

# Digital Storytelling as an Instructional Tool in Teaching Reproductive Health Concepts in Values Education Subject

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## ABSTRACT

Integrating reproductive health concepts into Values Education subject is challenging due to limited age and developmentally appropriate materials, lack of teacher training, and understudied classroom realities. With these implementation gaps, this study aimed to evaluate the effectiveness of digital storytelling as an instructional tool in teaching reproductive health concepts in Values Education subject within the MATATAG Curriculum. Employing a quantitative approach, specifically quasi-experimental nonequivalent control group design with convenience sampling, the research involved 61 Grade 8 participants from Bulacan State University's Laboratory High School. In the implementation, the four phases of Transmedia Integration Approach were used, specifically the analysis phase, design phase, development phase, and evaluation phase. The researchers also used 10 validated digital storytelling videos uploaded on YouTube by Roots of Health with original attribution to Amaze.org. Data collection utilized 20-item multiple-choice pretests and post-tests in both groups alongside the 10-item System Usability Scale (SUS) survey on experimental group only. Results showed the experimental group's mean score improved from 17.85 to 18.65, while the control group showed no meaningful change. Moreover, paired samples t-test analysis revealed this improvement as statistically significant, but the independent samples t-test revealed no significant difference—an inconsistency that highlights the mixed effectiveness of the intervention. Meanwhile, the SUS score of 79 indicated "excellent" usability for the digital tool. In conclusion, digital storytelling contributes to improving knowledge levels in reproductive health and is highly usable. However, it requires further testing through a scaled-up research design to confirm its pedagogical impact and its broader academic effectiveness.

**Keywords:** Digital Storytelling, Values Education, Reproductive Health Education (RHE), Transmedia Integration Approach, MATATAG Curriculum

## INTRODUCTION

Reproductive Health Education (RHE) is recognized worldwide as an essential part of sustainable development because it directly supports goals related to health, education, and gender equality (English & McKay, 2022). International organizations such as UNESCO and WHO emphasize that young people must be provided with accurate, age-appropriate, and culturally sensitive knowledge about reproductive health (WHO, 2023). However, despite these global efforts, many adolescents continue to face barriers in accessing reliable information, which results in challenges like early pregnancy, sexually transmitted infections, and gender-based violence (Wahyuningsih et al., 2024; Szymuś et al., 2024). In the Philippines, the Department of Education has attempted to address these issues by integrating reproductive health education (RHE) into basic education under the MATATAG curriculum through the DepEd Order No. 025, series of 2025 (DepEd, 2025). Yet, effective implementation remains limited due to a lack of teacher training (Navarro & Natividad, 2025), insufficient instructional resources (Rohmah et al, 2023), and unexplored classroom realities (Olamijuwon & Odimegwu, 2021; Feliza, 2025). This situation highlights the need for innovative strategies that can bridge the gap between curriculum goals and classroom realities.

This is consistent with the evidence established by similar findings. According to Feliza (2025), teaching reproductive health education remains challenging due to gaps in implementation and cultural sensitivity. Also, recent studies highlight digital storytelling as a promising tool, fostering empathy, reflection, and contextual understanding in sensitive topics (Abderrahim & Gutiérrez-Colón Plana, 2021; Kato Nabirye, 2025). It also supports inclusive learning for diverse classrooms (Manganello & Baldacci, 2024).

The approach is grounded in Narrative Paradigm Theory (Fisher, 1985, as cited by Richards, 2025; Zumbahlen, 2025), which emphasizes that people understand complex information through coherent and relevant stories. The paradigm's utility is therefore paramount as it establishes the methodological standard by which the research assesses the stories' communicative quality: the core criteria of narrative probability (internal coherence) and narrative fidelity (external resonance) become the indispensable metrics for judging a digital story's effectiveness. This robust theoretical lens anchors the central hypothesis that only a narrative high in both coherence and resonance can significantly influence students' beliefs and foster critical self-disclosure.

The study is based on a model where digital storytelling serves as the independent variable and students' awareness of reproductive health concepts is the dependent variable. The integration process follows the Transmedia Integration Approach, which includes analysis, design, development, and evaluation phases. This framework ensures that lessons are not only informative but also culturally sensitive and engaging.

The general problem of this study is: How does the integration of digital storytelling in the Values Education subject affect the level of students' awareness of Reproductive Health Concepts within the MATATAG Curriculum?

Specifically, the study seeks answers to the following questions:

1. What is the pretest performance of students on reproductive health concepts in Values Education lessons, specifically in terms of:
  - 1.1. Responsible teenage behavior
  - 1.2. Gender and development
2. How may the Transmedia Integration Approach using digital storytelling materials on reproductive health concepts be integrated into the teaching and learning process in the Values Education subject, specifically in terms of:
  - 2.1. Analysis phase;
  - 2.2. Design phase;
  - 2.3. Development phase; and
  - 2.4. Evaluation phase?
3. What is the post-test performance of students on reproductive health concepts in Values Education lessons?
4. Is there a significant difference between the students' pre-test and post-test levels of knowledge on reproductive health concepts after the integration of digital storytelling as compared to the control group?
5. What is the level of usability of digital storytelling on reproductive health concepts in the Values Education subject as perceived by the cooperating teacher and students?

This study benefits multiple stakeholders. Students gain a deeper understanding of reproductive health through engaging, values-centered lessons. Teachers acquire innovative strategies for handling sensitive topics. School administrators and curriculum developers receive evidence to support training and curriculum innovations. Policymakers, especially the Department of Education, gain empirical data for policy enhancement. Parents and communities are encouraged to collaborate in shaping learners' values, while future researchers can use this study as a foundation for digital pedagogy.

## METHODOLOGY

This study employed a quantitative, quasi-experimental non-equivalent control group design to examine the pedagogical effectiveness of digital storytelling (DST) in enhancing Grade 8 students' reproductive health knowledge within the Values Education subject under the MATATAG Curriculum. Intact sections were used, precluding random assignments but allowing meaningful comparison. Both groups completed a pre-test to

establish baseline knowledge, followed by DST integration in the experimental group, and a post-test for both groups to measure learning gains. While randomization was not feasible, the pre- and post-test framework provided reliable indicators of change, mitigating threats to internal validity. This design was chosen for its practicality and efficiency in authentic classroom settings.

The study was conducted at the Laboratory High School of Bulacan State University in Malolos, Bulacan, a secondary institution implementing reproductive health education under the MATATAG Curriculum. The locale was selected for its readiness, administrative support, and the availability of a cooperating Values Education teacher trained in reproductive health integration. Administrative approval and parental consent were secured, ensuring contextual relevance and curricular alignment. Participants included 61 Grade 8 students from two heterogeneous sections: 34 in Grade 8–Palosapis, which served as the experimental group, and 27 in Grade 8–Mahogany, which served as the control group. Convenience sampling was employed, as the cooperating teacher's classes provided accessible and comparable groups. Inclusion criteria required enrollment, parental consent, and willingness to participate, while exclusion criteria included absence during the intervention or refusal to consent. This strategy ensured feasibility and minimized instructional disruption.

Demographic data of the experimental group is 61.76% are male and 38.24% female, with most aged 14 (64.71%). In the control group, 33.33% were male and 66.67% female, with the majority also aged 14 (55.56%). Their academic grades in the same school year are also heterogeneous in nature. This natural heterogeneity allowed for nuanced analysis of DST's impact across diverse learners.

Two instruments were used in the study. The first was a researcher-developed pre- and post-test with 20 multiple-choice items aligned with a table of specification, validated by experts. The second was an adapted System Usability Scale (SUS) survey comprising 10 Likert-scale items, administered to the teacher and experimental group to assess the usability of DST. Moreover, ethical clearance and consent were obtained prior to implementation. Both groups took the pre-test, followed by a two-week intervention where the experimental group received DST-integrated lessons, while the control group had traditional instruction. Post-tests and SUS surveys were then administered. Data was collected via pen-and-paper, encoded digitally, and secured the data to ensure confidentiality.

Descriptive statistics such as mean, median, mode, and standard deviation were used to describe knowledge profiles, while paired and independent t-tests were used. Analyses were conducted using an online statistical tool, ensuring rigor and replicability. SUS scores were computed using standard procedures and benchmarked to classify usability levels. Furthermore, informed consent, confidentiality, and voluntary participation were upheld throughout the research. Institutional approval was secured, and participants retained the right to withdraw without penalty. Scientific integrity was maintained through transparency, debriefing, and avoidance of deception, safeguarding participant welfare and ensuring credibility.

## RESULTS AND DISCUSSION

### Part I. Integration of Digital Storytelling Videos in the Teaching and Learning Process

The four phases of the transmedia integration approach were used (Palioura & Dimoulas, 2022). First, the analysis phase where the researchers mapped the lessons in the Values Education subject appropriate for its time frame and curriculum; RHE concepts to be integrated; and the appropriate and validated digital storytelling (DST) materials. In particular, a criterion-based tool was used in selecting appropriate DST (Elola & Oskoz, 2022; Ring & Brahm, 2024). Then, the design phase, where the researchers provided lesson plans for the cooperating teacher to check and approve. In this phase, quality assurance was ensured by the subject coordinator and by the school head following the lesson plan guidelines as provided by the Department of Education (2016).

Afterwards, the development phase was conducted where one of the researchers delivered the actual teaching with intervention in the experimental group, while no intervention in the control group. Also, to ensure integrity and fairness, an adopted teaching demonstration rubric from BulSU (2021) was graded by the cooperating teacher. Finally, the evaluation phase where the post-test was administered to both groups to assess the cognitive knowledge of students while the usage of system usability scale (SUS) survey (Brooke, 1984, as cited by Bellio,

2025) was administered to the cooperating teacher and students of the experimental group to determine the usability scale of DST as an instructional tool in the context of this study.

## Part II. Pre-test and Post-Test of Control and Experimental Groups

**Table 4** Pretest and post-test results of control and experimental groups

Groups	Mean	Median	Mode	Standard Deviation
Control Group (Pre-test)	18.67	19	19	1.11
Control Group (Post-test)	18.33	19	19	1.11
Experimental Group (Pre-test)	17.85	18	19	1.52
Experimental Group (Post-test)	18.65	19	19	1.32

The pre-test results show that both groups achieved relatively high scores, establishing a comparable baseline. The control group recorded a mean of 18.67, with a median and mode of 19, and a low standard deviation of 1.11, indicating consistent performance. The experimental group had a slightly lower mean of 17.85, a median of 18, and a mode of 19, with a higher standard deviation of 1.52, suggesting greater variability. Post-test results reveal minimal change in the control group, whose mean declined slightly to 18.33 while other measures remained constant. In contrast, the experimental group improved, with its mean rising to 18.65 and standard deviation decreasing to 1.32, reflecting both higher average performance and greater consistency.

The similarity in pre-test scores between the two groups confirms group equivalence and validates the quasi-experimental design, ensuring that subsequent differences can be attributed to the intervention rather than initial disparities. The high baseline scores also imply that participants entered the study with foundational knowledge, likely due to prior exposure through Reproductive Health Education (RHE), formerly known as Comprehensive Sexuality Education (CSE), implemented by the Department of Education since 2018 (DepEd, 2025).

Furthermore, although the score differences are minimal and both groups show similar averages, the score gain in the experimental group suggests that the intervention can help learners achieve more even results. From a broader view, these findings highlight the importance of further testing teaching methods that build upon strong starting knowledge, while also showing how DST supports careful use of technology, long-term effectiveness, and strong educational systems (Abelon, 2023; Ugap et al., 2025), with pilot evidence that interactive digital stories in choose-your-own-adventure formats can improve young adults' understanding and communication about sexual health (Aidoo-Frimpong, 2025).

## Part III. Comparison between the pretest and Posttest of both groups

**Table 5** Paired t-test results between the Pretest and Posttest of both groups

Groups	t	Sig-value	Decision	Interpretation
Control Group	1.36	0.185	Do not Reject Ho	There is no significant difference between the pre-test and post-test of the control group.
Experimental Group	-3.1	0.004	Reject Ho	There is a significant difference between the pre-test and post-test of the experimental group.

The table compares the pretest and post-test results of both the control and experimental groups using paired samples t-test statistics, significance values, decisions, and interpretations. For the control group, the computed t-value is 1.36 with a Sig-value of 0.185, which is greater than the alpha level of 0.05. This indicates that the difference between pretest and post-test scores in the control group is not statistically significant. In contrast, the experimental group shows a t-value of -3.1 with a Sig-value of 0.004, which is below the 0.05 threshold. This result demonstrates a statistically significant difference between the pretest and post-test scores of the experimental group. The negative t-value further suggests that the post-test scores were higher than the pretest scores, highlighting a measurable improvement following the intervention.

The results demonstrate that the intervention produced a statistically significant improvement in the experimental group, while the control group showed no meaningful change, confirming that the treatment itself was the driver of the observed gains rather than external factors or random variation. Potential causes for this improvement include the intervention’s ability to directly target learning gaps, introduce structured methods that enhance retention, or increase participant motivation and engagement (Bouchrika, 2026). The absence of change in the control group further suggests that external influences were not responsible, isolating the treatment as the key factor (Cornell Statistical Consulting Unit, 2022). Broadly, these findings imply that intervention can serve as a successful model for enhancing learning or performance, validate the importance of rigorous experimental design, and open pathways for future research into scalability, long-term effects, and applicability across diverse contexts (Bobbit, 2021).

**Table 6 Results of the Independent Samples T-test of Post-tests of Control and Experimental Groups**

Groups	t	Sig-value	Decision	Interpretation
Control (Post Test) & Experimental (Post Test)	-0.99	0.328	Do not Reject Ho	There is no significant difference between the post-tests of control and experimental groups.

The independent samples t-test comparing the post-test scores of the control group and experimental group yielded a computed t-value of -0.99 with a Sig-value of 0.328. Since this significance value is greater than the alpha level of 0.05, the statistical test indicates that there is no significant difference between the two groups’ post-test results. The decision was therefore to retain the null hypothesis, meaning that the intervention did not produce a measurable effect compared to the control group

These findings suggest that the intervention applied to the experimental group was effective in improving the scores of students but not statistically significant relative to the control group, indicating that the treatment needs further testing and research. This highlights the importance of refining the design, duration, and implementation of the intervention to achieve further meaningful results. Broadly, these findings highlight the need for researchers to reconsider the structure of the intervention, explore alternative methods, and ensure that future studies incorporate rigorous experimental design to better capture potential effects (How to choose the right mixed Methods design, 2025) and improve the likelihood of achieving significant and lasting outcomes (Rajasekaran et al., 2024).

Also, with the comparison of the paired samples t-test result and the result of independent samples t-test, the finding suggests an inconsistency that highlights the mixed effectiveness of the intervention. While it is effective in improving the scores of participants in the experimental group, as supported by paired samples t-test, but when compared to the control group, as supported by independent samples t-test, the finding states no statistically significant difference. This phenomenon may be attributed to the imbalanced knowledge baseline in the pre-test results of both groups, causing a score advantage to the control group. Nonetheless, the findings still suggest promising potential in a large practical implementation by future researchers using a mixed method approach, wider population, and longer duration.

**Part IV. Usability of Digital Storytelling Videos about Reproductive Health Concepts**

**Table 7 Results of System Usability Scale (SUS) Survey**

Indicators	Mean	SD	Description
1. I think that I would like to use this system frequently.	4.23	0.69	Agree
2. I found the system unnecessarily complex.	1.60	0.85	Disagree
3. I thought the system was easy to use.	4.43	0.70	Agree
4. I think that I would need the support of a technical person to be able to use this system	2.69	1.59	Neither Agree nor Disagree
5. I found the various functions in this system were well-integrated	4.40	0.74	Agree

6. I thought there was too much inconsistency in this system.	1.26	0.44	Strongly Disagree
7. I would imagine that most people would learn to use this system very quickly.	4.09	0.89	Agree
8. I found the system very cumbersome to use.	1.34	0.54	Strongly Disagree
9. I felt very confident using the system.	3.71	0.79	Agree
10. I needed to learn a lot of things before I could get going with this system.	2.23	1.21	Disagree
<b>SUS Score</b>	<b>Grade</b>		<b>Rank</b>
79	A-		Excellent

The survey results reveal clear strengths in the system’s usability profile. The highest mean scores were recorded for Question 3 (ease of use, mean = 4.43), Question 5 (well-integrated functions, mean = 4.40), and Question 1 (frequent use preference, mean = 4.23). These values demonstrate strong user agreement with positive usability attributes, highlighting the system’s intuitive design and cohesive integration of functions. In contrast, the lowest mean scores were observed in Question 6 (inconsistency, mean = 1.26), Question 8 (cumbersomeness, mean = 1.34), and Question 2 (complexity, mean = 1.60). These results reflect strong disagreement with negative usability statements, reinforcing the perception that the system was neither inconsistent nor difficult to navigate. The overall SUS score of 79, graded A- and ranked Excellent, indicates a usability level above average industry benchmark. Standard deviations were generally low, suggesting consensus among respondents, though Question 4 (need for technical support, SD = 1.59) displayed notable variability, pointing to mixed experiences regarding initial support requirements.

The findings demonstrate that digital storytelling videos are effective, user-friendly, and aligned with broader institutional standards for technology-supported learning. The high SUS score confirms strong usability. These results resonate with the study of Maghoromi (2023), which emphasizes the importance of accessible infrastructure and comprehensive support systems in sustaining equitable online learning environments. Although most users reported confidence in navigating the system independently, divergence in responses to Question 4 suggests that optional onboarding or technical assistance may enhance inclusivity. This need for flexible support is reinforced by UNESCO’s (2025) observation of persistent inequalities in digital access and literacy among adolescents in low-resource contexts. Overall, the system aligns with scholarly advocacy for Digital Storytelling and Transmedia Integration Approaches, and with Rajasekaran et al. (2024) framework for embedding digital strategies to foster reflection and values-based learning in reproductive health education.

## CONCLUSIONS/RECOMMENDATIONS

Based on the results of the study, the baseline knowledge of participants on reproductive health concepts was already strong, reflecting high levels of understanding yet still leaving opportunities for further improvement. To address this, the study employed a transmedia integration approach, which involved validating the instruments prior to implementation, incorporating the validated digital storytelling videos into the lesson plan and presentation slides, and using these materials during the actual classroom implementation, followed by participant evaluation. After implementation, the control group maintained similar performance compared to their pretest, whereas the experimental group demonstrated an improvement in the mean score. Statistical analysis further clarified these outcomes: the paired samples t-test indicated a significant difference, thereby rejecting the null hypothesis, while the independent t-test revealed no significant difference, thus not rejecting the null hypothesis—an inconsistency that highlights the mixed effectiveness of the intervention. Finally, the System Usability Scale (SUS) survey results confirmed a high level of usability of the system for future use, with a rating of “A-” and a description of “Excellent.”

The findings further suggested that the strong baseline knowledge of students may have influenced the outcomes, as implementation was confined to the only school that agreed to participate. Although the study was proposed in several schools to provide more options, most declined due to conservative perspectives and limited openness to progressive and innovative approaches in the Values Education subject, leaving only one school available. Furthermore, schedule constraints shortened the intervention from one month to just two weeks. Recognizing

these challenges, future researchers should consider refining the research design, duration, locale, and use a mixed method approach to establish more solid findings and conclusions.

## Limitations

The study is limited to two major factors. Mainly, the research design is limited to quantitative approach, despite of possible deeper investigation and meaningful results by using mixed-method approach, due to time and resource constraints. Furthermore, the researchers are limited to participants' availability, largely due to the participants' time conflict and inconvenience that the research may cause to their academic overall learning in respect to their existing curriculum and priorly scheduled events. Additionally, the researchers are not able to acquire institutional permit to conduct in other schools due to sensitivity nature of the research content scope. With these limitations, the researchers recommend to the future researchers to use mixed-method approach and acquire longer institutional permit to conduct in a more inclusive school.

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## Ethical Considerations

As part of the research integrity, the following are the ethical considerations followed by the researchers:

- Participation in this study is voluntary, and the participant may choose to withdraw at any time without penalty or consequence.
- There are no threats, payments, or insurance involved in participating in this study.
- There is no conflict of interest provided that the researchers have no previous personal connection or affiliation with the participants.
- All information collected is confidential, protected, and used solely for purposes related to this research study. The data collection will follow the Data Privacy Act of 2012 (RA 10173) and other relevant laws as applicable.
- All data are stored in a personal google drive of the researchers and will be deleted once requested or after 3 years duration of time.
- All the digital storytelling videos, learning materials, records, and research results are made accessible to learners in a timely manner. The videos are available on the YouTube page of @UgatngKalusugan
- The parents or guardians of the participants were notified, requested approval, and informed in a timely manner regarding relevant information.
- The review panel of the Ethics Review Committee of Bulacan State University has approved the study and may be reached through the following contact for information regarding the rights of study participants, including grievances and complaints: [erc.rmo.rde@bulsu.edu.ph](mailto:erc.rmo.rde@bulsu.edu.ph)

## About The Authors

Edmark L. Esparaz, Danica Legesniana, Jeann May Olay, and John Ryan Torres are a group of 4th year student-researchers undertaking Bachelor of Secondary Education, majoring in Values Education in the College of Professional Teacher Education at Bulacan State University. Meanwhile, Dr. Joseline M. Santos and Dr. Aurora E. Perillo are our faculty collaborators in the College of Professional Teacher Education at Bulacan State University.