The Impact of Online Platforms on Generation Z's Learning Styles and Educational Outcomes: A Comprehensive Study

Elfindah Princes
Information Systems Management Department, BINUS Graduate Program – Master of Information Systems Bina Nusantara University, Jakarta, Indonesia, 11480

Abstract

Purposes - This study aims to investigate the relationship between material comprehension and satisfaction among Generation Z learners using online platforms. Specifically, it examines how variations in material comprehension influence overall satisfaction with the learning experience. The research also explores possible indirect effects of other variables, such as motivation, on this relationship.

Methodology - The study employed a quantitative research design, collecting data from 51 respondents. A path coefficient analysis was conducted to evaluate the direct and indirect effects of material comprehension on satisfaction. The data were analyzed using bootstrapping methods to determine the significance of the relationships between the variables.

Findings - The analysis revealed that material comprehension significantly impacts satisfaction (p-value = 0.002), with higher levels of comprehension leading to greater satisfaction. Additionally, learning motivation was found to have both direct and indirect effects on satisfaction through its influence on material comprehension. However, some anomalies were observed where high comprehension did not always correlate with high satisfaction, indicating the influence of other factors.

Novelty - This research contributes to the growing body of literature on Generation Z learning by focusing on the relationship between comprehension and satisfaction in online learning environments. The study also highlights the importance of understanding the role of motivation in enhancing both comprehension and satisfaction, offering new insights into the dynamics of digital education.

Research Implications - The findings have important implications for educators and policymakers, suggesting that efforts to improve material comprehension can significantly enhance student satisfaction in online learning environments. Moreover, the study highlights the need to address motivational factors to maximize learning outcomes. Future research should explore additional variables that may mediate or moderate the relationship between comprehension and satisfaction.

Keywords: Material Comprehension, Satisfaction, Generation Z, Online Learning, Path Coefficient, Motivation, Digital Education

I. Introduction

Research Background

The rise of digital platforms has significantly altered the landscape of education. With the introduction of online courses, virtual classrooms, and a wealth of digital resources, students are no longer confined to the traditional classroom setting. Generation Z, defined as individuals born between 1997 and 2012, has grown up in a world where access to the internet and digital technology is ubiquitous. This generation's exposure to online platforms has fundamentally influenced their learning styles, preferences, and academic performance.

The integration of technology in education offers numerous advantages, such as flexible access to information, enhanced interactivity, and opportunities for collaborative learning. However, the effectiveness of these platforms in meeting the unique educational needs of Generation Z remains a topic of debate. This study seeks to explore the impact of online platforms on Generation Z's educational experiences, focusing on how digital learning environments influence their motivation, comprehension of material, and satisfaction with their education.

Problem Statement

Despite the widespread adoption of online platforms in education, there is still limited understanding of their impact on Generation Z's learning styles and outcomes. Additionally, concerns have emerged regarding the potential over-reliance on AI for instant answers, which may inhibit the development of critical thinking and problem-solving skills. This research seeks to address these gaps by investigating the role of online platforms in shaping Generation Z's educational experiences.

Research Objectives

- To assess the impact of online platforms on Generation Z's learning motivation.
- To evaluate the relationship between learning styles and academic performance in an online learning environment.
- To identify the factors that contribute to Generation Z's satisfaction with online learning.
- To provide recommendations for optimizing online education for Generation Z.

II. Literature Review

The Role of Technology in Education

The integration of technology in education has revolutionized teaching and learning processes. Szymkowiak et al. (2021) argue that technology plays a crucial role in the education of Generation Z, providing tools that enhance learning through interactivity and accessibility. The emergence of

online platforms has expanded the boundaries of traditional education, allowing students to access resources from anywhere in the world.

Generation Z's Learning Preferences

Research indicates that Generation Z prefers a more interactive and visually engaging learning environment. According to Azman (2021), Generation Z learners are inclined towards visual learning styles, which are supported by the multimedia capabilities of online platforms. Schwieger and Ladwig (2018) further suggest that Generation Z values collaboration and social interaction in their learning experiences, making online platforms an attractive option for this generation.

Challenges of Online Learning

While online platforms offer numerous benefits, they also present challenges. One concern is the potential for students to become overly dependent on AI-driven tools that provide instant answers without encouraging deeper engagement with the material (Solomon, 2021). This reliance on technology may undermine critical thinking skills and reduce the effectiveness of online learning in fostering long-term academic success.

III. Research Methodology

Research Design

This study employed a quantitative research design to investigate the impact of online platforms on Generation Z's learning experiences. Data were collected from 51 respondents using an online survey distributed via a Google Form. The survey was designed to measure three primary variables: learning motivation, material comprehension, and satisfaction with the online learning experience.

Data Collection and Sampling

The sample consisted of Generation Z students who regularly use online platforms for educational purposes. The survey included questions designed to assess the frequency of online platform usage, the types of platforms used (e.g., educational websites, online courses, social media for learning), and their perceptions of how these platforms affected their learning experiences. Respondents were also asked to rate their levels of motivation, comprehension of material, and satisfaction with online learning on a Likert scale.

Data Analysis

Hypothesis testing was conducted using bootstrapping methods to evaluate the relationships between the variables. The study tested the following hypotheses:

1. Social interaction through online platforms positively influences Generation Z's learning motivation.

2. Generation Z's learning styles significantly impact their preferences for online learning methods and their comprehension of educational material.
3. Increased learning motivation is associated with improved academic performance.

The results were analyzed using path coefficient models to examine both direct and indirect effects between the variables.

IV. Results and Discussion
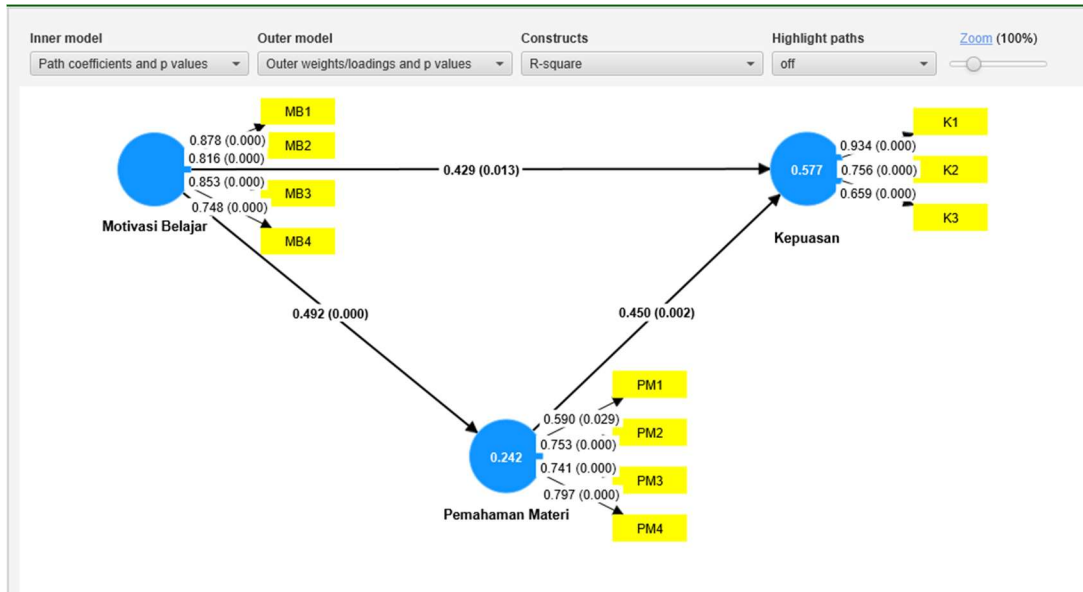
Hypothesis Testing Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Motivasi Belajar -> Kepuasan	0.429	0.441	0.172	2.492	0.013
Motivasi Belajar -> Pemahaman Materi	0.492	0.537	0.116	4.253	0.000
Pemahaman Materi -> Kepuasan	0.450	0.433	0.143	3.159	0.002

The results of the hypothesis testing indicate that the direct effects of several variables are statistically significant. Below is an explanation of these findings:

a. **Learning Motivation -> Satisfaction**

The test results show a p-value of 0.013, which is significant at the 5% level. This suggests a direct effect of learning motivation on satisfaction. In other words, the higher a student's learning motivation, the more likely they are to feel satisfied with the learning process. Learning motivation is a crucial factor in determining how students perceive the quality and outcomes of the educational experience they engage in.

b. **Learning Motivation -> Material Comprehension**

With a p-value of 0.000, the effect is highly significant. This indicates that learning motivation has a significant influence on students' comprehension of the material. Thus, the more motivated a student is, the better they tend to understand the content delivered through online platforms. High levels of learning motivation help students to focus and make a greater effort to grasp the material.

c. **Material Comprehension -> Satisfaction**

Material comprehension also significantly impacts satisfaction, with a p-value of 0.002. This means that students who better understand the material are more likely to feel satisfied with their learning experience. Satisfaction is influenced not only by motivation but also by the degree to which students can successfully comprehend the material being taught.

The data analysis revealed significant findings regarding the relationships between the variables:

- **Social Interaction and Learning Motivation:** The study found that social interaction through online platforms positively influences Generation Z's learning motivation ($p = 0.013$). This suggests that online platforms, which facilitate communication and collaboration, play a crucial role in motivating students to engage with their studies.
- **Learning Motivation and Material Comprehension:** Learning motivation was found to significantly impact material comprehension ($p = 0.000$). This indicates that students who are more motivated are better able to understand and retain educational content delivered through online platforms.
- **Material Comprehension and Satisfaction:** The results showed that material comprehension significantly influences satisfaction with online learning ($p = 0.002$). Students who have a better understanding of the material tend to feel more satisfied with their online learning experiences.

Specific indirect effects - Mean, STDEV, T values, p values   Zoom (100%)   Copy to Excel   Copy to R

|	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Motivasi Belajar -> Pemahaman Materi -> Kepuasan	0.222	0.229	0.084	2.632	0.009

Indirect Effect:

Learning Motivation -> Material Comprehension -> Satisfaction: The test results show that the p-value is significant at 0.009. This indicates that learning motivation has an indirect effect on satisfaction through material comprehension. In other words, learning motivation not only directly influences satisfaction but also indirectly enhances it by improving students' comprehension of the material. Therefore, higher learning motivation leads to better understanding, which subsequently increases overall satisfaction with the learning experience.

Total effects - Mean, STDEV, T values, p values   Zoom (100%)   Copy to Excel   Copy to R

|	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Motivasi Belajar -> Kepuasan	0.651	0.670	0.133	4.897	0.000
Motivasi Belajar -> Pemahaman Materi	0.492	0.537	0.116	4.253	0.000
Pemahaman Materi -> Kepuasan	0.450	0.433	0.143	3.159	0.002

Total Effect (Direct Effect + Indirect Effect):

i. **Learning Motivation -> Satisfaction**: The p-value is highly significant at 0.000, indicating that learning motivation has a strong overall effect on satisfaction. This includes both the direct impact of motivation on satisfaction and the indirect impact through other variables like material comprehension.

ii. **Learning Motivation -> Material Comprehension**: The p-value is also highly significant at 0.000, showing that learning motivation greatly influences material comprehension. This demonstrates that motivation is a key driver in how well students grasp the material.

iii. **Material Comprehension -> Satisfaction**: With a significant p-value of 0.002, material comprehension has a strong effect on satisfaction. This implies that students who better understand the material are more likely to feel satisfied with their learning experience, further underscoring the importance of comprehension in the overall educational process.
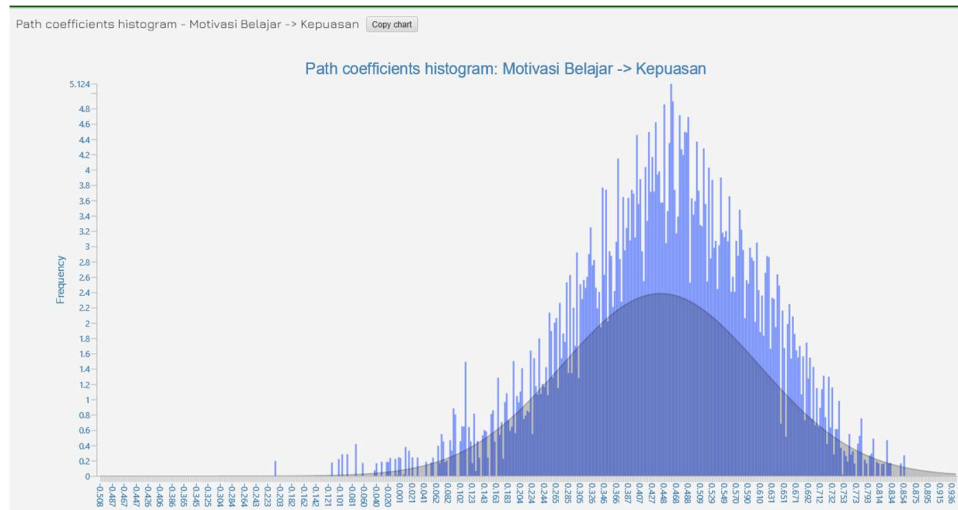
I. Path Coefficient histogram Learning Motivation → Satisfaction
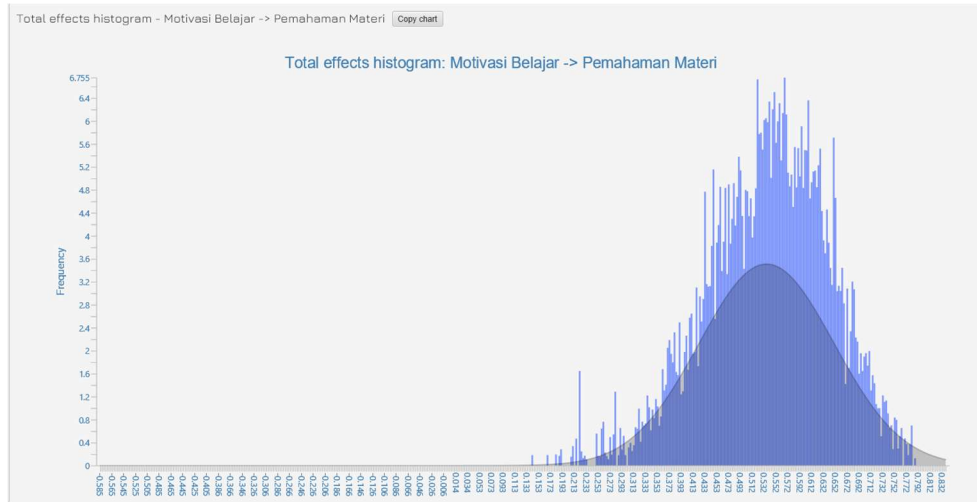
II.   Path Coefficient histogram Learning Motivation → Material Comprehension
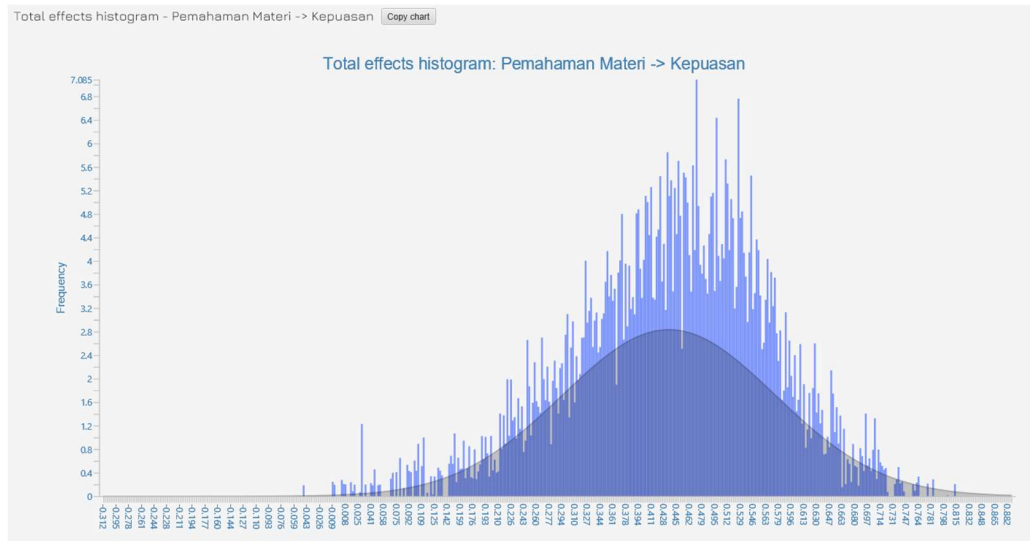
III.   Path Coefficient histogram Material Comprehension → Satisfaction

Case index	K1	K2	K3	MB1	MB2	MB3	MB4	PM1	PM2	PM3	PM4
0	5.000	5.000	5.000	4.000	4.000	4.000	4.000	3.000	3.000	4.000	3.000
1	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
2	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	2.000
3	4.000	1.000	5.000	5.000	5.000	5.000	5.000	1.000	5.000	2.000	1.000
4	5.000	5.000	5.000	4.000	5.000	1.000	1.000	1.000	5.000	5.000	5.000
5	5.000	5.000	1.000	5.000	5.000	5.000	1.000	1.000	5.000	5.000	5.000
6	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
7	5.000	5.000	4.000	5.000	5.000	5.000	5.000	3.000	5.000	5.000	3.000
8	1.000	1.000	1.000	5.000	5.000	1.000	1.000	1.000	1.000	5.000	1.000
9	4.000	4.000	3.000	4.000	4.000	4.000	3.000	2.000	3.000	4.000	3.000
10	4.000	4.000	1.000	4.000	4.000	4.000	2.000	2.000	2.000	4.000	3.000
11	5.000	5.000	2.000	5.000	4.000	5.000	3.000	3.000	5.000	4.000	4.000
12	5.000	5.000	3.000	4.000	5.000	5.000	4.000	2.000	3.000	4.000	3.000
13	3.000	4.000	3.000	3.000	3.000	3.000	2.000	3.000	1.000	5.000	1.000
14	3.000	3.000	2.000	3.000	3.000	3.000	3.000	3.000	2.000	3.000	1.000
15	4.000	4.000	4.000	5.000	4.000	4.000	3.000	4.000	4.000	5.000	4.000
16	5.000	5.000	5.000	5.000	4.000	5.000	5.000	2.000	5.000	5.000	2.000
17	3.000	5.000	2.000	4.000	5.000	5.000	3.000	2.000	3.000	5.000	2.000
18	5.000	5.000	1.000	5.000	4.000	4.000	1.000	4.000	4.000	5.000	3.000
19	4.000	4.000	5.000	5.000	4.000	5.000	5.000	2.000	2.000	5.000	3.000
20	4.000	5.000	4.000	5.000	4.000	4.000	3.000	3.000	3.000	4.000	2.000
21	3.000	4.000	3.000	5.000	5.000	3.000	2.000	3.000	4.000	4.000	3.000
22	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
23	5.000	5.000	3.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
24	4.000	4.000	4.000	4.000	4.000	4.000	3.000	4.000	4.000	4.000	4.000
25	5.000	5.000	4.000	5.000	4.000	4.000	4.000	5.000	4.000	4.000	5.000
26	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
27	4.000	5.000	2.000	4.000	4.000	4.000	2.000	4.000	4.000	4.000	4.000
28	4.000	5.000	3.000	5.000	4.000	5.000	3.000	3.000	4.000	5.000	3.000
29	2.000	2.000	2.000	2.000	2.000	2.000	1.000	5.000	3.000	3.000	3.000
30	4.000	5.000	2.000	4.000	3.000	4.000	2.000	5.000	3.000	5.000	2.000
31	3.000	5.000	2.000	4.000	3.000	3.000	2.000	3.000	2.000	5.000	2.000
32	5.000	5.000	5.000	5.000	5.000	5.000	5.000	1.000	3.000	5.000	3.000
33	3.000	4.000	1.000	4.000	3.000	4.000	1.000	4.000	4.000	5.000	4.000
34	4.000	5.000	3.000	5.000	4.000	4.000	3.000	3.000	4.000	4.000	3.000
35	5.000	1.000	5.000	5.000	5.000	5.000	5.000	1.000	5.000	5.000	1.000

Analysis of the Path Coefficient Table:

1. **Path Coefficient Representation**:
   o The columns labeled **MB1, MB2, MB3, MB4** likely represent different dimensions or measurements of material comprehension.
   o The columns labeled **PM1, PM2, PM3, PM4** likely represent different dimensions or measurements of satisfaction.
   o Each row corresponds to a specific case (participant or scenario) and contains values that could represent the path coefficients or the strength of the relationship between material comprehension and satisfaction.
2. **Observing Patterns**:
   o **Consistent High Scores**: Some cases (e.g., Case 0, Case 6, Case 15, and Case 35) show consistently high scores across both material comprehension and satisfaction, which suggests that there is a strong, positive relationship between material comprehension and satisfaction in these cases.
   o **Mixed Scores**: Some cases, like **Case 2** and **Case 29**, display lower scores for comprehension (MB columns) and consequently lower scores for satisfaction (PM

columns). This suggests that when material comprehension is low, satisfaction tends to be lower as well.

- o **High Comprehension and Lower Satisfaction**: There are instances (e.g., **Case 5, Case 17, and Case 19**) where comprehension scores are relatively high but satisfaction scores are lower, indicating a possible disconnect between comprehension and satisfaction for these cases.

3. **Hypothesized Relationships**:
    - o Based on this table, we can hypothesize that **higher material comprehension (MB scores)** generally leads to **higher satisfaction (PM scores)**, which is consistent with the path coefficient relationship that is being modeled. However, there are anomalies (e.g., high comprehension but lower satisfaction) that could be explored further in specific cases.

4. **Potential Outliers**:
    - o Some cases show more erratic or inconsistent data (e.g., **Case 9 and Case 14**), where comprehension scores are not uniformly high, yet satisfaction levels remain variable. These could be cases where other factors, such as motivation or external influences, affect satisfaction levels despite comprehension.

The table supports the analysis of the relationship between material comprehension and satisfaction. In most cases, there seems to be a positive correlation: as material comprehension increases, so does satisfaction. However, some cases present irregularities where high comprehension does not always lead to high satisfaction, suggesting that other factors could also play a role in determining overall satisfaction. Further analysis could involve exploring the reasons behind these anomalies, possibly looking at external factors or individual case characteristics.

Discussion

The findings of this study support the notion that online platforms can enhance educational outcomes for Generation Z by fostering social interaction and motivation. However, the results also highlight potential concerns regarding the over-reliance on AI for quick solutions, which may detract from the development of critical thinking and problem-solving skills. While online platforms can improve access to information and provide engaging learning experiences, educators must be mindful of these challenges and work to incorporate strategies that encourage deeper cognitive engagement.

V. Conclusion

This study confirms that online platforms positively influence Generation Z's learning motivation, comprehension of material, and satisfaction with their educational experiences. The results suggest that online platforms, when used effectively, can enhance learning outcomes for Generation Z by providing interactive and socially engaging learning environments.

However, the study also raises concerns about the potential negative effects of AI on students' learning processes. The over-reliance on technology for instant answers may undermine the

development of essential skills such as critical thinking and problem-solving, which are crucial for long-term academic and professional success.

Research Implications and Future Recommendations

The findings of this study have important implications for educators and policymakers. To optimize online learning for Generation Z, it is essential to create a balanced approach that leverages the benefits of digital platforms while mitigating potential drawbacks. Educators should focus on designing online learning experiences that foster active engagement and critical thinking, rather than passive consumption of information.

Future research should explore the long-term effects of AI on Generation Z's cognitive development and investigate strategies to reduce the negative impacts of over-reliance on technology. Additionally, further studies could examine the role of online platforms in developing other skills, such as creativity, collaboration, and leadership, which are critical for success in the digital age.

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