

## The Effect Of Using Educational Media Flipbook For Adolescent Reproductive Health On Knowledge Of Sexuality In Students At The Faculty Of Mathematics And Natural Sciences, Bengkulu University

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### ABSTRACT

**Background :** Adolescence is a critical period in human development involving complex biological, psychological, and social changes. College students often engage in premarital sexual behavior, which can lead to negative outcomes such as sexually transmitted infections and unwanted pregnancies. This study aims to determine the impact of using an educational flipbook on adolescent reproductive health on the sexual knowledge of students at the Faculty of Mathematics and Natural Sciences, University of Bengkulu.

**Method :** The research employed a quasi-experimental method with a pre-post-test control group design. Conducted from August 2023 to March 2024, the study involved 86 respondents, divided into 43 intervention group participants and 43 control group participants. Sexual knowledge was measured using a questionnaire and analyzed using the Mann-Whitney test.

**Result :** The results showed a significant increase in sexual knowledge scores in the intervention group, from 65.12 to 80.41, while there was no substantial change in the control group.

**Conclusion :** The study concludes that the flipbook effectively enhances adolescents' sexual knowledge, as evidenced by a p-value < 0.05.

**Keywords :** Adolescent, Flipbook, Reproductive Health Knowledge

### 1. INTRODUCTION

Adolescence is an important transition phase from childhood to adulthood, involving complex

biological, psychological, and social changes (Wulandari et al, 2023). The definition of

adolescence in Indonesia varies; the World Health Organization (WHO) sets the age range for teenagers at 10-19 years (2023), the Indonesian Minister of Health Regulation limits it to 10-18 years (2014), and the National Population and Family Planning Agency (BKKBN) defines teenagers as 10-24 years old and unmarried (2021). In the world, the teenage population reached 1.2 billion, equivalent to 18% of the global population (WHO, 2022), while in Indonesia, the 2020 census recorded around 67 million teenagers or 24% of the total population (BKKBN, 2021).

During adolescence, individuals experience significant physical, hormonal, cognitive, emotional, and social changes, as well as changes in values and morals, preparing them for adulthood (U.S. Department of Health and Human Services in Pratomo et al., 2022). This period is vulnerable and full of risks, so a good understanding of these changes is very important to maintain overall health (Wirenviona & Riris, 2020).

The challenges faced by adolescents, especially in achieving optimal reproductive health, are related to sexual maturity during puberty, media exposure, and the influence of the peer environment, which together can encourage risky sexual behavior (Ardiyansyah, 2022). Students are a group that is vulnerable to premarital sexual behavior, with the desire to live independently which is often reflected in the decision to live in a boarding house, bringing both positive and negative impacts (Anggri & Yuliani, 2020).

Research shows that college students' dating behavior often involves premarital sexual activity. A study in Ruteng City found that 21.56% of students had been involved in premarital sexual relations more than once, with 13.27% having intimate relations with more than one partner (Edu et al., 2020). Premarital sex has serious implications including the risk of STDs, abortion, and unwanted pregnancy (Nihayah et al., 2023), with adolescents aged 15-24 experiencing half of all new cases of sexually transmitted infections each year (Liddon et al., 2022).

One way to reduce this number is through comprehensive health education. This education includes how to care for reproductive organs, the

impact of pornography, unwanted pregnancies, and abortion, as well as HIV/AIDS and STI education, involving the role of government, parents, and peer groups (Ardiyansyah, 2022). Reproductive health includes physical, mental, and social aspects, as well as being free from diseases related to the reproductive system (Anggraini, 2022).

Research shows that interactive and interesting learning methods, such as audio-visual media and animation, are more effective in increasing teenagers' knowledge and attitudes about reproductive health than lecture methods (Lestari et al., 2021; Ramadhani & Ramadani, 2020). A study at the Cisarua Education Foundation Middle School in Bogor showed a significant increase in students' knowledge and attitudes after receiving education using audio-visual media (Rahayu et al., 2021).

At the University of Bengkulu, the Mathematics and Natural Sciences Faculty is one of the faculties that consistently accepts the largest number of students every year at the University of Bengkulu. The number of students will reach 2,546 in 2023 (UNIB, 2023). Preliminary surveys show that 90% of students at the Faculty of Mathematics and Natural Sciences have dated, with some engaging in behaviors such as holding hands, hugging, and kissing. The era of digitalization and the use of gadgets are expanding opportunities for digital educational media such as flipbooks to disseminate information about reproductive health practically.

Based on this background, this research aims to determine the effect of using the educational media flipbook Adolescent Reproductive Health on sexuality knowledge among students at the Faculty of Mathematics and Natural Sciences, University of Bengkulu.

## 2. METHODS

This research uses the method *quasi experiment* by designing *pre post test with control group*. The research population was all students at the Faculty of Mathematics and Natural Sciences, University of Bengkulu, totaling 2,546 people. The target population is Diploma 3 and Strata 1 students at the Faculty of Mathematics and Natural Sciences, University of Bengkulu in their first year of study, totaling 346 students.

Sampling was carried out by sorting the data of active, unmarried first year students at the Faculty of Mathematics and Natural Sciences, University of Bengkulu in 7 Study Programs, using the technique *quota sampling*. Determination of the intervention and control groups was carried out through randomization with the help of a computer program. The number of samples was determined using the Slovin formula, resulting in 86 samples which were divided into 43 intervention respondents and 43 respondents in the control group.

The intervention group was administered a *flipbook* on adolescent reproductive health, and a control group was provided an *e-leaflet* on adolescent reproductive health. Before the intervention, all respondents were asked to fill out a questionnaire pre-test to assess their prior knowledge. The intervention was given to understand for 3 days. *Post-test* done on the day 7th with respondents filling out a questionnaire to assess their final knowledge.

Data analysis begins with a data normality test using *Kolmogorov Smirnov*, the resulting data is not normally distributed. The next test uses the test *Mann-Whitney*. This research was carried out at the Faculty of Mathematics and Natural Sciences, University of Bengkulu from 1 August 2023 to 20 April 2024. This research was carried out in compliance with the principles of research ethics in accordance with letter number KEPK.BKL/115/03/2024.

### 3. RESULTS

Table 3.1 Respondent Characteristics

Characteristics	Group		Total (n=86)	
	Intervention (n=43)		Control (n=43)	
	N	%	N	%
<b>Age</b>				
17 years	18	41.9	5	11.6
18 years	21	48.8	8	18.6
19 years old	4	9.3	3	6.9
20 years	0	0	7	16.1
<b>Gender</b>				
Man	9	20.9	4	9.3
Woman	34	79.1	9	20.7

<b>Religion</b>						
Islam	38	88.4	4	9.3	8	18.6
Christian	5	11.6	1	2.3	6	13.9
<b>Study program</b>						
Statistics	4	9.3	7	16.1	1	2.3
Biology	8	18.6	6	13.9	1	2.3
Chemistry	8	18.6	7	16.1	5	11.6
Physics	3	7	2	4.6	5	11.6
Geophysics	9	21	8	18.6	1	2.3
Mathematics	6	13.9	6	13.9	2	4.6
Science Lab	5	11.6	7	16.1	2	4.6
<b>Last education</b>						
SMP	7	16.3	9	20.7	1	2.3
SMA	29	67.4	2	4.6	5	11.6
S1	6	14	3	6.9	1	2.3
S2	1	2.3	0	0	1	2.3
<b>Father's occupation</b>						
Private	7	16.3	3	6.9	3	6.9
Farmer	29	67.4	8	18.6	7	16.1
Civil servants	6	14	0	0	3	6.9
Trader	1	2.3	2	4.6	3	6.9

Table 3.1 presents the characteristics of respondents based on intervention and control groups. Each group had a total of 43 respondents. The majority of research respondents were 18 years old, 45.3%. The gender of the majority of respondents was female, 73.3%.

The majority of respondents adhere to Islam, amounting to 93.02%. Based on study program, the majority of respondents came from the Undergraduate Geophysics program with a proportion of 19.8% of the total sample, followed by the Undergraduate Chemistry study program (17.4%) and Undergraduate Biology (16.3%). The Physics undergraduate study program has the lowest proportion, namely 5.8%.

In terms of parental education, the majority of respondents' parents had a high school education, amounting to 58.1% of the total sample. The majority of respondents' fathers worked as farmers (43.02%), followed by private sector workers (38.9%).

**Table 3.2 Characteristics of Respondents' Sexuality Knowledge**

	Statistical Measures	Intervention (n=43)	Control (n=43)
Pretest	Mean±SD	65.12±5.19	66.24±12.82
	Minimum	55.00	37.00
	Maximum	80.00	86.00
Posttest	Mean±SD	80.41±3.53	67.12±3.73
	Minimum	76.00	58.00
	Maximum	95.50	76.50

Table 3.2 presents the characteristics of respondents' sexual knowledge based on the intervention and control groups. The average knowledge score of respondents in the intervention group before treatment was 65.12. The average knowledge score of respondents before being given treatment in the control group was 66.24. After being given treatment, the average knowledge score of respondents in the intervention group increased to 80.41. The average knowledge score of respondents in the control group after being given treatment was 67.12.

**Table 3.3 Differences in Knowledge of Intervention and Control Groups**

	Statistical Measures	Intervention (n=43)	Control (n=43)	Mean Difference	p-value
Pretest	Mean±SD	65.12±5.19	66.24±12.82	1.12	0,006
	Minimum	55.00	37.00	82	
	Maximum	80.00	86.00	37.00	
Posttest	Mean±SD	80.41±3.53	67.12±3.73	13.29	
	Minimum	76.00	58.00	3	
	Maximum	95.50	76.50	58.00	

Based on the analysis results from table 3.3, there is a significant difference in sexuality knowledge scores between respondents before and after treatment in the intervention group. The average sexuality knowledge score before treatment was 65.12, while after treatment it increased to 80.41. There was no significant difference in the level of knowledge of sexuality between respondents before and after treatment in the control group. The average sexuality knowledge score before treatment was 66.24, while after treatment it increased to 67.12. The difference in the average knowledge score before

treatment between the two groups was 1.12. After treatment, the difference in the average knowledge score between the intervention and control groups increased to 13.29. This shows that the treatment had a more significant impact in increasing respondents' sexual knowledge in the intervention group compared to the control group.

It can be concluded that the intervention group and control group have *p-value* (0.006) which is lower than the significance value  $\alpha$  (0.05), so it can be concluded that the null hypothesis  $H_0$  is rejected. This shows that there are differences in knowledge results between the control and intervention groups.

The results of the research show that there is a significant influence on use *flipbook* Adolescent reproductive health on sexuality knowledge among students at the Faculty of Mathematics and Natural Sciences, University of Bengkulu with *p-value* < 0.05.

#### 4. DISCUSSION

The results of the research show that there is a significant influence on use *flipbook* Adolescent reproductive health on sexuality knowledge among students at the Faculty of Mathematics and Natural Sciences, University of Bengkulu with *p-value* < 0.05. The results of this research are in line with the findings from Setiawati & Andayani's (2022) research, which shows that there are differences in the average value of knowledge between groups that use video media and *flipbook*.

The results of the analysis show that the probability of these two variables is less than 0.05, which indicates a significant relationship between the media used and the respondent's knowledge. From the results of this research, it was concluded that the average value of knowledge of respondents who received intervention through the media *flipbook* higher than those who received intervention via video media. This indicates that media use *flipbook* proven to be more effective in increasing the knowledge and attitudes of USU FKM students regarding physical activity. With an average knowledge of 22.39, the group that uses media *flipbook* had higher knowledge than the group that used video media, which had an average knowledge of 20.67.

This research is also in line with Sulastri & Hilman (2023) who analyzed the level of knowledge of pregnancy planning among respondents before they were given education through the media. *flipbook* shows that the average value *pretest* is 56.57, whereas *posttest* showed an increase to 83.44. This indicates a significant improvement, as confirmed through testing *Wilcoxon signed test* with a significance value of 0.001. Before getting education through the media *flipbook*, knowledge of women of childbearing age about pregnancy planning can be categorized as sufficient, but after receiving this education, their knowledge increases to good. Thus, this research confirms that education through media *flipbook* has a significant impact in increasing knowledge about pregnancy planning in women of childbearing age. Even though the research subjects of Sulastri and Hilman are different from the research carried out by this researcher, they both have the same research essence, namely increasing knowledge.

In line with research by Ochalek et al., (2018) who developed an HIV+HCV educational intervention using an automated iPad platform. The study participants consisted of 25 adults with opioid use disorder (OUD) enrolled in a 12-week randomized trial. Participants completed a basic HIV+HCV knowledge assessment (*Pre-Test*) followed by corrective feedback, both administered via iPad. They then finished *flipbook* interactive about HIV and an animated video about HCV, also on iPad, followed by a second knowledge assessment (*Post-Test*). In the beginning (*Pre-Test*), participants answered 69% and 65% of items correctly on the HIV and HCV assessments, respectively. After completing the educational intervention, participants answered 86% of items correctly on both HIV and HCV assessments ( $p < .001$ ). This increase in knowledge also persisted throughout the three-month study, with scores at weeks 4 and 12 significantly higher than baseline ( $p < .001$ ). An HIV+Hepatitis educational intervention delivered via a portable, automated iPad platform could result in significant and lasting improvements in knowledge about HIV and HCV among adults with OUD. The study results illustrate the potential for using digital health education interventions in increasing knowledge about

HIV and HCV in individuals at high risk of infectious disease.

The results of this study are not in line with the results of research by Wibowo et al., (2019), which shows that there is a difference in the percentage of knowledge before it is given. *flipbook*, 63% of teenagers have good knowledge, but after being given *flipbook*, this percentage has decreased to 48.1%. This decline is due to a lack of supervision of teenagers to ensure that they are reading *flipbook* provided and understand the download and installation tutorial on their device. When data is collected at school, the media used is still in HTML form, while the use of applications as easier media has not been maximized, such as the use of applications *Share It* as an alternative. The limitation of this research is that the researcher left the reading target alone *flipbook* independently, without ensuring that *flipbook* It can be read well by teenagers. Therefore, it is recommended for future researchers to use applications as a health promotion medium, prepare the application distribution process well, and ensure that the application is installed and used by target users. This will influence learning outcomes from using the application as a health promotion medium for teenagers.

Media use *flipbook* in health promotion, especially related to adolescent reproductive health, is a new innovation. Hence, the choice of media *flipbook* as an educational tool tailored to the intended audience, in this case students who have easy access to *smartphone* and laptops. However, changes in the level of knowledge do not only depend on educational media alone. However, the existence of media that plays a role in health promotion can be a supporting factor in stimulating changes in individuals' levels of knowledge regarding sexuality knowledge.

## 5. CONCLUSION

There is a significant influence of consumption *flipbook* Adolescent reproductive health on sexuality knowledge among students at the Faculty of Mathematics and Natural Sciences, University of Bengkulu with *p-value*  $< 0.05$ . This research can be a basis for further, more in-depth research on the influence of digital educational media on sexual behavior, as well as providing an opportunity to improve the final product with longer research time, so that the

results will be better and more useful in enriching understanding of the use of this media.

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