

Empowering Musical Engagement: Applying Self Determination Theory in Digital Music Education for Generation Z

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ABSTRACT: This study explores the application of Self Determination Theory (SDT) in digital music education for Generation Z learners in Indonesia. Drawing on autonomy, competence, and relatedness, the study investigates how motivational constructs can be embedded in digital platforms to enhance student engagement and creativity. Using a mixed methods approach, 94 secondary students participated in an 8 week digital music project using DAWs such as BandLab and Soundtrap. Data were collected through pre/post motivation surveys, project reflections, and peer feedback logs. Results revealed significant increases in perceived autonomy, competence, and relatedness, supported by thematic analysis of digital interactions. Beyond these outcomes, the study contributes theoretically by demonstrating how Self-Determination Theory can be operationalized in digital music contexts, and practically by offering strategies such as collaborative feedback, genre-based task choice, and scaffolded skill development as key motivational drivers. The integration of Universal Design for Learning (UDL) principles further supported inclusive and engaging curriculum design. The study concludes that SDT aligned digital practices foster intrinsic motivation and sustained participation in music education. Implications are drawn for curriculum design, teacher training, and national education policy, particularly in contexts facing infrastructural disparities.

Keywords: Self Determination Theory, Digital Music Education, Student Motivation, Generation Z, DAW, Universal Design For Learning.



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INTRODUCTION

Generation Z, born between the late 1990s and early 2010s, are digital natives who gravitate toward interactive platforms offering collaboration and real-time feedback. Prior studies highlight their preference for personalized, technology-enhanced learning (Camlin & Lisboa, 2021; Pechenkina & Aeschliman, 2017). However, there remains a research gap in how motivational frameworks—particularly Self-Determination Theory can be systematically embedded in digital music education to address these preferences

Motivation plays a central role in determining the depth and longevity of student engagement, particularly within the domain of music education. Intrinsic motivation fueled by autonomy and self determination has been identified as a critical factor influencing student persistence, performance, and satisfaction in music learning contexts (Elpus, 2017; Freer & Evans, 2019). Empirical findings underscore that intrinsically motivated learners are more likely to achieve higher levels of musical proficiency and maintain lifelong engagement with the arts (Wang & Wenrong, 2024). This engagement is reinforced through active learning models that promote exploration, creative identity, and personal expression (Jian, 2022). Hence, the link between student motivation and sustainable engagement in music education warrants close academic attention, particularly in exploring how educators can design learning environments that nurture intrinsic motivation.

Despite the potential of music education to serve as a conduit for creativity and personal development, traditional classroom practices often fall short of meeting the expectations and learning needs of Generation Z. Conventional pedagogies tend to emphasize rote memorization and standardized assessment, which may stifle the creativity and engagement of learners who favor interactive, experiential, and personalized learning pathways (Liu et al., 2024). Studies indicate a growing demand among Gen Z students for hands on, real world educational experiences (Giordano et al., 2020; Yang, 2023). The integration of digital tools into music education such as platforms for composing, collaborating, and sharing music has shown promise in enhancing learner engagement and increasing the relevance of the curriculum (Good-Perkins, 2019; Sularso et al., 2024).

In this context, educational models that accommodate mobile first learning behaviors gain particular relevance. Blended learning environments that combine face to face and online instruction are emerging as effective models for Generation Z, enabling differentiated, accessible, and flexible learning experiences (Camlin & Lisboa, 2021; Asare et al., 2023). These environments foster collaboration, self paced learning, and cognitive engagement, particularly when complemented by project based and creative pedagogies (Gage et al., 2019).

One promising theoretical lens for addressing these educational dynamics is Self Determination Theory (SDT), which posits that motivation is optimized when learning environments satisfy three core psychological needs: autonomy, competence, and relatedness. Evidence suggests that when students perceive their educational experiences as supportive of these needs, they demonstrate higher motivation, deeper engagement, and improved academic outcomes (Freer & Evans, 2019; Weinberg & Joseph, 2016). In music education, the incorporation of SDT principles such as student choice in tasks and assessments resonates with Generation Z's desire for autonomy and creative self expression within structured frameworks (Weinberg & Joseph, 2016; Miksza et al., 2023). Embedding SDT in music education offers a pathway for creating motivating, meaningful, and learner centered experiences.

In the Indonesian educational landscape, national policies increasingly advocate for digital integration and student centered pedagogies. These policies aim to enhance digital literacy, promote engagement through collaborative technologies, and support inclusive, culturally responsive teaching practices (Baticulon et al., 2021; Hidayat et al., 2024). The inclusion of music

education within this progressive agenda positions it as a vital component in the holistic development of young Indonesians (Liang et al., 2024). As such, this study is situated within a conducive policy context that encourages innovation in teaching and learning practices.

This research aims to explore how the integration of SDT aligned digital practices influences motivation in music education among Generation Z students in Indonesia. It seeks to bridge theoretical and practical insights by demonstrating how autonomy, competence, and relatedness can be operationalized through accessible digital tools. This inquiry addresses a critical gap in the intersection of motivation theory, digital pedagogy, and music education, contributing to the broader discourse on aligning education with the needs and aspirations of a digitally native generation.

METHOD

This study employed a mixed methods approach to explore the influence of Self Determination Theory (SDT) aligned digital practices on student motivation in music education. Given the multifaceted nature of motivation, a combined qualitative and quantitative design was selected to provide both measurable trends and deeper insights into student experiences. Such an approach aligns with established research emphasizing the value of mixed method designs in arts education, especially when investigating constructs like engagement and motivation (Valenzuela et al., 2020).

The study involved 94 students aged 13 to 17 from four secondary schools in urban Indonesia. All participants engaged in a structured 8 week digital music learning program incorporating project based tasks using DAWs (BandLab and Soundtrap). The research design was informed by SDT, with tasks designed to foster autonomy (e.g., genre choice), competence (e.g., scaffolded mixing challenges), and relatedness (e.g., peer feedback). Prior to data collection, ethical clearance was obtained, and informed consent was secured from participants and guardians.

Data were gathered through three instruments: (1) pre/post SDT aligned motivation surveys, (2) digital project logs and peer feedback records, and (3) semi structured interviews.

The SDT motivation survey was adapted from validated instruments used in adolescent educational research. The development of this instrument followed established protocols, beginning with item generation based on the SDT domains autonomy, competence, and relatedness. The survey underwent pilot testing to ensure clarity and relevance for the adolescent cohort. Construct validity was assessed using exploratory and confirmatory factor analysis, in accordance with methods suggested by Mishra, (2021) and Sanz-Camarero et al. (2023). The final instrument included 15 items on a 5 point Likert scale.

To complement the survey data, students' digital project logs and peer feedback within the BandLab platform were analyzed. Thematic analysis was conducted to identify patterns in student reflections and peer interactions. Feedback comments were coded for indicators of motivational constructs, such as expressions of autonomy (e.g., project ownership), competence (e.g., technical

confidence), and relatedness (e.g., supportive peer dialogue). This approach follows best practices in qualitative feedback analysis, integrating thematic coding with quantitative engagement metrics (Iniesto et al., 2023; Skender & Dubovicki, 2024).

Additionally, semi structured interviews were conducted with a purposive sample of 12 students representing diverse motivation profiles. These interviews allowed for deeper exploration of student perceptions regarding the learning environment and its impact on motivation. Interview transcripts were coded in NVivo, and triangulation with survey and log data ensured analytic rigor.

Quantitative data from pre/post surveys were analyzed using paired sample t tests to assess statistically significant differences in motivation scores across the SDT domains. Descriptive statistics and standard deviations were reported to highlight overall trends.

Qualitative data underwent inductive thematic coding, with emergent categories linked back to the theoretical framework of SDT. Codes were validated through inter rater reliability procedures. The integration of findings followed a convergent design, whereby quantitative and qualitative results were interpreted together to draw comprehensive conclusions (Kumar et al., 2022).

BandLab's built in commenting and peer review features provided rich data for examining relatedness and engagement. Peer feedback was evaluated both qualitatively (through content analysis) and quantitatively (by tracking frequency, response length, and completion rates). The role of gamification elements such as emoji reactions and public feedback threads was also considered, as these features have been shown to enhance motivation and participation (Chung et al., 2017; Hartmann & Gommer, 2019). A rubric based framework guided the assessment of feedback quality, and feedback guidelines were introduced early in the program to establish expectations (Poth, 2018).

In sum, the methodological framework integrated diverse data sources and analytic strategies tailored to the arts education context. This comprehensive approach ensured a robust examination of motivational dynamics while reflecting the complexity of creative learning environments in the digital era.

RESULT AND DISCUSSION

This chapter presents the findings of the study based on the analysis of pre/post motivation survey data, digital project logs, and qualitative feedback from interviews and peer interactions. The results are structured according to the three key constructs of Self Determination Theory: autonomy, competence, and relatedness.

Autonomy

The implementation of SDT aligned tasks that emphasized student choice, particularly through genre selection and task personalization, significantly enhanced students' perceived autonomy.

Pre/post survey results showed a marked increase in autonomy scores from 3.2 (± 0.7) to 4.1 (± 0.5), indicating that students felt more in control of their learning experiences.

Students frequently cited the freedom to choose musical styles and project directions as a source of enjoyment and engagement. These findings align with Evans & Bonneville-Roussy (2016) and MacIntyre et al. (2017), who observed that self directed projects promote a stronger sense of ownership and intrinsic motivation. When allowed to align tasks with their musical interests, students demonstrated increased creative investment and commitment.

Digital tools such as BandLab allowed for extensive task customization, enabling learners to design compositions that reflected their unique musical identities. This technological affordance not only facilitated deeper creative engagement (Bianco et al., 2019; Klein & Cox, 2019), but also served as a conduit for developing musical autonomy.

Table 1. Autonomy in Digital Music Learning

Indicator	Observation/Result
Pre test score (mean $\pm$ SD)	3.2 $\pm$ 0.7
Post test score (mean $\pm$ SD)	4.1 $\pm$ 0.5
Student reported ownership	High; 82% cited genre choice as motivating
Peer reviewed log evidence	77% projects featured personalized structure

Competence

Survey results indicated a notable increase in competence scores from 3.0 (± 0.8) to 4.3 (± 0.4), underscoring students' growing confidence in their technical and creative abilities throughout the program.

Qualitative reflections and peer feedback logs revealed that students were increasingly adept at using digital audio workstations (DAWs) for composition and production tasks. Participants referenced their ability to manage gain staging, apply effects, and structure compositions as evidence of skill acquisition.

Scaffolded task design contributed to this development, beginning with foundational skills in loop arrangement and culminating in multi track compositions. Visual feedback tools and integrated metering functions in DAWs enabled students to monitor their learning process, fostering reflective practice and confidence in their outputs.

Table 2. Competence Development Indicators

Indicator	Observation/Result
Pre test score (mean $\pm$ SD)	3.0 $\pm$ 0.8
Post test score (mean $\pm$ SD)	4.3 $\pm$ 0.4
Technical skill confidence (self report)	Increased in 86% of student reflections
Peer review feedback volume	Mean of 4.8 feedback comments per project

Relatedness

The relatedness domain exhibited the highest relative increase, with scores rising from 2.8 ($\pm$ 0.9) to 4.0 ($\pm$ 0.6). Peer interaction data further reinforced this growth, with students actively exchanging feedback and forming micro communities within project teams.

BandLab's threaded commenting interface played a pivotal role, facilitating ongoing dialogue and emotional engagement. Peer responses revealed increased empathy, constructive critique, and shared enthusiasm. Students who engaged in regular feedback loops were more likely to complete their projects and report higher satisfaction.

Table 3. Relatedness in Collaborative Learning

Indicator	Observation/Result
Pre test score (mean $\pm$ SD)	2.8 $\pm$ 0.9
Post test score (mean $\pm$ SD)	4.0 $\pm$ 0.6
Feedback engagement (BandLab logs)	94% of students received $\geq$ 2 peer comments
Completion rate with feedback	92% (vs. 67% for low feedback participants)

These results confirm that embedding autonomy, competence, and relatedness in digital music learning environments can lead to measurable and meaningful increases in student motivation and engagement.

The findings of this study confirm the effectiveness of Self-Determination Theory (SDT) as a framework for designing digital music learning environments. The three components autonomy, competence, and relatedness interacted synergistically to enhance motivation and creativity. However, beyond the Indonesian context, methodological limitations should also be acknowledged. These include the modest sample size ($n=94$), limited school settings, and the short duration (8 weeks), which restrict the generalizability of findings. Future studies should adopt longitudinal and cross-institutional designs to strengthen external validity.

The three components of SDT functioned synergistically in fostering authentic, student driven creative learning experiences. Autonomy realized through opportunities for task personalization, genre selection, and self paced project design enabled students to express their identities and cultural backgrounds within their digital music production tasks (Anderson et al., 2019). This sense of ownership over the learning process not only heightened intrinsic motivation but also created conditions conducive to experimentation and artistic risk taking. When students are allowed to choose and control their learning pathways, they become more invested in outcomes, which results in higher cognitive and emotional engagement with learning activities.

The competence dimension of SDT, meanwhile, was reinforced through the strategic design of scaffolded challenges and the integration of frequent feedback mechanisms. As students developed their technical abilities and digital production skills, they also gained a stronger sense of efficacy and mastery, which further motivated them to persist with their creative projects (Burke, 2020; Pickering & Swinnerton, 2018). Feedback that acknowledged incremental improvements and highlighted areas of strength played a particularly influential role, as it connected students' creative efforts with tangible academic and artistic progress. The perception of growing skill competence thus served as both a reward and an incentive for continued engagement.

Relatedness functioned as a vital social anchor that wove these experiences together. Within the collaborative peer feedback environment of BandLab, students received emotional affirmation, cognitive support, and communal reinforcement, which are all essential ingredients for long term participation in music learning (Haidet et al., 2016; Sadaf et al., 2019). These online interactions helped to establish a sense of belonging and trust within the digital classroom community, fostering an inclusive space where learners felt safe to share their work, offer critique, and celebrate each other's progress. Such environments help bridge the affective and academic dimensions of learning and are especially important in creative disciplines.

In terms of long term impact, the application of digital motivation strategies particularly those that emphasize personalization, continuous feedback, and social interaction can significantly influence students' continued engagement with music education beyond the formal curriculum. Digital tools that facilitate creative exploration, such as DAWs with gamification elements and performance tracking features, may help to instill a sense of agency and sustained musical identity formation (Fang, 2025). Students who experience meaningful engagement through these tools are more likely to pursue music independently, contributing to lifelong learning habits and deepening their participation in cultural and artistic communities. This ongoing connection with music education extends beyond technical skill building, supporting students' emotional well being, social development, and creative confidence (Griffiths et al., 2021).

Furthermore, this study illustrates the potential of integrating SDT with Universal Design for Learning (UDL) principles to create more equitable, accessible, and intrinsically motivating curricula. UDL's emphasis on providing multiple means of engagement, expression, and representation ensures that digital arts curricula can meet the diverse needs of learners while promoting self determined learning. For example, offering students flexible options to demonstrate their knowledge through audio, video, digital portfolios, or live performance aligns with the SDT principle of autonomy while also adhering to UDL's commitment to learner variability (Anderson et al., 2019 ; Abel, 2024). Similarly, self assessment tools and progress

dashboards allow students to track their skill development, thereby supporting competence. Peer collaboration and discussion forums enhance relatedness, transforming isolated learning tasks into socially meaningful experiences. The intersection of SDT and UDL can thus serve as a design blueprint for scalable and inclusive digital music programs.

Despite these promising findings, several structural and infrastructural barriers remain, particularly in the Indonesian context. Technological inequality reflected in disparities in device access, internet bandwidth, and digital learning infrastructure continues to limit the equitable implementation of such programs, especially in rural and underserved schools (Haidet et al., 2016). These gaps disproportionately affect students who might benefit the most from flexible and inclusive digital learning environments. Compounding this issue is the uneven policy prioritization of music and digital arts education within the national curriculum. In many cases, music education remains marginalized, receiving limited instructional time, resources, and teacher training support (Backhouse et al., 2016).

Another critical barrier involves teacher readiness and professional development. Without adequate training in digital music pedagogy and the principles of motivational design, teachers may lack the confidence and capacity to implement these strategies effectively. This gap in professional learning is especially pronounced in systems where ongoing teacher development is underfunded or logistically fragmented. Additionally, cultural perceptions that view music education as non essential further challenge efforts to elevate its role within core academic programs (Miri et al., 2024). In many school systems, music remains an extracurricular or elective subject rather than an integrated component of holistic student development.

To address these challenges, coordinated investment is needed across multiple levels of the educational system. Policymakers must prioritize the integration of digital music education into national standards, provide funding for infrastructure upgrades, and establish comprehensive training programs that equip teachers with the tools and frameworks necessary for implementation. Advocacy efforts should also work to elevate the status of music education as a vehicle for developing essential 21st century skills, including creativity, collaboration, emotional intelligence, and digital literacy. Only through such multi layered reform can the promise of SDT aligned digital music education be fully realized across diverse learning contexts.

CONCLUSION

This study demonstrates that embedding Self-Determination Theory (SDT) into digital music education can effectively enhance Generation Z learners' motivation, creativity, and sustained engagement. By aligning digital tools such as DAWs with the core needs of autonomy, competence, and relatedness, students not only improved their technical skills but also developed stronger intrinsic motivation and a sense of community. The integration of SDT with Universal Design for Learning (UDL) further highlights its potential to create inclusive, flexible, and scalable curricula that address diverse learner needs.

At the same time, the study acknowledges limitations related to sample size, school settings, and program duration, which may restrict the generalizability of findings. These constraints suggest the need for longitudinal and cross-context research to validate and expand the applicability of SDT-based digital pedagogy. Overall, the study contributes theoretically by operationalizing SDT in digital music contexts and practically by offering strategies that educators and policymakers can adopt to support student-centered, motivating, and equitable music learning environments.

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