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THE EMPIRICAL STUDY OF LEARNING TREATMENT ESCALATING LEARNING ENGAGEMENT AND CREATIVITY THROUGH YOUTUBE

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Abstract

The background of this research relates to the low levels of student engagement and creativity in the context of blended learning. This study aims to measure the increasing of learning engagement and creativity through learning treatment using a project-based learning (PBL) integrated with YouTube. This study used a quasi-experimental method with a pretest-posttest control group design. This study involved 40 students from the cosmetology and beauty program at Universitas Negeri Padang in West Sumatra, Indonesia. The results describe that learning using PBL integrated with YouTube contributes more in increasing learning engagement and creativity. This learning approach provides collaborative, meaningful, active and practical experience learning that support learning engagement. It also stimulates creativity through creative and inspirational content, innovative presentations, and imaginative thinking. These results can provide a reference for educators related utilizing Youtube platform in designing learning that can increase learning engagement and creativity. The recommendation for future research is that researchers should analyze the various learning treatments and factors that can contribute to enhancing student engagement and creativity in the era of digital learning.

Keywords: Project-Based Learning, Youtube, Learning Engagement, Creativity.

INTRODUCTION

Blended learning as a part of digital learning, often hailed as a transformative approach to education, has made its presence felt across a spectrum of educational institutions [1]–[3]. By merging the strengths of conventional in-person instruction with the flexibility and accessibility of digital resources, it addresses the ever-evolving educational needs of the 21st century [4], [5]. Furthermore, blended learning offers learners flexibility and autonomy in terms of when and how they interact with course materials [6]–[9]. The intricate blend of physical and digital elements in blended learning presents distinct challenges.

The transition to this model has exposed a disconcerting trend - a decrease in student engagement and creativity [10], [11]. Moreover, the online components of blended learning may potentially reduce the interpersonal connections, increase stress feeling and exchanges essential for stimulating student engagement [12]. As students navigate between the real and virtual realms, they may struggle to maintain a consistent level of learning engagement [13], [14].

Student learning engagement is a pivotal factor in the educational process, as it plays a fundamental role in determining the effectiveness and success of learning experiences [15]–[17]. Engaged learners tend to exhibit higher levels of curiosity,

intrinsic motivation [18], and a genuine interest in the subject matter, which, in turn, can lead to improved comprehension and retention of the material [19], [20].

Conversely, when student learning engagement is low, it can have detrimental consequences. Students may become disinterested, disengaged, and may struggle to grasp and retain essential concepts. This can lead to decreased academic performance, and a general lack of enthusiasm for learning [21]. This ultimately hinders the overall educational experience and achievement of both individual students and educational institutions as a whole.

An important learning target that also needs to be considered in the blended learning is student creativity. Creativity is an integral component of effective learning, yet it can be stifled within blended learning environments [22], [23]. The dynamic nature of creativity thrives in settings where students can explore, experiment, and collaborate freely. However, the integration of online components can sometimes impose constraints on creative expression. In a digital environment, students may find themselves constrained by predefined templates and standardized learning process, restricting their ability to express their creativity and their innovative thinking [24].

Indicators of low creativity in blended learning environments can take on various forms. These signs encompass limited divergent thinking, where students struggle to generate innovative solutions and exhibit a reluctance to explore unconventional ideas [25], [26]. Furthermore, rote memorization is evident when learners focus on memorizing facts rather than engaging in creative and deep comprehension. Lack of enthusiasm in creative tasks, like open-ended discussions, indicates a decrease of creative engagement. Finally, a tendency to focus solely on surface-level information and resistance to collaborative efforts with peers all highlight the need to enhance creative adaptability within blended learning environments [23], [27], [28].

To solve these problems, it is crucial to delve into the underlying factors affecting learning engagement and creativity, such as learning design, instructional model, technological learning tools, and the quality of interactions between instructors and students. This research will focus on two aspects that have the potential to enhance student engagement and creativity in learning: learning models and educational technology. After a thorough scientific analysis of existing studies, this research narrows down to Project-Based Learning (PBL) as the learning model and YouTube as the educational technology platform.

The selection of these two aspects is based on several reasons. First, PBL is a learning model that can be used as a strategy to create collaborative learning environments that stimulate high levels of student engagement [29]. Moreover, the projects at the core of PBL are dynamic and innovative, allowing for the design of learning activities in which students can develop skills independently, critically, and creatively [30], [31]. Research findings reveal that PBL has the potential to enhance teamwork, communication, and creativity competencies [32], [33].

Furthermore, YouTube is considered as a significant aspect because it is one of the most commonly used social media sites worldwide [34]. The accessibility of the YouTube platform offers many advantages for educational content [35]. Research findings suggest that YouTube can be applied to learning across various academic backgrounds and has been proven to have the potential to strengthen the achievement of learning objectives [36].

Additionally, studies describe that the ease of access and the features of YouTube, which can meet students' learning needs, can also stimulate students' desire to engage more deeply in YouTube-based learning [37]. The interaction facilitated through YouTube's comment section and the vast array of educational content available provide students with a rich experience, thereby increasing the intensity of student engagement [38]. Through this study, researchers intend to analyze the role of the project-based learning model integrated with Youtube in order to increase student engagement and creativity.

LITERATURE REVIEW

Learning Engagement

Research trends related to learning engagement have been started since 1984 until now [39]. In 1984 researchers began research with the topic of learning engagement in terms of theoretical developments in higher education [40]. By 1993 researchers had also analyzed the importance of learning engagement to reduce the number of students who decided to drop out of college [41].

Research continues in 2009 research concluded that one of the determinants of effectiveness of educational practices is learning engagement [42] And continued in 2013 researchers analyzed how to do framing students engagement in education [43]. And research continues until now many researchers analyze how to build student engagement through technology implementation approaches in learning, for example such as the use of flipped classroom [44].

The historical picture of the research indicates the importance of analyzing more deeply the role of learning engagement in learning. The results of the bibliometrics analysis conducted by Aparicio (2021) also suggest further research so that a systematic research map does not only stop at theoretical reviews, but needs to be implemented in real time in learning to improve learning objectives. The novelty value in this study is combining the Project-Based Learning learning approach with the Youtube platform to increase learning engagement.

Creativity

Good learning should be able to facilitate and emphasize the element of creativity [45]. This underlies the importance of analyzing what elements can increase creativity. Research related to creativity began in 1975 and continues to grow today [46]. Hernández-Torrano & Ibrayeva (2020) Also describing the upward trend in this field can be observed from the many cited articles that review creativity. 5 articles with the highest number of citations, among others, analyzing the nature of creativity [47], creativity achievement through several factors [48], mapping of creativity [49], and domain specificity of creativity [50].

The bibliometrics described by Hernández-Torrano & Ibrayeva (2020) also emphasizes the renewal of research adapted to current conditions. For example, today technology is increasingly developing and adapted in education. So it is important to analyze how the role of technology in increasing student creativity. The novelty of this research is collaborating a project-based learning approach with the YouTube platform to increase student creativity.

METHODS

Research Design

This research employed a quasi-experimental research method with a pretest-posttest control group design to investigate the impact of preject-based learning integrated with Youtube on student learning engagement and creativity.

The research design involved selecting two comparable groups of students: the control group, which received traditional instruction, and the experimental group, which received the intervention using project-based learning integrated with Youtube.

Before implementing the intervention, both groups were assessed with a pretest to establish a baseline for their learning engagement and creativity. Following the intervention, posttest measurements were administered to both groups. By comparing the pretest and posttest scores of the two groups, this study could evaluate whether the intervention had a statistically significant impact on learning engagement and creativity. Additionally, the use of a control group helps to control for external factors and isolate the effects of the intervention, enhancing the internal validity of the study.

Participants

This research comprised 40 participants enrolled in the cosmetology and beauty study program at Universitas Negeri Padang, West Sumatera, Indonesia. The sample selection for this study employed simple random sampling. This sampling technique was chosen because the population size is not large, and all individuals in the population have an equal chance of being included in the research sample. Simple random sampling was also selected due to its ability to mitigate bias in the study [51].

The participants were evenly distributed into two categories: 20 students were assigned to the control group, and the remaining 20 students were placed in the experimental group. The allocation of participants to these groups was done through a random selection process.

Instruments

This study employed a research instrument to assess and compare student learning engagement and creativity following two distinct teaching methodologies: project-based learning integrated with YouTube and traditional instruction.

The research instrument encompassed quantitative measures to comprehensively evaluate the impact of these teaching methods. To gauge student learning engagement, we examined factors such as classroom participation, attentiveness, and active involvement in the learning process, while creativity was assessed through tasks that required innovative problem-solving and idea generation.

This comprehensive approach enabled us to gain a deeper understanding of how the integration of YouTube into project-based learning influenced students' engagement and creativity, while also allowing for a direct comparison with the traditional instructional approach.

The frameworks of the research instrument are as follows:

Table 1: Questionnaire as Research Instrument

Learning Engagement		
No.	**Indicators**	**Statement Item**
1	The time span of students to participate and engage in learning and completion of learning tasks	12, 13, 16
2	Student effort and perseverance in the learning process and completion of learning tasks	14, 15, 18
3	Student focus and satisfaction in the learning process and assignments	17, 21
4	Student interest and motivation in learning and assignments	19, 20
Creativity		
5	Able to find new ways to create things according to their ideas and fantasies	1, 5, 11
6	Able to find alternatives in solving learning problems	6, 7, 9
7	Have the ability to think critically and produce original ideas	3, 10
8	Have flexibility in collaborating ideas and combining existing works into new works	2, 4, 8

The research instrument was validated using content and construct validity tests [52]. Content validity was assessed by engaging two experts in the field of learning. The results of the content validity test indicated that the instrument is deemed valid. Subsequently, construct validity was examined using statistical tests to evaluate the extent to which the instrument can measure the intended concepts or variables. The results of the construct validity test also affirmed the validity of the research instrument. Through the combination of content and construct validity, researchers can ensure that their research instrument possesses the requisite accuracy and precision necessary for generating valid and reliable data.

Data Analysis

The data analysis of this research encompasses a rigorous evaluation of the data's validity and reliability. To assess the validity, the Pearson Correlation coefficient was employed, allowing for an examination of the relationships and associations between variables [53].

This statistical method is crucial in determining the strength and direction of these relationships, ensuring that the data accurately reflects the research constructs. Furthermore, reliability was established using Cronbach's Alpha, which measures the internal consistency of scales or constructs. High Cronbach's Alpha values indicate that the data consistently measures what it is intended to measure, enhancing the reliability of the research findings [54].

In addition to validity and reliability, the data analysis process also included a series of preliminary tests. These included testing for the normality of data distribution using the Kolmogorov-Smirnov test, which assesses if the data adheres to a normal distribution, and examining the homogeneity of variances using Levene's Statistic. These tests were conducted to ensure that the data met the underlying assumptions necessary for further statistical analysis.

Finally, hypothesis testing was carried out using the t-test, enabling a comparison of means between control group and experimental group and determining whether observed differences were statistically significant [55]. This comprehensive data analysis framework ensures the robustness and credibility of the research findings.

RESULTS

The processing of research data encompasses several distinct phases, commencing with the validation and reliability assessment of research instruments, followed by evaluations of data normality and homogeneity for preliminary test, and independent sample t-test for hypothesis test. Subsequently, the outcomes derived from the processing of research data are presented as follows:

Construct Validity Test

The assessment of Construct validity is conducted through Pearson Correlation, facilitated by the SPSS software. The validation outcome is considered acceptable when the two-tailed significance (Sig.) value is less than 0.05. The findings from this validation assessment are displayed in the subsequent table:

Table 2: Result of Construct Validity Test

No.	Instrument Statement Item	Sig. (2-tailed) of Pearson Correlation.	Result
Learning Engagement			
1	EN1	0.013	Valid
2	EN2	0.004	Valid
3	EN3	0.000	Valid
4	EN4	0.000	Valid
5	EN5	0.000	Valid
6	EN6	0.000	Valid
7	EN7	0.014	Valid
8	EN8	0.000	Valid
9	EN9	0.000	Valid
10	EN10	0.000	Valid
Creativity			
11	CR1	0.000	Valid
12	CR2	0.000	Valid
13	CR3	0.000	Valid
14	CR4	0.000	Valid
15	CR5	0.000	Valid
16	CR6	0.000	Valid
17	CR7	0.000	Valid
18	CR8	0.000	Valid
19	CR9	0.000	Valid
20	CR10	0.000	Valid

The outcome of the two-tailed significance test (Sig.) for all items within the instrument yielded values below 0.05. Consequently, the results of the assessment affirm the validity of all items within the research instruments pertaining to the variables of engagement and creativity.

Reliability Test

Reliability test involves the analysis of the Cronbach's Alpha value. When the Cronbach's Alpha value exceeds 0.6, it signifies that the research variable can be considered reliable. The outcomes of the reliability assessments are outlined below:

Table 3: Result of Reliability Test

Variable	Cronbach's Alpha	Result
Learning Engagement	0,931	Reliable
Creativity	0,901	Reliable

The test outcomes revealed that the Cronbach's Alpha values for both the learning engagement and creativity variables exceeded 0.6. Consequently, the analysis results lead to the conclusion that both variables can be considered reliable.

Normality Test

The assessment of data normality was conducted through the Kolmogorov-Smirnov test. Data can be regarded as following a normal distribution when the significance (sig.) value derived from the Kolmogorov-Smirnov test surpasses 0.05. The outcomes of the normality test are presented below:

Table 4: Result of Normality Test

Variable	Group	Sig. of Kolmogorov Smirnov	Result
Learning Engagement	Pretest of Control Group	0.200	Normal
	Posttest of Control Group	0.200	Normal
	Pretest of Experimental Group	0.098	Normal
	Posttest of Experimental Group	0.200	Normal
Creativity	Pretest of Control Group	0.200	Normal
	Posttest of Control Group	0.200	Normal
	Pretest of Experimental Group	0.200	Normal
	Posttest of Experimental Group	0.200	Normal

The test results reveal that all variable data have sig. values exceeding 0.05, signifying that the entire research dataset conforms to a normal distribution.

Homogenity Test

The assessment of homogeneity was conducted using Levene's Statistic through the utilization of the SPSS application. It is considered that the population variances of the groups are homogenous when the significance (Sig.) value derived from the Levene Statistic exceeds 0.05. The outcomes of this homogeneity test are presented below:

Table 5: Result of Homogeneity Test

Variable	Sig. of Levene Statistic	Result
Learning Engagement	0.137	Homogeneous
Creativity	0.113	Homogeneous

Derived from the data collected using instruments assessing learning engagement and creativity, the Levene Statistic's significance (Sig.) value surpasses 0.05. Hence, it can be deduced that the study's participant population exhibits homogeneity.

Hypothesis Test

Hypothesis testing is conducted using an independent sample t-test, which assesses the disparities in the levels of learning engagement and creativity between the control and experimental groups. If the two-tailed significance value (Sig) of the t-test is less than 0.05 for both post-test achievements, it indicates a substantial distinction between the control and experimental groups. The specific test outcomes are available in the subsequent table:

Table 6: Result of Independent Sample t-test

Variable	Group	Mean	Mean Difference
Learning Engagement	Posttest Control Group	44.95	2.55
	Posttest Experimental Group	47.50	
Creativity	Posttest Control Group	38.15	4.75
	Posttest Experimental Group	42.90	

Variable	Sig. (2-tailed) of t-test for Equality of Means	Mean Difference	Result
Learning Engagement	0.013	2.55	Significantly Different
Creativity	0.000	4.75	Significantly Different

The results of the independent sample t-test indicate a two-tailed significance value of 0.13 for the learning engagement variable and 0.000 for the creativity variable. These findings lead to the conclusion that there is a significant difference in the levels of student learning engagement and creativity between the control and experimental groups. Furthermore, when examining the mean values in the descriptive data, it becomes evident that the experimental group, which employs project-based learning integrated with YouTube, outperforms the control classes that employ traditional teaching methods in terms of both learning engagement and creativity achievements. This is further substantiated by the substantial mean differences of 2.55 in the learning engagement variable and 4.75 in the creativity variable. In summary, the experimental class has achieved higher levels of success when compared to the control class.

DISCUSSIONS

The Contribution of Project-Based Learning through Youtube on Students Learning Engagement

The result of the independent sample t-test describes a two-tailed significance value of 0.13 for the learning engagement variable. This indicates that there is a significant difference in learning engagement achievements between the control group and the experimental group. This is further substantiated by the substantial mean differences of 2.55 of experimental group which is higher than control group. This proves that Project-based learning through YouTube has proven more effective in increasing student learning engagement.

Some research results that are in line with this study explain that integrating project-based learning with the YouTube platform not only enhances student engagement through captivating multimedia content but also capitalizes on fundamental aspects of the project-based learning model itself [56], [57]. Project-based learning offers students the opportunity to learn through practical experiences [58], [59], real-world problem-solving [60], [61], and close collaboration, all of which create a more engaging and profound learning environment [62], [63]. Students engaged in task-based projects tend to grasp concepts more effectively, as they can relate theory to practice, enriched by the learning materials available on YouTube [64], [65]. They do not merely comprehend concepts; they also apply them in relevant contexts. Furthermore, these projects lead to higher levels of engagement, as students actively identify problems, devise solutions [66], and present their work [67]. All of these aspects stimulate active engagement in the learning process, a central feature of the project-based learning model.

Consequently, through the integration of project-based learning with YouTube, students participate in a more engaging learning process, fostering stronger engagement and more meaningful learning experiences [68]. Task-based projects combined with the YouTube platform offer unique opportunities for students to understand, apply, and collaborate in stimulating ways, which, in turn, enhance their understanding of concepts, active engagement, and the potential for achieving more positive learning outcomes [69], [70].

Furthermore, The survey findings underscore the positive impact of Project-Based Learning (PBL) on project outcomes, indicating that PBL students exhibit higher levels of engagement in their learning process [71]. When PBL is integrated with technology (Youtube) in the classroom, it encourages active learning through increased interaction and collaboration opportunities [72]. Distinct variations in motivation and engagement emerge between students who have experienced PBL and those subjected to direct instruction [73]. The research reveals that engagement is fostered by several conditions during tasks, such as maintaining a sense of control, sustaining interest, and balancing challenge and skill. Additionally, group cohesion among project members and a focus on long-term project goals play crucial roles in sustaining engagement, highlighting key aspects of project design for educators to consider when implementing projects aimed at engaging students [74]. Finally, the integration of Project-Based Learning and YouTube in the classroom not only boosts student motivation but also elevates participation levels in the learning process [57].

After analyzing multiple discussions concerning research findings that align, one can deduce that the combination of project-based learning with YouTube integration has been verified to enhance student engagement in the learning process. This is primarily attributable to several factors, including the potential for students to engage in practical and meaningful learning experiences, the creation of a rich and immersive learning environment, the facilitation of collaborative learning, and the enrichment of educational content provided on YouTube. All of these aspects collectively serve to stimulate heightened levels of engagement in the learning process.

The Contribution of Project-Based Learning through Youtube on Students Creativity

The result of the independent sample t-test describes a two-tailed significance value of 0.000 for the creativity variable. This indicates that there is a significant difference in creativity achievements between the control group and the experimental group. This is further substantiated by the substantial mean differences of 4.75 of experimental group which is higher than control group. This proves that Project-based learning through YouTube has proven more effective in increasing student creativity.

The findings of this study are consistent with several previous research findings, which assert that the combination of PBL with YouTube has been proven effective in enhancing the level of students' creativity [75]–[77]. This can occur since integrating project-based learning with the YouTube platform yields a powerful synergy that fosters and enhances student creativity within the learning environment [76]–[79]. This integration offers a multitude of reasons for such a positive impact. Firstly, YouTube provides students with an extensive array of creative content, and innovative presentations [80]. This wealth of inspiration and creativity from diverse sources can serve as a wellspring for students' own creative thinking. They can explore witness unconventional presentations, and discover imaginative solutions, all of which can

stimulate their creative thought processes [81], [82]. Thus, YouTube acts as a boundless reservoir of creative ideas, enabling students to draw inspiration and spark their own imaginative thinking.

Furthermore, the active engagement of students in creative projects forms a pivotal aspect of project-based learning integrated with YouTube. These projects often require students to produce something original, be it a video, a presentation, or another creative product [83]. Through these assignments, students are actively involved in the creative process, encouraging them to develop their creative ideas, apply key concepts, and design innovative solutions [84], [85]. By participating in these projects, students exercise their creative faculties, which include problem-solving, ideation, and self-expression [86], [87]. As they embark on these creative journeys, students gain a deeper understanding of the value of creativity and how it shapes their learning experiences.

The collaborative aspect facilitated by YouTube in the context of project-based learning further amplifies the enhancement of creativity. YouTube enables students to collaborate with their peers in various projects, allowing them to share ideas, give feedback, and jointly contribute to creative endeavors [88]–[90]. Through collaboration, students can pool their creative thinking resources, enrich each other's ideas, and co-create innovative works. This collaborative dimension encourages a more diversified and holistic approach to creativity, where different perspectives and ideas intersect and interweave [91], [92]. Moreover, students have the opportunity to appreciate the significance of creative collaboration, an essential skill in the professional world where creative problem-solving often relies on the synergy of a team.

In summary, the integration of project-based learning with YouTube generates a fertile ground for nurturing and enhancing student creativity. The availability of diverse creative content on YouTube inspires and broadens students' creative horizons. Active engagement in creative projects encourages them to put their creative skills into practice, and collaborative opportunities amplify the depth and diversity of their creative thinking. This holistic approach to creativity not only fosters innovation within the educational setting but also equips students with essential creative skills that can serve them well in future endeavors.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the integration of project-based learning with YouTube has proven to be a highly effective strategy for enhancing student engagement in the learning process. This approach offers practical and meaningful learning experiences, creates a rich and immersive environment, promotes collaborative learning, and enriches educational content on YouTube. Moreover, it serves as a fertile ground for nurturing and enhancing student creativity by exposing them to diverse content that inspires creativity, providing opportunities for creative practice, and fostering collaborative creative thinking. Ultimately, this holistic approach not only fosters innovation within the educational setting but also equips students with vital creative skills for their future endeavors.

Although the results of this study can contribute theoretically and practically, this research is also still limited. The limitations of this study are the lack of treatment involved in the quasi-experimental process and the limited research variables

involved. Based on this, researchers recommend that future research can analyze and apply various technological features such as artificial intelligence in increasing student learning engagement and creativity. This is expected to be able to contribute more in efforts to achieve increased learning engagement and student creativity.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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