

Short Story Writing Model to Cultivate Creativity and Digitalpreneurship

Dian Nuzulia Armariena¹ , Agus Nuryatin^{2*} , Teguh Supriyanto³ , Nas Haryati Setyaningsih⁴ ,

Edward Harrington⁵ 

^{1, 2, 3, 4}Faculty of Language and Arts, Universitas Negeri Semarang, Indonesia

⁵Department of Informatics Engineering, Eduaward Incorporation, United Kingdom

¹diannuzulia@students.unnes.ac.id, ²agusnuryatin@mail.unnes.ac.id, ³teguh.supriyanto@mail.unnes.ac.id,

⁴nasharyati@mail.unnes.ac.id, ⁵e.harrington@eduaward.co.uk

*Corresponding Author

Article Info

Article history:

Submission May 20, 2025

Revised October 28, 2025

Accepted June 17, 2026

Published August 12, 2026

Keywords:

Scientific

Writing

Digitalpreneurial

Creativity

Short Story



ABSTRACT

In the context of higher education, particularly within teacher training institutions, there is a growing need for innovative instructional models that integrate scientific understanding with creative and entrepreneurial competencies. Writing short stories based on scientific principles provides a medium for students to merge analytical thinking with imaginative expression, fostering skills essential for the digital era. **This study aims** to design and assess a short story writing learning model grounded in scientific principles to foster university students' creativity and digitalpreneurial thinking. **The research was implemented** across three higher education institutions in South Sumatra Sriwijaya University (UNSRI), PGRI University of Palembang (UPGRIP), and Tridianti University of Palembang (UNANTI) using a Research and Development (R&D) methodology that included needs analysis, model design and validation, and effectiveness testing. The model was validated by experts, refined based on academic and practitioner feedback, and its effectiveness was evaluated through statistical analysis, including normality and homogeneity testing followed by a paired sample *t*-test. **The findings demonstrated** a significant improvement in students' short story writing performance, confirming the model's effectiveness in enhancing both creative and analytical writing abilities while supporting contextual and interdisciplinary learning. **The study concludes** that the scientific-based short story writing model not only strengthens students' academic and creative competencies but also nurtures entrepreneurial mindsets relevant to the digital era.

This is an open access article under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license.



DOI: <https://doi.org/10.34306/att.v8i3.727>

This is an open-access article under the CC-BY license (<https://creativecommons.org/licenses/by/4.0/>)

©Authors retain all copyrights

1. INTRODUCTION

In the evolving landscape of higher education, particularly in Teacher Training and Education Institutions (LPTK), literature has become not only a subject of study but also a transformative tool for developing students' cognitive, affective, and entrepreneurial competencies. Literary education today extends beyond text interpretation into creative production, especially short story writing. As a concise and impactful literary form, short stories allow students to explore experiences, convey scientific ideas, and engage with social realities

through narrative expression [1, 2]. Through short story writing, students can develop critical thinking, creativity, and communication skills while transforming knowledge into meaningful narratives. Moreover, this activity encourages learners to connect academic concepts with real-world issues, making literary learning more relevant and engaging.

Despite its inclusion in the curriculum, many students still struggle to write imaginative and coherent short stories that combine creativity with academic depth [3–5]. This difficulty arises from the gap between academic literacy and creative writing. Students are generally trained in formal academic genres such as reports and research papers but rarely in transforming scientific knowledge into engaging narratives [6, 7]. The challenge is particularly evident in LPTKs, where students are expected to master pedagogy, critical thinking, and creative expression simultaneously [8, 9].

Addressing this issue, the present study proposes an instructional model that guides students in creating short stories grounded in scientific ideas while nurturing creativity and digitalpreneurial mindsets [10, 11]. The paper demonstrates originality by introducing a scientific-based short story writing model that bridges academic literacy and creative expression an approach still underexplored in Indonesian higher education [12, 13]. The integration of scientific inquiry, literary creativity, and entrepreneurial thinking represents an innovative contribution to literature-based learning in the 21st century [14, 15].

Aligned with the principles of process-based writing, this research views writing as a reflective and iterative process that empowers students to reinterpret academic content through literary expression [16, 17]. Integrating scientific literacy into short story writing enhances self-reflection, deep learning, and the perception of storytelling as an intellectual and economically valuable activity [18, 19]. In the Indonesian context, where literacy and educational innovation remain national priorities, this study contributes to developing pedagogies that unite local wisdom, scientific insight, and entrepreneurial values [20].

Ultimately, developing a scientific-based short story writing model is essential for fostering creativity and digitalpreneurial mindsets among university students. This study also aligns with Sustainable Development Goals (SDGs) 4 (Quality Education), which promotes inclusive and innovative learning, and SDGs 8 (Decent Work and Economic Growth), which emphasizes entrepreneurship and skill development for sustainable digital-era employment. Furthermore, the model provides students with opportunities to integrate scientific knowledge, creative thinking, and digital competencies within meaningful learning activities. As a result, students are better prepared to adapt to the demands of the digital era while developing innovative and entrepreneurial perspectives through literary creation.

2. LITERATURE REVIEW

2.1. Writing Skill

Writing is one of the most complex and essential language skills in higher education [21, 22]. In developing scientific-based short stories, writing goes beyond linguistic accuracy to cultivate creativity, innovation, and entrepreneurial thinking. It progresses from mastering fundamental structures to expressing abstract ideas that demonstrate cognitive growth and the integration of scientific insights into literary forms [23, 24]. This process requires higher-order thinking, including analysis, synthesis, and structured communication [25, 26], alongside metacognitive skills such as planning, revising, and organizing, which parallel digital entrepreneurial traits like adaptability and strategic creativity [27, 28].

Writing is also a collaborative and reflective act, where peer and instructor feedback helps refine ideas and quality [29]. This iterative process mirrors entrepreneurial cycles of ideation and improvement, combining physical execution with cognitive-emotional engagement that drives creativity and problem-solving [30, 31]. Through integrating metacognitive strategies and contextual creativity, scientific-based short story writing empowers students to transform academic content into imaginative narratives, strengthening comprehension and digitalpreneurial competence.

2.2. The Purpose of Writing Skill

Writing serves multiple purposes, reflecting its cognitive, creative, and socio-cultural dimensions. It allows individuals to structure and express ideas coherently while stimulating critical thinking and embedding moral and humanistic values [32, 33]. In higher education, writing functions as both an academic and reflective practice that fosters logical organization, creativity, and communication skills. In the digital and entrepreneurial era, however, the function of writing has expanded. As [34] points out, contemporary writing increasingly responds to academic needs, creative self-expression, and digital consumer behavior, linking it to areas such as

digital publishing, content creation, and educational entrepreneurship. Applied to scientific-based short stories, writing becomes a transformative medium that bridges scientific reasoning and creative narration, cultivating digitalpreneurial mindsets and empowering students to create works that are intellectually rich, creatively engaging, and relevant to the digital age.

2.3. The Stages of Writing

Writing is a recursive cognitive process that develops through systematic stages, contributing to coherence and clarity. Several studies identify key phases such as prewriting, drafting, revising, and publishing, often incorporating idea generation, peer feedback, and technological support [35]. In modern education, digital tools are increasingly used to facilitate collaboration and online publication. Understanding this cyclical process is essential for developing effective instructional models, particularly in scientific-based short story writing that merges logical reasoning with creative expression [36]. Integrating cognitive and metacognitive strategies throughout these stages strengthens writing competence while fostering a digitalpreneurial mindset, enabling students to produce academically rigorous and digitally relevant works [37].

2.4. Short Story

A short story is a concise fictional narrative focused on a single event, conflict, or character within a limited setting. It aims to deliver a strong impression in a brief yet meaningful form. In education especially in teacher training and language programs it serves to enhance creativity, critical thinking, and imagination as part of 21st-century skill development [38, 39].

In designing a scientific-based short story writing model, understanding narrative structure is essential. The six key components include Abstract, which provides a summary of the core idea, Orientation, which introduces the setting and characters, Complication, which marks the emergence of conflict, Evaluation, which develops rising tension, Resolution, which presents the conflict resolution, and Coda, which offers a reflective or moral closure. These elements guide students in developing coherent, logical, and value-based storytelling.

Short stories are generally defined by concise length, focus on a single conflict, limited characters, minimal setting shifts, embedded moral or philosophical message, and strong emotional impact. These traits encourage precision in writing and support the integration of creativity, scientific literacy, and entrepreneurial thinking.

Moreover, the foundational elements of a short story are generally divided into intrinsic and extrinsic components. The intrinsic elements encompass the internal structure of the story, including the theme, which reflects the underlying idea or philosophical message; character and characterization, which portray the fictional individuals and their psychological complexity; the plot, representing the organized sequence of events that drive the narrative; and the setting, which defines the time, place, and environmental context of the story. Additionally, the point of view establishes the narrative perspective such as first-person or third-person while the language style shapes the tone through diction, sentence structure, and literary devices. Finally, the moral message conveys the implicit or explicit values that the author intends to communicate through the narrative.

Extrinsic elements are external factors that influence the creation and interpretation of a short story, including the author's socio-cultural background, ideological views, education, and life experiences. These aspects help readers understand a text within broader contexts and encourage students to connect literature with real-world scientific and social issues. When applied in a scientific-based short story writing model, these dimensions enable learners to transform factual knowledge into creative narratives that incorporate themes such as environmental sustainability, health, and technology. At the same time, students develop entrepreneurial thinking by using digital platforms for publishing, aligning literary creativity with digital innovation. This approach strengthens writing skills, creativity, and a forward-looking mindset for the digital era.

2.5. Learning Model

A well-structured learning model is essential for effective teaching and learning. It helps educators achieve objectives efficiently and supports students in understanding materials based on their abilities. Learning models enhance teaching interactivity, encourage independent study, and offer flexibility in learning. They may take various forms, such as printed, audio, or interactive media [40, 41]. This study applies printed models modules, handouts, and activity sheets to guide students through structured tasks. The approach aligns with SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth) by promoting inclusive, skill-oriented, and entrepreneurial learning.

3. METHODOLOGY

3.1. Research Design

This study employs a R&D approach to design a scientific-based short story writing model that enhances student creativity and fosters digitalpreneurial mindsets among English Education students. The research follows the development model by [42], consisting of ten stages, namely research and information collecting, which involves identifying needs and reviewing relevant literature, planning, which includes formulating objectives and developing learning strategies, developing the preliminary product, preliminary field testing, main product revision, main field testing, operational product revision, operational field testing, final product revision, and dissemination and implementation. Through these systematic stages, the study aims to produce an innovative and applicable learning model that strengthens students' literary and creative abilities while fostering entrepreneurial awareness in digital contexts.

3.2. Research Procedure

This study adopts the R&D model proposed by [42], consisting of ten systematic stages. The process begins with research and information collection through questionnaires, interviews, and observations at three universities (UNSRI, UPGRIP, UNANTI) to identify lecturer and student needs. The planning stage includes syllabus analysis, focus group discussions (FGDs), material design, and preparation of research instruments, followed by the development and expert validation of modules, lesson plans, worksheets, and evaluation tools [43]. Preliminary and main field tests are conducted using a one-group pretest–posttest design ($O_1 \times O_2$) and a quasi-experimental approach with experimental and control groups, leading to iterative revisions. The final stages involve dissemination through seminars, publications, ISBN registration, and intellectual property rights to support model implementation and sustainability [44, 45].

3.3. Source Data and Research Subject

The research subjects are students and lecturers from three universities: (1) Universitas Sriwijaya (UNSRI), (2) Universitas PGRI Palembang (UPGRIP), and (3) Universitas Tridianti Palembang (UNANTI). UNSRI was selected as it is the only public university in South Sumatra under the Ministry of Education and has an "A" accreditation for its Indonesian Language Education program. UPGRIP and UNANTI were chosen due to their stable student intake in the Indonesian Language Education program, with UPGRIP having a "Very Good" accreditation and UNANTI a "B" accreditation.

3.4. Technique Collecting Data

This study employs both test and non-test data collection methods. Questionnaires gather feedback from students and lecturers on the model's practicality and relevance in fostering creativity and digitalpreneurial mindsets [46]. Observations assess the model's implementation, student engagement, and performance before and after the intervention. Semi-structured interviews provide deeper insights into students' creative processes, entrepreneurial thinking, and perceptions of the model's effectiveness [47]. Pretests and posttests measure improvements in writing skills and creativity, while expert validation sheets, response questionnaires, and observation checklists ensure the model's validity, practicality, and overall impact on students' creative and entrepreneurial development.

3.5. Validity and Reliability

Before testing, all research instruments are validated for content, construct, and reliability. Content validity is ensured through expert judgment, aligning the instruments with the study's goals of enhancing creativity and digitalpreneurial mindsets. Construct validity is tested using factor analysis, while reliability is measured through construct reliability estimates. Data are analyzed using descriptive and inferential statistics to evaluate the model's feasibility, practicality, and effectiveness. Normality tests and F-tests ensure data validity, and paired t-tests ($p < 0.05$) determine the model's significant impact on students' creative writing skills and digitalpreneurial orientation.

4. RESULTS AND DISCUSSION

4.1. Analysis Results on the Needs of Lecturers and Students Regarding a Scientific-Based Short Story Writing Learning Model

The needs analysis, conducted through questionnaires and interviews at UNSRI, UPGRIP, and UNANTI, revealed that both lecturers and students require a learning model that integrates scientific content into short

story writing. Lecturers noted the absence of structured materials to guide this integration, while students expressed difficulty in generating ideas and connecting fiction with scientific themes. Both parties highlighted the need for a creative, engaging, and relevant model that fosters student creativity and supports the development of a digitalpreneurial mindset.

Quantitative findings from 13 questionnaire items indicate that student interest in short story writing is high, with 47% of respondents stating they are very interested, and 37% interested. A similar pattern is observed in their enthusiasm for innovative learning models, where over 80% expressed positive responses. The Cooperative Integrated Reading and Composition (CIRC) model was identified as the most commonly used (55%), followed by Project-Based Learning (30%) and Contextual Teaching and Learning (15%).

Despite this interest, students reported several challenges in the writing process chief among them being the difficulty in finding original ideas (67%), developing compelling characters (62%), and structuring coherent plots (48%). Importantly, a significant majority (85%) acknowledged the value of incorporating scientific elements into their stories, recognizing that such integration can enrich thematic depth and narrative quality. Their approaches to scientific integration typically include sourcing information online/offline (65%), aligning content with relevant themes (71%), and conducting interviews (45%).

From a pedagogical standpoint, most students (74%) reported receiving support from lecturers, including theoretical instruction (61%), direct mentoring (52%), and the use of lecturers' literary works as reference materials (38%). Collaborative learning environments also played a crucial role, with 69% of students engaging in peer discussions and guided feedback sessions elements that are vital for fostering creativity and collaborative digital skills.

Interview insights further support these findings. Students expressed a strong desire for a structured model that helps overcome their struggles in idea generation and narrative construction. They emphasized the need for guidance that bridges scientific inquiry with creative expression. Lecturers echoed this sentiment, emphasizing the importance of engaging students in active learning processes such as discussions, feedback sessions, and writing exercises that promote critical thinking and innovation. They advocated for a model that integrates scientific research as a source of inspiration, pushing students to develop original content while sharpening analytical skills.

University leadership added a strategic perspective by highlighting the importance of institutional support through writing workshops, digital tools, and accessible platforms to enhance learning outcomes. They agreed that such a model would align well with current educational goals, particularly those that aim to merge creativity, research competence, and digital entrepreneurship in the context of 21st-century learning.

In conclusion, the combined results of the questionnaire and interview analysis underline the urgent need for a short story writing model that merges scientific research with creative expression. This model should be designed not only to develop writing skills but also to foster student creativity and prepare them to think critically, act innovatively, and thrive in digital and entrepreneurial landscapes.

4.2. Results of Developing a Scientific-Based Short Story Writing Model: Reinterpreting Scientific Research into Literary Narratives

The development of a scientific-based short story writing model reflects a transformative learning innovation that blends scientific reasoning with literary creativity. This model shifts the orientation of student writing from purely imaginative storytelling to a structured process rooted in scientific inquiry. Through expert validation, the model is deemed appropriate, relevant, and suitable for implementation, particularly within LPTK. Experts acknowledged the model's novelty in harmonizing scientific logic with literary elements, while also recommending the addition of concrete examples to facilitate students' comprehension and application.

The model guides students in integrating academic literacy with imaginative writing. Experts highlight the need to explicitly incorporate soft skills such as analytical reasoning, synthesis, imagination, and problem-solving. It is valued for fostering critical thinking and academic literacy, essential for the digital and entrepreneurial era, though ongoing evaluation is recommended to assess long-term impacts on student competencies.

The learning model's syntax, starting from scientific data exploration and ending with literary production, is considered effective. Flexibility is recommended for application across disciplines, including social and natural sciences. Its step-by-step structure guides students from a scientific mindset to creative expression. Experts also emphasize the need for lecturer training to facilitate the integration of scientific research and literary storytelling. Overall, the model reinterprets stages of scientific research into literary storytelling structures. The

conceptual framework of the developed model is presented in Figure 1, illustrating how the process integrates scientific reasoning with creative expression through five interrelated stages.



Figure 1. Framework of the Scientific-Based Short Story Writing Model

As shown in Figure 1, the model outlines a systematic process that begins with scientific inquiry and gradually transitions into creative storytelling. Each stage functions as a reflective and iterative step that reinforces both analytical thinking and imaginative expression, as described in the following sections.

- **Topic Exploration and Idea Development**

In scientific research, students begin by selecting a topic, reviewing the literature, and formulating research questions. This is adapted in the model to guide students in identifying relevant issues or phenomena as a thematic basis for storytelling. Students are encouraged to explore social, cultural, or environmental topics through research, which then become the foundation of their narrative ideas. This method ensures that their stories are grounded in real-world relevance and intellectual depth.

- **Character and Plot Construction Based on Research Insights**

Just as scientific research requires a conceptual framework, students construct characters and plots that reflect their research findings. The protagonist's background, conflicts, and motivations may emerge from actual data, such as interviews, case studies, or surveys. This encourages students to view storytelling as a reflection of societal dynamics, fostering empathy, awareness, and analytical thinking.

- **Drafting the Narrative through Structured Writing**

Mirroring the structure of scientific writing, students begin their short story drafts with outlines derived from their research. They learn to maintain logical coherence while embedding imaginative elements into their narratives. The iterative nature of this stage reinforces precision and creativity simultaneously, as students continually revise and refine their drafts to enhance clarity, impact, and originality.

- **Feedback and Revision**

Peer feedback and instructor input core aspects of scientific publishing are embedded in the model to help students identify weaknesses in their drafts. This collaborative process strengthens critical reflection and communication, helping students elevate both the literary and conceptual quality of their stories. Feedback not only sharpens writing skills but also promotes interpersonal and evaluative skills necessary in creative industries and entrepreneurship.

- **Finalization and Publication-Ready Output**

The final stage mimics the process of submitting scientific work for publication. Students are guided to revise, polish, and present their short stories with professional standards in mind preparing them for literary contests, digital platforms, or online publishing. This step enhances ownership of the creative product and motivates students to the mindset of lifelong learning, entrepreneurship, and self-branding.

The reinterpretation of scientific procedures into literary components marks a significant pedagogical shift. Problem identification becomes narrative theme discovery; research objectives are reframed as character goals or conflicts; data collection informs setting and character details; and conclusions transform into the

story's resolution or message. Through this model, students engage in meaningful storytelling that is not only creative but also rooted in logic, analysis, and critical awareness.

In essence, this scientific-based short story writing model empowers students to merge academic knowledge with creative expression. By cultivating both scientific and literary competencies, it builds a foundation for innovation, reflective thinking, and digitalpreneurial skills key attributes for navigating the demands of the 21st-century knowledge economy.

4.3. Effectiveness of the Scientific-Based Short Story Writing Model in Enhancing Student Creativity and Digitalpreneurial Mindsets

The effectiveness of the developed scientific-based short story writing model was evaluated through several statistical tests. Initially, normality and homogeneity tests were conducted to confirm that the data met the assumptions of normal distribution and equal variances. Subsequently, a t-test was performed to compare the learning outcomes between the experimental group, which implemented the developed model, and the control group using traditional teaching methods. The results demonstrated that the scientific-based short story writing model significantly improved students' writing skills, creativity, and digitalpreneurial mindsets, proving its superiority over conventional approaches.

4.3.1. Normality Test

The normality test was conducted as a preliminary step to determine whether the data collected from the experimental and control groups followed a normal distribution. This test is crucial because it serves as a prerequisite for further parametric statistical analyses, such as the t-test, which assume that the data are normally distributed. In this study, the normality test was applied to the students' short story writing scores from both groups. The test used such as the Kolmogorov-Smirnov or Shapiro-Wilk test helped assess whether the distribution of scores deviated significantly from a normal curve. If the data were found to be normally distributed, it would validate the use of parametric tests in analyzing the effectiveness of the learning model.

Table 1. One-Sample Kolmogorov-Smirnov Test

		UNSRI	UPGRIP	UNANTI
N		38	35	30
Normal Parameters ^{a, b}	Mean	.0000000	.0000000	.0000000
	Std. Deviation	12.04924158	10.13656907	7.05544901
Most Extreme Differences	Absolute	.190	.187	.215
	Positive	.162	.142	.169
	Negative	-.190	-.187	-.215
Test Statistic		1.190	1.187	1.125
Asymp. Sig. (2-tailed)		.241 ^c	.123 ^c	.051 ^c

[a] Test distribution is Normal.

[b] Calculated from data.

[c] Lilliefors Significance Correction.

As presented in Table 1 the One-Sample Kolmogorov-Smirnov Test results for the three groups (UNSRI, UPGRIP, and UNANTI) showed that all datasets were normally distributed. The significance values (Asymp. Sig.) were 0.241 for UNSRI, 0.123 for UPGRIP, and 0.051 for UNANTI, all exceeding the 0.05 threshold. This indicates no significant deviation from normality in any group's data. Thus, the data meet the normality assumption, allowing further parametric analysis, such as the t-test, to assess the effectiveness of the scientific-based short story writing model in enhancing student creativity and digitalpreneurial mindsets.

4.3.2. Homogeneity Test

The homogeneity test was conducted to examine whether the variances between the experimental and control groups were equal or homogeneous. This test is essential in this study to ensure that comparisons between the groups are fair and valid. Commonly, tests such as Levene's or Bartlett's are used to assess the

consistency of variance across groups. If the results show no significant difference in variances (p-value > 0.05), the assumption of homogeneity is met, allowing for the appropriate use of parametric tests like the t-test to evaluate the effectiveness of the scientific-based short story writing model in enhancing student creativity and digitalpreneurial mindsets.

Table 2. Homogeneity Test

Posttest			
Levene Statistic	df1	df2	Sig.
.078	2	100	0.925

The Test of Homogeneity of Variances, as presented in Table 2, yielded a Levene's Statistic of 0.078 with degrees of freedom $df1 = 2$ and $df2 = 100$, and a significance value (p-value) of 0.925. Because this p-value is greater than 0.05, it indicates that there is no significant difference in variances among the data from the three universities. This means the variances are homogeneous across groups. Therefore, the assumption of equal variances is met, allowing for valid comparisons between the experimental and control groups using parametric tests, such as the t-test, in evaluating the effectiveness of the scientific-based short story writing model aimed at enhancing student creativity and digitalpreneurial mindsets.

4.3.3. Paired Sample T-test

The Paired Sample T-test was employed to compare the average scores of students' short story writing skills before and after the implementation of the scientific-based learning model. This test is appropriate for analyzing related data from the same participants at two different times. A p-value below 0.05 indicates a significant improvement in writing skills, demonstrating that the learning model effectively enhances student creativity and digitalpreneurial mindsets.

Table 3. Paired Sample T-test

		Paired Differences			95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
UNSRI	Pretest - Posttest	-20.39474	10.48690	1.70120	-23.84170	-16.94778	-11.988	37	.000
UPGRIP	Pretest - Posttest	-20.71429	10.78826	1.82355	-24.42018	-17.00839	-11.359	34	.000
UNANTI	Pretest - Posttest	-20.50000	10.53320	1.92309	-24.43316	-16.56684	-10.660	29	.000

Based on the Paired Sample T-test results from the three universities (UNSRI, UPGRIP, and UNANTI), as presented in Table 3, there is a statistically significant improvement between students' pretest and posttest scores following the application of the scientific-based short story writing learning model. The mean score improvements at UNSRI, UPGRIP, and UNANTI were -20.39, -20.71, and -20.50, respectively, with all significance values (Sig. 2-tailed) at 0.000, well below the 0.05 significance level. These findings confirm that the designed learning model effectively enhances students' creativity and digitalpreneurial mindsets through improved short story writing skills across all three universities. Beyond fostering general creativity, the model explicitly develops digitalpreneurial competencies by encouraging students to publish, promote, and monetize their literary works through digital platforms. This process nurtures digital literacy, branding awareness, and entrepreneurial thinking, aligning with the broader goal of preparing students to engage in creative industries and educational entrepreneurship in the digital era.

4.4. Discussion

The findings of this study demonstrate that the development of a scientific-based short story writing learning model to enhance student creativity and digitalpreneurial mindsets followed three key phases: needs analysis, model development and validation, and effectiveness evaluation.

In the initial phase, needs analysis was conducted through observations and interviews at three universities: Sriwijaya University (UNSRI), PGRI University of Palembang (UPGRIP), and Tridinanti University of Palembang (UNANTI). Results showed that although students were enthusiastic about writing short stories, they faced difficulties in generating ideas and incorporating scientific concepts alongside digitalpreneurial aspects into their narratives. This aligns with [48] and [49] perspective that literary learning disconnected from real academic and practical contexts often fails to stimulate creativity and deeper understanding.

During the second phase, the learning model was designed based on a scientific approach and developed into instructional materials including lesson plans, modules, and student worksheets. Expert validation was conducted focusing on content, language, and instructional design. The feedback indicated that the model was highly feasible with minor improvements needed, especially in language clarity and the sequencing of learning activities. This supports, who emphasize the importance of expert validation in systematically developing effective instructional models.

The final phase involved testing the model's effectiveness using statistical analyses such as normality, homogeneity, and paired sample t-tests. The normality and homogeneity tests confirmed that the data met the assumptions for parametric testing. The paired sample t-test revealed a significant improvement in students' creativity and digitalpreneurial mindsets as reflected in their scientific-based short story writing skills after the intervention. These findings are consistent with research by [50] and [51], which highlights that project-based scientific learning fosters critical thinking, creativity, and entrepreneurial competencies in literary writing.

In conclusion, the scientific-based short story writing model successfully addresses the challenges faced by students in developing their writing skills while integrating academic, creative, and digitalpreneurial elements in a contextual and meaningful way.

5. MANAGERIAL IMPLICATION

5.1. Curriculum and Teaching Integration

Higher education institutions, particularly LPTKs, can incorporate the scientific-based short story writing model into their curriculum to enhance students' academic literacy, creativity, and soft skills. Lecturer training is essential to ensure effective implementation and integration of scientific inquiry with literary creation. Furthermore, institutional support through learning resources, workshops, and digital platforms can strengthen the sustainability of the model's implementation. Such efforts can create a learning environment that encourages innovation, critical thinking, and entrepreneurial awareness among students.

5.2. Student Digitalpreneurial Development

Universities can encourage students to publish, promote, and monetize their literary works on digital platforms. This approach nurtures digital literacy, branding awareness, and entrepreneurial thinking, aligning with the preparation of students for creative industries and the digital economy. In addition, participation in digital publishing activities can enhance students' communication skills, creativity, and confidence in presenting their work to broader audiences. Such experiences provide valuable opportunities for students to transform creative ideas into productive and economically valuable outcomes.

5.3. Interdisciplinary Application and Evaluation

The model's flexible design allows adaptation across disciplines, including social and natural sciences. Continuous assessment mechanisms should be established to monitor its effectiveness and support evidence-based improvements for curriculum refinement. Furthermore, regular evaluation can help identify strengths and areas for improvement in the implementation process. This continuous refinement ensures that the model remains relevant to students' learning needs and responsive to developments in education and the digital era.

6. CONCLUSION

This study successfully developed a scientific-based short story writing learning model aimed at enhancing students' creativity and digitalpreneurial mindsets. The model was created through stages of needs

analysis, development and validation, and effectiveness testing, and it proved effective in significantly improving students' ability to write scientific-based short stories integrating creativity and digital entrepreneurship elements. The findings suggest that this learning model offers a valuable approach that combines academic rigor with practical skills relevant to today's creative and digital economy. The implications of this study highlight the importance for educators and institutions to adopt innovative and contextually relevant teaching methods that foster both literary skills and entrepreneurial mindsets in higher education. However, the study is limited by its sample, which involved only three universities in a specific region, and the relatively short duration of the effectiveness testing, which may not fully capture long-term impacts on student creativity and digitalpreneurial development. Future research is recommended to expand the sample size and geographical scope to enhance the generalizability of the findings, and to conduct longitudinal studies to observe long-term effects. Additionally, integrating interactive digital technologies or online learning platforms into the model could be explored to further engage students and enhance learning outcomes.

Moreover, this study aligns with the United Nations SDGs 4 (Quality Education) and SDGs 8 (Decent Work and Economic Growth). By fostering creativity, digital literacy, and entrepreneurial skills, the model contributes to preparing students to participate meaningfully in the digital economy and creative industries, supporting inclusive and sustainable economic growth. The integration of scientific inquiry and literary creativity also promotes critical thinking and problem-solving, which are key competencies for lifelong learning and responsible citizenship.

Finally, the study underscores the need for higher education institutions to continuously innovate teaching and learning strategies that respond to the evolving demands of the digital era. Implementing models like this not only enhances student competencies but also strengthens the role of universities as drivers of social and economic development. By linking academic learning with practical digitalpreneurial experiences, the model provides a replicable framework that other institutions can adapt to promote creativity, entrepreneurship, and sustainable development in higher education.

7. DECLARATIONS

7.1. About Authors

Dian Nuzulia Armariena (DN)  <https://orcid.org/0009-0006-3950-9850>

Agus Nuryatin (AN)  <https://orcid.org/0000-0002-8462-6187>

Teguh Supriyanto (TS)  <https://orcid.org/0000-0002-3883-1833>

Nas Haryati Setyaningsih (NH)  <https://orcid.org/0000-0002-3046-7141>

Edward Harrington (EH)  <https://orcid.org/0009-0002-9714-167X>

7.2. Author Contributions

Conceptualization: DN; Methodology: AN; Software: TS; Validation: NH and EH; Formal Analysis: DN and TS; Investigation: NH; Resources: DN; Data Curation: EH; Writing Original Draft Preparation: NH and DN; Writing Review and Editing: AN and TS; Visualization: AN; All authors, DN, AN, TS, NH, EH have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

7.4. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

REFERENCES

- [1] J. Changqing, "Abnormal sexual behavior," in *The ECPH Encyclopedia of Psychology*. Springer, 2025, pp. 7–8.
- [2] N. Halawa, M. Lahagu, and J. Laoli, "Improving students' short story writing skills: A study on the effects of problem based learning with image media," *International Journal of Contemporary Studies in Education*, vol. 2, no. 2, pp. 137–148, 2023.
- [3] B. E. H. Cahyono and I. Mulyaningsih, "Learning model based on creativity development in improving literature appreciation ability," *Jurnal Gramatika Jurnal Penelitian Pendidikan Bahasa dan Sastra Indonesia*, vol. 8, no. 1, 2022.
- [4] D. Martos-Garcia, L. Lozano-Sufrategui, and K. J. Drew, "'once upon a time'. exploring the possibilities and limitations for inclusive pe through creative writing: A tale of exclusion, integration and inclusion," *European Physical Education Review*, vol. 29, no. 3, pp. 455–471, 2023.
- [5] C. Martinez, "Developing 21st century teaching skills: A case study of teaching and learning through project-based curriculum," *Cogent Education*, vol. 9, no. 1, 2022.
- [6] P. Dhar and P. Pandya, *Connected Histories of India and Southeast Asia: Icons, Narratives, Monuments*. Sage Publishing India, 2022.
- [7] U. Hambali, R. Y. Natsir, E. Akib, and P. N. Valeryevna, "Language assessment literacy in efl edupreneurship among lecturers at muhammadiyah university of makassar and samarkand institute," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 6, no. 3, pp. 598–607, 2024, <https://doi.org/10.34306/att.v6i3.432>.
- [8] B. Tomlinson, *Developing materials for language teaching*. Bloomsbury Publishing, 2023.
- [9] B. B. Dash, "Digital tools for teaching and learning english language in 21st century," *International Journal of English Studies*, vol. 4, no. 2, pp. 8–13, 2022.
- [10] A. Boscolo, S. Lippiello, and A. Pierri, "Storytelling as a skeleton to design a learning unit: A model for teaching and learning optics," *Education Sciences*, vol. 14, no. 3, p. 218, 2024.
- [11] M. Üzümlü *et al.*, "The effect of stem-themed story writing training with artificial intelligence tools on the digital literacy and 21st century skills of preservice teachers," *Education and Information Technologies*, vol. 30, pp. 21 479–21 498, 2025.
- [12] S. Tobler, T. Sinha, K. Köhler, and M. Kapur, "Teaching biology with narratives: Examining the impact of affective and cognitive variables on undergraduate student learning," *Instructional Science*, pp. 1–28, 2025.
- [13] N. B. Ramírez, M. L. Ruiz Cansino, C. Anaya Campos, D. D. Borrego Gómez, and L. H. Garza Vázquez, "Creative writing: Story-based learning in public and private high school for exploration of written text," *Education Sciences*, vol. 14, no. 12, p. 1392, 2024.
- [14] A. Pambudi, N. Lutfiani, M. Hardini, A. R. A. Zahra, and U. Rahardja, "The digital revolution of startup matchmaking: Ai and computer science synergies," in *2023 Eighth International Conference on Informatics and Computing (ICIC)*. IEEE, 2023, pp. 1–6.
- [15] Ş. Metin, D. Kalyenci, M. Başaran, E. Relkin, and B. Bilir, "Design-based digital story program: Enhancing coding and computational thinking skills in early childhood education," *Early Childhood Education Journal*, vol. 53, no. 6, pp. 2255–2274, 2025.
- [16] G. Wirtu, R. Disasa, E. Daba *et al.*, "The effects of reflective learning integrated process writing instructions on high school students' paragraph writing performance and perception," *International Journal of Language Teaching and Education*, vol. 9, no. 2, pp. 47–62, 2025.
- [17] D. Alt, N. Raichel, and L. Naamati-Schneider, "Higher education students' reflective journal writing and lifelong learning skills: Insights from an exploratory sequential study," *Frontiers in Psychology*, vol. 12, p. 707168, 2022.
- [18] S. Mehta and L. Magdalena, "Education 4.0: Online learning management using education smart courses," *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, vol. 4, no. 1, pp. 70–76, 2022.
- [19] L. Henrickson, W. Jephcote, and R. Comissiong, "Soft skills, stories, and self-reflection: Applied digital storytelling for self-branding," *Convergence*, vol. 28, no. 6, pp. 1577–1597, 2022.
- [20] M. F. Rabella, "Evolving ai capabilities and the school curriculum: Emerging implications and a case study on writing," ser. OECD Education Working Papers, no. 338, Paris, 2025. [Online]. Available: https://www.oecd.org/en/publications/evolving-ai-capabilities-and-the-school-curriculum_647880aa-en.html
- [21] T. Peungcharoenkun and B. Waluyo, "Writing pedagogy in higher education: The efficacy of mediating feedback with technology," *Reading & Writing*, vol. 15, no. 1, pp. 1–12, 2024.

- [22] A. Apridayani, W. Han, and K. Sakkanayok, "Enhancing english writing competence in higher education: A comparative study of teacher-only assessment versus teacher and student self-assessment approaches," *Asian-Pacific Journal of Second and Foreign Language Education*, vol. 9, no. 1, p. 37, 2024.
- [23] E. Nusivera, A. Hikmat, A. R. A. Ghani *et al.*, "Improving students' academic writing skills through metacognitive strategies," *JPI (Jurnal Pendidikan Indonesia)*, vol. 14, no. 2, pp. 371–380, 2025.
- [24] F. Kruger, Z. Queen, O. Radelva, and N. Lawrence, "Comparative analysis of scientific approaches in computer science: A quantitative study," *International Transactions on Education Technology (ITEE)*, vol. 2, no. 2, pp. 120–128, 2024.
- [25] M. N. A. Kareem, "Importance of higher order thinking skills (hots in academic research writing): A structured literature survey," *South Asian Journal of Social Sciences & Humanities*, vol. 3, no. 3, 2022.
- [26] R. Royani, R. Fahrudin, A. F. Syatifa, and E. D. Astuti, "Impact of outcome-based education on graduate readiness in the era of globalization through international benchmarking: Pengaruh outcome-based education (obe) terhadap kesiapan lulusan di era globalisasi studi benchmarking internasional," *ADI Pengabdian Kepada Masyarakat*, vol. 5, no. 2, pp. 129–139, 2025.
- [27] L. Tian, Q. Liu, and X. Zhang, "Self-regulated writing strategy use when revising upon automated, peer, and teacher feedback in an online english as a foreign language writing course," *Frontiers in Psychology*, vol. 13, p. 873170, 2022.
- [28] N. Ayu, K. C. Suryandari *et al.*, "Exploration: Creative thinking skills in writing essays media-based image series," *International Journal of Elementary Education*, vol. 7, no. 1, pp. 1–7, 2023.
- [29] W. He and Y. Gao, "Explicating peer feedback quality and its impact on feedback implementation in efl writing," *Frontiers in Psychology*, vol. 14, p. 1177094, 2023.
- [30] S. Hwang, "The interplay of mindset, feedback perception, and academic emotion regulation in undergraduates' self-regulated writing ability," *Education Sciences*, vol. 15, no. 7, p. 804, 2025.
- [31] B. Rawat and D. Maulidditya, "Entrepreneurship in information technology as a method for improving student creativity in the digital economy," *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, vol. 4, no. 1, pp. 32–37, 2022.
- [32] P. A. Dhananjaya, F. H. Karima, and N. Egar, "Improving students' writing skill in writing descriptive text using brainstorming plus webbing techniques," *Jurnal Nusantara Pendidikan*, vol. 3, no. 2, pp. 69–78, 2024.
- [33] I. D. Girinzio, A. Ramadan, D. B. Saputra, G. Mustika, and Sulistio, "Improve critical thinking students in indonesia for new learning management system," pp. 111–121, 2023.
- [34] U. Kuswari and R. Dallyono, "A writing workshop model to enhance students' skills in writing essays in sundanese," *Indonesian Journal of Applied Linguistics*, vol. 12, no. 1, pp. 258–268, 2022.
- [35] A. Annisa and G. Gusnawaty, "Feedback and revisions in developing writing skills in second language learners: A systematic review," *Kajian Pendidikan, Seni, Budaya, Sosial dan Lingkungan*, vol. 1, no. 1, pp. 1–8, 2024.
- [36] L. Z. Fitri, A. Adam, and W. I. M. Rohmana, "Developing students' writing skills through short story in elt," *EDULANGUE*, vol. 7, no. 2, pp. 193–204, 2024.
- [37] E. Rahmi, D. Darmansyah, A. Yulastri, and C. Handrianto, "Bridging entrepreneurship education and digital transformation: A novel experiential learning model for entrepreneurial mindset development," *International Journal of Learning, Teaching and Educational Research*, vol. 24, no. 4, pp. 640–660, 2025.
- [38] S. Munir *et al.*, "The effectiveness of the short story writing program in developing students' creative writing skills," *JPI (Jurnal Pendidikan Indonesia)*, vol. 12, no. 4, pp. 782–791, 2023.
- [39] T. Hadi, S. O. Sihombing, M. Tukiran, and R. C. Wijaya, "Strengthening millennial teachers commitment to become edupreneurs," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 6, no. 3, pp. 586–597, 2024, <https://doi.org/10.34306/att.v6i3.474>.
- [40] M. A. Bircan, İ. Şeref, and O. Nacaroglu, "The effect of stem themed story writing training with artificial intelligence tools on the digital literacy and 21 st century skills of preservice teachers," *Education and Information Technologies*, pp. 1–20, 2025.
- [41] A. Dudhat and V. Agarwal, "Indonesia's digital economy's development," *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, vol. 4, no. 2, pp. 109–118, 2023.
- [42] S. Sok and K. Heng, "Chatgpt for education and research: A review of benefits and risks," *Available at SSRN 4378735*, 2023.

- [43] N. Yaakop, "A content validation of focus group discussions based on need analysis in a physical education training module for primary school teachers," *Retos*, vol. 50, pp. 1115–1122, 2023.
- [44] I. Väänänen, M. Kantola, M. Friman, and J. Lamberg, "From open access publishing to collaborative dissemination," *Tertiary Education and Management*, vol. 30, no. 4, pp. 303–316, 2024.
- [45] D. T. Cahyaningsih and D. B. Kharisma, "The role of intellectual property law in increasing science education capacity in indonesia," *Jurnal Penelitian Pendidikan IPA*, vol. 9, no. 7, pp. 5731–5736, 2023.
- [46] J. M. Lopes, S. Gomes, and E. Nogueira, "Educational insights into digital entrepreneurship: the influence of personality and innovation attitudes," *Journal of Innovation and Entrepreneurship*, vol. 14, no. 1, p. 16, 2025.
- [47] A. Al-Fattal, "Entrepreneurial aspirations and challenges among business students: A qualitative study," *Administrative Sciences*, vol. 14, no. 5, p. 101, 2024.
- [48] H. Akram, A. H. Abdelrady, A. S. Al-Adwan, and M. Ramzan, "Teachers' perceptions of technology integration in teaching-learning practices: A systematic review," *Frontiers in Psychology*, vol. 13, pp. 1–9, June 2022.
- [49] N. Soughati, K. E. Hadi, and A. Flyura, "Technopedagogical making workshop and writing/programming," *XLinguae*, vol. 18, no. 1, pp. 153–169, 2025.
- [50] O. E. Maamri, "Towards the modelling of a writing process integrating generative ai to develop the argumentative skills of secondary school writers," *XLinguae*, vol. 18, no. 1, pp. 133–143, 2025.
- [51] T. N. Fitria, "Creative writing skills in english: Develop students' potential and creativity," *EBONY Journal of English Language Teaching, Linguistics, and Literature*, vol. 4, no. 1, pp. 1–17, 2024.