied to increase dataset diversity and minimize overfitting.

### Machine Learning Model Training and Validation

The bad word detection system was trained using the Random Forest algorithm, which demonstrated superior performance compared to alternative models such as K-Nearest Neighbors (KNN), Gradient Boosting, and Logistic Regression. The model was evaluated using cross-validation, ensuring Precision Recall, and F1-score Optimization: To maintain a balance between minimizing false positives and ensuring offensive content is effectively detected.

**95% Accuracy:** The model outperformed other approaches, demonstrating high reliability in filtering inappropriate content.

### Real-Time Performance and User Customisation

The system allows users to toggle the bad word detection feature on or off, providing flexibility while maintaining a safe environment. The detection model was optimized to minimize false positives and false negatives, ensuring an intuitive user experience.

### Addressing Cultural Adaptation in Parental Controls

One of the platform’s unique aspects is its culturally adaptive parental control mechanisms. Unlike conventional parental control systems that apply broad content restrictions, this platform enables parents to:

**Customise Movie Discussions:** Parents can guide conversations on films, fostering critical thinking among children.

**Filter Content Contextually:** Instead of blocking entire categories, the system allows moderation based on cultural norms and family values.

**Encourage Family Cohesion:** By promoting family discussions around entertainment, the platform strengthens intergenerational communication and understanding.

### Challenges and Implementation Considerations

While the system introduces innovative solutions, its implementation poses certain challenges:

**Balancing Moderation with User Freedom:** Overly strict filtering may limit engagement, while lenient settings could expose users to unwanted content.

**Ensuring AI Model Fairness:** The detection system must avoid bias and account for linguistic variations across different Sri Lankan dialects.

**User Adoption and Training:** Educating families on the platform’s features and benefits is essential for successful adoption.

### Results and Discussions

The developed platform underwent extensive testing to evaluate the effectiveness of its features, particularly the bad word detection tool. The system’s performance was assessed through various machine learning models, including Random Forest, Logistic Regression, K-Nearest Neighbors (KNN), and Gradient Boosting. Key metrics such as accuracy, precision, recall, and F1-score were analyzed to determine the best-performing model.

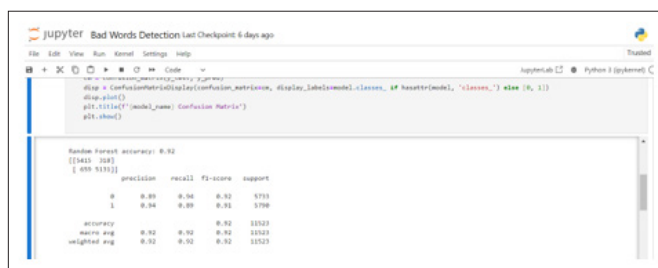
### Algorithm Performance

As shown in Table 1, the Random Forest model demonstrated the highest accuracy of 95%, outperforming other models in terms of precision and recall. This model effectively balanced false positives and false negatives, ensuring robust content moderation within the chat system. Logistic Regression followed closely with 91% accuracy, while Gradient Boosting achieved 89% accuracy. In

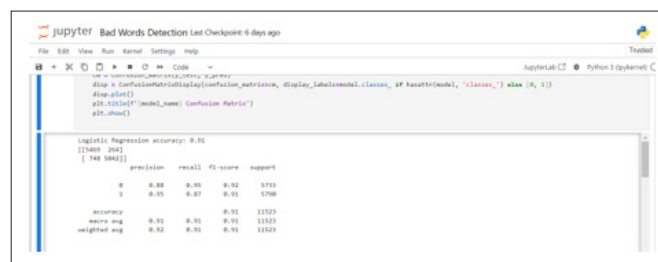
contrast, KNN showed a significantly lower accuracy of 56%, indicating its limitations in classifying offensive language.

**Table 1: Accuracy Comparison of Machine Learning Models**

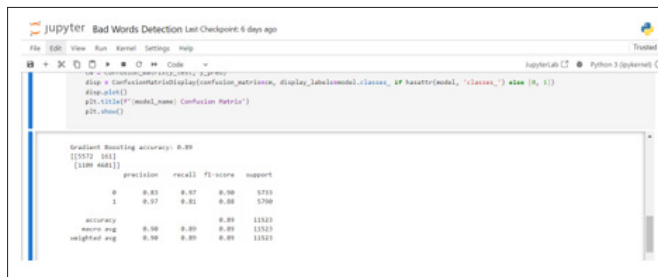
Algorithm	Accuracy (%)
Logistic Regression	91
Random Forest	95
KNN	56
Gradient Boosting	89



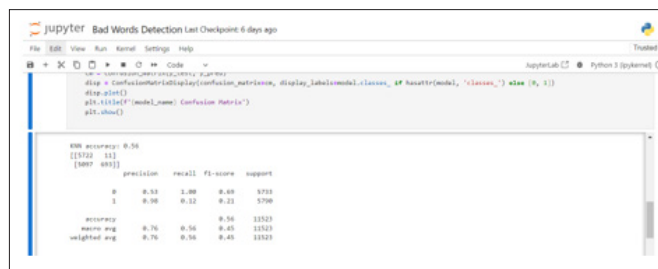
**Figure 1:** Accuracy, precision, recall, and F1-score metrics for Random Forest Algorithm.



**Figure 2:** Accuracy, precision, recall, and F1-score metrics for Logistic Regression Algorithm.



**Figure 3:** Accuracy, precision, recall, and F1-score metrics for Gradient Boosting Algorithm.



**Figure 4:** Accuracy, precision, recall, and F1-score metrics for KNN Algorithm.

Additionally, Singular Value Decomposition (SVD) was applied to reduce the dimensionality of the TF-IDF feature set, improving computational efficiency and reducing overfitting. The Random Forest model, when combined with SVD, produced the best results, making it the optimal choice for real-time content filtering.

### Confusion Matrix Analysis

To further assess model reliability, confusion matrices were generated for the four best-performing algorithms. As illustrated in Figures 1 - 4, the Random Forest model (Figure 1) recorded the highest number of true positives and true negatives, with minimal misclassification. This solidified its selection for integration into the bad word detection system.



Figure 1: Confusion Matrix of the Random Forest Algorithm

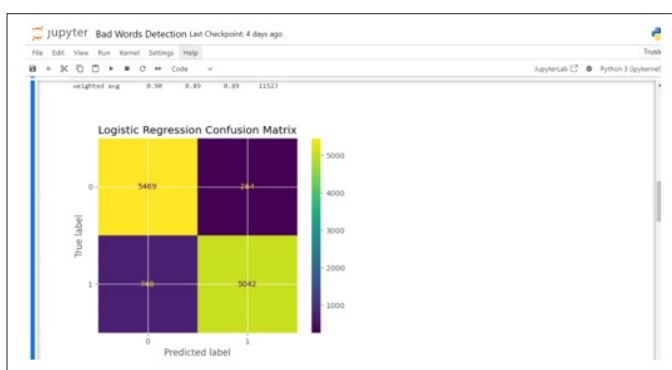


Figure 2: Confusion Matrix of the Logistic Regression Algorithm

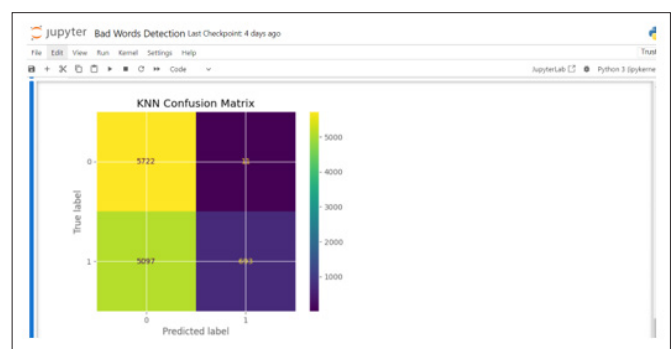


Figure 3: Confusion Matrix of the KNN Algorithm



Figure 4: Confusion Matrix of the Gradient Boosting Algorithm

### Feature Integration and User Testing

After model selection, the bad word detection feature was integrated into the chat system and subjected to user testing. This phase involved people from diverse backgrounds, providing valuable feedback on usability and effectiveness.

### Usability Testing and Feedback

**Real-time detection and filtering:** Users found the real-time filtering feature effective, allowing parents to monitor and control content seamlessly.

**Language Adaptability:** While the system currently supports English, several participants highlighted the need for Sinhala and Tamil language support, reinforcing the need for future enhancements.

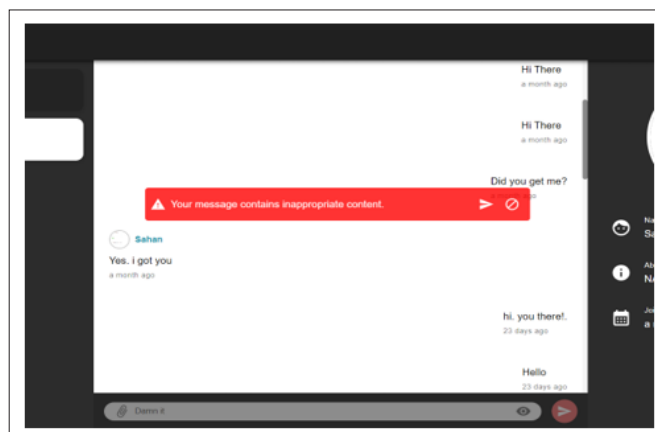


Figure 1: Chat System with Bad Word Detection Feature

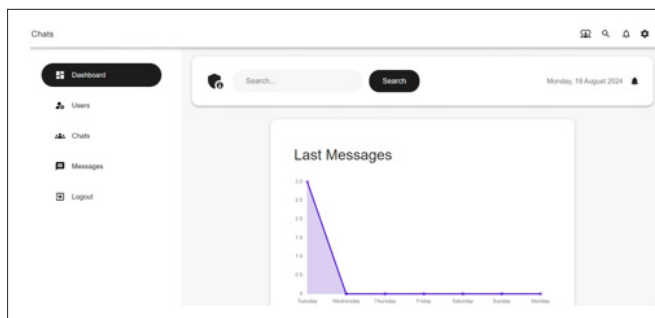


Figure 2: Parental Control Dashboard.

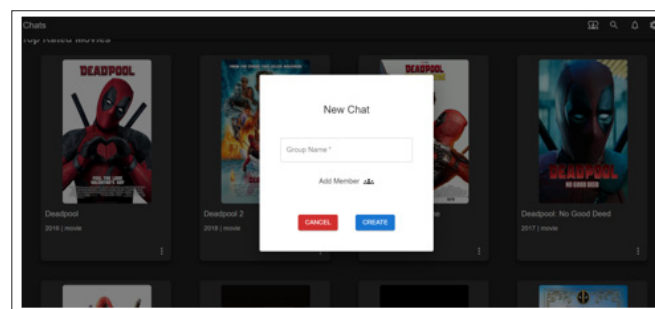


Figure 3: User-adding section for the logged-in user.

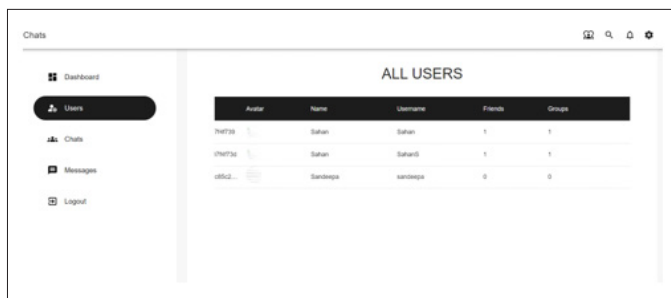


Figure 4: Added user by the parent.

### Cultural Adaptation and Family Engagement

One of the primary objectives of this research was to develop a culturally sensitive platform that aligns with Sri Lankan family values. Unlike generic social networking platforms, this system enables structured movie discussions and customizable content filtering that caters to cultural norms.

### Customizable Discussion Topics

The topic-based discussion feature fosters engagement by encouraging families to share opinions on movies, allowing parents to provide contextual guidance on themes, values, and lessons portrayed in films. This approach promotes constructive dialogue rather than simple content restriction.

### Enhancing Family Cohesion Through Digital Media

Unlike traditional parental control systems that focus solely on restriction, this platform aims to enhance family cohesion by: Encouraging joint media consumption and discussions. Allowing parents to guide their children on appropriate media choices. Providing structured engagement to bridge the digital generation gap.

### Challenges and Future Research Directions

#### Identified Limitations

While the platform achieved its intended objectives, several limitations were noted:

**Survey Representativeness:** The survey sample, though diverse, may not fully represent all Sri Lankan households. Future studies should expand the sample size to improve generalizability.

**Longitudinal Studies Needed:** The study assessed immediate impacts, but long-term effects on family dynamics remain unexplored.

**Limited Language Support:** The current bad word detection model is optimized for English only. Expanding to Sinhala and Tamil is a critical next step.

#### Future Research Opportunities

**Integration of AI for Cultural Context Detection:** AI models can be trained to detect nuanced cultural references, enabling smarter context-aware filtering.

**Comparative Studies on Parental Control Features:** Researching how different cultural contexts influence parental control effectiveness can inform system improvements.

**Expansion of Language Support:** Developing multi-language content moderation models to accommodate Sinhala and Tamil will significantly enhance adoption.

**User Engagement Analytics:** Implementing data-driven engagement tracking can provide insights into how families interact with the platform over time.

### Conclusion

This research introduced a family-oriented social networking platform that integrates movie streaming, parental controls, and content moderation, specifically designed to address the challenges Sri Lankan families face in digital media consumption. The platform fosters safe communication, cultural sensitivity, and structured engagement through features like topic-based discussions and a machine learning-driven bad word detection system.

### Key Findings

The platform evaluation demonstrated that:

- The bad word detection feature, powered by Random Forest algorithms, achieved 95% accuracy, making it an effective moderation tool.
- User testing confirmed that customizable parental controls and discussion-based engagement significantly enhance family interaction and digital safety.
- The integration of structured entertainment discussions proved valuable in bridging generational gaps and fostering meaningful conversations.

### Limitations

Despite its success, the study had certain limitations:

- **Survey Representativeness:** Although the survey covered diverse Sri Lankan demographics, a larger and more stratified sample would improve generalizability.
- **Longitudinal Assessment:** The study primarily evaluated immediate user experience and further long-term research is required to assess the platform's sustained impact on family dynamics.
- **Language Limitations:** The current version supports only English, limiting accessibility for Sinhala- and Tamil-speaking families.

### Future Research and Development

To enhance the platform's effectiveness and scalability, several areas of future research are proposed:

**AI-Driven Cultural Context Detection:** Developing artificial intelligence models to detect and interpret nuanced cultural references would improve content moderation accuracy.

**Expanded Language Support:** Implementing Sinhala and Tamil language processing will ensure greater inclusivity and usability.

**Cross-Cultural Adaptation:** Adapting the platform to other countries with similar digital media concerns will broaden its applicability and test its effectiveness in diverse cultural settings.

Furthermore, ongoing user feedback will be used to iteratively refine the platform, ensuring it continues to meet the evolving needs of Sri Lankan families. Potential collaborations with educational institutions and child welfare organisations will also be explored to enhance the platform's reach and effectiveness.

### References

1. Walker SK (2021) Technology use and families: Implications for work-family balance and parenting education. United Nations Department of Economic and Social Affairs <https://www.un.org/development/desa/family/wp-content/uploads/sites/23/2021/05/Technology-Families-Background.pdf>.
2. Wang Z, Xu X, Chen Y (2012) Family-oriented social network and services. International Joint Conference on Service Sciences. [https://www.researchgate.net/publication/261356205\\_Family-Oriented\\_Social\\_Network\\_and\\_Services](https://www.researchgate.net/publication/261356205_Family-Oriented_Social_Network_and_Services).

3. Tahar H, Ahmed D, Amale A (2016) Generational gap and youth in Arab countries. Munich Personal RePEc Archive.
4. Kinscape (2024) Kinscape provides a safe private social network for family. Kinscape. Retrieved from <https://join.kinscape.com/private-social-network-for-your-entire-family/>.
5. Walker SK (2016) Creating the future we want: A framework for integrating family and consumer sciences research, practice, and policy on technology use. *Journal of Family & Consumer Sciences*. *Journal of Family & Consumer Sciences* 108: 7-17.
6. Ghandali R, Hassani-Abharian P, Sadeghi-Firoozabadi V, Nooripour R (2022) The effect of violent and melodrama movies on risky decision-making and behavioral inhibition in adolescents. *Basic and Clinical Neuroscience Journal* 13: 765-776.
7. Kubrak T (2020) Impact of films: Changes in young people's attitudes after watching a movie. *Behavioral Sciences* 10: 86.
8. Lawati S (2019) Understanding the psychology of youths: Generation gap. *International Journal of Psychology and Counselling* 11: 46-58.
9. Sargent JD, Tanski S, Dalton M (2007). Parental rules and monitoring of children's movie viewing associated with children's risk for smoking and drinking. *ResearchGate* Retrieved from <https://pubmed.ncbi.nlm.nih.gov/17079564/>
10. Ravi A, Kuriakose J, Lakshmanan S (2019) Rating for parents: Predicting children's suitability rating for movies based on language of the movies. *ResearchGate*. Retrieved from [https://www.researchgate.net/publication/335319042\\_Rating\\_for\\_Parents\\_Predicting\\_Children\\_Suitability\\_Rating\\_for\\_Movies\\_Based\\_on\\_Language\\_of\\_the\\_Movies](https://www.researchgate.net/publication/335319042_Rating_for_Parents_Predicting_Children_Suitability_Rating_for_Movies_Based_on_Language_of_the_Movies).
11. Dalsgaard C, Ryberg T (2023) A theoretical framework for digital learning spaces: Learning in individual spaces, working groups, communities of interest, and open connections. *Research in Learning Technology* 31: 3084.
12. Smith M (Dec 22, 2023) Virtual connections for parental engagement: What do digital spaces offer? *STEL PubPub* 3: 1-29.
13. Lansford J (2016) What's good parenting for children in one place may be harmful in another *Child and Family Blog*. Retrieved from <https://childandfamilyblog.com/good-parenting/>.

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