DEVELOPING THE AESTHETIC CULTURE OF PRE-SERVICE TEACHERS ON THE BASIS OF A DIGITAL ENVIRONMENT IN THE CONTEXT OF INFORMATIZED EDUCATION

Dilafruz Kenjabayeva
Termez State University,
Interfaculty Department of Foreign Languages,
Doctor of Philosophy (PhD) in Pedagogical Sciences,
Acting Associate Professor

Abstract. In the context of informatized education, the digital environment has become one of the main spaces in which young people encounter art, visual information and cultural values. This creates new opportunities and new risks for the aesthetic culture of future teachers, who will be responsible for shaping the tastes and values of the next generation. The purpose of this study is to develop and test a digital-environment-based model for developing the aesthetic culture of pre-service teachers. Aesthetic culture is considered as an integrative quality comprising aesthetic consciousness, aesthetic perception and emotional sensitivity, aesthetic evaluation, digital-creative activity and the aesthetics of professional communication. The model includes four layers of the digital environment: resource, communicative, creative-productive and evaluative. The research used a mixed-methods design. A diagnostic survey of 214 pre-service teachers at Termez State University revealed that students actively consume visual content online but rarely analyse or create it purposefully. A 12-week formative experiment (experimental group n = 58; control group n = 56) was then implemented through content-based English language classes. Posttest results showed significantly higher scores in the experimental group across all five components (Cohen's d = 0.73–0.93), and the proportion of students with a high level of aesthetic culture rose from 13.8% to 37.9%.

Keywords: aesthetic culture; pre-service teachers; digital environment; informatized education; digital multimodal creativity.

1. INTRODUCTION

The informatization of education has fundamentally changed the environment in which students learn, communicate and form their values. Digital platforms, social networks, video services and, since recently, generative artificial intelligence tools have become everyday sources of images, music, texts and cultural models for young people. International analyses emphasize that technology in education should be judged by how it serves learning and human development rather than by the scale of its adoption (UNESCO, 2023), and that effective digital education requires a well-designed ecosystem of tools, content and teacher competence (OECD, 2023). In Uzbekistan, the priorities of educational reform defined in the Development Strategy of New Uzbekistan for 2022–2026 include both the digitalization of education and the upbringing of a harmoniously developed generation (President of the Republic of Uzbekistan, 2022). The combination of these two priorities raises a question of direct importance for teacher education: how can the digital environment be used not only as a technical instrument but as a space for the development of students' aesthetic culture?

Aesthetic culture is understood in this study as an integrative personal quality that manifests itself in a person's aesthetic consciousness (knowledge, ideals and values), the ability to perceive and emotionally experience beauty, the capacity for reasoned aesthetic evaluation and taste, creative activity according to the laws of beauty, and the aesthetic quality of behaviour and communication. For a teacher, aesthetic culture is part of professional culture: it determines the quality of the learning materials the teacher creates, the manner in which the teacher speaks and interacts with learners, and the teacher's ability to introduce students to the values of national and world culture. Philosophers of

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 13 Issue: 09 in September-2024
https://www.gejournal.net/index.php/IJSSIR

education argue that aesthetic experience and engagement with the arts are essential for human flourishing (D'Olimpio, 2022), and educational researchers show that learning through the arts develops distinctive forms of thinking and collaboration (Halverson & Sawyer, 2022).

The digital environment, however, has an ambiguous influence on aesthetic culture. It provides access to world museum collections, architectural heritage, music and literature, and it offers powerful tools for creating multimodal products. At the same time, the logic of social media favours speed, novelty and emotional stimulation over contemplation, and the massive circulation of standardized, often low-quality images can flatten aesthetic taste. The emergence of large language models and image generators further complicates the situation: content that looks polished can now be produced in seconds, and the ability to judge its quality, originality and appropriateness becomes a key competence (Kasneci et al., 2023; Mishra et al., 2023). Frameworks of digital competence such as DigComp 2.2 already include content creation, information evaluation and awareness of artificial intelligence (Vuorikari et al., 2022), but the aesthetic side of these activities is rarely made explicit.

Foreign language classes represent a particularly promising, though underused, context for the development of aesthetic culture in teacher education. Language learning inevitably involves working with texts, images, films and cultural artefacts, and contemporary language pedagogy increasingly relies on digital multimodal composing and digital storytelling (Tour & Barnes, 2022; Yuniarti & Yulian, 2022). If such activities are purposefully oriented towards aesthetic values, the foreign language classroom can become a space where future teachers of different specialities develop their aesthetic perception, evaluation and creativity together with their language skills.

The aim of this study is to develop and empirically test a model for developing the aesthetic culture of pre-service teachers on the basis of a digital environment in the context of informatized education. The research questions were: (RQ1) What are the characteristics of pre-service teachers' aesthetic practices in the digital environment? (RQ2) What structure should a digital-environment-based model for developing aesthetic culture have? (RQ3) How effective is this model in comparison with traditional teaching?

1.1. Literature review

Research relevant to the study can be grouped into three directions. The first direction examines aesthetic education and aesthetic culture in higher education. D'Olimpio (2022) argues that education for flourishing must include aesthetic experience because it cultivates perception, imagination and emotional understanding. Halverson and Sawyer (2022) show that arts-based learning involves representational, embodied and collaborative practices that support deep learning. Biesta (2021) emphasizes the importance of encountering the world attentively and with interest, which is closely related to the contemplative and non-instrumental attitude characteristic of aesthetic perception. Taken together, these works support the view that aesthetic culture is not a narrow artistic skill but a broad orientation of the personality, highly relevant for every teacher.

The second direction concerns the digital environment as a space of learning and cultural participation. Greenhow et al. (2022) analyse the foundations of online learning and stress the importance of social presence, community and authentic participation. Sailer et al. (2021) show that the benefits of digital technology depend on whether it supports active and constructive learning activities. Timotheou et al. (2023) identify teacher competence and a shared pedagogical vision as key factors of successful digital transformation. Pangrazio and Sefton-Green (2021) distinguish digital literacy, digital citizenship and digital rights, drawing attention to the critical and ethical dimensions of life in the digital environment. These dimensions are directly connected with aesthetic culture: critical evaluation of digital content presupposes criteria of quality and value, and responsible creation presupposes respect for authorship and cultural heritage.

The third direction investigates immersive, creative and AI-supported technologies. The cognitive affective model of immersive learning proposed by Makransky and Petersen (2021)

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 13 Issue: 09 in September-2024
https://www.gejournal.net/index.php/IJSSIR

explains how presence and agency in virtual environments influence both cognitive and emotional outcomes, which is essential for aesthetic experience. Hwang and Chien (2022) and Mystakidis (2022) describe the metaverse as a promising space for experiential learning, including visits to cultural heritage sites. Tavin et al. (2021) propose a post-digital perspective on art education, according to which digital and physical aesthetic experiences are intertwined. Ng et al. (2021) conceptualize AI literacy as including the ability to evaluate and use artificial intelligence critically, while Henriksen et al. (2021) show that the integration of creativity and technology in teaching remains difficult without dedicated pedagogical support. Studies of digital multimodal composing in language teacher education (Tour & Barnes, 2022) and of digital storytelling in EFL learning (Yuniarti & Yulian, 2022) confirm that multimodal creative tasks increase engagement and allow students to combine linguistic, visual and emotional means of expression.

Despite the richness of these studies, the literature contains few works that consider the digital environment as an integral pedagogical space for developing the aesthetic culture of future teachers, with defined layers, methods and measurable outcomes. This gap determined the direction of the present research.

2. MATERIALS AND METHODS

2.1. Research design

A sequential mixed-methods design was used. At the diagnostic stage (September 2022), a questionnaire survey was carried out to identify the characteristics of pre-service teachers' aesthetic practices in the digital environment (RQ1). On the basis of the diagnostic results and the literature review, a model for developing aesthetic culture was designed (RQ2). At the formative stage (February–May 2023), the model was tested in a quasi-experiment with experimental and control groups (RQ3).

2.2. Participants

The diagnostic survey involved 214 first- to third-year pre-service teachers of Termez State University representing the fields of primary education, preschool education, pedagogy and psychology, and foreign language teaching. For the formative experiment, eight academic groups of second-year students were selected; four groups formed the experimental group (EG, n = 58) and four groups the control group (CG, n = 56). The groups were comparable in academic performance and in their initial level of English proficiency (A2–B1). Participation was voluntary and data were processed anonymously.

2.3. The model

The model for developing aesthetic culture includes a target block (the formation of aesthetic culture as part of professional culture), a content block (five components of aesthetic culture), a procedural block (four layers of the digital environment with corresponding methods and tools) and a diagnostic-result block (criteria, indicators and levels). The central element of the model is the organization of the digital environment in four layers, presented in Table 1.

Table 1. Layers of the digital environment in the model for developing aesthetic culture

Layer	Pedagogical function	Forms of activity in English classes	Digital resources
Resource	Access to high-quality aesthetic content	Virtual museum visits, reading and listening to texts about art and heritage	Online museum collections, digital libraries, video lectures
Communicative	Aesthetic dialogue and sharing of impressions	Online discussions, audio and video responses, peer commentary	LMS forums, online boards, messengers

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 13 Issue: 09 in September-2024
https://www.gejournal.net/index.php/IJSSIR

Creative-productive	Creation of aesthetically valuable multimodal products	Digital stories, virtual exhibitions, illustrated e-posters, short videos in English	Graphic, presentation and video editors; AI tools under teacher guidance
Evaluative	Development of aesthetic judgement and self-assessment	Criteria-based peer review, critical analysis of digital and AI-generated content, reflective e-portfolio	Online rubrics, e-portfolio, surveys

The model was implemented through a 12-week module "Art, Culture and Beauty in the Digital World" integrated into the content-based English language course. Each week included a thematic unit (for example, architecture of Central Asia, miniature painting, national applied arts, music and film, design of learning materials), passing through the four layers: students first studied authentic materials, then discussed them, created their own multimodal product in English and finally evaluated their own and their peers' work according to jointly developed aesthetic criteria. Special attention was paid to national cultural heritage, including the archaeological monuments of ancient Termez, and to the critical use of AI tools: students compared AI-generated images and texts with authentic works and analysed their aesthetic and ethical limitations. The control group studied according to the standard English language programme with the same number of hours.

2.4. Instruments and data analysis

The diagnostic questionnaire contained 18 items on the frequency and nature of students' aesthetic practices in the digital environment. To measure aesthetic culture in the formative experiment, a 40-item questionnaire (eight items for each of the five components, five-point Likert scale) was used together with expert assessment of students' multimodal products by three experts according to the criteria of content value, compositional harmony, expressiveness, originality and linguistic accuracy. Reliability of the component scales was acceptable (Cronbach's $\alpha = 0.78–0.88$). Levels of aesthetic culture were determined on the basis of the integral index: high (4.00–5.00), medium (3.00–3.99) and low (below 3.00). Data were analysed using descriptive statistics, Pearson's chi-square test, Welch's t-test and Cohen's d; the significance level was $p < 0.05$. Students' reflective texts were analysed qualitatively.

3. RESULTS

3.1. Aesthetic practices of pre-service teachers in the digital environment

The diagnostic survey showed a clear imbalance between the consumption and the purposeful analysis or creation of aesthetic content (Table 2). Almost all students regularly viewed visual content on social networks, but less than a fifth had ever visited a virtual museum, and only about one in ten regularly created digital products with an aesthetic purpose.

Table 2. Aesthetic practices of pre-service teachers in the digital environment (N = 214), %

Practice	Regularly	Sometimes	Never / rarely
Viewing photos, videos and images on social networks	91.1	7.5	1.4
Listening to music via streaming services	84.6	12.1	3.3
Visiting virtual museums or online exhibitions	4.7	14.0	81.3
Reading or watching materials about art and cultural heritage	11.2	38.3	50.5
Analysing or discussing works of art online	6.1	21.5	72.4

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 13 Issue: 09 in September-2024
https://www.gejournal.net/index.php/IJSSIR

Creating digital products with an aesthetic purpose	9.8	27.1	63.1
Critically evaluating the quality of digital images or AI-generated content	7.0	24.3	68.7

In open-ended answers, many students explained that they did not know where to find high-quality cultural content online or how to judge whether an image or design was aesthetically valuable. These results confirmed the need for a model in which the digital environment is organized purposefully, and they determined the special emphasis on the resource and evaluative layers.

3.2. Results of the formative experiment

Before the experiment, the distribution of students by levels of aesthetic culture did not differ significantly between the experimental and control groups ($\chi^2(2) = 0.05$, $p = 0.975$). After the experiment, the differences became statistically significant ($\chi^2(2) = 8.20$, $p = 0.017$), as shown in Table 3.

Table 3. Levels of aesthetic culture of pre-service teachers before and after the experiment, n (%)

Level	EG pretest	EG posttest	CG pretest	CG posttest
High	8 (13.8)	22 (37.9)	7 (12.5)	11 (19.6)
Medium	28 (48.3)	30 (51.7)	27 (48.2)	29 (51.8)
Low	22 (37.9)	6 (10.3)	22 (39.3)	16 (28.6)
Total	58 (100)	58 (100)	56 (100)	56 (100)

Note. Pretest: $\chi^2(2) = 0.05$, $p = 0.975$; posttest: $\chi^2(2) = 8.20$, $p = 0.017$.

In the experimental group the share of students with a high level of aesthetic culture increased by 24.1 percentage points, while the share of students with a low level decreased from 37.9% to 10.3%. In the control group the corresponding changes were 7.1 and 10.7 percentage points. Table 4 shows the dynamics of the individual components.

Table 4. Mean scores (M ± SD) of the components of aesthetic culture and posttest comparison

Component	EG pre	EG post	CG pre	CG post	t (post)	d
Aesthetic consciousness	3.10±0.64	3.82±0.57	3.07±0.66	3.30±0.63	4.62***	0.87
Perception and emotional sensitivity	3.18±0.60	3.87±0.54	3.15±0.62	3.38±0.61	4.54***	0.85
Aesthetic evaluation	2.96±0.69	3.74±0.60	2.99±0.67	3.27±0.64	4.04***	0.76
Digital-creative activity	2.81±0.72	3.76±0.63	2.84±0.70	3.15±0.68	4.96***	0.93
Aesthetics of professional communication	3.02±0.65	3.70±0.58	3.00±0.66	3.26±0.62	3.91***	0.73
Integral index	3.01	3.78	3.01	3.27	–	–

Note. Welch's t-test; *** $p < 0.001$; d – Cohen's effect size. At the pretest there were no significant differences for any component (all $p > 0.79$).

The greatest increase in the experimental group was recorded for digital-creative activity (+0.95 points; $d = 0.93$). This corresponds to the central role of the creative-productive layer, in which students regularly created multimodal products in English and received criteria-based feedback. Substantial gains were also found in aesthetic consciousness and in perception and emotional

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 13 Issue: 09 in September-2024
https://www.gejournal.net/index.php/IJSSIR

sensitivity, which were supported by systematic work with authentic cultural content in the resource layer. The smallest, though still significant, effect was observed for the aesthetics of professional communication, which suggests that transferring aesthetic attitudes into everyday professional behaviour requires more time and practical teaching experience.

3.3. Qualitative results

Analysis of the reflective e-portfolios of the experimental group made it possible to identify three characteristic shifts. The first was a shift *from quantity to quality* of digital content: students wrote that they had begun to select and save fewer but more valuable images and to follow museum and cultural heritage accounts instead of random entertainment content. The second was a shift *from imitation to authorship*: at the beginning many students simply copied templates or used AI-generated images without changes, whereas by the end of the module they sought to create original compositions, to combine photographs of local monuments with their own texts in English and to justify their design choices. The third was a shift *from impression to argument*: students learned to express aesthetic judgements in English using appropriate vocabulary and reasoning, which was reflected in the quality of their peer reviews. Several students noted that comparing AI-generated "monuments" with real photographs of ancient Termez made them aware of the difference between an attractive surface and authentic cultural meaning.

4. DISCUSSION

The diagnostic results answer the first research question and reveal a typical paradox of the informatized environment: pre-service teachers are intensively immersed in visual digital culture but mostly as consumers. This picture is consistent with the observation that digital competence is uneven and weakest in content creation and critical evaluation (Vuorikari et al., 2022), and with the warnings of UNESCO (2023) that access to technology does not automatically lead to meaningful learning. The low frequency of visits to virtual museums, despite their free availability, shows that the resource potential of the digital environment remains unrealized without pedagogical guidance.

In response to the second question, the study proposed a model in which the digital environment is structured in four layers: resource, communicative, creative-productive and evaluative. This structure operationalizes the ideas of Sailer et al. (2021) and Greenhow et al. (2022) about the primacy of active, social and constructive learning activities, and translates them into the specific domain of aesthetic culture. The inclusion of the evaluative layer reflects the critical dimension emphasized by Pangrazio and Sefton-Green (2021) and by Ng et al. (2021) in relation to AI literacy.

The experimental results answer the third question: the model produced significant improvements in all components of aesthetic culture compared with traditional teaching. The particularly strong effect on digital-creative activity supports the findings of Tour and Barnes (2022) and Yuniarti and Yulian (2022) on the value of digital multimodal composing and digital storytelling in language education, and it shows that these activities can serve not only linguistic but also aesthetic goals. The gains in perception and emotional sensitivity are in line with the cognitive affective model of immersive learning (Makransky & Petersen, 2021), according to which presence and emotional involvement enhance learning; even the relatively simple immersive formats used in the study, such as virtual museum tours, evoked genuine aesthetic experience when they were followed by dialogue and reflection.

The qualitative shifts towards authorship and argument are important in the light of current debates on generative artificial intelligence. Mishra et al. (2023) and Kasneci et al. (2023) emphasize that the value of human expertise increasingly lies in judgement and critical use of AI outputs. The study indicates that aesthetic culture is one of the foundations of such judgement: students with more developed aesthetic criteria were better able to see the limitations of AI-generated images and to use

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 13 Issue: 09 in September-2024
https://www.gejournal.net/index.php/IJSSIR

these tools as aids rather than substitutes for their own creativity. This finding also agrees with the post-digital position of Tavin et al. (2021) that digital and non-digital forms of aesthetic experience should be integrated rather than opposed.

Some limitations should be noted. The research was conducted in a single university, the groups were not formed randomly, and the duration of the formative experiment was limited to one semester. The integration of the module into English language classes may have added a motivational effect related to the novelty of content. Future studies should test the model in other disciplines and institutions, assess the long-term stability of the results and examine how pre-service teachers apply their aesthetic culture during school teaching practice.

5. CONCLUSION

The study showed that in the context of informatized education the digital environment can become an effective basis for developing the aesthetic culture of pre-service teachers, provided that it is organized purposefully. The diagnostic stage revealed that students are active consumers but passive analysts and creators of aesthetic content online. The proposed model, which structures the digital environment into resource, communicative, creative-productive and evaluative layers and connects them with the five components of aesthetic culture, led to statistically significant improvements in all components and to a marked increase in the share of students with a high level of aesthetic culture.

The results have practical significance for teacher education. The model can be integrated into foreign language courses and other humanities disciplines without additional teaching hours, through content-based and project-based tasks. It is recommended that universities develop curated collections of digital cultural resources for students, introduce criteria-based evaluation of the aesthetic quality of student-created digital products, and include the critical and aesthetic evaluation of AI-generated content in the preparation of future teachers. In this way, the informatized educational environment can contribute to the upbringing of teachers who not only use digital tools skilfully but also carry and transmit a high aesthetic culture.

REFERENCES

Biesta, G. (2021). *World-centred education: A view for the present*. Routledge. https://doi.org/10.4324/9781003098331

D'Olimpio, L. (2022). Aesthetica and eudaimonia: Education for flourishing must include the arts. *Journal of Philosophy of Education, 56*(2), 238–250. https://doi.org/10.1111/1467-9752.12661

Greenhow, C., Graham, C. R., & Koehler, M. J. (2022). Foundations of online learning: Challenges and opportunities. *Educational Psychologist, 57*(3), 131–147. https://doi.org/10.1080/00461520.2022.2090364

Halverson, E., & Sawyer, K. (2022). Learning in and through the arts. *Journal of the Learning Sciences, 31*(1), 1–13. https://doi.org/10.1080/10508406.2022.2029127

Henriksen, D., Creely, E., Henderson, M., & Mishra, P. (2021). Creativity and technology in teaching and learning: A literature review of the uneasy space of implementation. *Educational Technology Research and Development, 69*(4), 2091–2108. https://doi.org/10.1007/s11423-020-09912-z

Hwang, G.-J., & Chien, S.-Y. (2022). Definition, roles, and potential research issues of the metaverse in education: An artificial intelligence perspective. *Computers and Education: Artificial Intelligence, 3*, Article 100082. https://doi.org/10.1016/j.caeai.2022.100082

Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., … Kasneci, G. (2023). ChatGPT

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 13 Issue: 09 in September-2024
https://www.gejournal.net/index.php/IJSSIR

for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, Article 102274. https://doi.org/10.1016/j.lindif.2023.102274

Makransky, G., & Petersen, G. B. (2021). The cognitive affective model of immersive learning (CAMIL): A theoretical research-based model of learning in immersive virtual reality. *Educational Psychology Review, 33*(3), 937–958. https://doi.org/10.1007/s10648-020-09586-2

Mishra, P., Warr, M., & Islam, R. (2023). TPACK in the age of ChatGPT and generative AI. *Journal of Digital Learning in Teacher Education, 39*(4), 235–251. https://doi.org/10.1080/21532974.2023.2247480

Mystakidis, S. (2022). Metaverse. *Encyclopedia, 2*(1), 486–497. https://doi.org/10.3390/encyclopedia2010031

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence, 2*, Article 100041. https://doi.org/10.1016/j.caeai.2021.100041

OECD. (2023). *OECD digital education outlook 2023: Towards an effective digital education ecosystem*. OECD Publishing. https://doi.org/10.1787/c74f03de-en

Pangrazio, L., & Sefton-Green, J. (2021). Digital rights, digital citizenship and digital literacy: What's the difference? *Journal of New Approaches in Educational Research, 10*(1), 15–27. https://doi.org/10.7821/naer.2021.1.616

President of the Republic of Uzbekistan. (2022, January 28). *Decree No. PF-60 on the Development Strategy of New Uzbekistan for 2022–2026*. National Database of Legislation of the Republic of Uzbekistan. https://lex.uz/docs/5841063

Sailer, M., Murböck, J., & Fischer, F. (2021). Digital learning in schools: What does it take beyond digital technology? *Teaching and Teacher Education, 103*, Article 103346. https://doi.org/10.1016/j.tate.2021.103346

Tavin, K., Kolb, G., & Tervo, J. (Eds.). (2021). *Post-digital, post-internet art and education: The future is all-over*. Palgrave Macmillan. https://doi.org/10.1007/978-3-030-73770-2

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies, 28*(6), 6695–6726. https://doi.org/10.1007/s10639-022-11431-8

Tour, E., & Barnes, M. (2022). Engaging English language learners in digital multimodal composing: Pre-service teachers' perspectives and experiences. *Language and Education, 36*(3), 243–258. https://doi.org/10.1080/09500782.2021.1912083

UNESCO. (2023). *Global education monitoring report 2023: Technology in education – A tool on whose terms?* UNESCO. https://doi.org/10.54676/UZQV8501

Vuorikari, R., Kluzer, S., & Punie, Y. (2022). *DigComp 2.2: The digital competence framework for citizens – With new examples of knowledge, skills and attitudes*. Publications Office of the European Union. https://doi.org/10.2760/115376

Yuniarti, Y., & Yulian, R. (2022). Digital storytelling based on multimodal elements on EFL learners' speaking performance. *Jurnal Pendidikan Indonesia, 11*(2), 308–316. https://doi.org/10.23887/jpiundiksha.v11i2.40217

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 13 Issue: 09 in September-2024
https://www.gejournal.net/index.php/IJSSIR