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PAPER

# Effects of Adventure Education with Digital Teaching on Students' Self-Efficacy and Interpersonal Relationship

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**ABSTRACT**

The rapid emergence of digital technology changes global appearance and intangibly affects people's thinking and lifestyles, making it the leading force that cannot be ignored. Countries around the world, realizing the importance of digital learning and information technology in education, have proposed relevant programs. There is overall or local planning, from basic environment building to changes in students' learning models. Considering the deep influence of digital teaching on students' learning experiences and teaching mechanisms, the emergence of "digital education" is a positive response to education. In an experimental research study conducted in south-central Taiwan, a cohort of 214 college students underwent an 18-week experimental teaching exercise (amounting to 48 hours, at three hours per week). The data was then scrutinized using SPSS 12.0. The findings delineated two primary outcomes: 1) When juxtaposed with conventional teaching methodologies, the infusion of digital teaching into adventure education led to pronounced improvements in students' self-efficacy and interpersonal relationships. 2) A discernible positive correlation was observed between students' self-efficacy and their interpersonal relationships. Drawing upon these results, it's inferred that both self-efficacy and interpersonal relationships can be bolstered through judicious curriculum design. In light of these insights, the study offers several recommendations. The overarching aspiration is to not only foster a self-directed learning proclivity among students, making them better equipped to navigate life, but also to offer them the tools and guidance to pinpoint and realize their aspirations and ideals.

**KEYWORDS**

digital teaching, adventure education, self-efficacy, interpersonal relationship

## 1 INTRODUCTION

Along with social and cultural changes, education presents distinct orientations at different stages. From "child-centered" orientation stressing creative self-expression in the 1960s, "subject-centered" orientation in the 1980s, and post-modern education in the 1990s, "visual education" is then proposed. In consideration of the deep

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effect of digital teaching on students' learning experiences, the influence of teaching mechanisms cannot be neglected. There are positive responses in education to the educational trend of "digital education." Based on subjects, visual culture is the nutrition, digitalization is the character, networks are the path, and digital technology is the tool. The discussion is classified into "the learning meaning and value of education to individual thought and subjective ideology under the digital visual era" and "exploration of contemporary application practice and mechanisms to digital technology in teaching sites." In adventure education curricula, a teacher plays the role of a counselor, with oral encouragement, to have students think and actively learn, guide students viewing questions from different aspects, as well as allow students attempting to think and induce creativity with personal experience and practice operation. Contrastingly, educators who exhibit an authoritative demeanor and adhere strictly to predetermined paces and structures in lesson planning could potentially hinder the learning enthusiasm of students, especially those struggling to keep pace. Such an approach may lead to a passive learning environment where students rely heavily on direction, refrain from independent thinking, and simply await answers. In contrast, adventure education underscores the importance of student interaction and positive feedback during the learning process. This approach encourages educators to maintain healthy relationships with their students, closely monitor student reactions, and offer timely guidance, all aiming to foster students' proactive problem-solving skills [1].

Modern educational objectives pivot towards alleviating the undue academic pressures on children, bolstering students' capacity for autonomous learning, and promoting a diverse learning environment. This seeks to prioritize the unique strengths of each learner over a traditional emphasis on purely cognitive education. This study delves into the impact of integrating adventure education with digital pedagogy, especially on students' self-efficacy and interpersonal relationships. The overarching ambition is to unshackle students from the confines of rigid educational systems, enabling them to proactively develop life skills, nurture self-reliant learning habits, and truly realize their potential, setting them on a path to genuine success and the pursuit of their aspirations.

## 2 LITERATURE REVIEW

Tsolou et al. [2] highlighted the merits of merging adventure education with digital teaching, emphasizing principles such as experiential learning, reflection, teamwork, autonomous challenge, problem-solving, trust cultivation, and fostering listening and expressive skills. When courses infused both adventure education and digital pedagogy, students exhibited enhancements in their problem-solving aptitude, team cohesion, interpersonal engagement, resilience in the face of setbacks, character development, and self-identity. When combined with digital methodologies, adventure education represents an instructional paradigm where exploratory events or challenges are woven into activities, guiding participants through stages of experience, emotional response, insight, understanding, and practical application [3]. This amalgamation crafts a conducive learning milieu, offering learners avenues for introspection and collaborative exploration, enabling the discovery of inherent capabilities, values, passions, and a sense of duty [4].

Viner et al. [5], while dissecting the notion of self-efficacy, posited that an individual's behavioral drive stems from their belief in their capacity to execute or

exert control. This sense of self-assurance is fortified through repetitive practice. Çeliktürk Sezgin [6] delineated three pillars of self-efficacy:

1. **Self-concept** pertains to personal sentiments and viewpoints.
2. **Control** is anchored in one's capability to act and influenced by individual experiences, cognitive processes, and self-belief.
3. **Cognitive processes** encompass judgments made about understanding events based on prior experiences, which subsequently mold an individual's motivation.

Raju et al. [7] elucidated that the experiential aspect of "learning by doing" within adventure education, supplemented with digital techniques, nurtures problem-solving skills and fosters a personal understanding of one's abilities, values, and responsibilities—traits universally applicable to life [8]. Abuhassna et al. [9] observed that the integration of digital teaching methodologies might present challenges in fostering students' autonomous learning abilities. However, formulating solutions based on individual experiences represents the next milestone for students. Achieving this allows them to grasp the significance and devise strategies for realization. This concept aligns with the self-regulatory behavioral motivation described in extant literature [10]. Based on these insights, this research endeavors to establish the subsequent hypothesis.

*H1: Adventure education with digital teaching would affect self-efficacy.*

Santosa et al. [11] introduced a tri-dimensional perspective on interpersonal relationships, emphasizing that every individual inherently seeks interpersonal connections. This theory is organized into three primary dimensions:

1. **Acceptance** pertains to an individual's desire to feel valued, significant, and cherished.
2. **Control** underscores an individual's need to exert influence over others while also occasionally being under the influence or guidance of others within interpersonal contexts.
3. **Affection** signifies the emotional bond or connection that exists between two individuals [12].

Adventure education operates primarily as a team-centric instructional model. It accentuates the pivotal role of the team and underscores that the evolution of a team can be assessed through the lens of individual interpersonal relations. Chen et al. [13] outlined objectives for interpersonal relations within the framework of adventure education, integrated with digital teaching. The primary objectives are:

1. Team perspective: Envisioning students as a cohesive unit where experiential learning is prioritized and problems are collaboratively addressed through online team deliberations.
2. Collaborative endeavor: This involves viewing both the individual and the team as a singular entity, working in tandem to navigate challenges and realize shared aspirations.

Incorporating digital pedagogy into curricula fosters an appreciation for the essence of teamwork. It facilitates a hands-on understanding of the significance of collective effort, promotes individual growth, and cultivates a culture of valuing

diverse perspectives [14]. Given these insights, this research subsequently formulates a new hypothesis for investigation.

*H2: Adventure education with digital teaching would affect interpersonal relationship.*

Luan and Tsai [15] underscored that during the learning phase, students are tasked with a plethora of activities, assignments, and other duties. It was observed that students with higher self-efficacy demonstrated superior self-regulation and self-assurance. Moreover, there was a noticeable trend of students engaging in collaborative interactions, leveraging such exchanges to glean insights from their peers' strengths, thereby enhancing their interpersonal dynamics.

Rizos and Gkrekas [16] discerned a notable shift in students' self-realization and interpersonal rapport pre- and post-participation in an adventure education camp. This difference was statistically significant, underscoring the impact of such educational experiences.

Pallathadka et al. [17] revealed that the quality of interpersonal relationships among high school students on campus played a pivotal role in augmenting their self-efficacy in learning. A school environment acts as a microcosm of society, offering students a conducive platform to hone their abilities through observational learning. This environment also spurs students to strive for enhanced interpersonal bonds and competencies [18].

In light of the above findings and discussions, this research puts forth an additional hypothesis for further exploration.

*H3: Self-efficacy reveals significant and positive effects on interpersonal relationship.*

# 3 RESEARCH METHOD

## 3.1 Measurement of research variable

**Self-efficacy.** Referring to the self-efficacy questionnaire of Lan et al. [19], two dimensions are covered in self-efficacy (see Table 1).

**Table 1.** Measurement of self-efficacy

| Dimension | Definition |
|---|---|
| Self-control | Performance on self-confident things |
| Self-confidence | Self-trust on things |

## 3.2 Interpersonal relationship

Referring to the interpersonal relationship questionnaire of Pai et al. [20], the single dimension is used (see Table 2).

**Table 2.** Measurement of interpersonal relationship

| Dimension | Definition |
|---|---|
| Interpersonal relationship | Interaction with friends |

### 3.3 Research object and sampling data

In this experimental study, 214 college students from central and southern Taiwan, consisting of 122 males and 92 females, were selected as participants (see Table 3). They underwent an 18-week adventure education program integrating digital teaching, with each session lasting three hours and accumulating to a total of 48 hours. Data collected from the administered questionnaires were subjected to statistical analysis using SPSS. Various statistical methods, such as factor analysis, reliability analysis, regression analysis, and analysis of variance, were employed to test the proposed hypotheses.

**Table 3.** Number of subjects and percentage in each group

| Group | Adventure Education with Digital Teaching | Percentage (%) |
|---|---|---|
| Male | 122 | 57% |
| Female | 92 | 43% |
| Total | 214 | 100% |

### 3.4 Analysis method

A T-test was conducted to examine the differences in self-efficacy and interpersonal relationship outcomes resulting from the integration of adventure education with digital teaching. Additionally, regression analysis was employed to delve deeper into the relationship between self-efficacy and interpersonal relationships.

## 4 ANALYSIS RESULT

### 4.1 Analysis of reliability and validity

Following factor analysis, self-efficacy yielded two distinct factors. The first factor, "self-control," had an eigenvalue of 3.625 and demonstrated strong reliability with an alpha coefficient ($\alpha$) of 0.91. The second factor, "self-confidence," had an eigenvalue of 2.957 and an alpha coefficient ($\alpha$) of 0.89. Collectively, these two factors accounted for 84.275% of the total variance in self-efficacy.

In the realm of interpersonal relationships, factor analysis isolated a single factor with an eigenvalue of 5.327. This factor exhibited robust reliability, as indicated by its alpha coefficient ($\alpha$) of 0.92. Remarkably, this factor accounted for 88.192% of the total variance in interpersonal relationships.

### 4.2 Effects of adventure education with digital teaching on self-efficacy and interpersonal relationship

**Variance analysis of adventure education with digital teaching in self-efficacy.** Independent T test analysis is used in this study to discuss the difference between adventure education and digital teaching in terms of self-efficacy. Table 4 shows remarkable differences between adventure education and digital teaching in self-control (t = 6.881, P = 0.000***) and self-efficacy. Self-confidence is

higher after adventure education with digital teaching (4.27) than before adventure education with digital teaching (3.72).

**Table 4.** Variance analysis of adventure education with digital teaching in self-efficacy

| Variable | | | Mean | t | P |
|---|---|---|---|---|---|
| Self-efficacy | Self-control | Before teaching | 3.54 | 6.881 | 0.000*** |
| | | After teaching | 4.03 | | |
| | Self-confidence | Before teaching | 3.72 | 8.295 | 0.000*** |
| | | After teaching | 4.27 | | |

*Note:* *** stands for $p < 0.001$.

Figure 1 shows higher self-control after adventure education with digital teaching (4.03) than before adventure education with digital teaching (3.54) and higher self-confidence after adventure education with digital teaching (4.27) than before adventure education with digital teaching (3.72). H1 is therefore supported.

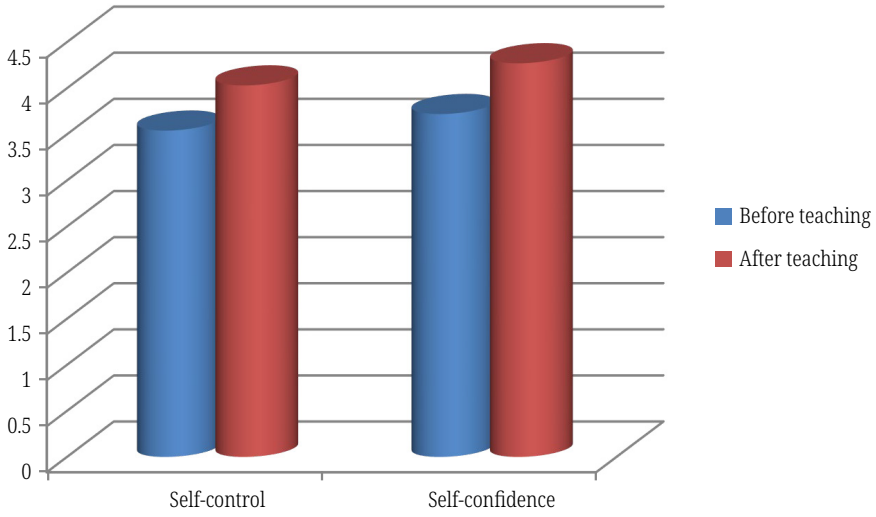


**Fig. 1.** Variance analysis of self-efficacy

**Variance analysis of adventure education with digital teaching in interpersonal relationship.** According to independent t test analysis to discuss the difference of adventure education with digital teaching in interpersonal relationship. Figure 2 and Table 5 reveal notable difference of adventure education with digital teaching in interpersonal relationship ($t = 11.746$, $P = 0.000$***), which is higher after adventure education with digital teaching (4.36) than before adventure education with digital teaching (3.83). Consequently, H2 is supported.

**Table 5.** Variance analysis of adventure education with digital teaching in interpersonal relationship

| Variable | | Mean | t | P |
|---|---|---|---|---|
| Interpersonal relationship | Before teaching | 3.83 | 11.746 | 0.000*** |
| | After teaching | 4.36 | | |

*Note:* ***stands for $p < 0.001$.

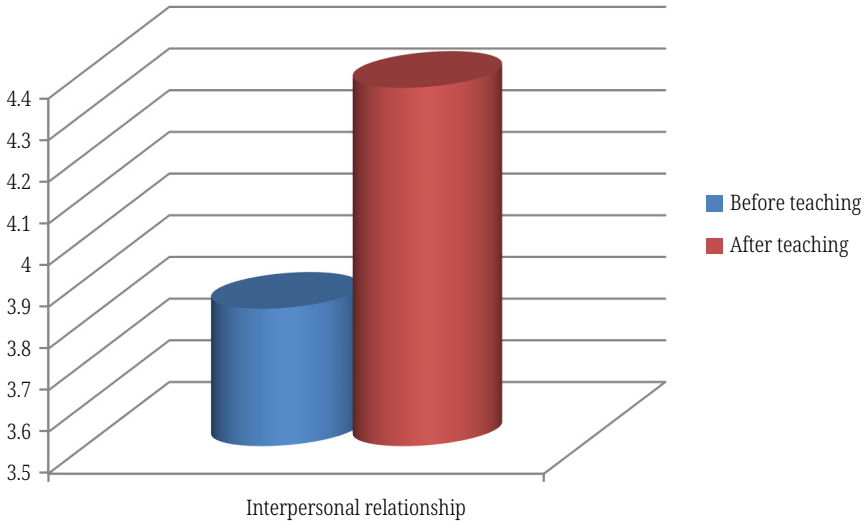


**Fig. 2.** Variance analysis of interpersonal relationship

### 4.3 Correlation analysis of self-efficacy and interpersonal relationship

The results for hypothesis H3, as presented in Table 6, demonstrate that both "self-control" and "self-confidence" significantly influence interpersonal relationships. Specifically, the beta coefficient (β) for self-control is 2.542, and for self-confidence, it is 2.723, both at a significance level of $p < 0.01$. Therefore, the data supports hypothesis H3, indicating that both facets of self-efficacy—self-control and self-confidence—positively impact interpersonal relationships.

**Table 6.** Analysis of self-efficacy to interpersonal relationship

| Dependent Variable → / Independent Variable ↓ | Interpersonal Relationship | |
|---|---|---|
| Self-efficacy | β | P |
| Self-control | 2.542** | 0.000 |
| Self-confidence | 2.723** | 0.000 |
| F | 35.952 | |
| Significance | **0.000*** ** | |
| $R^2$ | 0.375 | |
| Adjusted $R^2$ | 0.351 | |

*Notes:* *stands for $p < 0.05$; **for $p < 0.01$.

## 5 DISCUSSION AND SUGGESTION

Students in this study discover that thinking about different aspects could calm themselves down and help them deal with bad emotions. Some students could not trust their classmates in the interaction process, causing emotional panic. Through teachers' guidance, students gradually try to overcome the mood and start

to trust their classmates. In this case, students change the emotion due to different course contents. Some students show further comprehension about mood control through the course; other students seek out trusted people to relieve the mood. Apparently, it is important to have teachers guide students in adventure education.

In adventure education with digital teaching, students find out lots of opinions among many people. Too many opinions would result in the dilemma of not knowing what to do. In this case, a leader would integrate opinions into ones accepted by everyone and present leadership and social ability in the integration process. An adequate social ability would receive people's trust and help them more easily become leaders. Adventure education with digital teaching is preceded by digital interaction, so students could better experience the feeling of a social leader in adventure education with digital teaching.

## 6 CONCLUSION

The inclusion of adventure education with digital teaching has proven to be a transformative learning experience for students. The findings indicate that post-adventure education, both self-efficacy and interpersonal relationship metrics, sees a notable improvement in students' post-test results.

Efficiency is a paramount lesson from this educational strategy. Students learn the essence of thoughtful execution. Rapid action does not equate to effectiveness; deliberation can lead to reduced errors, and subsequently, an enhancement in overall efficiency. This realization is not confined merely to the context of educational activities. Instead, it transcends to broader life contexts, such as time management, a skill that has significant implications in daily life. Adventure education with digital teaching, therefore, serves as a microcosm of the larger world, where the importance of efficiency and time management are realized and applied in everyday routines.

Equally crucial is the lesson on self-confidence. Adventure education pushes students out of their comfort zones, allowing them to engage with unfamiliar situations and challenges. Some students lean into their past experiences as a source of self-assurance, while others draw confidence from overcoming the new challenges presented to them. These activities illuminate a crucial truth: evading challenges due to a lack of self-confidence results in a perpetuating cycle of self-doubt. Instead, facing them head-on, starting with simpler tasks and gradually moving to more complex ones, allows for the cultivation and growth of genuine self-confidence.

In essence, the integration of adventure education with digital teaching offers students a holistic, immersive learning experience. It teaches them about the nuances of efficiency and the invaluable nature of self-confidence. These lessons are not just academic but deeply personal, enabling students to navigate the real world with increased competence and assurance.

## 7 REFERENCES

[1] N. S. Baron, "Know what? How digital technologies undermine learning and remembering," *Journal of Pragmatics*, vol. 175, pp. 27–37, 2021. https://doi.org/10.1016/j.pragma.2021.01.011

[2] O. Tsolou, T. Babalis, and K. Tsoli, "The impact of COVID-19 pandemic on education: Social exclusion and dropping out of school," *Creative Education*, vol. 12, no. 3, pp. 529–544, 2021. https://doi.org/10.4236/ce.2021.123036

[3] B. A. Akhmedov and S. K. Khasanova, "Public education system methods of distance in education in development of employees," *Journal of Innovations in Engineering Research and Technology*, vol. 1, no. 1, pp. 252–256, 2020. https://doi.org/10.1080/0158791860070103

[4] R. R. Maaliw III, "Adaptive virtual learning environment based on learning styles for personalizing e-learning system: Design and implementation," *International Journal of Recent Technology and Engineering*, vol. 8, no. 6, pp. 3398–3406, 2020. https://doi.org/10.35940/ijrte.F8901.038620

[5] R. M. Viner, S. J. Russell, H. Croker, J. Packer, J. Ward, C. Stansfield, O. Mytton, C. Bonell, and R. Booy, "School closure and management practices during coronavirus outbreaks including COVID-19: A rapid systematic review," *The Lancet Child & Adolescent Health*, vol. 4, no. 5, pp. 397–404, 2020. https://doi.org/10.2139/ssrn.3556648

[6] Z. Çeliktürk Sezgin, "Systematic analysis of digital reading studies in the digital age," *Participatory Educational Research*, vol. 9, no. 1, pp. 233–250, 2022. https://doi.org/10.17275/per.22.13.9.1

[7] R. Raju, N. Abd Rahman, and A. Ahmad, "Cyber security awareness in using digital platforms among students in a higher learning institution," *Asian Journal of University Education*, vol. 18, no. 3, pp. 756–766, 2022. https://doi.org/10.24191/ajue.v18i3.18967

[8] S. Mukhtar and K. Y. S. Putri, "Technology integrated on media literacy in economic studies on higher education," *Journal of Social Studies Education Research*, vol. 12, no. 1, pp. 95–123, 2021. https://doi.org/10.21061/jots.v37i1.a.4

[9] H. Abuhassna, W. M. Al-Rahmi, N. Yahya, M. A. Z. M. Zakaria, A. B. M. Kosnin, and M. Darwish, "Development of a new model on utilizing online learning platforms to improve students' academic achievements and satisfaction," *International Journal of Educational Technology in Higher Education*, vol. 17, no. 38, pp. 1–23, 2020. https://doi.org/10.1186/s41239-020-00216-z

[10] W. Zhang, Y. Wang, L. Yang, and C. Wang, "Suspending classes without stopping learning: China's education emergency management policy in the COVID-19 outbreak," *Journal of Risk and Financial Management*, vol. 13, no. 55, pp. 2–6, 2020. https://doi.org/10.3390/jrfm13030055

[11] F. H. Santosa, S. Samsuriadi, S. Hadi, R. Jinan, and L. M. Astutiyani, "Students' mathematical understanding of online learning: Evaluation of triangular and rectangular materials," *Jurnal Teori dan Aplikasi Matematika (JTAM)*, vol. 6, no. 1, pp. 126–133, 2022. https://doi.org/10.1080/10986065.2019.1570833

[12] K. M. Ouverson, A. G. Ostrander, J. Walton, A. Kohl, S. B. Gilbert, M. C. Dorneich, E. Winner, and A. M. Sinatra, "Analysis of communication, team situational awareness, and feedback in a three-person intelligent team tutoring system," *Frontiers in Psychology*, vol. 12, p. 553015, 2021. https://doi.org/10.3389/fpsyg.2021.553015

[13] L. Chen, P. Chen, and Z. Lin, "Artificial intelligence in education: A review," *IEEE Access*, vol. 8, pp. 75264–75278, 2020. https://doi.org/10.1109/ACCESS.2020.2988510

[14] H. A, El-Sabagh, "Adaptive e-learning environment based on learning styles and its impact on development students' engagement," *International Journal of Educational Technology in Higher Education*, vol. 18, no. 53, pp. 1–24, 2021. https://doi.org/10.1186/s41239-021-00289-4

[15] H. Luan and C. C. Tsai, "A review of using machine learning approaches for precision education," *Educational Technology & Society*, vol. 24, no. 1, pp. 250–266, 2021. https://doi.org/10.52458/978-81-955020-5-9-18

[16] I. Rizos and N. Gkrekas, "Is there room for conjectures in mathematics? The role of dynamic geometry environments," *European Journal of Science and Mathematics Education*, vol. 11, no. 4, pp. 589–598, 2023. https://doi.org/10.30935/scimath/13204

[17] H. Pallathadka, A. Wenda, E. Ramirez-Asís, M. Asís-López, J. Flores-Albornoz, and K. Phasinam, "Classification and prediction of student performance data using various machine learning algorithms," *Materials Today: Proceedings*, vol. 80, pp. 3782–3785, 2023. https://doi.org/10.1016/j.matpr.2021.07.382

[18] Y. F. Wang, Y. F. Hsu, and K. Fang, "The key elements of gamification in corporate training–the delphi method," *Entertainment Computing*, vol. 40, p. 100463, 2022. https://doi.org/10.1016/j.entcom.2021.100463

[19] P. S. Lan, M. C. Liu, and D. Baranwal, "Applying contracts and online communities to promote student self-regulation in English learning at the primary-school level," *Interactive Learning Environments*, vol. 31, no. 1, pp. 468–479, 2023. https://doi.org/10.1080/10494820.2020.1789674

[20] K. C Pai, B. C. Kuo, C. H. Liao, and Y. M. Liu, "An application of Chinese dialogue-based intelligent tutoring system in remedial instruction for mathematics learning," *Educational Psychology*, vol. 41, no. 2, pp. 137–152, 2021. https://doi.org/10.1080/01443410.2020.1731427

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