International Journal of Education, Vocational and Social Science
https://e-journal.citakonsulfindo.or.id/index.php/IJEVSS
E-ISSN : 2963 4954
IJEVSS

Fashion Students' Adaptation To Resources By Utilization In The Digital Learning Era: A Phenomenological Study

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Abstract

Digital transformation expands students' access to learning resources outside of the sources formally provided by the institution. This condition requires students to be able to adapt in selecting, combining, evaluating, and utilizing various digital resources according to learning needs. This study aims to describe the process of adaptation of Fashion Education students to resources by utilization, the foundation of self-regulation and critical awareness in their utilization, as well as the results obtained in independent learning. The research uses a qualitative approach with a transcendental phenomenological design. The participants consisted of seven students of the Fashion Studies Program of Yogyakarta State University who were selected purposively based on their experience using various digital learning resources. Data were collected through in-depth interviews and field notes, then analyzed using Moustakas' phenomenological procedures through horizontalization, identification of invariant constituents, thematic grouping, and synthesis of experience descriptions. The results of the study showed that adaptation took place cyclically and iteratively, starting from learning needs gaps, resource exploration, resource selection and combination, evaluation and verification, integration and application, and reflection that can give rise to the next learning need. Self-regulation and critical awareness are the cornerstones in managing the diversity of sources, while the successful use of resources enriches insights, supports the application of knowledge in practice and work, and strengthens independent learning. The study concludes that adaptation to resources by utilization is the process of building and managing a personal learning ecosystem in an adaptive and reflective manner in Fashion Learning.

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Keywords: Adaptation, Independent Learning, Fashion Education, Resources By Utilization, Digital Learning Resources

INTRODUCTION

Digital transformation has fundamentally changed the way students access and utilize learning resources. The availability of the internet and web-based platforms has expanded learning spaces from those previously limited to materials, modules, and Learning Management Systems (LMS) provided by institutions to a much broader, open, and dynamic information ecosystem. Describing the digital transformation of higher education as the creation of new digital learning spaces, not just the digitization of existing systems. This situation requires students not only to receive the learning resources that have been prepared, but also to find, choose, and utilize other resources in the digital environment according to their learning needs. Bygstad et al. (2022)

In the study of Learning Technology, the distinction between Resources by Design and Resources by Utilization that serves as an important framework for understanding these changes. and explains that Resources by Deisgn are learning resources that are intentionally designed for learning purposes, such as modules, worksheets, and LMSs. Resources by Utilization are resources that are not specifically designed for learning but are used by learners to support their learning, such as videos on YouTube, visual references on Pinterest and Instagram, search engines, social media, and even generative AI. Betrus (2008) Seels & Richey (1994) Widespread digital access is making resources by utilization more accessible, so that the value of a resource in learning is no longer determined by the original purpose of its design, but rather by how learners use it.

The ability of learners to utilize learning resources independently is closely related to self-regulated learning (SRL), which is the process by which learners cyclically plan, monitor, and reflect on their learning, which is supported by self-efficacy and motivation. Self-efficacy influences students' decision to continue exploring learning resources The digital era expands the relevance of this concept because the abundance of information demands digital literacy, which is the ability to evaluate, select, and utilize information critically. in Indonesian students showed that digital literacy is related to involvement in informal digital learning, self-efficacy, and academic achievement. It was also found that students' self-regulation is reflected in the use of digital resources, and this use mediates the influence of self-regulation on academic

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achievement. Thus, digital resources in the learning environment are an important medium for students to actualize their self-regulation in managing learning. (Zimmerman, 2002) (Pintrich, 2000) (Bandura, 1997). Zakir et al. (2025) von Keyserlingk et al. (2026)

This need is evident in fashion education. This field combines conceptual competencies (such as an understanding of textile materials and design theory), procedural competencies (such as pattern making and sewing techniques), and creative competencies (e.g., developing ideas and designs that follow fashion trends). These visual and practical competencies cannot always be met with modules or LMS alone. shows that the effectiveness of digital media in practical learning for fashion students is influenced by their ability to choose media that suits the characteristics of their assignments and learning strategies. Pinterest primarily supports conceptual ideation and exploration, while YouTube facilitates procedural learning and technical execution. Shows that digital reflective practices in textile design education are related to creativity. shows that Pinterest is effective as a learning medium for fashion design, improves the skills, understanding, and idea development of fashion design vocational education students, and recommends the integration of digital technology such as Pinterest in learning Zahro et al. (2026) Hameed & Mimirinis (2023) Pandansari et al. (2024) **.** Anjar & Saputra (2024) adding that Pinterest serves as an effective source of visual inspiration for Generation Z learners, while showing that video tutorials are effective in improving student learning outcomes in men's fashion courses in online learning. These studies indicate that the use of digital resources in the design and fashion family is a meaningful learning decision, not just the use of technology. Aisyah & Suryana (2023)

The increasing reliance on resources by utilization raises an important question: how do learners adapt to the diversity and uncertainty of resources that are not designed for learning? Previous studies have shown that digital technologies contribute to the strengthening of self-regulated learning (SRL) through the management of learning strategies and resources. In its systematic review, it was found that cognitive, metacognitive, motivational, and resource management strategies improve learning in (Faza & Lestari, 2025; Luo & Zhou, 2024) Fayaza & Ahangama (2024) blended learning environments, although some strategies do not have an impact on the context. showed that most of the articles reviewed found a positive relationship between SRL strategies and learning outcomes, although there were variations in effects influenced by context and learner characteristics. found that although distance learners applied cognitive, metacognitive, and resource management SRL strategies, their academic achievement was not solely determined by these strategies, but was also influenced by learning independence,

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teacher characteristics, blended learning modes, collaborative learning, motivation, and availability of learning resources. found that adaptive digital learning ecosystems are associated with academic perseverance.) shows that students use a variety of digital information sources for learning, including in informal learning environments. However, extensive access also brings challenges, such as visual impairment and misuse of digital resources; . The use of generative AI by college students presents both benefits and challenges, and systematic reviews show a lack of a single guideline for effective use in higher education. Luo & Zhou (2024) Kayi & Van Wyk (2025) Wibowo Helmi et al. (2025) Degner et al. (2022) (Faza & Lestari, 2025) Anjar & Saputra, 2024) (Chan & Hu, 2023) (Ogunleye et al., 2024)

However, these studies generally discuss the use of digital resources in general and have not explored how the process of adaptation to resources through utilization is experienced subjectively, especially by students in vocational-creative fields such as fashion. Several phenomenological studies have explored learners' experiences with digital technology, such as digital learning experiences during disruptive educational periods (Pontillas, 2025), the use of AI in independent learning (Rabuandika & Pujiriyanto, 2025), and the use of LMS. Md Khairulanwar and Jamaluddin (2025) used a descriptive phenomenological approach to explore the application of AI in fashion design learning in certificate programs in Malaysia, and found that AI facilitates students in accessing relevant information efficiently and improving their understanding of fashion concepts, despite technical constraints, value concerns, and resource limitations. Fashion concept, despite technical constraints, value concerns, and limited learning resources.

The phenomenological approach is appropriate to reveal these experiences because it focuses on individual lived experiences, and in a transcendental variant seeks to explain the essence of experience without being burdened by the researcher's assumptions (Moustakas, 1994), as well as allowing researchers to describe complex social phenomena in the context of education (Alhazmi & Kaufmann, 2022; Stolz, 2023). Based on this description, this article aims to describe the process, the basis of self-regulation, critical awareness, and the results of Fashion Designers' adaptation to resources by utilization in independent learning in the digital era. Conceptually, this study enriches the understanding of the domain of utilization in Learning Technology; practically, the results are expected to help lecturers and study program managers design a learning resource ecosystem that integrates resources by design with resources by utilization intentionally and in a targeted manner. The novelty of this research lies in an in-depth exploration of how fashion students who face the demands of conceptual, procedural, and

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creative competencies simultaneously adapt to digital resources that are not designed for learning, as well as how self-regulation and critical awareness play a role in the process.

RESEARCH METHODS

This research uses a qualitative approach with a transcendental phenomenological design. This design was chosen because it aims to uncover the meaning and essence of students' life experiences in adapting to resources through utilization, rather than measuring or testing relationships between variables. Transcendental phenomenology places experience as the main focus, allowing researchers to understand both what is experienced (textual aspect) and how that experience occurs (structural aspect). This approach has been widely used in educational research to explore participants' experiences with digital technologies, including in the context of online learning the use of AI in self-paced learning Transcendental phenomenology allows researchers to obtain rich and in-depth descriptions of participants' life experiences and provides structured procedures for capturing the essence of phenomena through epoche, horizontalization, and thematic reduction. (Moustakas, 1994) (Pontillas, 2025), (Rabuandika & Pujiriyanto, 2025).

This research was conducted at the Fashion Study Program, Faculty of Engineering, Yogyakarta State University. This study program was chosen because its learning integrates conceptual, visual, creative, and practical competencies, which require students to use a variety of learning resources, both formally provided and those found and used independently through digital technology. This context is relevant to the study of phenomenology in fashion design education, which emphasizes the importance of understanding students' subjective experiences in navigating the complexity of digital resources This context is also in line with phenomenological research practices, which emphasize the importance of an environment rich in the phenomena being studied (Md Khairulanwar & Jamaluddin, 2025) (Moustakas, 1994)

Participants consisted of seven active students who were selected by purposive sampling based on their experience using various digital learning resources. They came from six batches (2020–2025) who were in the second to twelfth semesters and from various secondary education backgrounds, thus providing a diverse range of experiences in utilizing resources. This deliberate selection of participants was in line with the recommendations, which emphasized the importance of selecting participants who had experienced the phenomenon being studied and were able to provide a rich description of their experiences. Data were collected through in-depth

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interviews and field notes, with researchers as the main instruments. Data validity was maintained through source triangulation, member checking, and audit trails throughout the data collection and analysis process. Moustakas (1994)

The data analysis adapted the Van Kaam procedure, modified by , in five steps: (1) horizontalization, which involves recording and reducing transcript statements into invariant constituents relevant to the adaptation experience; (2) grouping of invariant constituents into core themes and validation of those themes on transcripts; (3) drafting individual textual descriptions; (4) drafting individual structural descriptions; and (5) synthesis of composite textual-structural descriptions across participants to formulate the essence of the experience. Each statement was treated equally in the horizontalization stage, then tested for adequacy in understanding the experience and its ability to be abstracted into thematic labels; overlapping, repetitive, or irrelevant statements were eliminated. This procedure has been used consistently in recent phenomenological research and has been shown to be effective in unraveling the essence of participants' experiences in an educational context Moustakas (1994) (Bolin, 2025) (Moustakas, 1994)

RESULTS AND DISCUSSION

An analysis of the experiences of seven participants showed that the adaptation of Fashion Education students to resources by utilization took place as a dynamic, gradual, and interrelated process. Adaptation does not arise solely because of the availability of digital technology, but develops when students face certain learning needs that cannot be fully met by the resources that have been formally provided. These needs then encourage students to explore alternative sources, choose sources that are considered appropriate, combine several sources, examine information, and adjust strategies based on the results obtained. Thus, adaptation to resources through utilization can be understood as an active learning decision-making process.

The findings of the study show that there is a series of interconnected processes, namely triggering learning needs, adaptive exploration of various sources, self-regulation as a basis for decision-making, critical-reflective awareness of information quality, as well as results in the form of richer insights, the ability to apply information in practice and work, and strengthening independent learning. These series do not always take place in a rigid order. Students can return to the exploration stage when the chosen source has not met their needs, verify when they find dubious information, or change strategies after gaining experience from the use of previous

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sources. Therefore, adaptation in this study is more accurately understood as an iterative learning cycle rather than as a linear information search activity.

Learning Needs Gap as a Trigger for Adaptation

Students' adaptation to resources by utilization begins with a gap between learning needs and the adequacy of available learning resources. These needs arise when the learning resources provided through formal learning have not fully provided the information, explanations, examples, or demonstrations needed by students. This condition becomes more complex in Fashion Learning which not only involves mastering concepts, but also visual, creative, procedural, and practical aspects.

Students use digital resources outside of the sources that have been provided when they have difficulty understanding the material, need more concrete explanations of techniques or procedures, look for visual references to develop design ideas, or need more actual information. The need for actual information is one of the triggers mentioned by participants, especially when they need to keep up with the development of rapidly changing fashion trends. Web resources such as social media and fashion news sites allow students to update their knowledge about the latest trends, which are then used as analysis materials and the basis for design development in practical assignments. Thus, the use of resources by utilization is not solely driven by the ease of access to technology, but by situational and contextual learning needs.

The findings show that adaptation begins when students realize that the resources being used have not fully answered their learning needs. This condition encourages students to look for alternatives that are considered more relevant to the goals they want to achieve. The principle of relevance in the learning process is related to the ability of students to connect learning activities with needs and goals that are felt to be important to them. In the context of digital learning, these gaps can encourage students to take advantage of alternative resources available through the digital environment (Keller, 1987) (Chan & Hu, 2023) .

Thus, resources by utilization appear in response to the real needs of students. These resources serve to complement learning resources that have been formally designed when students need more specific information, demonstrations, or references.

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From Reliance on Resources by Design to a Flexible Learning Resource Ecosystem

After realizing the need, students do not use one source linearly but explore the various available sources. Students can compare several sources, assess their adequacy, and then move or add other sources when the information obtained is not in accordance with their needs. This pattern shows a shift from dependence on one source to a more flexible management of the learning resource ecosystem.

The ecosystem brings together resources by design, such as LMS, modules, RPS, and jobsheets, with resources by utilization, such as video tutorials, search engines, scientific articles, e-books, Pinterest, Instagram, TikTok, and generative artificial intelligence (GenAI). Not every resource is always used for the same purpose. Videos are more appropriate when students need procedural and visual demonstrations, articles or e-books are used to deepen conceptual understanding, social media is used to obtain visual references and creative ideas, while AI can be used to obtain additional explanations or explore information.

This pattern shows a shift from dependence on a single source to a more flexible management of the learning resource ecosystem. This condition is in line with the character of the digital learning environment that provides students with access to a variety of media and learning resources, while increasing the demand for autonomy and the ability to manage the learning process independently (Edisherashvili et al., 2022)

These findings show that adaptation is not characterized by an increasing number of resources used, but by the ability of students to determine the functions and combinations of resources as needed. It shows that digital media expands the possibilities of informal learning through access to a wide range of resources outside of the formal learning environment. In the context of Fashion education, the flexibility of resource utilization is also seen in the use of digital media to support design processes and practices. Pinterest, for example, can serve as a space for visual reference search and inspiration development for digital generation students, while reflective digital practices can support exploration and creativity in textile design education Degner et al. (2022) (Zahro et al., 2026) (Anjar & Saputra, 2024) (Hameed & Mimirinis, 2023).

Thus, students are not only users of learning resources, but also managers of learning resources. They determine when a resource is used, for what needs, and when it is necessary to look for alternative sources. This ability is an important part of the adaptation process in a digital learning environment that provides resources openly and diversely.

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Self-Regulation as a Foundation for Adaptation

The ability to adapt to resources through resource utilization does not occur spontaneously but depends on self-regulation. In the planning phase, students set learning objectives, predict resource needs, and choose initial strategies, in line with self-efficacy, which influences decisions to explore and the SRL framework, which emphasizes planning and motivation. In the implementation phase, students implement strategies while monitoring the suitability of information, then modify strategies or replace resources if the results are inadequate. This capacity to monitor this process of self-thinking is a manifestation of metacognition. In the self-reflection phase, students evaluate the results and interpret the success or failure of their strategies as the basis for adjustments to future needs, in line with the analysis that self-regulation is a dynamic and continuous process. (Bandura, 1997) (Pintrich, 2000; Zimmerman, 2002) (Flavell, 1979; Tinajero et al., 2024) Tinajero et al. (2024)

These findings support findings that link self-regulation and motivation with students' digital resource usage patterns. systematically review various learning analytics-based interventions aimed at supporting von Keyserlingk et al. (2026) Heikkinen et al. (2023) self-regulated learning (SRL) in the planning, implementation, and reflection phases. These findings are in line with those that show that technology in the digital environment can support the process of self-regulation through goal setting, planning, monitoring, cognitive and metacognitive processes, and reflection. Faza & Lestari (2025)

In the context of Fashion Design, self-organization becomes increasingly important because the learning resources students need can differ according to the character of the task. Students who are learning design concepts need different sources than students who are looking for technical demonstrations or developing visual references. Therefore, decisions about sources cannot be completely determined by a fixed pattern of use.

The importance of self-regulation is increasingly evident in the use of generative artificial intelligence (GenAI). showed that students perform various self-regulation actions when interacting with GenAI, including setting goals, monitoring AI processes and outputs, and making adjustments during task completion. The findings show that interactions with GenAI involve a dynamic regulatory process, although they do not always take place sequentially like conventional SRL stages. In line with that, research on SRL-based GenAI literacy shows that the use of human-centered AI can be developed through Cheng & Cheung (2026) a plan–iterate–evaluate cycle, with students still setting evaluation criteria, monitoring the quality of AI output,

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and reflecting on the process of using AI to determine the next utilization. (Anders & Dux Speltz, 2025)

Thus, self-regulation can be understood as a foundation that allows students to turn the diversity of digital sources into productive learning resources. Without self-regulation, the existence of many sources can actually result in the use of undirected information. On the other hand, when students are able to determine needs, monitor processes, and evaluate results, the diversity of sources becomes an opportunity to expand the learning experience.

Reflective and Critical Awareness in Utilizing Resources by Utilization

Adaptation to resources by utilization is also marked by the awareness that not all digital resources have the same level of credibility, relevance, and accuracy. In contrast to resources by design, which have generally been selected and compiled in the context of formal learning, resources by utilization come from a more open digital environment. Therefore, students need to assess information before using it in the learning process.

The findings of the study show that students compare information from several sources, search for original sources, consider the credibility of the author or platform, and verify the information obtained. This process is also applied when students use GenAI because AI outputs do not automatically guarantee the accuracy of information or the completeness of reference sources.

In the context of independent learning, it shows that the use of AI is related to the need for students to make critical assessments of the information obtained. It also shows that students see GenAI as a resource that provides benefits while presenting challenges in higher education learning. Thus, the ability to use digital resources does not stop at the technical ability to access information, but includes the ability to evaluate and determine the feasibility of the information to be used. Rabuandika & Pujiriyanto (2025) Chan & Hu (2023)

This aspect is related to digital literacy. It shows the importance of digital literacy in supporting student learning processes and outcomes. In the vocational education environment, digital literacy also develops from just the ability to operate technology to the ability to use technology as a tool to manage and validate information. This is relevant to the character of Fashion Learning which requires a large amount of visual and procedural references, but still requires an assessment of the accuracy and suitability of information. Zakir et al. (2025)

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Reflective awareness also has an important position in design education. It shows that reflective practice is an important part of the textile design learning process. Reflection allows students not only to assess the work, but also to review the processes and sources used to produce the work. Degner et al. (2022)

Thus, learning independence in a digital environment cannot be interpreted as the ability to learn without assistance. Independence is actually seen in the ability of students to determine relevant sources, know when to look for alternatives, assess the quality of information, and decide how the information is used. In this sense, the use of resources by utilization requires reflective and critical awareness as part of adaptation.

Adaptation Outcomes: Richer Insights and Stronger Independence

The process of adapting to resources by utilization ultimately results in changes in the student learning experience. Information obtained from various sources does not only stop at reading or watching activities, but is transformed into understanding, practice, and work. In learning Fashion Design, this transformation can be in the form of developing mood boards, searching and processing design references, understanding techniques, implementing procedures, and completing practical tasks.

One of the results that can be seen is the ability of students to relate the latest trend information with analysis and practice tasks. Students not only collect visual references, but also process them into arguments about the direction of fashion development, which is then implemented in design or practical works. This ability shows that the use of web resources does not stop at information consumption, but develops into analytical and creative competencies that are relevant to the needs of the fashion field.

The character of Fashion Learning that combines theory and practice makes the success of using resources can be observed through the ability of students to connect information with action. Visual information, for example, is not only used to be seen, but also a reference in developing design ideas. Similarly, technical tutorials do not stop at watching activities, but can be applied in the process of working on assignments or works.

The experience when the chosen resource is able to help solve learning needs also results in positive experiences such as happiness, satisfaction, relief, and confidence. These experiences then become psychological capital and learning experiences for students when facing similar needs at the next opportunity. , in their study of learning environments that promote SRL in

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vocational education, found that learning environments that support autonomy and competence contribute to vocational students' motivation and learning engagement. These findings are in line with the experiences of Fashion students who are increasingly motivated to explore resources independently when they feel success in utilizing those resources. Mejeh & Grieder (2025)

Wibowo Helmi et al. (2025) show that adaptive digital learning ecosystems are related to strengthening self-regulation and academic persistence, including aspects of goal setting, planning, self-monitoring, reflection, autonomy, metacognitive awareness, and motivation. Their longitudinal study found significant improvements in SRL behaviors such as goal setting, planning, self-monitoring, and reflection among students engaged with adaptive learning environments. Students in adaptive systems also showed greater autonomy, increased metacognitive awareness, and higher motivation, as well as stronger academic persistence. These findings reinforce the argument that successfully using resources by utilization can strengthen the experience of independence and encourage students to re-explore when facing their next learning needs.

The findings broaden the understanding of the use of digital resources in vocational and creative learning. Adaptation to resources is not only about expanding access to information, but also transforming information into learning experiences that can be used to produce understanding and work. Thus, successful use of resources can strengthen the experience of independence and encourage students to explore again when facing the next learning need.

Synthesis of the Process of Adaptation to Resources by Utilization

Overall, the research findings show that students' adaptation to resources by utilization takes place as a cyclical and iterative process. The process does not start from the need to use certain technology, but from the existence of learning needs that have not been fully met by the available learning resources. These needs encourage students to explore various sources, then choose and combine resources based on their suitability for learning objectives.

The process then involves evaluating and verifying the information obtained. Students not only consider the availability of information, but also assess its relevance, adequacy, and credibility. When the resources used are not able to meet their needs, students can return to explore or change sources. Thus, the use of resources takes place in an adaptive manner through an ever-evolving monitoring and adjustment process.

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Information that is considered relevant is then integrated into learning activities and applied in practice and work. In Fashion Learning, this process can be in the form of applying techniques, developing design ideas, searching for visual references, or completing practical tasks. The experience then becomes a reflection material for students to assess the success of the strategies used and determine how to learn for the next need.

Based on this pattern, the student adaptation process can be synthesized into a cyclic series. The series is cyclical, so the next stage of adaptation can give rise to new needs and reactivate the source exploration process.

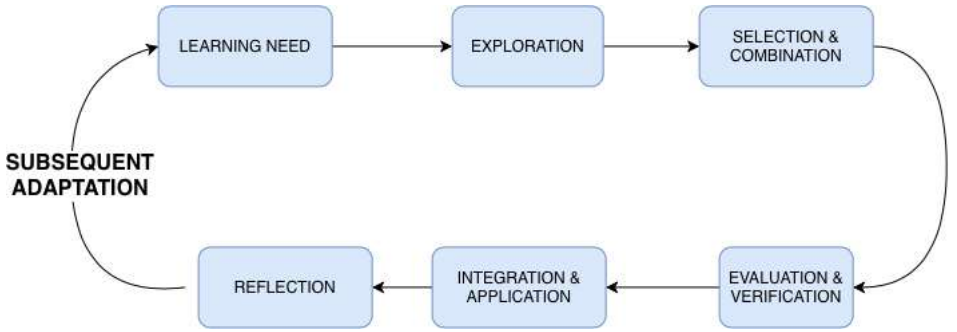


Figure 1. Synthesis of Student Adaptation Process to Resources by Utilization

Figure 1 shows that the adaptation process does not take place as a rigid and linear stage. Students can return to the exploration stage when the resources used are insufficient, re-verify when they find dubious information, or form new needs after applying the information in practice. Thus, each experience of using resources becomes a learning experience that can influence students' decisions in the next process.

This pattern shows that adaptation to resources by utilization is not just the ability to find and use many digital resources. Adaptation is the ability of students to build and manage a personal learning ecosystem in an adaptive and reflective manner. In this process, self-regulation functions as a mechanism that allows students to determine needs, monitor the use of resources, evaluate information, and adjust strategies based on previous learning experiences.

Conceptual Implications on Learning Technology and Fashion Education

The findings of the study provide conceptual implications that adaptation to resources by utilization needs to be understood as a pedagogical process, not just a technical response to technological developments. Students not only need access to digital resources, but also need

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the ability to identify relevant resources, manage their use, evaluate information, and integrate this information into learning activities.

In the perspective of Learning Technology, resource utilization is an important part because learning is not only related to how resources are designed, but also how resources are used to facilitate learning. In the context of this research, students actively make decisions about the use of resources outside of the sources that have been formally provided. Resources by utilization can thus complement resources by design when formal resources do not meet certain needs while providing space for students to run agencies in the learning process.

The relationship between self-regulation and resource utilization also shows a dynamic relationship. Self-regulation allows students to use resources productively, while success in using resources can enrich the learning experience and strengthen students' readiness to face the next learning need. This pattern is in line with the self-regulation framework that places planning, implementation, monitoring, and reflection as interconnected processes. (Zimmerman, 2002)

These implications are important in Fashion Education because the learning character demands the integration of conceptual knowledge, visual skills, creativity, procedural skills, and the ability to produce works. Students need different resources to meet these needs. Formal resources can provide a learning structure, while resources by utilization can expand examples, demonstrations, visual references, actual information, and alternative problem-solving solutions.

However, the over-reliance on openly available sources also presents the need for digital literacy and critical awareness. If students are only directed to find as many sources as possible without being equipped with the ability to evaluate and verify information, the diversity of sources can produce untested information or the use of digital outputs uncritically. Therefore, resources by design and resources by utilization are more appropriately seen as complementary components in the learning ecosystem.

Conceptually, this study shows that the ability to learn independently is an important prerequisite for the use of multi-resources in the digital era. Students no longer only play the role of recipients of learning resources that have been selected by the institution, but also as managers of the personal learning ecosystem. They determine needs, explore sources, select and combine information, evaluate credibility, apply information in practice, and reflect on the results as the basis for the next adaptation. Thus, the contribution of this research lies in the understanding that adaptation to resources by utilization is the process of building and managing

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a personal learning ecosystem in an adaptive and reflective manner in the context of Fashion learning.

CONCLUSION

This study shows that the adaptation of Fashion Education students to resources by utilization in the digital learning era is a dynamic, cyclical, and reflective learning process. Adaptation is not primarily triggered by the existence of technology, but by the gap between students' learning needs and the adequacy of formally available learning resources. These needs encourage students to explore various digital sources, select and combine sources based on objectives, evaluate and verify information, and then integrate it into learning activities, practices, and works. These findings show that resources by utilization function as a complement to resources by design, especially when students need more specific, actual, visual, procedural, or creative information in learning Fashion Design.

This research also found that the ability to learn independently and self-regulate is an important foundation in managing the diversity of digital resources. Students not only need the ability to find and access information, but also the ability to determine needs, choose sources, monitor their suitability, evaluate the credibility of information, and reflect on the results of its use. Success in utilizing resources then becomes an experience that influences the next learning strategy. Thus, the main contribution of this research lies in the understanding that adaptation to resources by utilization is not just an activity of searching for information, but the process of building and managing a personal learning ecosystem in an adaptive and reflective manner. In the context of Fashion Education that combines conceptual, visual, creative, procedural, and practical knowledge, this ability allows students to transform the diversity of digital sources into knowledge, skills, and meaningful works.

Further research can develop these findings through research on study programs or other vocational fields with different learning characteristics to see how patterns of adaptation to resources by utilization develop in more diverse contexts. Future research can also examine more deeply the use of GenAI and other digital resources at each stage of the adaptation cycle, including how students evaluate AI outputs and how the experience of success and failure in resource use affects subsequent learning strategies. In addition, longitudinal research can be conducted to look at changes in students' ability to build and manage a personalized learning ecosystem during the educational process

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