



Canva Content Development; Smart Infographics as Microlearning Media to Improve Student Learning Motivation

Muhammad Choerul Umam^{1,2}, Mustaji Mustaji² and Andi Kristanto²

¹ Universitas Sebelas Maret, Surakarta, Indonesia

² Universitas Negeri Surabaya. Surabaya, Indonesia

*mc_umam07@staff.uns.ac.id

Abstract. This study aims to develop Canva application content in the form of smart infographics as a website-based microlearning media to increase the learning motivation of UNIPA Surabaya students. This research and development succeeded in developing Canva application content as smart infographics as a website-based microlearning medium using a model from Thiagarajan known as the 4-D model, whose stages include defining, designing, developing, and disseminating. The researcher used a quantitative descriptive data analysis technique, which showed an assessment of the validator at 83.33% with a decent category. The effectiveness of learning media by developing Canva application content in the form of smart infographics to increase the learning motivation of UNIPA Surabaya students through a limited-scale trial showed an increase of 70% of students who achieved a standard threshold value, while based on the results of the paired sample T-test, there was a significant difference between pretest and post-test with a significance value of 0.001. In comparison, on a broader trial of respondents, the results of an increase in learning outcomes were obtained by 40% of students who achieved a standard threshold value before (Pretest) and by 93% after (Post-test), while based on test results from the Paired Sample T-Test, there is a significant difference between the pretest and post-test with a significance value of 0.000. It identifies that microlearning media is effective in increasing student learning motivation.

Keywords: Content Development, Canva, Microlearning Media, Learning Motivation

1 Introduction

The changing landscape of higher education, driven by the infusion of new technologies and the adoption of alternative pedagogies [1], has given rise to innovative trends like microlearning. This student-centred approach to teaching and learning, characterized by its focus on small, targeted learning segments, is recognized as a dynamic response to the evolving educational landscape [2].

Microlearning's emphasis on delivering results aligns with the broader shift towards outcome-oriented education in higher learning environments[3].

In this context of educational transformation, the role of learning media as catalysts becomes increasingly significant. When harnessed effectively by educators and students, learning media can amplify these pedagogical shifts' impact [4]. Strategic implementation of learning media is integral to providing high-quality education [5]. Learning media not only support the attainment of learning objectives but also offer a conduit for adapting to new instructional paradigms. The planning of learning media is a multi-faceted process involving several stages [6]. This includes assessing student needs and characteristics, setting clear learning objectives, structuring teaching materials effectively, designing tools for measuring success, scripting educational content, and rigorously testing and refining the materials. These steps ensure that the learning media align with the instructional goals and create a seamless learner experience.

Furthermore, learning media possess distinct attributes that contribute to their effectiveness in modern education [7]. good learning media are designed to be efficient in terms of time and energy usage[8]. They transcend the limitations of traditional constraints such as physical space and time, allowing for flexible and accessible learning. Moreover, these media cater to various human senses, enhancing engagement and understanding and bridging the gap between abstract concepts and concrete comprehension. The confluence of innovative pedagogies like microlearning with the strategic use of learning media underscores the transformative journey that higher education embarks upon [9]. This synergy empowers educators and students alike to navigate the changing educational landscape with efficiency, efficacy, and a focus on meaningful learning outcomes.

Nowadays, highly advanced and sophisticated technological advances require every lecturer as a teacher and every student as a student to understand technology to improve the quality of education. Microlearning media can be used as a tool in the teaching and learning process, enabling lecturers and students to apply learning with new, more practical skills. An example of a technology and information application is Canva. Canva is an online design platform that provides various tools such as presentations, resumes, posters, flyers, brochures, graphics, infographics, banners, bookmarks, bulletins and the like, which can be accessed through the Canva application [10].

According to interviews with several lecturers at UNIPA Surabaya, the data reveals that out of 320 lecturers who teach, only about 100 lecturers or about 31.25% use web-based microlearning media and modern information technology to teach the subject matter. Most lecturers need to enhance their use of technology where they rely on existing learning media such as textbooks, worksheets/modules and other learning media that are considered less attractive. By developing Canva application content in the form of smart infographics as a website-based microlearning medium, it is expected that this will increase the learning motivation of UNIPA Surabaya students during the endemic period, which limits face-to-face learning. One solution is to develop Canva application content in the form of smart infographics as a website-based microlearning medium. Canva is an online application with an attractive design

and numerous available templates, features and categories [11]. Its variety and uniqueness can make the learning process more fascinating and exciting [12]. The Canva application also allows lecturers to impart knowledge, creativity and skills that benefit students in numerous aspects of life [13]. Therefore, using the Canva application in learning can be an effective and efficient alternative to enhance the quality of learning aftermath pandemic [14]. Teachers can use this thrilling and innovative learning medium to engage students and enhance learning. Based on the numerous explanations above, the researchers conducted research entitled Canva content development: smart infographics as a microlearning medium to increase student learning motivation.

2 Method

The Research and Development model used in this study is procedural. This model was chosen because it has clear and systematic stages in product development. In this research, the content of the Canva application will be developed in the form of Smart Infographics as an effective and efficient learning medium for Special Education Study Program students in semester V at UNIPA Surabaya in the ABK learning media course in the 2022/2023 Academic Year.

Development of Canva Application Content in the form of Smart Infographics uses a model from Thiagarajan (1974) known as the 4D model. This 4D model has four stages: Define, Design, Develop, and Disseminate [15]. The 4D model by Thiagarajan (1974) provides a structured framework for developing smart infographics using the Canva application. The first stage is Define, which involves formulating the learning objectives and key concepts to convey visually in the infographic. The target audience and goals are also identified. In the Design stage, the visual appearance and layout of the infographic are outlined, including selecting appropriate charts, icons, colors, and graphic elements to effectively communicate the information. The Develop stage utilizes Canvas tools and content library to actually create the infographic by integrating the textual, statistical, and graphical content based on the design framework. Finally, the Disseminate stage publishes and shares the completed infographic with the intended audience through suitable channels like social media and websites. Following the systematic 4D model enhances the development of informative, visually-engaging Canva infographics that meet defined educational goals. The four phases guide the process in a structured manner, from defining objectives to disseminating the final product to learners.

The reason for selecting the Thiagarajan 4D model is that this model provides a comprehensive framework for developing learning media applications [16]. This model allows developers to consider user needs at every application development stage. In developing Canva applications in the form of smart infographics, the Thiagarajan model will assist developers in considering the needs of microlearning users at each stage of development, thus ensuring that the application content developed matches user needs.

The research procedures carried out by researchers are based on research steps and Canva application content development in the form of Smart infographics as a website-based microlearning medium to increase student motivation at UNIPA Surabaya, described in the following table:

Table 1. Research procedure

No	Stages	Method	Instrument	Collected data	Respondents
1	<i>Define</i>	Interview	interview guidelines	The results of interviews on common problems at universities, namely the fundamental problems of students and lecturers in the implementation of limited face-to-face learning related to the development of Canva application content in the form of smart infographics as a website-based learning media	Student and Lecturer at UNIPA Surabaya
		Documentation	Basic Competency, objectives, and Indicators of learning media subject ABK Test Validity and Reliability.	ABK learning media material is to be presented as a website-based learning media by developing Canva application content in the form of smart infographics with the appropriate order of material presentation	RPS ABK learning media
		Interview	Theoretical studies, references and scientific literature	Validity and Reliability of RPS and Test Questions	Expert Team UNIPA Surabaya students
		Literature review	Training on making microlearning media by developing Canva application content in the form of smart infographics	The contents of the Canva application and the main concepts of the subject matter regarding creating learning media by developing Canva application content. Creating a Personal Website with the Canva application as well Creation of interactive quizzes integration of Canva with Quizizz.	Journal Articles and Reference Literature on the Canva App And microlearning articles
2	<i>Design</i>	Documentation	Existing records or documents.	Defining and Using Canva application content used and utilized in developing Canva application content in the form of smart infographics as a	Canva application

				website-based microlearning medium. Designing and creating initial designs for website-based microlearning media by developing Canva application content in the form of smart infographics	
3	Develop	Interview	interview guidelines	Suggestions for improving Learning Media Content by using the Canva application to look for anything that needs to be changed, modified or added The final stage of production (development) is to produce a product in the form of website-based microlearning media by developing Canva application content in smart infographics, which receive favorable ratings from experts and have proven consistent performance.	Expert Team Expert Team
		Questionnaire		Website-based learning media by developing Canva application content in the form of smart infographics and then being tested on students	PK UNIPA Study Program Students in Surabaya
4	Disseminate (Dissemination) / Dissemination of Results	Observation	Observation Guidelines	Utilization of Canva application content development product results in the form of smart infographics as a website-based learning medium to be applied in face-to-face learning activities Student motivation in learning activities using website-based learning media by developing Canva application content in the form of smart infographics	Lecturer in Learning Media for ABK UNIPA Surabaya PK UNIPA Study Program Students in Surabaya
		test	Pretest and Post-test	Student learning outcomes in understanding the subject matter.	PK UNIPA Study Program Students in Surabaya
		Questionnaire	Questionnaire	Student learning outcomes in	PK UNIPA Study Program

3 Trial Design

In order to develop Canva application content in the form of smart infographics as a website-based learning medium, a pilot design was carried out in small groups consisting of class A students in semester V Special Education Study Program UNIPA Surabaya in the 2022/2023 academic year. This trial design was carried out to convey essential competencies in selecting media appropriate for Children with special needs in ABK learning media lectures.

3.1 Subject Try

In this case, researchers choose the target users of the product. In this case, the researcher took the test subjects for class B semester V Special Education Study Program at UNIPA Surabaya in the 2022/2023 school year and lecturers of the ABK learning media course, which are subjects that are allied with the researcher. Thirty students in the fifth semester of the Special Education Study Program UNIPA Surabaya in the 2022/2023 academic year, consisting of 18 male and 12 female students. Meanwhile, the lecturer for the ABK learning media course who teaches in the Special Education Study Program for semester V students at UNIPA Surabaya in the 2022/2023 academic year is a lecturer with an educational qualification at the Master of Management level.

Table 2. Content Development Data Types

Product Development	Method of collecting data	Collected Data	Research Instruments	Data analysis
Canva application content in the form of smart infographics as a website-based micro-learning media	Documentation	Content that is used and exploited in creating attractive microlearning media using Canva application content in the form of smart infographics	Existing and published records or documents Online training on creating learning media content for the Canva application.	Qualitative descriptive
Validation instrument	test Interview	Suggestions for improving Canva Application Content in the form of smart infographics as a website-based learning media	Interview guidelines	Qualitative descriptive

Product Development	Method of collecting data	Collected Data	Research Instruments	Data analysis
Suggestions for improving Canva Application Content in the form of smart infographics as a website-based microlearning medium	Observation	Improved Canva Application Content in the form of smart infographics as a website-based microlearning medium	Direct observation	Qualitative discriminatory
Assessment of Learning Media by developing Canva application content in the form of smart infographics as a website-based microlearning medium	Interview	Modification and addition of Canva Application Content in the form of smart infographics as a website-based microlearning medium	Closed Questions	Qualitative discriminatory
Student motivation in learning activities uses Canva Application Content development in the form of smart infographics as a website-based microlearning medium.	Observation	Learning Motivation Level and Learning outcomes Student Level of understanding of the subject matter	Observation guide Pretest and Post-test Self-Assessment Questionnaire	Quantitative discriminatory Quantitative discriminatory and T-test Quantitative discriminatory

4 Results and Discussion

4.1 Analysis of Needs for Canva Application Content Development in the Form of Smart Infographics as a website-based microlearning Media

4.1.1 Analysis of Lecturer Characteristics

The use of learning media in the learning process obtained data from some 26 lecturers who teach; around 85% of lecturers in the learning process still use conventional learning media. Lecturers' constraints in the use of learning media used during the learning process showed that almost all lecturers, namely 90% of lecturers, experienced problems in implementing classroom learning, especially related to student motivation in participating in learning. Identification of data regarding the Lecturer's Knowledge of learning media made using the content of the Canva application obtained data that around 70% of lecturers already know learning media using Canva application content, and around 30% of lecturers do not know about it. The constraints and problems encountered by lecturers in making learning media using Canva application content are regarding using paid Canva application content

(Templates, Elements, Writing Etc.), so lecturers need to develop Canva application content that can be used freely without paid (free).

4.1.2 Analysis of Student Characteristics

Students' character in participating in learning activities at the university shows that there are still many students who need more motivation in carrying out learning activities, namely around 39% of students. The desire of students in the process of learning activities in class obtained data that students want lecturers to use engaging learning media in learning activities in class. Students' initial knowledge about website-based learning media by developing Canva application content obtained data that most students are interested in learning activities, using the website-based learning media by developing Canva application content in the form of smart infographics.

Analysis of Research and Development of Canva Application Content in the form of smart infographics as a website-based learning media. The validity test data of the RPS conducted by a team of experts as validators obtained the following data:

Table 3. RPS Validity Test Data

Validator Name	Answer	Score
Winarno, S.Pd.M. Pd	Fill RPS relevant	4
Toyib., S.Pd. M. Pd	Fill RPS with very relevant	5
Total Answer Score		9

% Answer = $9/10 \times 100\% = 90\%$

Based on these data, the RPS Learning Media for ABK is excellent. Validation and reliability test data for pretest and post-test items. The validation results for each item are presented in the following table:

Table 4. Validation of pretest and post-test item items

No. Question	r count	r table	Information
1.	0.719	0.444	Valid
2.	0.697	0.444	Valid
3.	0.909	0.444	Valid
4.	0.909	0.444	Valid
5.	0.719	0.444	Valid

From the table above, it can be explained that the value of $r \text{ count} > r \text{ table}$ is based on a significance test of 0.05. This means that the items mentioned above are valid.

Table 5. Reliability of Pretest and Reliable Items

Cronbach's Alpha	N of Items
.805	6

The reliability statistics table above shows the results of the analysis of the reliability test with Cronbach's Alpha = 0.805 of 5 variable items. The reliability value of 0.805 is substantial, so the pretest and post-test questions are said to be consistent (reliable). Identify Basic *Competencies*, Learning Objectives, and Indicators from ABK Grade A Semester Learning Media Course. Identification of Canva Application Content In the form of smart infographics at this stage, the researcher conducted a literacy study regarding the Canva application—training on making microlearning media by developing Canva application content in infographic form. Test the validation of learning media by developing Canva application content from the validator; the following results are obtained: $100 : 120 \times 100\% = 83.33\%$. From these results, learning media is feasible to use and get positive ratings from experts and has proven consistent performance.

4.2 The effectiveness of website-based learning media by developing Canva application content in smart infographics can increase the learning motivation of UNIPA Surabaya students.

4.2.1 Limited-scale trial design

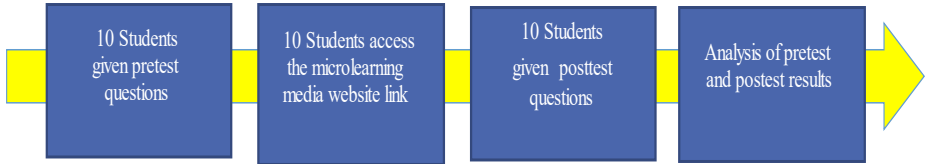


Fig. 1. Limited Scale Trial Design

Based on the learning outcomes of students in class A in semester V at UNIPA Surabaya during the pretest, the number of students who reached the standard threshold value was two students (20%), while the number of students who reached the standard threshold value during the post-test was nine students (90%). There is an increase of 70%, so it can be concluded that there is an increase in learning outcomes before (Pretest). Furthermore, after (Post-test) using Canva Application Content Development Microlearning Media in Smart infographics.

4.2.2 Limited Scale T-Test Analysis Results

The results of the calculation of the T-test data before and after the use of learning media by developing Canva application content in the form of Smart infographics are presented in the following data table:

Table 6. Results of the t-test pretest and post-test limited scale test

Paired Samples Statistics						
		Means	N	std. Deviation	std. Error Means	Sig. (2-tailed)
Pair 1	Pretest	56.00	10	15,776	4,989	001
	Posttest	88.00	10	16,865	5,333	

Based on the table above, it is known that the Mean is the average value of each variable. From this example, it can be seen that the pretest has a smaller average of 56.00 vs 88.00. So, descriptively, there is a significant (significant) difference between the pretest and post-test of the limited scale trials of ABK learning media courses using microlearning media for developing Canva application content in the form of smart infographics before and after. While the standard deviation of the pretest is 15.776 and the post-test is 16.85, indicating that the value is less than the average value (Mean), it can be concluded that the use of microlearning media by developing Canva application content in the form of smart infographics is effective because it has good performance.

Based on the results of the analysis above, it can also be seen that Sig. (2-tailed) < Alpha (0.001 < 0.05). This means that H0 is rejected, and Ha is accepted. In other words, there is a significant difference between the pretest and post-test based on the results of the Paired Sample T-Test with an Alpha of 5% (0.05). Design of a wider respondent scale trial



Fig. 2. More comprehensive Respondent Scale Trial Design

The learning outcomes of class B students in semester V at UNIPA Surabaya who achieved standard threshold scores on the Pretest and Post-test also experienced differences; the number of students who completed the pretest was 12 students (40%), while during the post-test, the number of students who completed the 28 students (93%). So that it can be concluded that there is an increase in learning outcomes before (Pretest) and after (Post-test) using microlearning media Development of Canva Application Content in the form of smart infographics

Table 7. Results of the Wider Scale Respondents' Pretest and Post-test T-Test

Paired Samples Statistics						
		Means	N	std. Deviation	St. Error Means	Sig. (2-tailed)
Pair 1	Pretest	64.00	30	15,222	2,779	.000
	Posttest	95.33	30	11,366	2075	

Based on the table above, it is known that the Mean is the average value of each variable. From this example, it can be seen that the pretest has a smaller average of 64.00 vs 95.33. So, descriptively, there is a significant (absolute) difference between the pretest and post-test trials of a broader scale of respondents on management concept material using learning media for developing Canva application content before and after. While the standard deviation of the pretest is 15.222 and the post-test is 11.366, indicating that the value is less than the average value, it can be concluded that using learning media by developing Canva application content is effective because it performs well. Based on the results of the analysis above, it can be seen that Sig. (2-tailed) < Alpha (0.000 < 0.05). This means that H₀ is rejected, and H_a is accepted. In other words, there is a significant difference between the pretest and post-test based on the results of the Paired Sample T-Test with an Alpha of 5% (0.05).

4.2.3 Field Validation Test

Response, Student Reaction Results of Lecturer Observations

Student responses to teaching and learning activities that used microlearning media developed with the Canva application in the form of smart infographics. The researchers focused on three aspects of student engagement - Interest, Livability and Courage to ask questions during the activities.

The results showed that students showed positive responses across these three dimensions, which were rated as "good" overall. In particular, the smart infographic microlearning media stimulated students' interest and liveliness during the lessons. Students appeared attentive, curious and enthusiastic about interacting with the visual information delivery. In addition, the microlearning approach encouraged students to have the courage to ask questions for clarification or additional information.

The researchers concluded that using Canva to create infographic-style microlearning media helped to increase student engagement. The condensed, visually appealing information was effective in generating student interest and participation. The researchers recommend that educators consider incorporating Canva-created infographic microlearning content as a strategy to promote active learning and student engagement during classroom activities. Further research is needed to explore the effectiveness of this approach across different educational levels, subject areas and learning objectives.

Response, student reaction through Student Self-Assessment

Student responses to teaching and learning activities that used microlearning media developed with the Canva application in the form of smart infographics. The recent implementation of microlearning techniques utilizing Canva to develop engaging infographic content has shown tremendous success in boosting student mastery of subject material to a level of 95%. This high level of mastery demonstrates the power of bite-sized, visually-driven information delivery to focus attention, improve retention, and motivate learners. Students reported feeling more interested in the material after utilizing the microlearning media, with the vast majority preferring the infographic lessons to traditional lectures. Given the 95% mastery level based on assessments, the microlearning media show immense promise for increasing comprehension of the subject matter. The customized Canva infographics offered focused, engaging content catered to students' diverse learning styles. Their success highlights the benefits of implementing multimodal microlearning techniques to strengthen understanding and promote excellent subject mastery, as evidenced by the 95% criteria rating of "Very Good".

5 Conclusions and Recommendations

This research successfully developed web-based microlearning content using Canva to create smart infographics, following the 4D model of Define, Design, Develop, and Disseminate. Validation and field testing showed the microlearning approach effectively increased student motivation and learning. The promising results suggest this microlearning format should be adopted more widely, especially by large universities with ample resources. To scale up the approach, universities need to invest in digital infrastructure to support innovative formats like microlearning. The content should be disseminated across university websites and portals to maximize reach. Further research can refine the approach and personalize content to individual learners. Ongoing evaluation and feedback should iteratively improve the microlearning over time. This microlearning model should expand across various subjects and fields beyond the initial scope. Educators need training on leveraging microlearning and infographic principles as well. In summary, this successful microlearning initiative should be adopted more broadly in higher education to enhance student engagement. Continued research, dissemination, training, and iteration will help refine the approach and maximize its learning impact across institutions.

References

1. Grevtseva, Y., Willems, J., & Adachi, C. (2017). Social media as a tool for microlearning in the context of higher education.
2. So, H., Lee, H., & Roh, S. (2020, December 23). Examining the Design of Microlearning for Korean Adult Learners. <https://doi.org/10.5281/zenodo.4057859>

3. Shatte, A.B., & Teague, S.J. (2020). Microlearning for improved student outcomes in higher education: A scoping review.
4. Yanti, F. (2022). Innovative Learning Media in Era 4.0: Review. *Journal of digital learning and distance education*.
5. Meiryani, Lindawati, A.S., Fernando, E., Deniswara, K., & Wahyuningtias, D. (2021). The Role of Information Technology and Communication Technology as Online Learning Media. Proceedings of the 5th International Conference on E-Commerce, E-Business and E-Government.
6. Farwell, S.M. (1998). Profile of planning: A study of a three-year project on the implementation of collaborative library media programs.
7. Devega, A.T., Ambiyar, A., Panyahuti, P., Adi, N.H., & Riyanda, A.R. (2022). The Effectiveness Of Learning Media On The Outcome Of Computer And Basic Network of Vocational Students. *Jurnal Pendidikan Teknologi Kejuruan*.
8. Littlejohn, A., Falconer, I., & McGill, L. (2008). Characterising effective eLearning resources. *Comput. Educ.*, 50, 757-771.
9. Coakley, D., Garvey, R., & O'Neill, Í. (2017). Micro-learning—Adopting Digital Pedagogies to Facilitate Technology-Enhanced Teaching and Learning for CPD.
10. Rainbow Line. (2020). Utilization of the Canva Application as a Medium for Learning the Indonesian Language and Literature for SMA/MA Level. *Unpam Sasindo Journal* , 8 (2), 79–96.
11. Mudinillah, A., Amrina, A., & Hamid, M. (2022). The Utilization of the Canva Application as A Media for Arabic Learning at MTs Negeri Sungai Jambu. *Acitya: Journal of Teaching and Education*. <https://doi.org/10.30650/ajte.v4i2.3192>.
12. Melinia, S., & Nugroho, N. (2022). Creating a Video Using Canva Application as an English Learning Media of Recount Text Material. *JEduc: Journal of English Education*.
13. Ferreira, L.F., & Silva, V.M. (2020). O uso do aplicativo Canva Educacional como recurso para avaliação da aprendizagem na Educação Online. *Research, Society and Development*, 9.
14. Kiswati, & Kunsarwani, M. (2022). Implementing Canva in a Flipped Classroom: A Challenge in Post-Pandemic Era. *ETJaR: English Teaching Journal and Research*.
15. Hinon, K. (2021). The Development of 4D Model for Learning Management with Free Platform to Encourage The ICT Literacy Skills of Undergraduates. 2021 Research, Invention, and Innovation Congress: Innovation Electricals and Electronics (RI2C), 183-186.
16. Irawan, A., Padmadewi, N.N., & Artini, L.P. (2018). Instructional materials development through 4D model.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

