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EXPLORING THE ROLE OF PORTFOLIOS IN FOSTERING STUDENT COURSE ENGAGEMENT

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Abstract. *Reflective learning is an important factor that has a positive impact on students' learning efficacy. The study aims to bring insight into the use of e-portfolios as a means and tool to promote reflection in the classroom and build self-reflection habits, plan learning activities and build learning autonomy. Mahara e-portfolio was used during the period of eight months with a group of secondary school students in Croatia (n = 57) who filled in the student course engagement questionnaire consisting of 23 Likert-scale items before and after this period. The questionnaire data are categorized into four categories, dimensions: skills engagement, participation/ interaction engagement, emotional engagement and performance engagement. Students systematically worked with Mahara, and based on the data collected that were analysed using Statistica software, no positive impact on students' engagement was proved. Even though the quantitative results are relatively neutral, the observations and discussions with teachers and students indicate a positive impact on motivation. Building autonomy and using tools for reflection and self-reflection should become necessary components of university pre-service teacher education.*

Keywords: *portfolio; self-reflection; autonomy; efficacy; course engagement.*

ВИВЧЕННЯ РОЛІ ПОРТФОЛІО В ЗАЛУЧЕННІ СТУДЕНТІВ У НАВЧАЛЬНИЙ ПРОЦЕС

Рефлексивне навчання є важливим фактором, який позитивно впливає на ефективність навчання студентів. Метою дослідження є вивчення використання е-портфоліо як засобу та інструменту для сприяння рефлексії в класі та формування навичок самоаналізу, планування навчальної діяльності та розвитку навчальної автономії. Е-портфоліо Mahara використовувалося протягом восьми місяців з групою учнів середньої школи в Хорватії (n = 57), які заповнювали анкету, що складається з 23 пунктів за шкалою Лайкерта, до і після експериментального

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навчання. Анкета має чотири виміри: залучення навичок, участь/взаємодія, емоційне залучення та залучення до виконання завдань. Студенти систематично працювали з Mahara, і на основі зібраних даних, які були проаналізовані за допомогою програмного забезпечення Statistica, не було доведено позитивного впливу на залученість студентів. Хоча кількісні результати є відносно нейтральними, спостереження та обговорення з викладачами та студентами свідчать про позитивний вплив на мотивацію. Розвиток автономії та використання інструментів для рефлексії та саморефлексії мають стати необхідними компонентами університетської педагогічної освіти.

Ключові слова: *портфоліо; саморефлексія; автономія; ефективність; залучення до курсу.*

1. INTRODUCTION

Learning is a fundamental aspect of our lives. While individuals typically have the autonomy to choose what they wish to learn and how they wish to learn it, students in the majority of schools are formally educated based on syllabi formulated by responsible institutions. Teaching is adjusted to accommodate the needs of the majority of learners. Consequently, understanding oneself, cultivating effective learning habits, and adopting learning strategies are crucial steps that should be initiated at the onset of schooling and continually developed thereafter. Furthermore, building a creative atmosphere (e.g. Ofoghi et al., 2016; Omar & Awang, 2023; Wolf, 2019), nurturing motivation (e.g. Yudho et al., 2023; Bambang Purwanto, 2022) and enhancing learners' self-efficacy (Honicke et al., 2023; (Chanana, 2018) are additional factors that can positively impact learners' engagement in the learning process and enhance the effectiveness of teaching.

The term **perceived self-efficacy** was coined by Albert Bandura and he defined the concept as “beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments” (1997, p. 3). In 1993, Bandura stated that “perceived self-efficacy exerts its influence through four major processes”, including cognitive, motivational, affective, and selection processes (1993, p. 117). In their study, Galyon et al. (2011) examined the relationship of academic self-efficacy to engagement in class discussion and performance on major course exams among students (N = 165) in an undergraduate human development course. The groups in their sample did not differ significantly in terms of either self-efficacy or class participation, but self-efficacy was most strongly related to class participation and exam performance.

Students who possess high self-efficacy are inclined to establish ambitious objectives, demonstrate increased determination and resilience when facing challenges or obstacles, and tend to academically outperform peers with lower self-efficacy (Honicke & Broadbent, 2016). Self-efficacy is naturally connected to the ability to reflect objectively on one’s performance and to foster motivation.

Reflective learning has demonstrated a positive impact on academic performance. Levytskyi et al. (2021) examined the correlation between four components, namely self-orientation, feedback seeking, critical thinking, self-regulation correlate and students' performance. They emphasise that students receive information for analysis through

reflection, consider self-awareness as a subject of study, and design strategies for future progress. Colomer et al. (2013) used 4 different methodologies with their university students in their study. In the field of nursing, a reflective journal was used to reflect on and learn from their experiences; in the field of psychology, a reflective portfolio was used as a method for teaching and assessment; in the social education field, activities were based around reflective learning strategies designed to develop personal and professional skills to prepare students for their work placement and in the environmental science field, students worked on independent study and reflection on learning through activities such as solving case experiments, viewing videos, etc. The authors conclude that reflection aids students in recognizing their individual learning requirements and enhances their awareness of the potential value of their learning in future contexts. Reflective learning emerges as a beneficial and fitting approach for nurturing versatile skills like self-directed learning and adaptability to novel professional scenarios, among other competencies. However, a qualitative study conducted by Tan (2021) aimed at understanding students' perceptions of reflection yielded mixed results. While some conclusions were positive, the author notes that "reflection can be perceived as an ambiguous task, subject to a variety of interpretations" (p. 1). Tan describes the transition of 11 Malaysian students from an initial state of uncertainty to a habit of reflection. In another study, Bourner (2003) sought to identify problems in assessing reflective learning and proposed potential resolutions. However, it's important to note that the primary goal of reflection in teaching and learning is not to conduct evaluations, but rather to serve as a tool for coaching and mentoring learners throughout the learning process. The aim is to foster learner self-efficacy by guiding them in critically examining their experiences and identifying strengths and areas for improvement. Bandura (1977a, p. 194) points out, "Not only can perceived self-efficacy have a directive influence on the choice of activities and settings, but, through expectations of eventual success, it can affect coping efforts once they are initiated. Efficacy expectations determine how much effort people will expend and how long they will persist in the face of obstacles and aversive experiences".

One of the ways how to foster self-efficacy is to increase the self-engagement of the students. Despite its relatively common usage, **self-engagement** is used in different disciplines to mean different things and its definition varies among researchers. Skinner et al. (1990) suggest that engagement is "children's initiation of action, effort, and persistence on schoolwork, as well as their ambient emotional states during learning activities" (p. 24). Kuh (2003) maintains that engagement is "the time and energy students devote to educationally sound activities inside and outside of the classroom" (p. 25). Skinner, Kindermann, & Furrer (2009) mention the word quality in their definition and use the term self-engagement to refer to the quality of a student's connection or involvement with the endeavor of schooling and hence with the people, activities, goals, values, and place that compose it" (p. 494).

Generally, the following categories of engagement are defined: intellectual or cognitive engagement, emotional or affective engagement, behavioral engagement. Some authors add three more types: physical engagement, social engagement and cultural engagement. When discussing engagement, people often narrow their focus to the learners themselves and their activity. However, we must consider different types of interactions as

student-teacher, student-student, and student-material. Speaking about course engagement and self-engagement, we should also mention the term “disengagement”, which is used to denote learners with unfulfilled personal needs who become disconnected from school (Smyth & Fasoli, 2007; Sidorkin, 2002; Shernoff, 2013). Schools and teachers should create a safe and positive atmosphere to prevent disengagement, support engagement and self-efficacy, and foster motivation, providing space for personalization, interactions, self-reflection, and reflection. A number of authors have studied the effects of engagement (e.g. Wang et al., 2022), factors affecting the level of engagement (Fadilah et al., 2023; Jung et al., 2023; Morris et al., 2017), the tools (e.g. Dao, 2019; Barana et al., 2019) to support engagement.

The issue of using **portfolios** in education has received considerable attention (see e.g. Ilie, 2022; Narayan, 2022; Beka & Kulinxha, 2021; Součková, 2021; Leslie & Camargo-Borges, 2017; Straková, 2016). The term portfolio generally covers the range of information, activities, documents and materials. Based on its aim and use Crow & Harrison (2006, p.12) categorise 5 types of portfolios: (1) assessment portfolios (examples of the owner’s work for viewing by others for assessment purposes); (2) showcase portfolios (the best examples of the owner’s work, usually formatted in date order); (3) development portfolio (allows the owners to monitor and plan their own development); (4) reflective portfolios (allows the owners to review their own development; typically shared when the owner is applying for a job, or wanting to highlight work to other; (5) hybrid portfolios (combination of two or more of the above). A portfolio can be a personal tool offering space for self-reflection and external reflection, serving as a tool for personal growth and fostering intrinsic and extrinsic motivation and, consequently, self-efficacy. Safdari & Maftoon (2017) highlight that compared to intrinsic motivation, extrinsic motivators may not produce the same results for their incapacity to produce pleasure and enjoyment, “nevertheless, under certain conditions, they may become internalised and generate positive result” (p. 99). An e-portfolio is a tool that is easily accessible to the community, making it a space for feedback from all members of the community rather than solely from the teacher, as is often the case with pen and paper portfolios. This can also be a way to challenge and foster learners’ engagement in a course.

2. RESEARCH DESCRIPTION

Preservice teacher education must reflect the needs of the learners they are being prepared to teach. The research results demonstrated the efficacy of using portfolios in university student education. However, autonomous learning should not be limited to university students. The aim of the study was to test and determine the effect of e-portfolio application on course engagement of secondary school students in Croatia. The following research question was formulated: What is the impact of utilizing e-portfolio applications on the level of course engagement among secondary school students in Croatia? The study used a non-randomised convenience sample consisting of secondary school students aged 16-17 in Croatia. The one-group pre- and post-test design with dependent variables was measured before the treatment implementation and once after its implementation.

The e-portfolio in the Mahara LMS system was used from December 2023 till June 2023, i.e. 7 months. The portfolio was used regularly, monthly, within the framework of the Croatian language course to keep a reading journal of the mandatory literature assigned for

the first and second grades of high school. Students wrote summaries of the assigned works and responded to questions provided by the teacher to assess their comprehension. They also exchanged opinions and commented on each other's writing. Through this process, they developed their own repository of read works and analyses, which proved beneficial in preparing for the state graduation exam. The school has general approval to use anonymised educational data for research purposes.

In History, the portfolio was used multiple times a month for studying historical periods, conducting independent research on specific topics, completing homework assignments, and undertaking project tasks. Students were given the opportunity to review and offer constructive feedback on their peers' work, providing insights, suggestions for improvement, and reflections on their classmates' historical analyses and interpretations.

Quantitative data were collected using a student course engagement questionnaire (SCEQ), and statistical analyses were conducted using Statistica software (version 14.1.0.8).

SCEQ consists of 23 questions categorized into 4 dimensions of student engagement: skills engagement (9 statements), participation/interaction engagement (6 statements), emotional engagement (5 statements), and performance engagement (3 statements) (see Handelsman et al., 2005).

The normality of variables was assessed visually and with the Kolmogorov-Smirnov test, and the non-normal distribution was recorded. Thus, to evaluate independent samples, the non-parametric Mann-Whitney U test was used. A Mann-Whitney U test was used to compare overall engagement as well as each engagement factor.

3. RESULTS

The average post-test scores are similar to the average pre-test scores; only 8 statements out of 23 have better results, higher than in the pre-test (see Table 1). The box and whiskers plots (Figures 1–4) display the results regarding 4 different dimensions separately: skills engagement, participation/interaction engagement, emotional engagement, and performance engagement, for both measurements.

The four dimensions were studied, and the medians and means of pretest and posttest were compared. No significant difference was observed; and only slight differences were noted in the means. The mean value of skills engagement in M1 was 3.263, and in M2, it was 3.300. As can be seen, the difference is 0.037, and the medians are the same. Out of eight statements where a positive increase was observed, four statements belong to the skills engagement dimension. The graph (figure 1) shows that the interquartile range is lower, and the scores are higher compared to those in the pre-test.

Table 1. Pre-test and post-test results for the SCEQ statements

	measurement=M1 Descriptive Statistics (croatia)						measurement=M2 Descriptive Statistics (croatia)						
	Valid N	Mean	Median	Min	Max	Std. Dev.	Valid N	Mean	Median	Min	Max	Std. Dev.	mean incr
1. Raising my hand in class /PI	50	2.660	2.0	1	5	1.136	57	2.737	3.0	1	5	1.044	+
2. Participating actively in small group discussions /PI	50	3.200	3.0	1	5	0.904	57	2.877	3.0	1	5	1.351	
3. Asking questions when I don't understand the instructor /PI	50	2.820	2.5	1	5	1.508	57	2.614	3.0	1	5	1.278	
4. Doing all the homework problems / SE	50	3.160	3.0	1	5	1.201	57	2.825	3.0	1	5	1.403	
5. Coming to class every day /SE	50	4.340	5.0	2	5	0.872	57	4.298	5.0	1	5	1.101	
6. Going to the professor's office hours to review assignments or tests, or to ask questions /PI	50	1.940	1.5	1	5	1.150	57	1.579	1.0	1	5	0.963	
7. Thinking about the course between classes meetings / E	50	2.540	2.0	1	5	1.073	57	2.158	2.0	1	5	1.049	
8. Finding ways to make the course interesting to me / E	50	3.140	3.0	1	5	1.309	57	2.772	3.0	1	5	1.282	
9. Taking good notes in clas /SE	50	3.220	3.5	1	5	1.217	57	3.667	4.0	1	5	1.418	+
10. Looking over class notes between classes to make sure I understand the material /SE	50	2.800	3.0	1	5	1.309	57	2.439	2.0	1	5	1.254	
11. Really desiring to learn the material / E	50	2.880	3.0	1	5	1.206	57	2.807	3.0	1	5	1.172	
12. Being confident that I can learn and do well in the class / P	50	3.460	3.0	1	5	1.073	57	3.526	3.0	1	5	1.037	+
13. Putting forth effort /SE	50	2.720	3.0	1	5	1.161	57	3.211	3.0	1	5	1.176	+
14. Being organized /SE	50	3.420	3.0	1	5	1.012	57	3.140	3.0	1	5	1.302	
15. Getting a good grade/P	50	3.360	3.0	1	5	0.964	57	3.596	4.0	1	5	1.050	+
16. Doing well on the tests / P	50	3.180	3.0	1	5	0.896	57	3.456	3.0	1	5	1.036	+
17. Staying up on the readings /SE	50	3.100	3.0	1	5	1.389	57	2.719	3.0	1	5	1.398	
18. Having fun in class /PI	50	3.660	4.0	1	5	1.272	57	3.421	3.0	1	5	1.336	
19. Helping fellow students /PI	50	3.680	4.0	1	5	1.253	57	3.421	3.0	1	5	1.322	
20. Making sure to study on a regular basis /SE	50	3.460	4.0	1	5	1.182	57	3.649	4.0	1	5	1.126	+
21. Finding ways to make the course material relevant to my life / E	50	2.840	3.0	1	5	1.149	57	2.351	2.0	1	5	1.172	
22. Applying course material to my life / E	50	2.940	3.0	1	5	0.935	57	2.667	3.0	1	5	1.170	
23. Listening carefully in class /SE	50	2.920	3.0	1	5	0.877	57	2.947	3.0	1	5	1.141	+

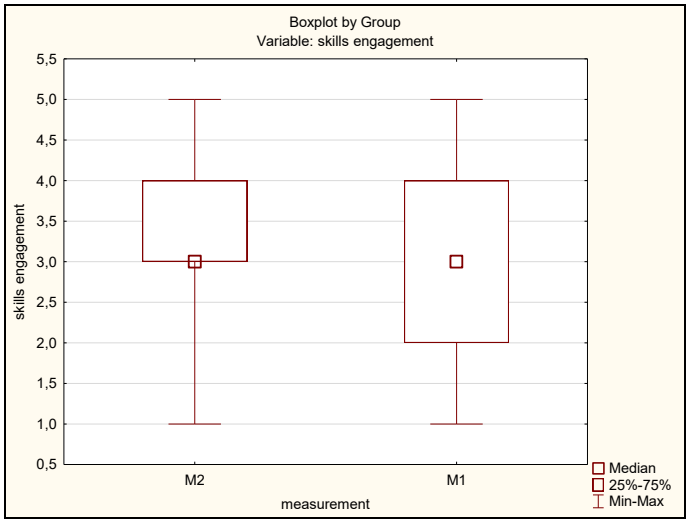

Figure 1. Box and whisker plot – comparison of pre-test (M1) and post-test (M2) scores of skills engagement

The mean score in the participation engagement in the pre-test was 2.993 (n=50; SD=0.757) and dropped to 2.775 (n=57; SD=0.826). The scores of all statements in this dimension were lower in the post-test compared to the pre-test.

Figure 2. Box and whisker plot – comparison of pre-test (M1) and post-test (M2) scores of participation/interaction engagement

The most significant negative differences between pre-test and post-test scores were recorded in the dimension of emotional engagement. The mean value reached in the pre-test is 2.868 (SD=0.876), and the score has dropped by 0.317 points, i.e. the mean score in the post-test reached 2.551 (n=57, SD=0.874).

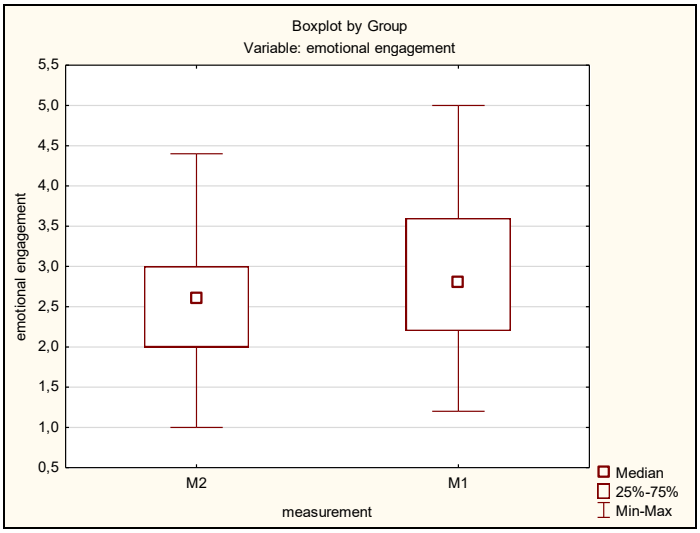

Figure 3. Box and whisker plot – comparison of pre-test (M1) and post-test (M2) scores of emotional engagement

The positive difference between the pre-test and post-test means (0.193) was observed in the dimension of performance engagement). The pre-test mean value was the highest out of 4 dimensions (N= 50, M=3.333, SD= 0.814). The same can be said about the post-test values, where the performance engagement score was 3.526 (N= 57, M=3.333, SD= 0.891).

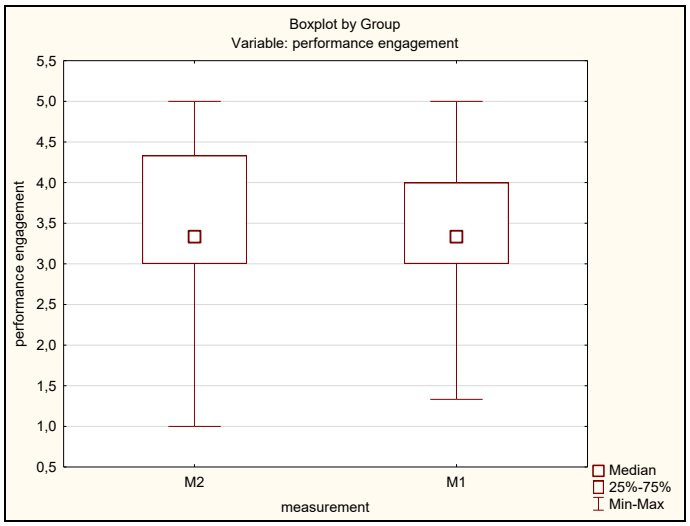

Figure 4. Box and whisker plot – comparison of pre-test (M1) and post-test (M2) scores of performance engagement

The Mann-Whitney test rejected the hypothesis that there was a significant difference in the level of course engagement before and after using the e-portfolio.

Table 2. Mann-Whitney U test for pre- and post-test values

	Mann-Whitney U Test (w/ continuity correction) (croatia) By variable measurement Marked tests are significant at p <,05000									
Variable	Rank Sum M2	Rank Sum M1	U	Z	p-value	Z adjusted	p-value	Valid N M1	Valid N M2	2*1 sided exact p
skills engagement	3063,500	2714,500	1410,500	-0,08741	0,930342	-0,09122	0,927317	57	50	0,928166
participation/ interaction engagement	2873,000	2905,000	1220,000	-1,27688	0,201646	-1,28025	0,200457	57	50	0,202529
emotional engagement	2818,000	2960,000	1165,000	-1,62029	0,105170	-1,62509	0,104145	57	50	0,105357
performance engagement	3291,500	2486,500	1211,500	1,32995	0,183535	1,34358	0,179086	57	50	0,183274

We understand that applying the one-group pre- and post-test design does not allow us to conclude this with a high degree of certainty because there may be other explanations for why the post-test scores have not changed. The results are discussed in the following section.

4. DISCUSSION

As mentioned in the literature review, prior studies have noted the importance of portfolios in teaching and learning practice. However, not many studies focus on and evaluate the relationship between using e-portfolios and course engagement. The present study was designed to determine that effect; however, statistical analysis of the pretest-posttest data did not reveal a significant difference in course engagement scores before and after the intervention, suggesting that the use of the e-portfolio application did not lead to a measurable change in course engagement among the participants. Students generally appreciated the organization and accessibility of the e-portfolio but expressed mixed feelings regarding its impact on their overall engagement with the course. These neutral results suggest that while e-portfolio applications may offer benefits in terms of organization and accessibility, they influence course engagement.

In interpreting the findings of this study, several limitations should be considered. First, as already mentioned, the one-group pre- and post-test design was applied, and thus the study lacks a comparison group. Furthermore, implementing a different instructional strategy may require more time, as it necessitates a change in attitude in this case and expects a higher level of self-organization and responsibility. This is also confirmed by the teacher, who explained that she observed a slight change starting from apathy, hesitance, and a certain reluctance to increased enthusiasm and motivation. She believes that prolonging the use of a portfolio may bring positive results and benefits in the ability to cooperate, collaborate, and provide and perceive constructive feedback. These results would likely differ significantly for online education at other universities. The teacher himself /herself can influence the data significantly in this kind of research design. The data and this study are the results of a larger project where Croatian, German, and Slovak secondary schools were involved, and the results differ in every country.

It is important to mention that there are studies (e.g. Arntfield et al., 2016) that warn that portfolio can be a vulnerable method of learning. They highlight the acts of adaptability, which serve to strengthen the student-mentor relationship.

The research findings are significant for pre-service teacher education. In contemporary discourse, there is frequent emphasis on 21st-century skills. It is essential for teacher trainees to not only engage in the development of these skills but also receive training on how to cultivate them effectively. Likewise, teachers-to-be should be exposed to student-centered teaching methodologies and be instructed on how to implement learner-centered teaching practices, fostering student autonomy. This is not an easy task, but research results indicate that systematic work on the development of metacognitive learning strategies and self-reflection leads to self-engagement and, indirectly, to more effective learning.

5. CONCLUSIONS

The findings contribute to an expanding body of literature on the use of portfolios in teaching. The study examined the potential impact of employing e-portfolios on course engagement at the selected secondary school. The research employed a quantitative method, utilizing the SCEQ questionnaire. Despite not observing a significant difference, it is recommended to extend the study and introduce an experimental group to compare the results. Additionally, a larger sample size involving more teachers should be utilized to verify and control for more variables, thereby assessing the true impact of using e-portfolios, potentially not only on course engagement but also self-engagement. Encouraging students to use e-portfolios can positively influence self-efficacy and motivation, thereby potentially impacting academic performance. Another limitation of this study is that the results primarily reflect the views and behaviors of this specific age group.

The findings suggest a neutral to positive impact on the responsibility and autonomy of secondary school learners, implicitly highlighting the necessity of preparing both current and future teachers to foster greater learner responsibility and autonomy. Pre-service teacher education programs should broaden curricula to incorporate comprehensive learning strategies, especially cognitive and metacognitive domains and learner-centered

teaching. At the same time, they should equip the graduates with knowledge and experience with the tools and practices to promote autonomous learning and (self)reflection.

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