

Students' Readiness for the Digitalization of Typography Learning Materials in Vocational Graphic Design Education

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ABSTRACT

The digital transformation in education drives the development of more flexible and adaptive instructional materials aligned with the characteristics of 21st-century learners. In vocational education, particularly within the field of Visual Communication Design (VCD), typography constitutes a fundamental competency; however, the instruction of this subject continues to face considerable challenges, especially regarding the limited availability and inadequate appeal of existing learning resources. This study aims to analyze student readiness toward the digitalization of typography instructional materials in VCD vocational education. A quantitative approach employing a descriptive survey method was adopted, involving 120 tenth-grade VCD students from several Vocational High Schools (Sekolah Menengah Kejuruan/SMK) in Sragen Regency as respondents. Data were collected through a questionnaire measuring five dimensions: interest in typography learning, difficulties in comprehending typographic concepts, the condition of currently available learning resources, self-regulated learning, and readiness toward the digitalization of typography materials. The findings indicate that 87% of students expressed interest in learning typography; however, 78% encountered difficulties in understanding its core concepts. Regarding learning resources, 67% of students reported a need for supplementary instructional materials, while 87% perceived the existing materials as insufficiently engaging. In terms of self-regulated learning, 71% of students actively sought alternative learning sources when the subject matter remained unclear, yet 62% rarely revisited typography content independently. With respect to digitalization readiness, 74% of students expressed a need for instructional materials that can be accessed flexibly, and 83% indicated support for the digitalization of typography content. These findings suggest that the digitalization of typography instructional materials holds significant potential for promoting more flexible learning experiences, strengthening conceptual understanding, and fostering self-regulated learning among students in VCD vocational education.

Keywords: learning digitalization; typography; vocational education; student readiness; self-regulated learning

INTRODUCTION

The accelerative advancement of digital technology has brought about fundamental changes across various aspects of human life, including the field of education. The digital era has driven the transformation of learning systems from conventional face-to-face models toward more flexible, open, and technology-based approaches. According to Basilotta-Gómez-Pablos et al. (2022), digital transformation in education encompasses not merely the integration of technological tools into the teaching and learning process, but also a paradigmatic pedagogical shift oriented toward learner activeness, autonomy, and individual needs. This condition demands that all educational stakeholders proactively respond to such changes through the development of a more adaptive and responsive learning ecosystem that addresses the needs of 21st-century learners.

Vocational education plays a strategic role in preparing a skilled workforce capable of meeting industry demands. In the context of the digital era, vocational education is not only expected to develop technical competencies, but also digital competencies relevant to the dynamics of the contemporary world of work. According to the OECD (2023), digital literacy and technological adaptability constitute essential competencies for 21st-century workers. Lucas et al. (2012) emphasize that effective vocational education must integrate digital technology into both the curriculum and the learning process to ensure that graduates possess high relevance and competitiveness in the labor market. Technology-based learning in vocational education has been demonstrated to enhance student engagement, strengthen conceptual understanding, and foster the self-regulated learning indispensable in professional work environments.

Visual Communication Design (VCD) represents one of the vocational specialization programs most closely associated with the advancement of digital technology. Among the fundamental competencies within VCD, typography stands as one of the most essential. Lupton (2014) defines typography as the art and technique of arranging type with the aim of optimizing legibility and the effectiveness of visual communication. Ambrose and Harris (2020) further assert that mastery of typography constitutes a core competency for prospective graphic designers, given that virtually all visual design products ranging from brand identity and print media to digital interfaces involve the use of letterforms as the primary element of communication. Without an adequate understanding of typography, the quality of visual

communication produced will be substantially diminished, both in terms of aesthetics and the effectiveness of message delivery.

Despite its critical importance, the instruction of typography within VCD vocational education continues to confront significant challenges. Typography content is inherently conceptual and highly visual in nature, requiring students to simultaneously integrate theoretical knowledge with aesthetic sensibility. Furthermore, the limited availability of high-quality Indonesian-language instructional materials, the scarcity of contextual examples relevant to local design practices, and the misalignment between prevailing pedagogical approaches and the learning styles of the digital generation collectively contribute to students' inadequate comprehension of typographic concepts. The pronounced dependence on direct teacher instruction also poses a barrier to the development of student learning autonomy a competency of paramount importance in vocational education.

In response to these challenges, the digitalization of instructional materials has emerged as a prospective and relevant solution. Mayer (2021), through the cognitive theory of multimedia learning, affirms that presenting content through an integrated combination of text, images, animations, and interactive elements can substantially enhance conceptual understanding compared to text-only presentation. Interactive e-books, instructional videos, and other digital learning materials enable students to access content at any time and from any location, in accordance with their individual learning pace and style. Furthermore, Zimmermann (2002), through the framework of self-regulated learning theory, emphasizes that well-designed digital instructional materials can effectively facilitate the development of student learning autonomy through features such as self-directed navigation, formative feedback, and integrated self-reflection activities.

Prior studies examining digital instructional materials in design learning and student readiness toward digital transformation have been conducted quite extensively. Nevertheless, research that specifically analyzes student readiness toward the digitalization of typography materials and its implications for the development of self-regulated learning within the context of VCD vocational education remains considerably limited. This research gap warrants attention, as student readiness constitutes a fundamental prerequisite for the successful implementation of digital instructional materials (Che Ku Mohd & Saud, 2023). Without an adequate understanding of the actual state of student

readiness, the development of digital learning materials risks being misaligned with the needs and characteristics of its intended users.

Based on the aforementioned background and identified research gap, this study aims to analyze student readiness toward the digitalization of typography instructional materials in VCD vocational education, encompassing: (1) student interest in typography learning; (2) difficulties in comprehending typographic concepts; (3) the current condition of available learning resources; (4) student self-regulated learning; and (5) readiness toward the digitalization of typography materials. The findings of this study are expected to provide a robust empirical foundation for the development of digital typography instructional materials that are relevant, effective, and responsive to the needs of VCD vocational learners in the digital era.

METHOD

Research Design

This study employed a quantitative approach with a descriptive survey design. A descriptive survey design is utilized to portray the characteristics, tendencies, or conditions of a population based on data obtained from a research sample (Creswell & Creswell, 2018). This design was selected to obtain a comprehensive depiction of student readiness toward the digitalization of typography instructional materials in Visual Communication Design (VCD) vocational education. Specifically, this study explored student interest in typography learning, difficulties in comprehending typographic concepts, self-directed learning habits, and student readiness in utilizing digital instructional materials for typography instruction.

Participants and data collection

The participants in this study comprised 120 tenth-grade students enrolled in the Visual Communication Design (VCD) specialization program at vocational high schools (Sekolah Menengah Kejuruan/SMK) in Sragen Regency, Indonesia. Participants were selected through purposive sampling, on the grounds that the students had previously undertaken typography instruction and therefore possessed learning experience directly relevant to the objectives of this study.

Data were collected using a questionnaire administered directly to the participants during the current academic semester. The questionnaire was employed to gather information pertaining to the conditions of typography instruction, learning difficulties encountered

by students, self-directed learning habits, and student perceptions toward the digitalization of typography instructional materials.

Research Tools

The research instrument employed in this study consisted of a questionnaire comprising 15 items with dichotomous response options, namely "Yes" and "No." The instrument was developed based on a review of the literature pertaining to digital learning, typography instruction, and self-regulated learning.

The questionnaire encompassed five principal dimensions: (1) student interest in typography learning, (2) difficulties in comprehending typographic concepts, (3) the condition of currently utilized learning resources, (4) student self-directed learning habits, and (5) student readiness toward the digitalization of typography instructional materials. A detailed overview of the dimensions and corresponding indicators of the instrument is presented in Figure 1.

Figure 1:
Analysis Instrument Framework

NO	Aspect	Number of Items	Item Number	Indicators
1	Interest in typography learning	1	1	Students' interest in learning typography
2	Difficulties in learning typography	2	2-3	Difficulties in understanding typography concepts
3	Current learning resources	4	4-7	Availability and attractiveness of learning resources
4	Self-regulated learning habits	4	8-11	Independent learning behaviors and learning initiatives
5	Readiness toward digitalization	4	12-15	Acceptance and readiness to use digital learning materials

Data Analysis

The data obtained were analyzed using descriptive statistics in the form of percentage calculations. Percentage analysis was employed to describe the distribution of student responses across each questionnaire item and to identify the level of student readiness toward the digitalization of typography instructional materials. The results of the analysis were subsequently interpreted to provide a comprehensive depiction of the current conditions of typography instruction and its implications for the development of digital instructional materials in Visual Communication Design vocational education. The percentage interpretation criteria proposed by Riduwan (2018) are presented in Figure 2.

Figure 2:
Percentage Interpretation Criteria according to Riduwan (2018)

NO	Percentage	Interpretation
1	81%–100%	Very High
2	61%–80%	High
3	41%–60%	Moderate
4	21%–40%	Low
5	0%–20%	Very Low

FINDINGS AND DISCUSSION

Result

The findings obtained through a descriptive survey conducted among 120 tenth-grade VCD students in Sragen Regency revealed an informative and comprehensive readiness profile encompassing the five dimensions under investigation. In general, students demonstrated a high level of interest in typography learning and a positive disposition toward the digitalization of instructional materials; however, they continued to experience difficulties in comprehending typographic concepts and had not yet fully developed autonomous learning practices. The following section presents a detailed account of the results and discussion for each dimension.

Student Interest in Typography Learning

The results of the analysis indicate that 87% of students expressed interest in typography learning. This percentage falls within the very high category based on the interpretation criteria commonly employed in descriptive survey research. This finding suggests that the majority of VCD students regard typography as an engaging subject matter that is directly relevant to their chosen field of specialization.

The high level of student interest demonstrates that typography constitutes an inherently appealing subject for VCD learners. A strong interest in learning represents a critical prerequisite in the instructional process, as it has the capacity to enhance student engagement, sustained attention, and motivation throughout the course of learning. Accordingly, the development of digital typography instructional materials should seek to sustain and optimize this learning interest through the presentation of content that is interactive and aligned with the characteristics of the learners.

Difficulties in Comprehending Typographic Concepts

Despite the very high level of interest, 78% of students reported experiencing difficulties in comprehending typographic concepts. This figure falls within the high category and indicates a significant gap between students' interest and their actual capacity to understand the subject matter. The aspects most frequently identified as sources of difficulty include the comprehension of letterform anatomy, historical typeface classification, and the application of the principles of readability and legibility within real-world design contexts.

These difficulties are largely attributable to the inherently conceptual and highly visual nature of typography as a discipline, which requires students to simultaneously process and integrate theoretical knowledge with aesthetic judgment. Such complexity renders the subject particularly demanding when instruction relies solely on conventional text-based materials. In this respect, the digitalization of typography instructional materials represents a promising pedagogical response, as the incorporation of visual representations, illustrative examples, and interactive elements into digital learning materials is expected to facilitate more accessible and effective comprehension of typographic concepts among vocational learners.

The Current Condition of Available Learning Resources

The analysis of the learning resources dimension revealed two notable findings. First, 67% of students indicated a need for supplementary instructional materials beyond those already provided by the school. Second, 87% of students perceived the currently available typography instructional materials as insufficiently engaging. Taken together, these findings point to a considerable misalignment between the existing instructional materials and the needs and expectations of students, both in terms of content comprehensiveness and the appeal of its presentation.

These results suggest that the instructional materials currently in use have not fully addressed the learning needs of students. In the digital era, learners require learning resources that not only convey information, but also deliver engaging, flexible, and readily accessible learning experiences. The predominance of conventional, text-based instructional materials is increasingly inadequate in meeting the expectations of digitally-oriented learners who are accustomed to dynamic and visually rich content. Consequently, the development of innovative digital typography instructional materials emerges as a

pertinent and pressing need in supporting effective learning within VCD vocational education.

Student Self-Regulated Learning

The self-regulated learning dimension revealed an intriguing profile warranting careful examination. On one hand, 71% of students actively sought alternative learning sources when they had not yet fully understood typography subject matter, a behavior reflective of a positive learning initiative. On the other hand, 62% of students rarely revisited typography material independently without external encouragement from teachers or structured assignments. This pattern indicates that while students possess a degree of reactive initiative seeking additional resources when confronted with difficulty they have yet to develop systematic and proactive learning habits in the form of independent material review and in-depth self-study.

These findings suggest that although students have demonstrated a willingness to seek supplementary learning resources, they have not yet exhibited consistently autonomous learning habits. This condition indicates that students' self-regulated learning capacities remain in need of further development. In the context of contemporary education, self-regulated learning constitutes one of the pivotal competencies underpinning lifelong learning and deep learning. Furthermore, learning autonomy represents one of the dimensions within the Graduate Profile framework, which is expected to be progressively cultivated through the learning process. Accordingly, the digital instructional materials to be developed should be deliberately designed to support independent learning through the incorporation of features such as clearly defined learning objectives, self-reflection prompts, independent practice exercises, and formative feedback mechanisms.

Readiness Toward the Digitalization of Typography Materials

The digitalization readiness dimension yielded the highest results among all dimensions examined in this study. A total of 74% of students expressed a need for instructional materials that can be studied flexibly, independently, and in accordance with each learner's individual pace. More significantly, 83% of students indicated their support for and agreement with the digitalization of typography instructional materials. These notably high percentages suggest that students are not merely passive recipients of digital instructional innovation, but rather active proponents of such transformation.

The high level of support for the digitalization of typography materials demonstrates that students hold a positive disposition toward the utilization of technology in learning. This condition indicates that the students' learning environment is sufficiently conducive to the implementation of digital instructional materials. These findings reflect the broader trajectory of digital transformation in education, which calls for the purposeful integration of technology to create learning experiences that are more flexible and learner-centered. Consequently, the digitalization of typography instructional materials holds considerable potential for supporting learning experiences that are better aligned with the characteristics of digital-generation learners within VCD vocational education. A summary of the analysis results is presented in Figure 3.

Figure 3:
Analysis Results on Five Aspects of Student Readiness

NO	Aspect	Result	Percentage	Interpretation
1	Interest in typography learning	Students' interest in learning typography	87%	Very High
2	Difficulties in learning typography	Difficulties in understanding typography concepts	78%	High
3	Current learning resources	Availability of learning resources	67%	High
		Attractiveness of learning resources	87%	Very High
4	Self-regulated learning habits	Independent learning behaviors	71%	High
		Learning initiatives	62%	High
5	Readiness toward digitalization	Acceptance to digital learning materials	74%	High
		Readiness to use digital learning materials	83%	Very High

CONCLUSION

Based on the findings of this study, it can be concluded that students in Visual Communication Design vocational education demonstrated a positive readiness toward the digitalization of typography instructional materials. Although students exhibited a high level of interest in typography learning, the majority continued to experience difficulties in comprehending typographic concepts and had not yet developed fully optimal self-regulated learning habits. Furthermore, the instructional materials currently in use were perceived as not having adequately met the learning needs of students. The high level of support for the digitalization of typography materials indicates that the development of digital instructional materials holds considerable potential for fostering more engaging and flexible learning experiences, as well as for cultivating greater learning autonomy among

students in VCD vocational education. Future research is recommended to develop and empirically evaluate the effectiveness of digital typography instructional materials designed in accordance with the needs and characteristics of vocational learners.

Discussion

Overall, the findings of this study indicate that students in Visual Communication Design vocational education demonstrated a positive readiness toward the digitalization of typography instructional materials. The high level of student interest in typography learning, coupled with the high degree of acceptance toward digital instructional materials, suggests that the integration of technology into typography instruction presents considerable opportunity for implementation. Nevertheless, the persisting difficulties in comprehending typographic concepts, the limited availability of learning resources, and the not yet optimal self-regulated learning habits collectively underscore the necessity for innovation in the development of instructional materials.

These findings affirm that the development of digital typography instructional materials must extend beyond a mere focus on content digitalization, and should equally be capable of supporting conceptual understanding, enhancing student engagement, and facilitating the development of self-regulated learning. In this regard, the digitalization of typography materials holds significant potential as a strategic approach to advancing a more flexible, learner-centered mode of instruction that is responsive to the demands of education in the digital era.

REFERENCES

- Ambrose, G., & Harris, P. (2020). *Typography* (3rd ed.). London: Bloomsbury Visual Arts.
<https://doi.org/10.5040/9781316941355>
- Basilotta-Gomez-Pablos, V., Matarranz, M., Casado-Aranda, L. A., & Otto, A. (2022). Teachers' digital competencies in higher education: A systematic literature review. *International Journal of Educational Technology in Higher Education*, 19(1), 1–16.
<https://doi.org/10.1186/s41239-021-00286-7>
- Che Ku Mohd, C. K. N., & Saud, M. S. (2023). Readiness of vocational students toward digital learning: A systematic review. *Journal of Technical Education and Training*, 15(1), 1–14.
<https://doi.org/10.30880/jtet.2023.15.01.001>

- Clark, R. C., & Mayer, R. E. (2023). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (5th ed.). Hoboken, NJ: Wiley.
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). New York: Routledge.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Thousand Oaks, CA: SAGE Publications.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). New York: McGraw-Hill.
- Hwang, G.-J., Xie, H., Wah, B. W., & Gašević, D. (2023). Vision, challenges, roles and research issues of artificial intelligence in education. *Computers and Education: Artificial Intelligence*, 1, 100001. <https://doi.org/10.1016/j.caeai.2020.100001>
- Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. New York: Association Press.
- Lucas, B., Spencer, E., & Claxton, G. (2012). *How to teach vocational education: A theory of vocational pedagogy*. London: City & Guilds Centre for Skills Development.
- Lupton, E. (2014). *Thinking with type: A critical guide for designers, writers, editors, & students* (2nd ed.). New York: Princeton Architectural Press.
- Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge: Cambridge University Press. <https://doi.org/10.1017/9781316941355>
- OECD. (2023). *Education at a glance 2023: OECD indicators*. Paris: OECD Publishing. <https://doi.org/10.1787/e13bef63-en>
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1–6. <https://doi.org/10.1108/10748120110424816>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Schunk, D. H., Meece, J. R., & Pintrich, P. R. (2014). *Motivation in education: Theory, research, and applications* (4th ed.). Upper Saddle River, NJ: Pearson Education.

- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257–285.
https://doi.org/10.1207/s15516709cog1202_4
- Zimmermann, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64–70.
https://doi.org/10.1207/s15430421tip4102_2