Effects of Vocational Students' after-School Use of YouTube on Painting Learning Performance: The Roles of Motivation and Media Engagement

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***Abstract*—With the advancement of digital technology, YouTube has become a global video platform that not only offers rich entertainment content but also serves as an important source of supplementary learning for students. Its flexible, self-directed, and visualized learning features enable students to pursue learning based on their individual interests and needs. However, few studies have examined how YouTube is utilized in vocational high school art education, especially in the field of advertising design. The lack of empirical evidence on how specific types of learning motivation interact with media usage behaviors to influence creative skill acquisition represents a notable research gap. In Taiwan, drawing skills and creative expression are considered core competencies for students enrolled in vocational advertising design programs. Whether using YouTube to view drawing-related content during after-school hours can effectively enhance students' learning performance is a topic worthy of investigation. This study aims to explore Taiwanese vocational high school students' learning motivation for viewing drawing-related videos on YouTube, as well as to examine the impact of their after-school YouTube usage behavior on drawing learning performance. Furthermore, it investigates whether such behavior moderates the relationship between learning motivation and learning performance. A questionnaire survey was conducted among students from a vocational advertising design program at a vocational high school in Taiwan, and the collected data were analyzed statistically. The results indicate that both expectancy motivation and volitional motivation have a significantly positive impact on students' drawing learning performance. Additionally, after-school YouTube usage was found to moderate the relationship between emotional motivation and learning performance. These findings contribute to the understanding of how media platforms can support creative education in vocational settings and offer insights for educators and curriculum designers to better integrate digital resources into skill-based instruction.**

***Keywords*—vocational high school students, drawing learning performance, after-school YouTube use, learning motivation, media engagement**

I. Introduction

With the rapid advancement of technology and the internet, learning has evolved from the era of information digitization to an era characterized by cloud-based and media-integrated education. Online media platforms have become essential tools in modern learning environments. According to recent studies, such platforms not only enhance access to educational resources but also transform students' perceptions of and engagement with learning [1, 2]. As digital natives, adolescents are highly familiar with various online platforms and multimedia content, and their learning behaviors are deeply influenced by developments in information and communication technologies [3].

Although younger generations are often assumed to be naturally adept at using digital tools due to growing up in technology-rich environments, this generalization has been widely challenged. Brown and Czerniewicz [4] argue that the concept of "digital natives" oversimplifies the diversity of students' digital skills and falsely attributes competence solely to age. Instead, students' media habits and technological proficiency are shaped more by their access, prior experience, and learning environments than by generational identity. Therefore, it is more accurate to consider how students' exposure to digital technologies and the nature of their educational settings influence their learning behavior and digital engagement.

YouTube, the world's largest video-sharing platform, hosts a wide range of open-access content that includes instructional videos, tutorials, and creative showcases [5]. Its engaging, visual, and flexible format has made it a popular supplementary learning tool among students. However, despite its popularity, students' actual use of YouTube for educational purposes remains limited, raising questions about how such behavior relates to skill development in creative domains.

Recent surveys have shown that YouTube is one of the most frequently used platforms by adolescents worldwide. In Taiwan, more than 85% of high school and vocational students watch YouTube daily, and approximately 62% spend over one hour per day on the platform [6]. However, studies indicate that only a small proportion of students actively use YouTube for instructional purposes, with educational or tutorial content accounting for less than 10% of their total viewing time [7]. This highlights an important research gap. Prior studies have demonstrated that visual-based platforms like YouTube can enhance learning in creative subjects by offering process-oriented demonstrations and fostering observational learning [8, 9]. However, the effectiveness of such platforms is often influenced by the learner's self-regulation ability and access to guided feedback [10]. In the context of vocational education, students often face challenges such as insufficient classroom time for practice, varying levels of foundational skills, and limited opportunities for one-on-one instructor feedback [11]. These issues may hinder the development of drawing proficiency, particularly when formal instruction alone cannot accommodate individualized pacing and needs. While many vocational high school students frequently use

YouTube after school, it remains unclear whether and how such usage contributes to their drawing learning performance. For advertising design students, whose creative and technical skills require continuous practice beyond formal instruction, understanding this relationship is essential.

For vocational high school students in advertising design programs, drawing skills and creative thinking are essential core competencies. In addition to formal instruction, extended learning during after-school hours plays a critical role in skill development. As more creators in the fields of illustration and design have launched YouTube channels to freely share practical tutorials, students now have greater opportunities to engage in self-directed learning outside the classroom. However, not all students demonstrate the same patterns of media use or motivation. Whether differences in after-school YouTube usage behavior lead to measurable differences in learning outcomes remains an important issue for further investigation.

Therefore, this study aimed to examine the learning motivation of vocational advertising design students in Taiwan for watching drawing-related videos on YouTube, to analyze the effects of after-school YouTube usage behavior on their drawing learning performance, and to explore whether such behavior moderates the relationship between learning motivation and learning performance.

II. Literature Review

A. Online Media-Assisted Learning

With the rapid advancement of information technology, the use of online media to support learning has become a significant topic in the field of education. Online media, as tools for information transmission and learning, enable students to construct knowledge, grasp subject matter concepts, and facilitate interdisciplinary learning [3]. Through online platforms, students can easily access a wide range of educational resources, thereby enhancing their autonomy and initiative in the learning process [12]. Many studies have shown that online media offer various advantages in education. They provide flexible learning schedules that allow students to learn at their own pace and leverage multimedia content to stimulate learning interest and motivation [13–15]. In addition, online platforms can offer real-time feedback and personalized learning support, which contribute to improved learning performance [16].

YouTube has emerged as a key vehicle for media-assisted instruction, offering diverse educational content such as tutorials, academic explanations, and skill demonstrations. Its visual and auditory features help make abstract concepts more concrete and comprehensible [17, 18], while its flexibility allows learners to control their pace, revisit materials, and personalize their learning according to individual needs [15]. Moreover, interactive functions such as video comments and content sharing foster peer communication and collaborative learning [9, 19]. These affordances have made YouTube an increasingly valuable tool in supporting self-directed learning, especially in creative fields.

YouTube also offers diverse formats of instructional content, including animations, hands-on demonstrations, and expert talks, which can cater to learners' varying preferences and cognitive needs. This variety enhances learning engagement and supports personalized pacing and review. However, YouTube's educational value largely depends on how students use the platform. Without guidance, students may prioritize entertainment over instruction. To maximize learning benefits, educators can play a key role by curating high-quality educational videos, integrating them into instructional planning, and providing contextual support. This ensures both the relevance and quality control of the content, making YouTube a more effective and targeted tool for skill-based learning.

Existing studies have consistently demonstrated that YouTube can enhance learners' motivation, comprehension, and overall learning outcomes in various disciplines [9, 12, 19]. However, most prior research has either focused on general populations or investigated the platform's potential benefits in conceptual knowledge acquisition. Few empirical studies have examined how YouTube is used by vocational high school students for skill-based learning, such as drawing, and whether differences in their after-school usage behaviors lead to measurable differences in learning outcomes. This gap is particularly significant given that vocational students often rely on after-school learning opportunities to strengthen their practical skills.

B. Learning Motivation

Learning motivation refers to the internal drive and psychological state that prompts learners to engage in learning activities [20–22]. It is a mental process that initiates, sustains, and directs a learner's participation in learning tasks toward specific goals [23, 24]. Learning motivation reflects the learner's willingness to engage in and commit to educational experiences, which in turn influences the direction and intensity of their learning efforts. Because students' self-perceptions during the learning process often determine the effectiveness of their learning and predict performance outcomes, learning motivation is typically assessed from a cognitive-psychological perspective [22, 25].

Pintrich *et al.* [24] proposed the expectancy-value theory model, which classifies learning motivation into three dimensions: value motivation, expectancy motivation, and affective motivation. Each dimension plays a critical role in shaping students' learning attitudes and performance.

Value motivation refers to the learner's reasons and beliefs for engaging in learning, primarily encompassing goal orientation and task value. Goal orientation can be further divided into intrinsic and extrinsic types. Intrinsic goal orientation involves learning driven by interest, curiosity, or challenge, while extrinsic goal orientation is driven by external rewards such as praise or compensation [26]. Task value includes the perceived importance, interest, and utility of the learning content [27]. A student's valuation of learning activities directly affects their persistence and engagement. Greater interest enhances attention and memory, and high utility value increases willingness to participate in related tasks.

Expectancy motivation focuses on the learner's expectations of success or failure in learning. It comprises control beliefs, self-efficacy beliefs, and expectancy for success [22, 28]. Control beliefs affect how students attribute

learning outcomes. Learners with strong internal control beliefs attribute success or failure to their own effort and ability, while those with external control beliefs may attribute outcomes to luck or environmental factors [29]. Self-efficacy beliefs relate to learners' confidence in their ability to complete learning tasks [30]. High self-efficacy is associated with persistence and optimism, whereas low self-efficacy may lead to anxiety and lack of motivation. Expectancy for success influences students' confidence in achieving academic goals and is closely related to their learning persistence and future career decisions [31].

Affective motivation pertains to learners' emotional responses to academic tasks, including test anxiety, emotional reactions to performance, and self-evaluations of learning competence [32]. Learners' self-esteem and perceived self-worth can shape their attitudes toward learning [33]. Positive self-perceptions foster higher motivation, while lack of confidence may result in anxiety and avoidance of learning activities [34].

C. Learning Outcomes

Learning outcomes refer to the changes in students' knowledge, skills, and attitudes that occur as a result of participating in specific learning activities or instructional processes. They serve as one of the most essential indicators for evaluating both instructional effectiveness and academic achievement. The concept of learning outcomes emphasizes the substantive change from a learner's "initial behavior" to their "resultant behavior," functioning not only as a metric for quantifying learning performance but also as a foundation for students' self-regulation and for instructors to refine their teaching approaches [35]. In practical teaching contexts, effective assessment of learning outcomes enables educators to monitor students' progress and facilitates a more responsive and iterative teaching–learning cycle [36, 37].

Research has shown that learning motivation is a key psychological factor influencing learning outcomes. When students hold strong expectations and value beliefs toward their learning activities, they are more likely to exert sustained effort and engage deeply in the learning process, resulting in improved knowledge acquisition and skill development [38, 39]. Guo and Wu [40] indicated that learning motivation is positively correlated with learning satisfaction, which, in turn, acts as a significant mediator of learning achievement. Lo *et al.* [41] found that higher expectancy components of motivation lead to stronger predictive effects on learning outcomes. Similarly, Agustina *et al.* [42] argued that highly motivated learners tend to exhibit a strong desire to learn, set clear learning goals, and demonstrate persistence—factors that collectively contribute to more effective learning outcomes.

In the context of vocational education, learning outcomes extend beyond conceptual understanding to encompass the acquisition of practical skills and the development of creative expression [43]. For example, in advertising design courses, students' mastery of basic drawing techniques, understanding of composition principles, and ability to visually communicate creative ideas are all regarded as essential indicators of learning achievement. Such competencies not only impact students' academic performance but also directly influence their future employability in the creative industry.

The growing integration of digital media resources in recent years has significantly affected students' learning outcomes. Platforms like YouTube, characterized by visual content and learner autonomy, offer opportunities for repeated viewing and modeled practice, thereby facilitating the internalization of skills. By watching drawing tutorials during after-school hours, students can practise at their own pace and engage in observational learning, which helps improve their technical proficiency and creative application abilities [44]. Consequently, the extent to which students' motivation drives their after-school use of YouTube for supplementary learning may play a critical moderating role in the enhancement of their learning outcomes.

In sum, learning outcomes are indispensable indicators in the teaching–learning process. They are influenced not only by internal factors such as motivation but also by students' proactive engagement with external resources like online media. In particular, different types of learning motivation—such as expectancy (belief in success), volitional (effort and persistence), and emotional (interest and enjoyment)—can distinctly influence learners' willingness to engage with educational content. On the other hand, media engagement, including behaviors such as selective video searching, active note-taking, and repeated viewing of drawing tutorials, plays a pivotal role in reinforcing skill acquisition and shaping self-directed learning habits. Yet, little is known about how students' learning motivation interacts with their after-school use of YouTube to shape their performance in drawing-related courses, especially in the context of vocational education. Investigating this relationship can provide deeper insights into learners' behavioral mechanisms and offer empirical guidance for instructional design and learning strategy development.

III. Methodology

A. Research Framework and Hypotheses

For students in vocational advertising design programs, drawing ability is a fundamental and essential skill. The program places great emphasis on students' creative performance and level of engagement. The primary purpose of this study is to investigate vocational high school students' learning motivation and learning outcomes in the context of drawing instruction. Furthermore, it aims to explore whether students' after-school use of YouTube, an online media platform rich in visual learning content, contributes to enhancing their learning motivation and improving their learning outcomes in drawing. The research framework is illustrated in Fig. 1. Based on this framework, the following hypotheses are proposed:

1) Direct effects

- H1: Students' learning motivation in drawing has a significant positive effect on their drawing learning outcomes.
- H1-1: Students' value motivation in drawing has a significant positive effect on their drawing learning outcomes.
- H1-2: Students' expectancy motivation in drawing has a significant positive effect on their drawing learning outcomes.

- H1-3: Students' affective motivation in drawing has a significant positive effect on their drawing learning outcomes.
- H1-4: Students' volitional motivation in drawing has a significant positive effect on their drawing learning outcomes.
- H2: Students' after-school use of YouTube has a significant positive effect on their drawing learning outcomes.

2) Moderating effect

- H3: Students' after-school use of YouTube positively moderates the relationship between their learning motivation and drawing learning outcomes.

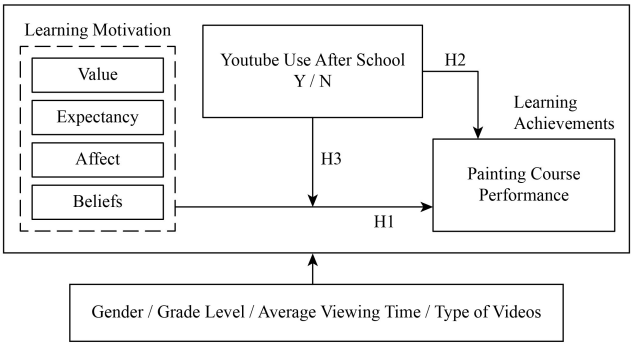

Fig. 1. Research framework.

B. Participants and Research Instruments

This study targeted students from the Advertising Design Department at a vocational high school in Taiwan. A purposive sampling method was adopted for questionnaire distribution and data collection. A total of 180 questionnaires were distributed equally among first-, second-, and third-year students (60 per grade level). Of these, 147 valid responses were collected, resulting in an effective response rate of 81.67%.

Although purposive sampling was used, the selection encompassed all three grade levels within the Advertising Design Department to ensure diversity across different stages of vocational training. This approach increases the likelihood of capturing variations in student experiences and learning behaviors. The sampled school is known for its specialization in design education and enrolls a demographically diverse student body, which enhances the generalizability of the findings within similar vocational contexts. The collected data include both categorical variables (e.g., gender, grade level, video usage patterns) and continuous variables (e.g., Likert-scale motivation scores and course grades). These variables were designed to meet the assumptions of parametric statistical analyses, such as correlation and regression, ensuring the appropriateness of subsequent inferential procedures.

Drawing on the classifications proposed in relevant literature [9, 23, 24, 45], learning motivation in this study was divided into four dimensions: value motivation, expectancy motivation, affective motivation, and volitional motivation. Value motivation refers to students' perceptions of the importance and utility of using the YouTube platform for learning. Expectancy motivation denotes students' expectations regarding the likelihood of successfully learning via YouTube. Affective motivation concerns students' emotional responses toward using YouTube for learning purposes. Volitional motivation represents students' ability to translate their intention to use YouTube for learning into action.

Learning outcomes are often used to evaluate students' responses to digital learning activities, as well as the resulting behavioral and cognitive changes [36, 46]. In this study, students' drawing course grades for the current semester were used as the measure of their drawing learning outcomes. The questionnaire was composed of two main parts. The first part collected basic demographic and behavioral data, including gender, grade level, whether the student used YouTube during after-school hours, average viewing time, and preferred video types (five items in total). The second part assessed learning motivation. Based on the framework proposed by Liu *et al.* [45], the learning motivation scale included four dimensions—value, expectancy, affective, and volitional motivation—and consisted of 35 items in total. A five-point Likert scale was used to measure students' motivation toward the drawing course. The internal consistency of the questionnaire, as indicated by Cronbach's alpha, was 0.96, demonstrating high reliability. To provide a clearer overview of the questionnaire structure and content, Table 1 presents the main components of the instrument, including item counts, construct dimensions, and example items.

Table 1. Questionnaire structure and content overview

Part	Subscale / Dimension	Number of Items	Example Item (translated)	Scale
Part I	Demographic & Behavioral	5	"Do you use YouTube after school?" / "What types of videos do you watch on YouTube?"	Multiple Choice / Categorical
Part II	Value Motivation	7	"I think it is important to watch drawing-related instructional videos on YouTube".	5-point Likert (1–5)
	Expectancy Motivation	6	"I believe I can continue to perform well in drawing classes".	5-point Likert (1–5)
	Affective Motivation	11	"I enjoy learning to draw by watching YouTube videos".	5-point Likert (1–5)
	Volitional Motivation	11	"Even when I'm tired, I will push myself to finish watching the entire drawing tutorial on YouTube".	5-point Likert (1–5)
	Total	**35**		

To ensure the content validity of the instrument, the questionnaire items were reviewed by three experts in the fields of art and design education and educational psychology. These experts evaluated whether each item appropriately reflected the intended construct (value motivation, expectancy motivation, affective motivation, and volitional motivation) and provided feedback on item clarity and relevance. Minor revisions were made based on their suggestions to improve the precision and comprehensibility of the questionnaire items. Combined with the high internal consistency (Cronbach's alpha = 0.96), these procedures ensured the reliability and validity of the instrument.

C. Research Procedure

To clarify the stages of this study, Fig. 2 illustrates the full research procedure, encompassing research design, expert validation, data collection, statistical analysis, and interpretation of findings. This structured approach ensures that each phase of the study, from the development of research instruments to the execution of data analysis, is conducted rigorously and systematically.

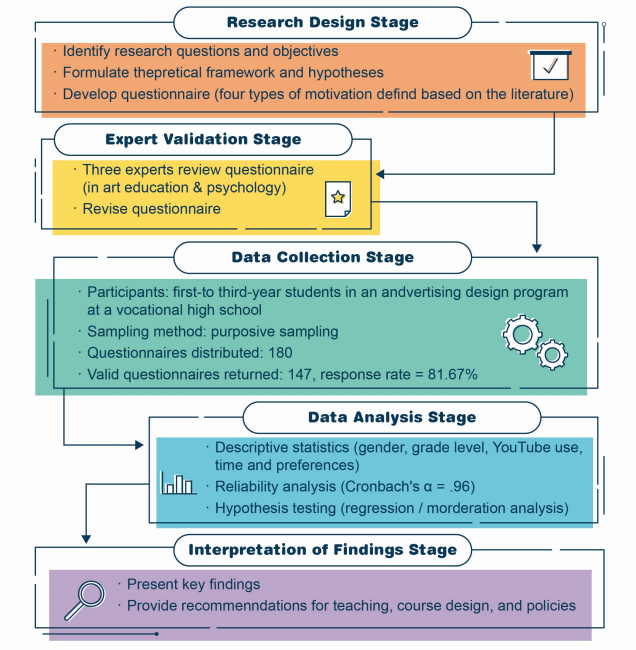

Fig. 2. Research procedure flowchart.

IV. Results and Discussion

This section presents the results of the quantitative analysis, which aimed to explore how students' learning motivation and after-school YouTube usage are related to their drawing learning outcomes. The analyses include descriptive statistics, group comparisons, and regression testing of the proposed hypotheses.

This study employed a quantitative research approach. For data analysis, SPSS statistical software was used to perform statistical computations and hypothesis testing. To examine whether students' perceptions of learning motivation and learning outcomes differed across demographic variables, independent sample analyses were conducted. Additionally, regression analysis was used to investigate the relationships among variables and to verify the proposed research hypotheses. Table 2 presents the descriptive statistics of the four subdimensions of learning motivation (value, expectancy, affective, and volitional), as perceived by the vocational high school students.

Table 2. Descriptive statistics of subdimensions of learning motivation

Construct	Mean
Learning Motivation	3.91
Value	4.06
Expectancy	2.80
Affect	3.86
Volitional	3.53

Based on the questionnaire data collected, this study analyzed whether students from the vocational advertising design program exhibited significant differences in their perceptions of value motivation, expectancy motivation, affective motivation, volitional motivation, and drawing learning outcomes across various background variables. Independent-samples *t*-tests were conducted to examine differences based on gender, while one-way ANOVA was applied to analyze differences by grade level, average YouTube viewing time, and preferred video type. When significant differences were identified, Scheffé post hoc tests were performed to further explore the nature of the group differences.

Results of the *t*-test for gender differences are shown in Table 3. The analysis revealed no significant gender differences in students' perceptions of value motivation, expectancy motivation, affective motivation, or volitional motivation. However, a statistically significant difference was found in drawing learning outcomes between male and female students. Specifically, the *t*-value was 4.272 ($p < 0.001$), indicating that female students demonstrated significantly higher learning outcomes than their male counterparts.

Table 3. Independent samples t-test analysis of students by gender

Construct	Gender	N	Mean	SD	*t*
Value	M	47	4.01	0.652	0.552
	F	99	3.95	0.543	
Expectancy	M	47	3.36	0.760	0.231
	F	99	3.39	0.612	
Affect	M	47	3.72	0.650	0.585
	F	99	3.66	0.583	
Volitional	M	47	3.31	0.695	1.322
	F	99	3.16	0.639	
Learning Achievements	M	47	2.70	1.397	4.272***
	F	99	3.61	1.086	

Note: $^{***}p < 0.001$

To examine the effects of learning motivation on students' drawing performance, a hierarchical regression analysis was designed in three steps based on the research framework. Step 1 (Model 1): The direct effects of the four dimensions of learning motivation (value, expectancy, affective, and volitional) on learning outcomes were tested. Step 2 (Model 2): The independent effect of after-school YouTube usage on drawing performance was examined. Step 3 (Model 3): An interaction-term regression analysis was conducted to investigate whether after-school YouTube usage moderates the relationship between learning motivation and learning outcomes. Interaction terms between each motivation dimension and YouTube usage were included to evaluate whether the strength of the relationship varied depending on students' engagement with YouTube.

The regression models were established as follows:

1) Model 1: Learning Outcomes = $a + b_1 \times$ (Value Motivation) $+ b_2 \times$ (Expectancy Motivation) $+ b_3 \times$ (Affective Motivation) $+ b_4 \times$ (Volitional Motivation)
2) Model 2: Learning Outcomes = $a + c \times$ (After-School YouTube Use)
3) Model 3: Learning Outcomes = $a + b_1 \times$ (Value Motivation) $+ b_2 \times$ (Expectancy Motivation) $+ b_3 \times$ (Affective Motivation) $+ b_4 \times$ (Volitional Motivation) $+ c \times$ (After-School YouTube Use) $+ d_1 \times$ (Value Motivation × YouTube Use) $+ d_2 \times$ (Expectancy Motivation × YouTube Use) $+ d_3 \times$ (Affective Motivation × YouTube Use) $+ d_4 \times$ (Volitional Motivation × YouTube Use)

A. The Influence of Learning Motivation on Learning Outcomes

A multiple regression analysis was conducted to examine the effects of the four dimensions of learning motivation—value motivation, expectancy motivation, affective motivation, and volitional motivation—as predictor variables, with learning outcomes as the criterion variable.

As shown in Model 1 of Table 4, the *F*-value for the overall regression model was 5.826 ($p < 0.001$), indicating that the model explained a statistically significant amount of variance in learning outcomes. Among the four motivational dimensions, expectancy motivation ($\beta = 0.338$, $t = 3.404$, $p < 0.01$) and volitional motivation ($\beta = 0.230$, $t = 2.331$, $p < 0.05$) were found to significantly and positively predict learning outcomes. Therefore, Hypothesis H1-2 and Hypothesis H1-4 were supported. These findings suggest that students with stronger expectations of learning success and greater persistence in watching drawing-related YouTube videos tend to perform better in their drawing courses. In contrast, value motivation ($\beta = 0.043$, $t = 0.525$, $p > 0.05$) and affective motivation ($\beta = –0.086$, $t = –1.096$, $p > 0.05$) did not have significant effects on learning outcomes. Accordingly, Hypothesis H1-1 and Hypothesis H1-3 were not supported. Taken together, these results partially support Hypothesis H1, indicating that only expectancy motivation and volitional motivation are significant predictors of drawing performance among vocational high school students.

Table 4. Results of the regression analysis

Predictor Variables	Learning Achievements		
	Model 1	Model 2	Model 3
Value	0.098		0.465
Expectancy	0.338***		0.180
Affect	0.181		1.258***
Volitional	0.223*		0.141
Youtube Use After School		0.033	1.107*
Value * Youtube Use After School			0.988
Expectancy * Youtube Use After School			1.001
Affect * Youtube Use After School			2.603**
Volitional * Youtube Use After School			0.677
R^2	0.141	0.001	0.228
F	5.826***	0.157	4.498***

Note: *$p<0.05$; ***$p<0.001$; The values in the table are standardized regression coefficients (β)

B. The Influence of after-School Use of YouTube on Learning Outcomes

To examine the direct effect of after-school YouTube usage on learning outcomes, a regression analysis was conducted with after-school use of YouTube as the predictor variable and drawing learning outcomes as the criterion variable. As shown in Model 2 of Table 4, the F-value for the regression model was 0.157 ($p > 0.05$), indicating that the model did not reach a statistically significant level of explained variance. Therefore, the effect of after-school YouTube usage on learning outcomes was found to be not significant, and Hypothesis H2 was not supported.

Although the statistical results did not support a direct positive relationship, this finding provides important insights into the broader research framework. According to the model, media engagement, which is represented by after-school YouTube use, was hypothesized to serve as both an independent and a moderating variable. The non-significant result in this model suggests that using YouTube after school by itself does not guarantee improved drawing performance. Instead, its impact may depend on the type and quality of motivation students bring to the learning process. This aligns with the theoretical underpinnings of the framework, which emphasizes the interaction between learner motivation and media engagement. Specifically, while YouTube offers abundant visual and instructional content, passive consumption without strong volitional or affective motivation may limit its educational benefit. Thus, after-school media engagement must be accompanied by meaningful self-regulation and goal-directed learning behavior to positively influence outcomes.

Taken together, these results suggest that after-school YouTube use should be considered a contextual factor that, in isolation, may not significantly affect performance. However, its potential value lies in how it interacts with learners' intrinsic drive and emotional engagement, which is further explored in the moderation analysis in Model 3.

C. Moderating Effect of after-School Use of YouTube

To examine the moderating effect of after-school use of YouTube, an interaction-term regression analysis was conducted to test whether the interaction between learning motivation and YouTube usage significantly affected learning outcomes. As shown in Model 3 of Table 4, the *F*-value for the overall model was 4.498 ($p < 0.001$), indicating that the model accounted for a significant proportion of the variance in learning outcomes. Among the predictors, affective motivation ($t = 3.219$, $p < 0.01$), after-school YouTube use ($t = 2.229$, $p < 0.05$), and the interaction term affective motivation × YouTube use ($t = 2.961$, $p < 0.01$) all reached statistical significance. These results suggest that after-school YouTube use strengthens the relationship between affective motivation and drawing learning outcomes. In other words, students who exhibit higher affective motivation and frequently engage with YouTube content outside of class tend to demonstrate enhanced drawing performance, likely due to improved emotional engagement with the learning process. Accordingly, Hypothesis H3, which proposed that after-school YouTube use positively moderates the relationship between learning motivation and drawing learning outcomes, was partially supported.

V. Discussion

This study had several limitations that warrant consideration. First, it employed a convenience sampling method, targeting advertising design students from a single vocational high school. While this approach ensured relevance to the research context, it limited the generalizability of the findings to broader populations. Data collection relied exclusively on quantitative methods, specifically questionnaire responses and students' course grades. Although the instrument was evaluated for content validity by three experts and demonstrated high internal consistency, respondents' potential misinterpretation of questionnaire items may have influenced the accuracy of the results. Additionally, for the sake of efficiency and feasibility, the research was confined to the researcher's affiliated institution, which may further constrain the applicability of the findings to other contexts. Moreover, drawing learning

outcomes were measured solely based on students' course grades. While grades provide a general indication of performance, they may not fully capture the nuances of students' creative processes, specific skill development, or the quality of their artistic outputs. Relying on grades as the only indicator risks overlooking incremental progress and critical aspects of the learning process.

Despite these limitations, this study contributes meaningful insights into how learning motivation and YouTube engagement influence learning performance in the context of drawing education. The analysis results showed that the overall mean score for learning motivation was 3.91, indicating that vocational high school students in the advertising design program generally agreed with the learning motivation items. Among the four dimensions, value motivation had the highest mean score, suggesting that students widely recognized the value of watching instructional videos on YouTube. In other words, YouTube was perceived as a useful and important learning resource among the respondents. Additionally, a significant gender difference was found in learning outcomes, with female students outperforming male students in drawing-related performance.

The results of the regression analysis revealed that expectancy motivation and volitional motivation had significant positive effects on drawing learning outcomes. This finding is consistent with previous research, which has shown a positive relationship between learning motivation and learning performance [2, 47]. Expectancy motivation refers to students' belief in their likelihood of success when using YouTube as a learning tool. A higher expectation of success can strengthen positive beliefs and thereby improve learning outcomes. Volitional motivation reflects the student's ability to put their intentions into practice, that is, to actively engage in learning via YouTube. Such deliberate use and accumulated experience may lead to noticeable learning effects over time.

However, after-school YouTube usage did not have a significant direct effect on learning outcomes. According to the questionnaire results, only 8.2% of students reported watching instructional videos regularly. Therefore, analyzing learning outcomes solely based on whether students used YouTube outside of class may not sufficiently capture the learning experiences of those who purposefully engage with instructional content. Although YouTube is one of the most popular media platforms among adolescents, the descriptive statistics from this study indicated that the proportion of students who actively used YouTube for instructional purposes (e.g., drawing tutorials) was relatively low. One possible explanation is that students may primarily perceive YouTube as a platform for entertainment rather than formal learning, resulting in limited intentional use for skill development [48]. Another explanation could be the lack of teacher guidance or recommended channels, which may reduce students' confidence in selecting high-quality instructional content. This pattern is consistent with prior research suggesting that students tend to default to entertainment-oriented content unless explicit scaffolding is provided to support purposeful learning [12].

The interaction-term regression analysis revealed a significant interaction between affective motivation and after-school YouTube use, indicating that YouTube usage can enhance the relationship between affective motivation and learning outcomes. Students who use YouTube outside of class may experience greater emotional engagement, which can improve their creative expression and drawing performance. The moderating effect of YouTube usage suggests that students may recognize the usefulness of searching for specific content to enhance learning enjoyment, which in turn can improve learning effectiveness. When encountering difficulties in learning drawing techniques, YouTube offers a flexible and accessible environment, allowing students to learn anytime and anywhere, thereby potentially improving long-term practical performance.

VI. Conclusion

Based on the findings of this study, two key directions for future work emerge. First, the relatively low rate of students' intentional use of YouTube for learning purposes underscores the need for structured guidance and media literacy interventions. Second, more nuanced assessments of drawing learning performance, such as incorporating qualitative evaluations in addition to course grades, are required to better capture students' creative development and skill mastery. For researchers, future studies should consider replicating this research across different institutions, disciplines, and regions to enhance generalizability and validate the current findings. Combining quantitative and qualitative approaches is also encouraged to deepen understanding of the learning processes involved. For learners, it is recommended that students take initiative in identifying and using high-quality educational content on YouTube and develop media literacy skills that allow them to distinguish between entertainment and instructional materials. For educators, particularly those in vocational and creative disciplines, integrating YouTube-based tutorials into lesson planning, recommending trustworthy instructional channels, and scaffolding student use of digital content can enhance student engagement and learning outcomes. For course and module designers, incorporating curated video-based learning materials into formal curricula, along with interactive and reflective learning activities, may support more effective instructional design and cater to diverse learner needs. For institutions, offering structured training or workshops to enhance both teacher and student media literacy can help bridge the gap between entertainment use and educational application of digital platforms. Cross-departmental collaboration in resource sharing may further optimize implementation. At the policy level, education authorities are advised to integrate digital and media literacy into national vocational education curricula, especially in creative fields. Establishing guidelines or best practices for integrating online resources like YouTube into teaching can help ensure equitable and meaningful learning experiences across schools.

It is recommended that teachers in vocational education, particularly those working in creative fields such as advertising design, incorporate curated YouTube content into their formal teaching plans. Teachers may consider recommending high-quality instructional channels and integrating video-based learning into classroom activities to reinforce students' technical and creative skills. Additionally,

institutions could offer workshops or training sessions to enhance students' media literacy, guiding them to evaluate and utilize digital content effectively for learning purposes. By doing so, educators can bridge the gap between students' entertainment-oriented media habits and their academic or skill-based learning needs, thereby fostering a more supportive and engaging blended learning environment.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Chiu and Lin conducted the research; Chiu analyzed the data; Chiu and Lin wrote the paper; Lin revised and edited the paper; All authors have read and approved the final manuscript.

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