Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 4 Desember 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

THE CONTRIBUTION OF DIGITAL LITERACY AND CREATIVITY TO STUDENTS' ADVERSITY QUOTIENT THROUGH SELF-MANAGEMENT IN CONSTRUCTION VOCATIONAL EDUCATION

Arvieka Sabilla Putri Setiadi[1a*], Isnandar[2b], Machmud Sugandi[3c]

[123]Universitas Negeri Malang, Malang, Jawa Timur, Indonesia

[a]*E-mail: arvieka.sabilla.2405518@students.um.ac.id*
[b]*E-mail: isnandar.ft@um.ac.id*
[c]*E-mail: r.machmud.ft@um.ac.id*

(*) Corresponding Author
arvieka.sabilla.2405518@students.um.ac.id

ARTICLE HISTORY
Received : 29-08-2026
Revised : 01-10-2026
Accepted : 25-10-2026

KEYWORDS
Adversity Quotient; Construction Vocational Education; Creativity; Digital Literacy; Self-Management

ABSTRACT

This study aims to analyze the contribution of digital literacy and creativity to students' adversity quotient in construction vocational education, with self-management as a mediating variable. A quantitative approach was employed involving students of the Construction and Building Technology Program in vocational high schools in the Greater Malang area. Data were collected using instruments measuring digital literacy, creativity, self-management, and adversity quotient, and were analyzed using path analysis to examine the direct and indirect relationships among the variables, while the Sobel test was used to examine the mediating role of self-management. The findings indicate that digital literacy and creativity contribute positively and significantly to self-management and adversity quotient. Self-management also contributes positively and significantly to adversity quotient. Furthermore, self-management significantly mediates the contributions of both digital literacy and creativity to adversity quotient. These findings indicate that digital literacy and creativity contribute to students' adversity quotient through different mechanisms. Integrating digital literacy, creative problem solving, and self-management into technical drawing instruction is therefore important to support students' ability to face and overcome learning difficulties.

This is an open access article under the CC–BY-SA license.

INTRODUCTION

In the era of digital transformation, vocational education demands an integration of technical skill mastery and student character resilience. Vocational High Schools (SMK), as institutions preparing work-ready graduates, are required to produce human resources who are not only technically competent but also adaptable to technological advancements and industrial dynamics. In this context, instruction can no longer focus solely on knowledge transfer; it must also foster critical thinking, creativity, and resilience. Resilience in the face of learning difficulties is crucial, as vocational students often encounter complex practical tasks requiring high precision. Hence, strengthening the character trait of "adversity quotient" or resilience becomes a vital component in developing sustainable vocational competence.

Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 4 Desember 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

Adversity quotient, reflects an individual's ability to persevere, bounce back, and keep striving when faced with challenges or failure. In learning building technical drawing, students may encounter issues such as scale errors, inaccuracies in construction details, and repeated revisions that demand persistence. Such situations can impact learning motivation if not balanced with adequate resilience. Learning environment factors and intrinsic motivation play a role in shaping resilience against difficulties, while learning independence reinforces student responsibility for task completion (Abidin & Asy'ari, 2023; Arifin, 2022). Thus, adversity quotient emerges as a key factor in enabling students to consistently meet the demands of vocational learning.

Digital technology advancements have further increased the complexity of building technical drawing instruction in vocational high schools (Panjaitan et al., 2022). The use of design software such as CAD and modeling applications requires students not only to understand manual drafting principles but also to operate and utilize technology effectively. Digital literacy enables students to access information, evaluate learning resources, and independently solve technical problems. Further, digital literacy contributes to academic performance and efficiency in software mastery, thereby minimizing technical obstacles (Adawiah & Nurhidayati, 2024; Nurachmat et al., 2018). Students with a high adversity quotient also tend to be better at managing failure and maintaining their commitment to learning (Haq et al., 2024). Likewise, technology-based learning support and innovative methods can strengthen students' conceptual grasp and mental resilience when dealing with complex subject matter (Dalti & Kurniati, 2020).

Technological advancements in the construction sector are also evident in the use of software such as AutoCAD and Revit (Pratama & Marzuki, 2024). AutoCAD is used to generate technical drawings digitally, whereas Revit supports Building Information Modeling (BIM)-based modeling, which integrates building information into a single model. These distinct characteristics indicate that instruction in architectural technical drawing must adapt to the technological developments utilized in the construction industry. Consequently, students are required not only to produce drawings that meet standards but also to be capable of accessing, understanding, and effectively utilizing digital technology.

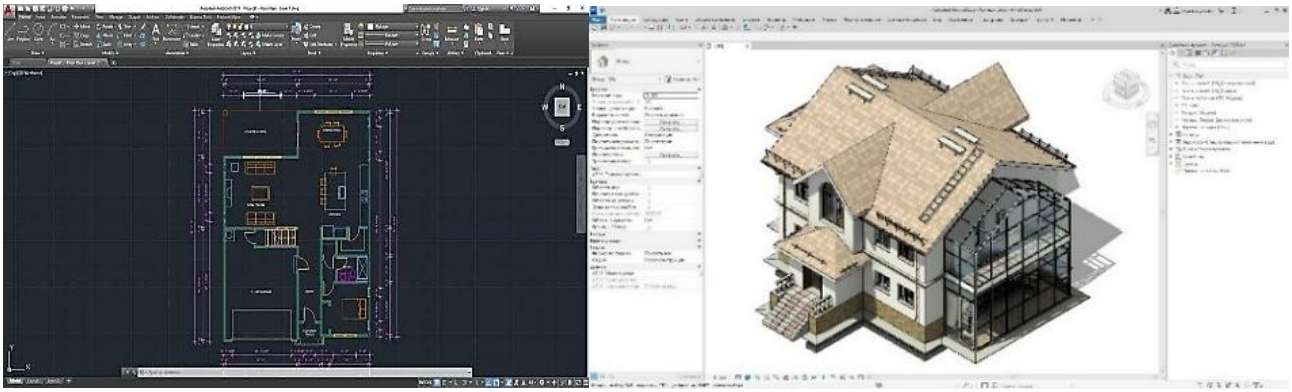


Figure 1. Comparison of the Use of Digital Technology in Building Engineering Drawings
Source: Independent source (left) & https://stepik.org/course/119267/ (right)

In addition to digital literacy, creativity is a crucial factor in learning architectural drafting. Creativity enables students to generate alternative solutions when faced with technical limitations or the specific demands of construction drawings. Utilizing both manual and digital methods expands the scope for idea exploration and fosters adaptation to technological advancements (AlFajri & Nasution, 2016). Contextually relevant instructional materials also support the development of creativity in solving practical problems within the field of building engineering (Ruiz-Jaramillo & Vargas-Yáñez, 2018). Thus, creativity can assist students in developing alternative strategies when encountering difficulties during the learning process.

The relationship between creativity and resilience can be understood through students' ability to generate alternative solutions while maintaining consistent effort when facing learning difficulties. Creativity supports the exploration of alternative solutions, whereas self-management helps students organize, control, and sustain the process of applying those solutions. Thus, creativity may contribute to resilience both directly and indirectly through self-management. Creativity

Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 4 Desember 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

drives exploration and innovation, while resilience sustains the consistency of effort until a solution is found (Amalia et al., 2023; Hasibuan, 2020). In vocational education, project-based learning and interactive learning experiences can also enhance student collaboration, innovation, and learning resilience (Fariza & Kusuma, 2024; Ismail & Nurhayati, 2015). Yet creative abilities may not necessarily develop optimally unless accompanied by the ability to manage the learning process in a directed manner.

Self-management serves as a vital link connecting digital literacy and creativity with resilience. Skills such as work planning, time management, emotional control, and the evaluation of work outcomes are associated with increased resilience and student work readiness (Barus et al., 2023; Nurjaman et al., 2023). In architectural drafting which is a discipline requiring precision and iterative revisions, self-management enables students to organize their workflow, maintain focus, and evaluate errors. With effective self-management, learning obstacles can be addressed through a more focused improvement process. Although various studies have examined digital literacy, creativity, and resilience, research integrating these three aspects within the context of architectural drafting instruction in vocational high schools (SMK) remains limited. Several studies indicate that digital literacy can foster independent learning and creativity (Mutohhari et al., 2021; Syefrinando et al., 2022), while others emphasize the importance of strengthening critical and creative thinking skills in vocational education (Rini et al., 2022; Ririen & Heriasman, 2021). Conversely, limited technological competence remains a barrier to optimizing digital learning (Jia & Huang, 2023). These circumstances highlight the need for an approach that integrates technical-digital skills, creativity, and self-management to explain students' resilience.

Addressing this gap, this study aims to analyze the contributions of digital literacy and creativity to students' resilience mediated by self-management within the context of vocational education in construction. The study examines the contributions of digital literacy and creativity to self-management; the contributions of digital literacy, creativity, and self-management to resilience; and the role of self-management as an intervening variable in the relationship between digital literacy, creativity, and student resilience.

METHOD

This study employed a quantitative approach with an ex post facto design. The study examined the contribution of digital literacy and creativity to students' adversity quotient in building technical drawing, with self-management as an intervening variable. The research was conducted among students in Construction and Building Technology programs at vocational high schools in the Greater Malang area. The research model examined the relationships of digital literacy and creativity with self-management, the relationships of these variables with adversity quotient, and the indirect contributions of digital literacy and creativity to adversity quotient through self-management.

The population consisted of all twelfth-grade students enrolled in Construction and Building Technology programs at vocational high schools in the Greater Malang area. Twelfth-grade students were selected because they had completed productive vocational subjects, including building technical drawing, and therefore had relevant learning experiences related to the variables investigated. The population consisted of 265 students from four schools: SMKN 11 Kota Malang, SMKN 6 Kota Malang, SMKN 1 Singosari, and SMKS Nasional.

Table 1. Sampling Results for Grade XII TKB students at SMK Malang Raya

SMK	Population	Sample
SMKN 11 Kota Malang	53 students	$= \frac{55}{265}\ x\ 160 = 34$ students
SMKN 6 Kota Malang	80 students	$= \frac{80}{265}\ x\ 160 = 47$ students
SMKN 1 Singosari	92 students	$= \frac{92}{265}\ x\ 160 = 55$ students
SMKS Nasional	40 students	$= \frac{40}{265}\ x\ 160 = 24$ students
Amount	265 students	160 students

Source: Researcher's Processed Data, 2026

The sample was selected using proportional random sampling to ensure proportional representation from each school. Using the Slovin formula with a 5% margin of error, a sample of 160 students was obtained. The sample consisted

Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 4 Desember 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

of 34 students from SMKN 11 Kota Malang, 47 from SMKN 6 Kota Malang, 55 from SMKN 1 Singosari, and 24 from SMKS Nasional. Respondents within each school were then selected randomly.

The study involved four variables: digital literacy (X_1), creativity (X_2), self-management (M), and adversity quotient in building technical drawing (Y). Digital literacy and creativity served as independent variables, self-management served as the intervening variable, and adversity quotient served as the dependent variable. Data were collected using a closed-ended questionnaire with a five-point Likert scale, ranging from Strongly Agree (5) to Strongly Disagree (1). The instruments measured digital literacy, creativity, self-management, and adversity quotient in building technical drawing.

Digital literacy was measured through digital access and use, digital information evaluation, and digital production and communication. Creativity was measured through fluency, flexibility, originality, and elaboration. Self-management was measured through learning planning, self-control, and self-evaluation, while adversity quotient was measured using the four CORE dimensions: Control, Origin and Ownership, Reach, and Endurance.

The primary data were collected through questionnaires administered to the respondents. The questionnaires were distributed using Google Forms, with the researcher supervising the data collection process at the research sites. Documentation was also used as supporting data, while observations and interviews were conducted to obtain information regarding the learning conditions and phenomena relevant to the study.

Data were analyzed using IBM SPSS Statistics version 27 through path analysis. Path analysis was employed to examine the direct and indirect contributions among variables, with self-management serving as the intervening variable. Two multiple linear regression equations were used: Structural Equation I examined the contribution of digital literacy and creativity to self-management, while Structural Equation II examined the contribution of digital literacy, creativity, and self-management to adversity quotient.

The analysis began with descriptive statistics and prerequisite tests. Hypotheses were tested using the t-test for partial contributions and the F-test for simultaneous contributions. The coefficient of determination (R^2) was used to determine the explanatory contribution of the independent variables. The indirect contributions of digital literacy and creativity to adversity quotient through self-management were subsequently examined using the Sobel test.

RESULT AND DISCUSSION

Result

Descriptive Statistics

The study involved 160 students from Construction and Building Technology programs at vocational high schools in the Greater Malang area. Descriptive statistical analysis showed that creativity had the highest mean score of 4.135, followed by digital literacy at 4.081, self-management at 4.071, and adversity quotient at 3.904. The standard deviations were 0.505, 0.582, 0.521, and 0.570, respectively. Overall, the four variables demonstrated relatively high mean scores among the respondents.

Table 2. Descriptive Statistics Results

Variable	N	Mean	SD
Digital Literacy	160	4.081	0.582
Creativity	160	4.135	0.505
Self-Management	160	4.071	0.521
Adversity Quotient	160	3.904	0.570

Source: Researcher's data analysis using SPSS 27 (2026)

Contribution of Digital Literacy and Creativity to Self-Management

The first structural equation examined the contributions of digital literacy and creativity to self-management. The results showed that both variables contributed positively and significantly to self-management. Digital literacy had a standardized path coefficient of $\beta = 0.284$, with $t = 4.235$ and $p < 0.001$, while creativity had a standardized path coefficient of $\beta = 0.605$, with $t = 9.016$ and $p < 0.001$.

Simultaneously, digital literacy and creativity significantly contributed to self-management, as indicated by an F-value of 192.768 ($p < 0.001$). The model yielded an R^2 of 0.711, indicating that digital literacy and creativity jointly explained

Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 4 Desember 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

71.1% of the variance in self-management, while the remaining 28.9% was attributable to factors outside the model. These results are consistent with the structural equation reported in the research.

Table 3. Path Analysis of Digital Literacy and Creativity on Self-Management

Predictor	β	t	Sig.
Digital Literacy	0.284	4.235	<0.001
Creativity	0.605	9.016	<0.001
F	192.768		<0.001
R^2	0.711		

Source: Researcher's data analysis (2026)

Contribution of Digital Literacy, Creativity, and Self-Management to Adversity Quotient

The second structural equation examined the contributions of digital literacy, creativity, and self-management to students' adversity quotient in building technical drawing. The model produced an F-value of 78.008 ($p < 0.001$) and an R^2 value of 0.600. Thus, the three predictors jointly explained 60.0% of the variance in adversity quotient, while the remaining 40.0% was attributable to other factors outside the model.

The partial analysis showed that digital literacy contributed positively and significantly to adversity quotient, with $\beta = 0.273$, $t = 3.263$, and $p = 0.001$. Self-management also contributed positively and significantly, with $\beta = 0.667$, $t = 7.091$, and $p < 0.001$.

In contrast, creativity showed a positive but statistically non-significant contribution to adversity quotient. The standardized coefficient was $\beta = 0.264$, with $t = 2.914$ and $p = 0.155$. Thus, although the direction of the relationship was positive, the direct contribution of creativity to adversity quotient was not statistically significant.

Indirect Contribution through Self-Management

The mediation analysis showed that the indirect contribution of digital literacy to adversity quotient through self-management was 0.1894. The Sobel test produced a Z-value of 3.636 and a p-value of 0.0003. Because the Sobel Z-value exceeded 1.96 and the p-value was below 0.05, the indirect contribution was statistically significant. Therefore, self-management significantly mediated the contribution of digital literacy to adversity quotient in building technical drawing.

The mediation analysis further showed that the indirect contribution of creativity to adversity quotient through self-management was 0.4035. The Sobel test produced a Z-value of 2.694 and a p-value of 0.007. Because the Sobel Z-value was greater than 1.96 and the p-value was below 0.05, the indirect contribution was statistically significant. Thus, self-management significantly mediated the contribution of creativity to adversity quotient in building technical drawing. The Week-4 thesis reports this indirect effect as 0.4035.

Table 4. Indirect Effects of Digital Literacy and Creativity through Self-Management

Indirect Path	Indirect Effect	Sobel Z	p	Result
Digital Literacy → Self-Management → Adversity Quotient	0.184448	3.636	0.0003	Significant
Creativity → Self-Management → Adversity Quotient	0.4035	2.694	0.007	Significant

Source: Researcher's data analysis (2026)

Discussion

Digital Literacy, Creativity, and Self-Management

The findings show that digital literacy and creativity significantly contribute to students' self-management. This result indicates that self-management in building technical drawing learning is related not only to students' ability to regulate their behavior, but also to their ability to utilize digital resources and develop alternative solutions.

Digital literacy enables students to access, evaluate, and utilize information needed to complete technical drawing tasks. In a learning environment that involves digital applications such as AutoCAD and Revit, students are required to independently search for information, identify solutions to technical problems, and evaluate their work. These activities can encourage students to organize and manage their learning processes more effectively. This finding is consistent with previous studies showing that digital literacy supports learning performance and students' ability to utilize digital technologies effectively (Adawiah & Nurhidayati, 2024; Nurachmat et al., 2018). In the context of vocational education, this finding is also supported by the study of (Azzahra et al., 2025), which shows that digital literacy has a negative and significant effect on the academic

Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 4 Desember 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

procrastination of vocational high school (SMK) students. This finding indicates that the ability to utilize digital resources effectively can help students complete learning tasks more efficiently and reduce the tendency to postpone academic work. This further confirms that digital literacy not only supports learning achievement but also helps students manage their learning process in a more organized manner.

Creativity also significantly contributes to self-management because producing alternative solutions requires students to plan, explore, evaluate, and determine appropriate actions. In vocational learning, creativity is therefore not merely related to generating ideas but also to managing the process of developing those ideas into completed work. This finding is consistent with research showing the relationship between creativity and self-regulated learning among vocational students (Núñez-Regueiro et al., 2025). (Wang et al., 2025) reported that fluency and flexibility of ideas, as indicators of creativity, predicted students' self-monitoring on the following day, and that self-monitoring in turn predicted the flexibility and usefulness of ideas, so the relationship between the two is reciprocal. Similar findings were shown by (Nufus et al., 2024), who found that students with high self-regulated learning had better creative thinking ability than students with moderate or low levels. Thus, the development of creativity and digital literacy can simultaneously support students in managing the learning process.

Factors Associated with Students' Adversity Quotient

The findings further demonstrate that digital literacy and self-management significantly contribute to students' adversity quotient, whereas the direct contribution of creativity to adversity quotient is positive but not statistically significant. This finding indicates that the ability to access digital resources and manage the learning process has a more direct relationship with students' ability to deal with difficulties in building technical drawing learning.

Digital literacy provides students with access to information and technological resources that can be used to overcome technical problems. Students can search for references, tutorials, examples, and alternative procedures when encountering difficulties. Therefore, digital literacy can function as a supporting resource that enables students to respond to learning problems rather than immediately abandoning the task. This interpretation is consistent with previous findings regarding the contribution of digital literacy to learning performance and the importance of adversity quotient in maintaining students' learning commitment (Adawiah & Nurhidayati, 2024; Haq et al., 2024). The link between digital literacy and students' ability to face academic difficulties is also reflected in a study of university students completing their theses, which found a positive relationship between digital literacy and adversity quotient (AQ) (Sahidun & Dzikrullah, 2025). This finding implies that the ability to utilize digital technology can help university students deal with academic situations that require strategy adjustments, particularly when they face limited information or obstacles in completing tasks. This is in line with (Solahudin et al., 2022), who linked digital literacy to academic resilience through self-efficacy. Thus, digital literacy is relevant not only in providing access to learning resources but can also support university students' ability to maintain engagement and adjust their responses when facing academic demands.

Self-management also contributes significantly to adversity quotient. Learning technical drawing requires students to manage time, maintain concentration, monitor work progress, evaluate errors, and complete repeated revisions. These activities require students to regulate their behavior and maintain their efforts when facing difficulties. Thus, students who are able to manage their learning process in a structured manner have greater resources for maintaining their efforts when encountering technical problems. This relationship can be understood through the role of self-regulated learning in helping students manage their responses to difficulties in a directed manner. When facing complex tasks, students who are able to set goals, monitor progress, evaluate errors, and adjust learning strategies have a more systematic mechanism for dealing with obstacles without immediately stopping their efforts. This regulation process allows difficulties to be treated as part of a process that can be evaluated and improved, rather than merely as failure. This pattern is in line with the findings of (Siboro, 2024) among vocational high school students and (Zakila & Purwantini, 2022) among university students, which showed a positive relationship between adversity quotient and self-regulated learning. Thus, the relationship between the two not only reflects the ability to persist when facing difficulties, but also shows that academic resilience can be reflected in students' ability to control, evaluate, and adjust their learning process when facing increasingly complex demands.

In contrast, although creativity showed a positive direction of contribution, its direct contribution to adversity quotient was not statistically significant. This finding suggests that the ability to generate ideas or alternative solutions alone may not be sufficient to explain students' persistence when facing difficulties. In building technical drawing, creative ideas

Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 4 Desember 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

still need to be implemented through systematic planning, evaluation, revision, and completion. Therefore, creativity may become more meaningful for adversity quotient when accompanied by other abilities, particularly self-management.

This finding is important because it indicates that creativity and adversity quotient should not necessarily be understood as having a simple direct relationship. Students may possess the ability to generate original ideas but may still experience difficulties in maintaining their efforts when the ideas require repeated revisions or encounter technical constraints. Consequently, the contribution of creativity to adversity quotient may operate through other mechanisms, including students' ability to manage their learning process.

Self-Management as a Mediating Mechanism

The most important finding of this study concerns the significant mediating role of self-management in both the relationship between digital literacy and adversity quotient and the relationship between creativity and adversity quotient. The significant mediation of digital literacy indicates that the contribution of digital literacy to students' adversity quotient can also operate through their ability to manage the learning process. Digital literacy provides students with access to information, references, tutorials, and digital learning resources. However, access to these resources becomes more meaningful when students are able to organize their use, determine priorities, manage time, monitor their progress, and evaluate the results of their work.

This finding is supported by (Chasanah et al., 2020), who found a positive relationship between self-regulated learning and academic resilience among students in Informatics Engineering and Electrical Engineering programs. Although self-regulated learning is not completely identical to self-management, both constructs involve regulating learning activities, managing behavior, applying learning strategies, and evaluating learning processes. The results of the study by (Lan et al., 2025) further strengthen the evidence of a moderate and significant relationship between digital literacy and self-regulated learning, which indicates that students' ability to search for and utilize digital resources is closely related to their ability to organize their learning activities. Their findings therefore provide support for the role of self-regulation in students' ability to persist when facing academic difficulties. Self-regulated learning has a positive relationship with academic resilience and can serve as an important mechanism that enables students to develop adaptive responses to academic challenges (Suud et al., 2024).

In the context of building technical drawing, the mediation process can occur when students encounter difficulties such as errors in dimensions, difficulties understanding construction details, problems operating digital drawing applications, or repeated revisions. Digital literacy enables students to search for relevant information or technical solutions, while self-management helps them organize and apply the information systematically. Through this process, digital literacy can contribute not only to the availability of solutions but also to students' ability to continue working until the task is completed. The significant mediation of creativity similarly indicates that the contribution of creativity to adversity quotient can operate through students' ability to manage the learning process. Generating alternative solutions alone may not be sufficient to maintain students' persistence. Students must also be able to select an appropriate alternative, organize work stages, manage time, monitor progress, identify errors, and revise their work. In this context, self-management becomes a mechanism that transforms creative potential into sustained action. This interpretation is also supported by (Nufus et al., 2024), who showed a significant relationship between self-regulated learning and creative thinking ability, in which students who demonstrated a higher level of self-regulated learning tended to have stronger creative thinking skills.

This finding is consistent with research linking creativity and self-regulated learning among vocational students (Núñez-Regueiro et al., 2025). It also corresponds with Magenes et al. (2022), who identified relationships among learning skills, creativity, and self-efficacy in vocational students. These findings suggest that creativity can support students in generating possibilities for solving problems, while regulation and management of the learning process help students transform those possibilities into concrete actions.

The different mediation pathways suggest that digital literacy and creativity may contribute to adversity quotient through complementary processes. Overall, these findings indicate that students' adaptability is influenced not only by the resources and ideas available to them, but also by their ability to organize how those resources and ideas are translated into action. Digital competence and the regulation process are closely interrelated in contemporary learning environments. Digital literacy expands students' access to information and technological resources, whereas creativity expands the range of possible solutions. Self-management helps students organize, select, implement, and evaluate those resources and solutions.

Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 4 Desember 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

Therefore, self-management functions as an important mechanism through which students' digital and creative capacities can be translated into sustained effort when facing difficulties.

Implications for Vocational Education

These findings have important implications for building technical drawing instruction in vocational education. Learning activities should not only train students to operate digital drawing software or produce technically correct drawings but should also provide opportunities for creative problem solving and systematic management of the work process.

Project-based assignments, open-ended design problems, alternative design tasks, time targets, self-checking, reflection, and revision activities can be integrated so that students practice generating solutions while simultaneously managing the process of completing them. In particular, students should be encouraged to use digital resources independently, compare alternative solutions, evaluate errors, and revise their work until the required standards are achieved.

The findings also indicate that the development of creativity should not be separated from the development of self-management. Although creativity showed a positive direction, its direct contribution to adversity quotient was not statistically significant. However, creativity demonstrated a significant indirect contribution through self-management. This suggests that creative potential can become more meaningful when students are able to regulate and manage the process of implementing their ideas.

Similarly, digital literacy should not be limited to the ability to operate software or search for information. Students should be trained to use digital resources strategically, evaluate the relevance of information, apply appropriate solutions, and organize their learning activities. Through this approach, digital literacy can contribute to students' ability to respond to technical difficulties while self-management helps sustain the process.

Overall, the findings emphasize that strengthening students' adversity quotient requires an integrated approach involving digital literacy, creativity, and self-management. The significant mediating role of self-management in both pathways highlights the importance of connecting students' digital and creative capabilities with organized and sustained action. In authentic vocational tasks, students should therefore be given opportunities to explore solutions, manage their work process, respond to errors, conduct revisions, and maintain their efforts until the task is completed.

CONCLUSION

This study shows that digital literacy and creativity contribute positively and significantly to students' self-management and adversity quotient in building technical drawing learning in construction vocational education. Self-management also contributes positively and significantly to adversity quotient and mediates the relationship between digital literacy and creativity and adversity quotient. This finding indicates that the ability to manage the learning process is an important mechanism that helps students utilize their digital competence and creativity to maintain their efforts when facing technical difficulties, errors, and revisions in learning.

The implication is that building technical drawing learning needs to be oriented not only toward mastering technical skills, but also toward integrating the development of digital literacy, creativity, and self-management. Teachers can provide activities that encourage students to explore information and digital technology, develop alternative solutions, organize task completion, monitor progress, evaluate errors, and carry out revisions independently. This approach can support the mastery of technical competence while strengthening students' ability to manage the learning process and face difficulties.

This study has several limitations. The cross-sectional design limits the interpretation of relationships among variables, so the findings cannot yet be used to conclude causal relationships. In addition, the study focused on construction vocational education students, so the generalization of the findings to other vocational fields or student populations needs to be carried out with caution. Future research can use longitudinal or experimental designs to examine the development of digital literacy, creativity, self-management, and adversity quotient over time and to evaluate the effectiveness of learning interventions specifically designed to strengthen these abilities. Testing in different vocational fields and educational contexts is also needed to determine the consistency and breadth of the findings' applicability.

ACKNOWLEDGMENT

During the preparation of this work the authors used Artificial Intelligence (AI), in order to improve the language and readability of the manuscript. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Sosioedukasi
JURNAL ILMIAH ILMU PENDIDIKAN DAN SOSIAL
ISSN: 2086-6135 E-ISSN: 2541-612x
Volume 15 No. 4 Desember 2026 https://ejournal.unibabwi.ac.id/index.php/sosioedukasi/index

REFERENCES

Abidin, R., & Asy'ari. (2023). *Buku Metode Pembelajaran Anak Usia Dini*. UMSurabaya Publishing.

Adawiah, A., & Nurhidayati, A. (2024). Pengaruh Literasi Digital Terhadap Kinerja Tenaga Kependidikan Pada Universitas Lamappapoleonro. *Jurnal Ilmiah Metansi (Manajemen Dan Akuntansi)*, *7*(2), 436–446. https://doi.org/10.57093/metansi.v7i2.339

AlFajri, S., & Nasution, I. N. (2016). Aplikasi Menggambar Teknik Bangunan Dengan Menggunakan Metode Manual Dan Digital. *Educational Building*, *2*(1), 31–40. https://doi.org/10.24114/eb.v2i1.3744

Amalia, A. N., Suyono, S., Arthur, R., & Supriyadi, S. (2023). The Effect of Social Intelligence and Adversity Intelligence of Students on Videographic Creativity. *Path of Science*, *9*(8), 4023–4028. https://doi.org/10.22178/pos.95-22

Arifin, N. (2022). Pengaruh Daya Juang dan Kemandirian Belajar Secara Online terhadap Tanggung Jawab Belajar Mahasiswa PGSD. *Jurnal Basicedu*, *6*(3), 3268–3278. https://doi.org/10.31004/basicedu.v6i3.2244

Azzahra, V. D., Wahono, P., & Adha, M. A. (2025). The Influence of Self-Regulated Learning and Digital Literacy on Academic Procrastination in Vocational Students. *Jurnal Pendidikan Ekonomi, Perkantoran, Dan Akuntansi*, *6*(1), 127–136. https://doi.org/10.21009/jpepa.0601.11

Barus, D. A. B. R., Ahmad, N., & Goit, M. A. D. (2023). Efektivitas Self Management Terhadap Daya Juang Enterpreneur Muda Di Era Digital. *SENTRI: Jurnal Riset Ilmiah*, *2*(12), 5341–5346. https://doi.org/10.55681/sentri.v2i12.1951

Chasanah, D. U., Rejeki, A., & Amelasasih, P. (2020). Peranan Self Regulated Learning dalam Mempengaruhi Resiliensi Akademik pada Mahasiswa Program Studi Teknik Informatika dan Teknik Elektro Universitas Muhammadiyah Gresik yang Bekerja. *PSIKOSAINS (Jurnal Penelitian Dan Pemikiran Psikologi)*, *14*(2), 102–114. https://doi.org/10.30587/psikosains.v14i2.1272

Dalti, Y., & Kurniati, A. (2020). Pengaruh Penerapan Pendekatan Realistic Mathematics Education (RME) Terhadap Kemampuan Koneksi Matematis Berdasarkan Adversity Quotient (Daya Juang) Siswa SMP. *JURING (Journal for Research in Mathematics Learning)*, *3*(2), 159–168. https://doi.org/10.24014/juring.v3i2.9012

Fariza, N. A., & Kusuma, I. H. (2024). Implementasi Model Pembelajaran Berbasis Proyek dalam Meningkatkan Kreativitas Siswa Sekolah Dasar. *Pubmedia Jurnal Penelitian Tindakan Kelas Indonesia*, *1*(3), 1–10. https://doi.org/10.47134/ptk.v1i3.453

Haq, A. F., Riyanti, N., Zariana, A., A'yuni, N. Q., Yuniar, A., Lestari, D. A., & Masitoh, D. (2024). Pengaruh Perbandingan Sosial Terhadap Daya Juang Mahasiswa Dalam Meraih Prestasi Akademik. *MOTIVA: JURNAL PSIKOLOGI*, *7*(1), 73–81. https://doi.org/10.31293/mv.v7i1.7839

Hasibuan, F. H. K. (2020). Bimbingan Kelompok Teknik Self Instruction Untuk Meningkatkan Daya Juang Mahasiswa Yang Kuliah Sambil Bekerja. *JIEGC Journal of Islamic Education Guidance and Counselling*, *1*(1), 33–48. https://doi.org/10.51875/jiegc.v1i1.146

Ismail, A., & Nurhayati. (2015). Hubungan Kreativitas Siswa Dan Gaya Belajar Dengan Hasil Belajar Mata Pelajaran Simulasi Digital Siswa Kelas X di SMK Negeri 1 Bojonggede Kabupaten Bogor. *Jurnal Teknologi Pendidikan*, *4*(2), 23–29. https://doi.org/10.32832/tek.pend.v4i2.480

Jia, W., & Huang, X. (2023). Digital Literacy and Vocational Education: Essential Skills for the Modern Workforce. *International Journal of Academic Research in Business and Social Sciences*, *13*(5), 2227–2234. https://doi.org/10.6007/ijarbss/v13-i5/17080

Lan, M., Liu, H., & Pan, Q. (2025). Unpacking the digital literacy–self-regulated learning nexus: A systematic review and a three-level meta-analysis. *Educational Research Review*, 100713. https://doi.org/10.1016/j.edurev.2025.100713

Mutohhari, F., Sutiman, S., Nurtanto, M., Kholifah, N., & Samsudin, A. (2021). Difficulties in implementing 21st century skills competence in vocational education learning. *International Journal of Evaluation and Research in Education (IJERE)*, *10*(4), 1229–1236. https://doi.org/10.11591/ijere.v10i4.22028

Nufus, H., Muhandaz, R., Nurdin, E., Ariawan, R., Fineldi, R. J., Hayati, I. R., & Situmorang, D. D. B. (2024). Analyzing the students' mathematical creative thinking ability in terms of self-regulated learning: How do we find what we are looking for? *Heliyon*, *10*(3), e24871. https://doi.org/10.1016/j.heliyon.2024.e24871

Núñez-Regueiro, F., Verger, N. B., Bressoux, P., Batruch, A., Bouet, M., Bressan, M., Brown, G., Butera, F., Cherbonnier, A., Darnon, C., Demolliens, M., de Place, A.-L., Desrichard, O., Goron, L., Hémon, B., Huguet, P., Jamet, E., Mazenod, V., Mella-Barraco, N., … Pansu, P. (2025). How teacher autonomy support and student creativity jointly contribute to self-regulated learning: A dynamic, person-environment fit perspective. *Thinking Skills and Creativity*, *58*, 101873. https://doi.org/10.1016/j.tsc.2025.101873

Nurachmat, S., Arthur, R., & Saleh, R. (2018). Pengaruh Gaya Belajar Terhadap Prestasi Belajar Mata Pelajaran Menggambar dengan Perangkat Lunak Kelas XI Teknik Gambar Bangunan di SMK Negeri 6 Bekasi. *Jurnal PenSil*, *7*(1), 45–52. https://doi.org/10.21009/pensil.7.1.5

Nurjaman, J., Suryadi, D., & Rahayu, S. (2023). Pengaruh Emotional Intelligence Terhadap Kesiapan Kerja Mahasiswa Pendidikan Teknik Bangunan Universitas Pendidikan Indonesia. *Jurnal Pendidikan Teknik Bangunan*, *3*(1), 1–10. https://doi.org/10.17509/jptb.v3i1.56895

Panjaitan, K., Sihombing, E., Pasaribu, C. C., & Siregar, C. A. E. (2022). Students'difficulties in Speaking Comprehension of Vocational High School Students. *Review of Multidisciplinary Education, Culture and Pedagogy*, *1*(2), 69–74. https://doi.org/10.55047/romeo.v1i2.94

Pratama, A., & Marzuki, P. F. (2024). Kajian Implementasi BIM (Building Information Modeling) di Indonesia Berdasarkan Perspektif Pelaksana Konstruksi (Studi Kasus: Proyek Kontraktor BUMN). *Jurnal Teknik Sipil*, *30*(2), 277–296. https://doi.org/10.5614/jts.2023.30.2.15

Rini, R., Mujiyati, M., Sukamto, I., & Hariri, H. (2022). The Effect of Self-Directed Learning on Students' Digital Literacy Levels in Online Learning. *International Journal of Instruction*, *15*(3), 329–344. https://doi.org/10.29333/iji.2022.15318a

Ririen, D., & Heriasman, H. (2021). Does Self-Management Affect Students' Digital Literacy? Evidence from a Campus in Riau Province. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *7*(4), 946–955. https://doi.org/10.33394/jk.v7i4.4333

Ruiz-Jaramillo, J., & Vargas-Yáñez, A. (2018). Teaching structures on Architecture degrees: ICT-based methodology and teaching innovation. *Revista Española de Pedagogía*, *76*(270), 353–372. https://doi.org/10.22550/REP76-2-2018-08

Sahidun, M., & Dzikrullah, A. M. (2025). Peningkatan Literasi Digital: Mendongkrak Adversity Quotient Mahasiswa untuk Mempermudah Penyelesaian Skripsi di Tengah Pandemi COVID-19. *WACANA*, *17*(2), 106–117. https://doi.org/10.20961/wacana.v17i2.96241

Siboro, E. R. (2024). The Correlation Between Adversity Quotient and Self-Regulated Learning of Official Students at Forestry. *Reslaj: Religion Education Social Laa Roiba Journal*, *6*(4), 2018–2029. https://doi.org/10.47467/reslaj.v6i4.1196

Solahudin, M., Sujiarto, H., Mudrikah, A., & Kosasih, U. (2022). The effect of digital literature ability on academic resilience through student self-efficiency. *International Journal of Humanities Education and Social Sciences (IJHESS)*, *2*(2), 377–382. https://doi.org/10.55227/ijhess.v2i2.250

Suud, F. M., Agilkaya-Sahin, Z., Na'Imah, T., Azhar, M., & Kibtiyah, M. (2024). The impact of family social support on academic resilience in Indonesian and Turkish students: The mediating role of self-regulated learning. *International Journal of Adolescence and Youth*, *29*(1), 2361725. https://doi.org/10.1080/02673843.2024.2361725

Syefrinando, B., Sukarno, S., Ariawijaya, M., & Nasukha, A. (2022). The Effect of Digital Literacy Capabilities and Self-Regulation on the Student's Creativity in Online Physics Teaching. *Jurnal Pendidikan IPA Indonesia*, *11*(3), 489–499. https://doi.org/10.15294/jpii.v11i3.31811

Wang, X., Ren, H., Reiter-Palmon, R., & Pang, W. (2025). Exploring creativity in self-regulated learning and its association with academic performance. *Learning and Instruction*, *100*, 102224. https://doi.org/10.1016/j.learninstruc.2025.102224

Zakila, A., & Purwantini, L. (2022). Self regulated learning dan optimisme karier terhadap adaptabilitas karier pada mahasiswa tingkat akhir. *SOUL: Jurnal Ilmiah Psikologi*, *14*(1), 45–59. https://doi.org/10.33558/soul.v14i1.5965