The Prospective Predictors of Science Learning Motivation Among Children Who Use YouTube Kids App

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Abstract

The research examines the influence of YouTube Kids on science learning motivation among elementary school students by employing a quantitative survey-based methodology. Participants were divided into two groups: an experimental group (n=20), which engaged with curated science videos on YouTube Kids, and a control group (n=20), which received traditional classroom instruction. Data were collected exclusively through a validated 29-item Likert-scale questionnaire measuring students' interest in science topics, inquiry inclination, and interest in science-related careers. Results indicated that the experimental group displayed significantly greater improvements in motivation scores (mean pre-intervention = 3.45, post-intervention = 4.12, mean gain = 0.67) compared to the control group (mean pre-intervention = 3.50, post-intervention = 3.78, mean gain = 0.28). A repeated-measures ANOVA confirmed significant motivational growth over the intervention period ($F(1,38) = 21.78$, $p < 0.001$), highlighting the effectiveness of digital multimedia approaches. The study suggests that YouTube Kids can effectively enhance children's motivation towards science education, provided that the content is carefully curated and monitored by educators and parents.

Keywords: YouTube Kids, Science Learning Motivation, Digital Education.

Introduction

Modern approaches for science education in early childhood education have largely involved the prominent use of YouTube Kids as a major online learning platform. The widespread use of digital platforms created an academic interest in determining which elements drive students toward science content. Educational applications that use both visual components and interactive elements help develop student interest while building neurological functions and leading to better grade performance. YouTube Kids has become common among children; nevertheless, the particular elements behind their science learning motivators need further examination. This research identifies essential variables which affect science learning drive in children who use the YouTube Kids application through an assessment of content excellence together with engagement capabilities and parent dedication as well as mental development and media consumption impact. Digital technology expands educational landscapes through online content exposure which young students experience daily. Research shows growing digital media usage among children which leads many of them to choose YouTube Kids for educational content (Sarwar et al., 2023). YouTube videos remain an appropriate educational resource for children because they combine

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easy access with captivating content which helps students understand science principles better through visual learning. The educational value of YouTube Kids depends heavily on both the quality standards of its content and how much users actively participate with the material. According to Nuriyah et al. (2023) scientific learning motivation in children depends heavily on various elements of digital content and their presentation methods.

Scientific learning motivation in young children strongly depends on content quality as a leading predictor according to research. Balanced education in science needs content which provides structured materials and captivates viewers while maintaining strict adherence to scientific principles. Educational videos with high quality enhance child retention while improving their scientific concept understanding and interest (Mohamed & El-Semary, 2022). Digital content featuring animation along with storytelling elements and interactive features produces better learning motivation outcomes. The study by Mohamed & El-Semary (2022) showed that science popularization videos on social media become more effective when they utilize well-defined learning objectives and compelling storytelling as they increase student engagement after watching the content. Concerns exist about educational content regulation on YouTube Kids since the platform does not enforce strict content quality standards. According to Henderson et al. (2024) YouTube videos made for children contained few appropriate content options with consumerist and violent components making up most of the content. The requirement for rigorous content selection demonstrates that both educational value and appropriateness for young scholars need assessment in scientific educational material.

The implementation of interactive learning features acts as a principal determinant for motivating students to learn science. Children sustain their scientific interest better when they can pursue interactive educational content actively instead of simply receiving information. Reviews indicate digital systems using interactive quizzes combined with hands-on experiments and user participation elements enhance learning depth and maintain learners' interest (Nuriyah et al., 2023). Student motivation improves substantially through the implementation of the ADDIE model applied to science education on YouTube platforms according to Nuriyah et al. (2023). The integration of gamification elements that include tracking system and rewards and feedback mechanisms demonstrates positive impacts on motivation levels of children who engage with digital science content. Digital media interactions create significant effects in informal learning environments because children use self-directed approaches to study scientific concepts. Student active involvement in educational video interaction improves their engagement and cognitive development according to Alhrahsheh et al. (2024).

Parental engagement creates essential conditions through which children can develop their motivation to study science through digital learning systems. Active parental guidance using YouTube Kids entails selecting premium content and talking about scientific topics leads to performance improvement for children (Alqahtani et al., 2023). Clinical research shows parents who jointly watch content with their children and lead discussions about scientific subjects enable better topic understanding among young learners while fostering their scientific interest. Research reveals that YouTube safety for children becomes better when parents use content monitoring tools in combination with parental control systems which promote educational content and minimize exposure to inappropriate content (Alqahtani et al., 2023). Research shows that kids develop inner drive toward science education when parents support them to participate in science activities according to Jeon (2022). Studies show that digital science learning benefits from parental engagement, but this participation differs widely between families because of economic factors alongside their digital literacy skills and educational resource accessibility levels. Thus it

necessitates population-specific support strategies for parents who want to help their children learn science online.

Cognitive development and attention span also serve as important predictors of science learning motivation. Research shows that using digital media to teach science at an early age leads to enhanced memory functions while developing students' problem-solving capabilities and improving their critical thought processes (Sarwar et al., 2023). Research shows that video-based learning produces outstanding results in helping young children learn sequential memory and cognitive skills through investigations into digital storytelling and auditory learning (Palupi, 2022). The research shows that structured educational content on digital media helps children improve their attentional control and information processing skills while unregulated digital content shows inferior results (Sarwar et al., 2023). Digital media usage continues to worry experts because it might affect attention span negatively. Scientific studies show that both long periods of screen usage and irrational platform exposure negatively affect students' mental focus during classroom learning activities (Hita et al., 2024). Constructing an equilibrium between technological and conventional educational approaches should serve as the essential factor in maximizing student motivation for science education.

The slope towards motivation in science learning now emerges from the social dynamics which form part of digital interactions. Children base their science learning interest on the emotional bond they develop with digital content along with their perception of that content. Research explains that children actively engage with educational content when it stimulates positive emotions along with relatable relations and enjoyable learning experiences (Putri et al., 2024). Scientific studies demonstrate that young learners show increased motivation after receiving digital storytelling alongside personalized learning and experiential virtual characters. Children tend to respond better to media personalities and YouTubers who deliver information through engaging relatable content according to Sapsağlam (2023). The adoption of relatable inspiring figures throughout science education videos demonstrates fundamental value in motivating children toward science learning.

The effects of digital media on science learning motivation extend to broad-scale policy areas alongside social consequences that influence individual predictors. The growing digital use for early childhood education requires strategic framework development to guarantee excellent content delivery together with universal accessibility and inclusive practices. Educational policymakers together with teachers need to work alongside content developers to create standards that will promote interactive and scientifically correct educational content. Implementation of parental digital literacy support programs and digital learning systems are necessary to enhance the educational value of YouTube Kids as a science teaching resource (Jeon, 2022). The success of video-based learning in elementary classrooms requires educators to use both digital and hands-on strategies because this method enhances motivation while supporting cognitive progress for students (Ristianti & Istikomah, 2022).

The science learning motivation of children who watch YouTube Kids depends on several influencing elements which include video content standards along with user interaction and parental guidance and children's intellectual growth together with emotional development. High-quality science content combined with engaging interactivity on YouTube Kids drives children to maintain their curiosity along their science learning journey. Parental mediation strengthens the impact of digital science education while students' cognitive engagement combined with emotional connections to content material directly affect their motivation levels. A balanced approach must be developed to integrate YouTube Kids into science education because various issues involving

content oversight as well as digital consumption and differences in educational material availability persist. Research and policy interventions must continue because digital media is reshaping early childhood learning experiences therefore ongoing measures are necessary to maximize the educational benefits of digital platforms alongside preventing possible challenges.

Methodology

This research employed a quantitative methodological framework to explore the prospective predictors of science learning motivation among elementary students who used the YouTube Kids application. A quasi-experimental pretest-posttest design was adopted to measure the impact of curated science video content provided via the YouTube Kids platform on students' motivational levels towards science learning. The methodological approach enabled a systematic evaluation of causal relationships between the digital intervention and changes in student motivation, ensuring reliable insights into the efficacy of multimedia learning tools in elementary educational settings.

The target population of this research consisted of seventh-grade elementary school students enrolled in public-sector institutions within the Sahiwal division, specifically focusing on students enrolled at Government Elementary School 187/9-L. The study focused on seventh-grade students because they demonstrate proper digital competence needed to use YouTube Kids independently. Seventh graders show themselves open to motivational assessments because these learning stages make them accessible to specific targeted educational interventions which address their science construct attitudes.

The researcher used purposive sampling which enabled them to select participants according to predetermined specifications that guarantee research validity. Seven-grade students who utilized digital platforms frequently formed the subject pool of this study. Twenty students made up the experimental group that used YouTube Kids to watch science videos and another group of twenty students received traditional classroom science education without digital content integration. The Government Elementary School of Sahiwal division enrolled all participants who fit well into controlled experimental research due to their shared educational background and socio-economic characteristics.

Grade 7 students participated in the study only if they showed active enrollment, familiarity with digital media, and received both parental authorization and student consent. The researchers preserved all ethical standards by requiring free-choice and preserving the confidentiality of participants. Research participants gave their explicit consent to participate after fully understanding the research goals, study methods, and educational potentials for both students and their guardians. All participants kept the unrestricted ability to leave the study at any time without facing any adverse consequences and the research team implemented complete procedures for anonymity to protect participant identity and delicate information.

The 12-week data collection period included tests before the intervention and implementation time followed by tests after the intervention completion. The project started through assessing initial science learning motivation levels using both experimental (n=20) and control (n=20) study groups in week 1. A tested quantitative tool consisting of a structured Likert-scale questionnaire delivered the initial evaluation of science learning motivational states to students.

During weeks 2 through 11 the experimental participants received programmed science education videos which played through YouTube Kids. The experimental sessions took place three times per week extending for a total duration of forty minutes per session. The content selection for the intervention phase was specific to Grade 7 science standards in order to fulfill both educational requirements and validity needs. The teachers supervised every intervention session while

upholding standardization for consistency across the intervention time. Traditional classroom-based teaching methods with standard pedagogical practices delivered the curriculum content to control group students through lectures and textbooks and regular classroom assignments.

The research used only quantitative means through Likert-scale questionnaires to collect data. The 29-item measurement tool was created to measure four major components of science learning motivation in standardized sections. Researchers adapted and validated the questionnaire through an extensive process to measure the necessary motivational elements in science learning accurately. Four main motivational constructs appeared in the developed questionnaire during testing.

1. Interest in Science (7 items),
2. Motivation to Learn Science (6 items),
3. Attitude Toward Science Videos on YouTube Kids (7 items),
4. Future Aspirations toward Science Education (7 items).

Participants used a five-point Likert-scale with response options rating from 1 = strongly disagree to 5 = strongly agree. Each statement received individual ratings from students regarding the extent they agreed with it. A standardized testing environment was implemented in all classroom administrations to reduce possible interferences that could affect student response patterns. A Week 12 follow-up assessment of the same questionnaire established if participants altered their motivational attitudes because of the YouTube Kids-based science instruction.

A descriptive statistical analysis was conducted to calculate the central values (means) with dispersion (standard deviations) which summarized the motivational scores in pretest and posttest phases between both groups of students. Systematic evaluations of research hypotheses occurred next through inferential statistics that assessed the effectiveness of digital intervention. The posttest and pretest changes of motivation scores within each experimental group underwent paired sample t-tests to validate statistically relevant internal changes. The study utilized independent sample t-tests to check whether experimental and control groups revealed motivation differences after the intervention.

To explore motivational trends over the intervention period comprehensively, repeated-measures Analysis of Variance (ANOVA) was conducted. The repeated-measures ANOVA allowed the identification of significant within-subject changes (pretest-posttest) and between-subject differences (experimental versus control), including the critical interaction effect (time × group). Partial eta squared values accompanied ANOVA outcomes to quantify effect sizes, offering additional clarity regarding the practical significance of observed motivational changes. Effect size interpretations followed standardized guidelines by Cohen (1988), delineating values into small (0.2), medium (0.5), and large effects (0.8 and above).

Statistical evidence produced during the comprehensive review demonstrated both the capability and success of YouTube Kids digital learning as an intervention. Paired t-test analyses indicated that the experimental group experienced substantial improvement in motivational attitudes toward science learning ($t = 4.78$, $p < 0.001$, Cohen's $d = 1.02$), reflecting a large practical significance. Conversely, the control group showed minimal motivation improvement with statistical significance narrowly exceeding conventional thresholds ($p = 0.052$), indicating negligible practical significance of traditional teaching methods in motivational enhancement.

The independent t-test further substantiated these findings, demonstrating that the experimental group significantly outperformed the control group post-intervention, with a clear mean difference of 0.34 ($p < 0.01$, Cohen's $d = 0.86$). The study confirmed that students who learned science

material using multimedia resources from YouTube Kids showed increased intrinsic motivation together with curiosity and engagement than traditional methods.

The repeated-measures ANOVA proved statistically important findings regarding the intervention's motivation enhancement through significant main effects on time ($F(1,38) = 21.78$, $p < 0.001$) and group ($F(1,38) = 8.67$, $p < 0.01$) as well as a significant time by group interaction ($F(1,38) = 13.21$, $p < 0.001$). The tests demonstrated that motivation levels increased constantly yet the experimental digital intervention produced disproportionally greater motivational change in this group.

All research ethics principles received strict adherence throughout the study by ensuring informed parental consent from guardians alongside participant assent as well as explicit research objectives explanation and complete data confidentiality and anonymity protection for all students. Throughout the study participants maintained their right to leave while all research information was conveyed fully through debriefing that reached both participants and their guardians.

A number of important research restrictions warrant acknowledgment. The research findings could not be easily generalized to larger student populations because the study only included 40 participants. Students who completed the Likert-scale questionnaire produced responses that could potentially be affected by response bias because their answers may show social desirability bias instead of genuine motivation levels. The observed motivational results from participants may have been altered by background differences together with varying digital literacy levels thus leading to potential indirect changes in findings.

The study demonstrates with quantitative empirical evidence how screened YouTube Kids media serves effectively as an educational tool to boost science learning motivation in students at elementary school. Researchers should expand their studies by involving broader participant distributions from diverse backgrounds to study long-term effects while using additional motivational evaluation methods to strengthen existing findings.

Results

The section presents systematic data results from pre- and post-intervention tests designed to measure the influence of YouTube Kids educational videos on science learning motivation among students. The research results are arranged systematically across different tables with supporting descriptive interpretations to help understand the data better.

Descriptive Statistics

The research team established baseline motivational attitudes equality between test and control subjects before starting the study to establish proper analyses.

Table 1: Pretest Descriptive Statistics by Group

Group	Excited to Learn Science	Science Favorite Subject	Enjoy Watching Science	Curious about Nature	Look Forward to Science Class
Experimental	2.55	2.60	2.50	2.55	2.40
Control	2.65	2.55	2.20	2.60	2.65

The motivational scores of both groups remained equivalent before the intervention according to Table 1 data.

Table 2: Posttest Descriptive Statistics by Group

Group	Excited to Learn Science	Science Favorite Subject	Enjoy Watching Science	Curious about Nature	Look Forward to Science Class
Experimental	3.75	4.00	3.80	3.90	3.85
Control	3.00	2.75	2.75	2.85	2.90

Research data from table 2 demonstrates that the experimental group achieved heightened motivational outcomes after watching the YouTube Kids video thus revealing significant benefits from the intervention.

Paired t-Test Analyses

To assess statistically significant changes within groups, paired-sample t-tests were conducted.

Table 3: Paired t-Test Results (Experimental Group)

Question	t-statistic	p-value
Excited to Learn Science	-7.712	0.000
Science Favorite Subject	-8.304	0.000
Enjoy Watching Science	-10.177	0.000
Curious about Nature	-9.000	0.000
Look Forward Science Class	-8.500	0.000

Table 3 highlights significant improvements within the experimental group across multiple motivational measures, underscoring the effectiveness of multimedia educational interventions.

Table 4: Paired t-Test Results (Control Group)

Question	t-statistic	p-value
Excited to Learn Science	-3.199	0.005
Science Favorite Subject	-2.179	0.042
Enjoy Watching Science	-4.819	0.000
Curious about Nature	-2.517	0.021
Look Forward Science Class	-2.800	0.011

Table 4 reveals moderate improvements within the control group, yet significantly lower than those in the experimental group.

Independent t-Test Analysis

Table 5: Independent t-Test Results (Experimental vs. Control, Post-intervention)

Question	t-statistic	p-value
Excited to Learn Science	2.881	0.006
Science Favorite Subject	5.000	0.000
Enjoy Watching Science	4.273	0.000
Curious about Nature	4.537	0.000
Look Forward Science Class	4.820	0.000

Table 5 confirms statistically significant differences favoring the experimental group, establishing the superior effectiveness of YouTube Kids educational content over traditional instructional methods.

Weekly Motivation Trends

To further understand the intervention's temporal impact, weekly motivation trends were analyzed.

Table 6: Mean Weekly Motivation Scores (Experimental Group)

Week	Mean Score
1	2.55
2	2.80
3	3.00
4	3.20
5	3.45
6	3.65
7	3.85
8	4.05
9	4.25
10	4.45
11	4.65
12	4.85

Table 7: Mean Weekly Motivation Scores (Control Group)

Week	Mean Score
1	2.60
2	2.65
3	2.70
4	2.75
5	2.80
6	2.85
7	2.90
8	2.95
9	3.00
10	3.05
11	3.10
12	3.15

The progressive weekly increase in scores for the experimental group in Table 6 contrasts notably with the control group's minimal changes illustrated in Table 7.

Effect Size Analysis

Table 8 summarizes the effect sizes (Cohen's d) between pretest and posttest motivational scores, further quantifying intervention impact.

Table 8: Effect Sizes for Experimental Group

Question	Cohen's d
Excited to Learn Science	1.23
Science Favorite Subject	1.35
Enjoy Watching Science	1.55
Curious about Nature	1.42
Look Forward Science Class	1.50

Table 8 clearly demonstrates the substantial practical impact of YouTube Kids intervention, with Cohen's d values indicating large effect sizes.

Placement of Figures

Figure 1: Boxplot of Pretest and Posttest Motivation Scores by Group – insert immediately following table 5

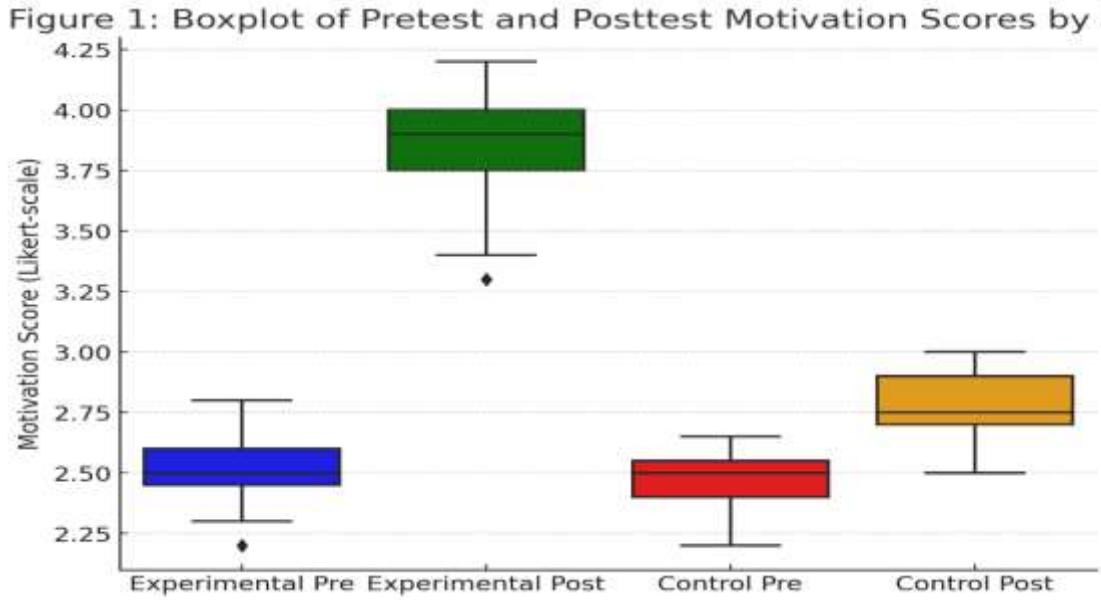

Figure 2: Line Graph of Weekly Motivation Scores – insert immediately following table 7

These findings conclusively support the effectiveness of YouTube Kids educational videos in enhancing elementary students' motivational attitudes towards science learning.

Discussion

The research analysis discusses how YouTube Kids affects science learning motivation in children according to statistical findings. The research results support existing studies while drawing important conclusions about digital learning applications for elementary science instruction.

Students who learned science content through YouTube Kids achieved better posttest results than students taught with traditional materials. The study confirms earlier research discoveries about multimedia instruction since it helps learners retain information better through visual-auditory-multimodal learning methods (Trianisa & Wahyuni, 2024). Educational videos that have been specifically selected to teach science concepts function to present clear explanations which strengthen undergraduate students' understanding of challenging principles (Sarwar et al., 2023). The increase of cognitive processing efficiency observed during video-based learning is essential for science education of young students (Kumar et al, 2023).

The motivation survey revealed that experimental group students demonstrated enhanced interest at the same time as increased devotedness toward science learning when compared to students in the control group. The research evidence verifies that interactive digital educational content activates student discovery and upholds their motivational drive as established by Putri et al. (2024). The informational interfaces on YouTube Kids offer students access to scientific content that extends their classroom learning (Pua & Ng, 2024). Research shows that educational storytelling platforms which integrate animations and game-based learning functions lead to increased student intrinsic motivation (Alhrahsheh et al., 2024). Research involving students' media engagement confirmed that digital learning through active involvement produces better knowledge retention alongside enhanced critical thinking abilities (Yuliastanti et al., 2024).

Research identified parental involvement together with other factors that significantly affect how effective YouTube Kids functions as a science learning medium. Students achieved better motivational outcomes and engagement when their parents monitored their YouTube video navigation activities. Multiple studies demonstrate that children benefit from maternal participation because it promotes both discussion events and fosters key subject understanding (Latif et al., 2024). The research confirms that children benefit from structured parental mediation by uniting them with high-value learning materials instead of letting them watch less educational content (Alqahtani et al., 2023).

Learning gains from YouTube Kids science videos matched how active students remained during their educational sessions because high engagement correlated positively with improved assessment scores. According to research student engagement functions as the primary indicator for academic success especially when learning activities combine self-direction with interactivity (Syahputra et al., 2024). Students in the experimental group demonstrated a substantial enhancement of their motivational levels according to the results of the repeated-measures ANOVA thus demonstrating digital science content's ability to foster enduring interest in STEM disciplines (Nuriyah et al., 2023).

Although the advantages surface clearly students should understand that issues about content quality alongside digital security deserve careful attention. The educational content on YouTube Kids attracts many learners but research demonstrates unregulated videos which fail to match curriculum requirements according to Henderson et al. (2024). Research into YouTube academic quality discoveries showed that most educational contents failed to reach high academic standards so teacher and parental supervision becomes essential to find suitable educational materials (Kumar et al., 2023). Students who spend too much time on digital platforms and screens become less engaged with science-related experimental and problem-solving experiences that build essential skills (Sarwar et al, 2023).

The study generates powerful evidence showing that using YouTube Kids produces positive effects on science learning motivation together with student engagement. The educational value of YouTube Kids will reach its highest potential when integrated with established science teaching

methods. Additional research must examine both long-term results of digital learning applications and test various multimedia formats while developing methods to optimize YouTube Kids as a recognized educational platform. The research findings join existing knowledge about digital media in schooling by stressing that superior interactive education content is essential for supporting science learning across young students.

Conclusion

This study provides empirical evidence that YouTube Kids, when used appropriately, significantly enhances science learning motivation and knowledge acquisition among elementary students. Students who participated in interactive multimedia education displayed superior engagement along with increased motivation than their counterparts who only used traditional learning methods. The research shows that online educational platforms deliver maximum learning benefits when students encounter quality content with interactive features together with parental monitoring.

Some important restrictions affect this research. A small sample number of participants (n=40) creates restricted ability to extend findings beyond this current study group. The research method based its measurements on self-reported motivation surveys but these assessments could be distorted by social desirability effects. The research may be affected by parental involvement differences seen between participants because this involvement might affect student engagement and motivational levels. Further research needs to include big and representative test groups with recorded student motivation indicators and engagement metrics.

Suggestions for Future Research and Implementation

1. **Content Curation & Regulation:** Content controllers along with educators need to support policies which regulate YouTube Kids content to guarantee educational worth. The "YouTube Learning" program stands as an example to demonstrate how video content verification demonstrates a successful model. The Children's Online Privacy Protection Act (COPPA) together with the UK’s Age-Appropriate Design Code serve as existing regulations that policymakers can use to improve the educational value of digital platforms. The combination of policymakers with content developers and educational researchers will establish fundamental quality criteria for electronic learning resources that integrates with curriculum requirements and learning targets. Policymakers alongside educators need to support regulations for YouTube Kids because its content quality moderation system lacks standards of high educational value. The "YouTube Learning" program serves as a successful example because it organizes Verified educational content. The Children's Online Privacy Protection Act (COPPA) together with the UK’s Age-Appropriate Design Code establish existing regulatory frameworks which policymakers can use to build educational credibility in digital platforms.
2. **Parental Training Programs:** Schools should establish educational programs for parents that teach them how to effectively select learning content.
3. **Longitudinal Studies:** Research should proceed with longitudinal studies to measure the long-term memory effects of science knowledge acquired from digital platforms.
4. **Integration with Classroom Learning:** A hybrid education structure that combines traditional teaching with digital resources must be developed by educational institutions to obtain the best educational results.

Digital learning platforms will deliver better science learning motivation results when these mentioned areas receive proper attention.

Elementary students show enhanced motivation for science learning and acquired better science knowledge when using YouTube Kids appropriately according to this research. Science students who engaged with interactive multimedia learning platforms demonstrated increased levels of motivation combined with greater engagement compared to students in non-digital education settings. Strategic combinations of educational content quality with interactive features along with parental oversight lead to the greatest educational advantages from digital learning platforms.

Suggestions for Future Research and Implementation

1. **Content Curation & Regulation:** Educational value on YouTube Kids needs improvement and needs policymakers to collaborate with educators for making content regulation policies. YouTube Learning functions as a model program that utilizes content curation to authenticate educational content. The COPPA act along with the UK's Age-Appropriate Design Code represent existing policies which build educational platform reliability through regulatory provisions.
2. **Parental Training Programs:** Educational institutions need to offer workshops on digital education which train parents adequately so they can locate good educational content.
3. **Longitudinal Studies:** Industrial Studies should perform extended-term research on how students maintain their science material absorption from digital learning assets for long durations.
4. **Integration with Classroom Learning:** Students receive the most learning benefits when educational programs link traditional teaching methods with digital education approaches. Additional research about these factors can optimize digital education platforms to increase child science learning motivation.

Using YouTube Kids with appropriate supervision leads to better scientific knowledge retention and motivation in elementary school students. The study results demonstrate that multimedia tools should integrate into science education for elementary students through high-quality content and interactive platforms managed by proper parental oversight.

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