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Reflective ePortfolios Support Personal and Professional Growth in Pre-Nursing Students

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The use of electronic portfolios (ePortfolios) in education has become increasingly popular as a tool for documenting and managing learning. Initially designed as simple repositories, ePortfolios have evolved into platforms that encourage critical thinking and reflection, benefiting both personal growth and career preparation. In this study, we explore student perceptions of reflective ePortfolios in three pre-nursing science courses: Anatomy & Physiology I (API), Anatomy & Physiology II (APII), and Microbiology. Through these courses, students used ePortfolios to track academic progress, reflect on their learning experiences, and develop digital communication skills. We also examine how students view ePortfolios as a learning tool and a means to enhance career readiness. While ePortfolios are recognized for fostering self-awareness, professional development, and promoting a digital identity, it is crucial to assess student engagement and willingness to continue using them after graduation. The findings show that over 80% of students valued the personal growth and creativity ePortfolios provided, yet only 60% felt that instructor feedback improved their work. Many students also raised concerns about the workload involved. Although two-thirds of students recommended ePortfolios for future courses, less than 60% planned to use them postgraduation. We highlight the need for increased integration of ePortfolios into career development to sustain long-term engagement.

Many systems have been used to collect, organize, and preserve educational materials for future use. In recent years electronic portfolios (ePortfolios) have gained popularity to digitally preserve materials for various purposes. Jenson and Treuer (2014) defined an ePortfolio as a tool for documenting and managing one's own learning over a lifetime in ways that foster deep and continuous learning. The definition of ePortfolios has evolved from just a simple depository of artifacts like a large electronic file cabinet to a highly organized social network system where critical thinking is promoted and seen as a tool for authentic assessment (Robnolt et al., 2017). Several educators have defined the ePortfolio as a course management tool or a learning platform (Likhushina & Radchenko, 2021; Olstad, 2020) while others have viewed it primarily as a space for creating a virtual identity (Jenson & Treuer, 2014).

Watson et al. (2016) has recognized ePortfolio as a high-impact practice due to its potential to produce self-directed learners and autonomous thinkers through critical thinking and active learning experiences. ePortfolios are designed within an academic framework where students critically reflect on their learning and professional aspirations under faculty guidance. With ePortfolios, students work individually and collaboratively to develop and preserve academic and nonacademic artifacts including coursework, skills, interests, and accomplishments. ePortfolios also provide a platform where students can demonstrate abilities through multiple modes and technologies to potential employers or recruitment agencies (Panyukova, 2020; Reese & Levy, 2009; Simatele, 2015; Watson et al., 2016). Due to the significant value that ePortfolios provide to students as a skills and career enhancement tool, many academic programs are eager to implement them as part of their curriculum to increase student success (Cooney et al., 2020; Meeus et al., 2006; Pospíšilová & Rohlíková, 2023). ePortfolios have been used for multiple reasons in higher education. Slepcevic-Zach and Stock (2018) utilized a classification by Baumgartner (2009) in which ePortfolios are divided into the following three types:

- Development portfolio: "students include work completed early and late in the program so that development can be judged" (University of Hawai'i at Mānoa, n.d., section 4).
- Presentation portfolio: "Students select and submit their best work. The showcase portfolio emphasizes the products of learning" (University of Hawai'i at Mānoa, n.d., section 1; Samardzija & Balaban, 2014).
- Reflection portfolio: "a collection of evidence that attests to achievement as well as personal and professional development through critical analysis and self-reflection" (Pandya et al., 2017, p. 78).

Pandya et al. (2017) observed that reflective portfolios promoted self-awareness and critical thinking skills for students and enabled faculty to provide feedback on

students' application of academic learning to professional practice. This type of portfolio enables students to reflect on their learning and personal growth and to document skills and experiences during their academic career.

Academic institutions commonly use reflective ePortfolios in capstone courses (Goertzen et al., 2016; Harver et al., 2019). Holdsworth et al. (2009) suggested that a capstone course is defined as a bridge between knowledge and knowledge integration. For example, students in a senior-level internship course apply newly acquired knowledge from multiple courses to the internship environment. Senior-level capstone experiences allow students to learn new material as they are in the internship; it is the reflection on those experiences that truly enables them to create new knowledge (Kolb & Kolb, 2005). ePortfolio activities in capstone courses allow students to capture, organize, demonstrate, and reflect on their previous learning in various forms usually done at the end of their academic journey just prior to graduation (Goertzen et al., 2016). However, ePortfolios can also enable students to learn to portray themselves professionally, academically, and personally earlier in their academic careers. For example, pre-service teacher education students use ePortfolios to document their technology competency (Lim et al., 2016), reflections upon working in the classroom, and as a repository for documents relevant to their eventual teaching.

The AAC&U report *How College Contributes to Workforce Success: Employer Views on What Matters Most* (Finley, 2021) found that while college graduates are becoming more effective at communicating their achievements to employers, they need more practice at this skill. An ePortfolio can be used as a learning tool to support a student transition from student to professional by giving them practice early and often in the development of articulating their accomplishments. In completing the assignments, students learn to formally introduce themselves to potential schools or employers, identify appropriate artifacts that can demonstrate their skills and experiences, and reflect on those skills and experiences in the moment. Instead of waiting until the end of the academic journey to try to recall what they have accomplished, building an ePortfolio along the way allows students to regularly and on a consistent basis, collect reflections, artifacts, awards, recognitions, or experiences gained in different classes.

ePortfolio activities introduced early in their academic careers through multiple courses may present more opportunities for students to reflect on their learning and how their experiences relate to their career goals, while providing documentation of their accomplishments through reflection and artifacts (Mohammed et al., 2015; Rossi et al., 2008). Thus, we sought to determine students' perceptions of the use of reflective ePortfolios across three courses within a pre-nursing course of study leading up to the application to nursing school.

Methods

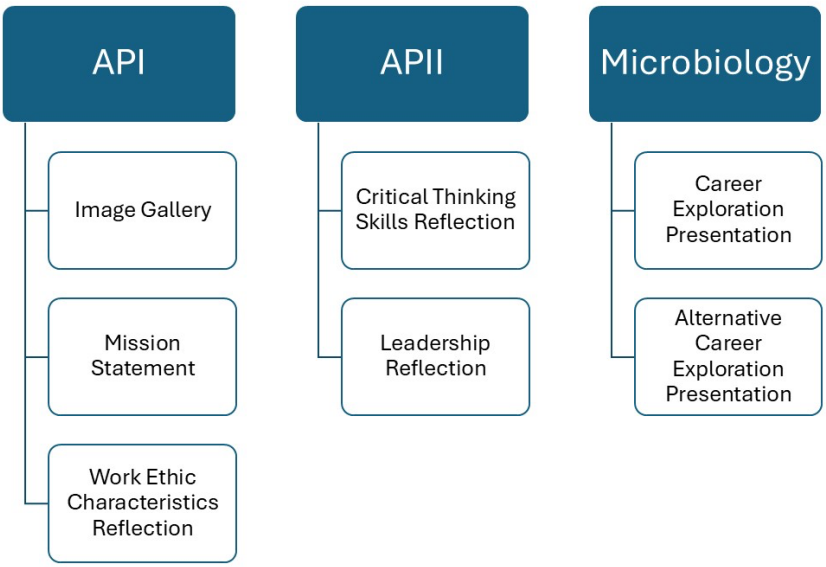
We asked students to complete ePortfolio assignments in three pre-nursing science courses (Anatomy & Physiology I [API], Anatomy & Physiology II [APII], and Foundations of Microbiology [Microbiology]) based on evidence from a pilot study by several faculty for each course. In API, three faculty participated across three semesters (Spring 2023, Fall 2023, and Spring 2024) for a total of 19 sections (397 total students which was 49% of the total sections across the three semesters). In APII, two faculty participated across three semesters (Spring 2023, Fall 2023, and Spring 2024) for a total of eight sections (273 total students) (28% of the total sections across the three semesters). In Microbiology, three faculty participated across three semesters (Spring 2023, Fall 2023, and Spring 2024) for a total of 11 sections (376 total students) (48% of the total sections across the three semesters). At this institution, each section is capped at 24 students.

Prior to starting the project, we gave students information on the benefits of ePortfolios, how to access the ePortfolio electronic platform and the specific assignments pertaining to each course. We used Watermark Student Learning & Licensure as the electronic platform for the ePortfolios in the courses. The grade weight for each ePortfolio assignment was at the discretion of the section faculty and ranged from 5% to 7.5% of the final course grade.

We provided a template for the ePortfolio, which included pages for each course. Given that only certain sections of each course participated in this study, not all students in APII and/or Microbiology had assignments from the previous course. We designed the ePortfolio template to be flexible, allowing students to start with any of the three courses. While it did not require initiation at a specific starting point, all pages and assignments were accessible, enabling students to begin where needed. If students desired, they could complete any previous pages but were not required to do so within a specific course.

At the end of each semester, we asked students to complete a Qualtrics electronic survey. In the survey, we asked students whether they consented to participate in this study which was approved by the college's institutional review board. We asked those students who consented to participate for academic-related information including career aspiration, expected course grade, and previous experience with ePortfolios. Furthermore, we asked students to reflect over the ePortfolio experience assigned within their specific course for that semester and answer the following questions based on a disagree, neither, or agree Likert scale; additionally, we included two free-response reflective questions. Table 1 contains an itemized list of the questions and their respective survey response scales.

Figure 1
Flowchart Demonstrating Specific Pages of the ePortfolio Done as Assignments Within Each Course



Note. API = Anatomy & Physiology I course; APII = Anatomy & Physiology II course; Microbiology = Foundations of Microbiology course.

Assignments Description per Course

We developed ePortfolio assignments to reflect on experiences obtained across five pillars (critical thinking, career exploration, communication, leadership, connection) for success in healthcare professions. Each course had unique assignments (Figure 1) which when combined represented a complete ePortfolio. We considered each ePortfolio assignment a page in the Watermark Student Learning & Licensure electronic ePortfolio template. Assignment details per course are presented below in Tables 2, 3, and 4.

Data Analysis

We collected data during three consecutive semesters (Spring 2023, Fall 2023, and Spring 2024) and combined them to obtain frequency counts for each statement in the Qualtrics electronic survey. We then created figures in Microsoft Excel using percentage data representing percentage responses of disagree, neither, or agree for each statement and summarized qualitative data by theme.

Results

A total of 246 API students (62% of the total possible students enrolled in the 19 sections which participated in the ePortfolio project), 183 APII students (67% of the total possible students enrolled in the eight sections which participated in the ePortfolio project), and 252 Microbiology students (67% of the total possible students enrolled in the 11 sections which participated in the ePortfolio project) responded to the electronic survey.

When asked about having previously completed an ePortfolio, the API students reported YES less frequently than the other courses for each semester, but the number of students responding YES to this question increased as the project continued, from 32% during Spring 2023 to 54% during Spring 2024. In the APII and Microbiology courses, the YES response increased by semester as well from 38% during Spring 2023 to 76% during Spring 2024 for APII and 48% during Spring 2023 to 65% during Spring 2024 for Microbiology (Figure 2).

Consistently across all three courses, over 80% of the students said that they knew what an ePortfolio was (Table 1, Question 7) and the instructions were clear (Table 1, Question 1) across all courses (Figure 3). The students in API and APII were evenly distributed in their response to the amount of workload (Table 1, Question 2) with approximately a third agreeing that the workload was too much, a third neither agreeing or disagreeing, and a third disagreeing that the workload was too much. Only in the Microbiology course did greater than 50% of the students disagree that the workload was too much (Figure 3). Only 16% of Microbiology students agreed that the workload was too much.

Figure 2

Change in Previous ePortfolio Exposure Across Semesters and Courses



Note. API = Anatomy & Physiology I course; APII = Anatomy & Physiology II course; Micro = Foundations of Microbiology course.

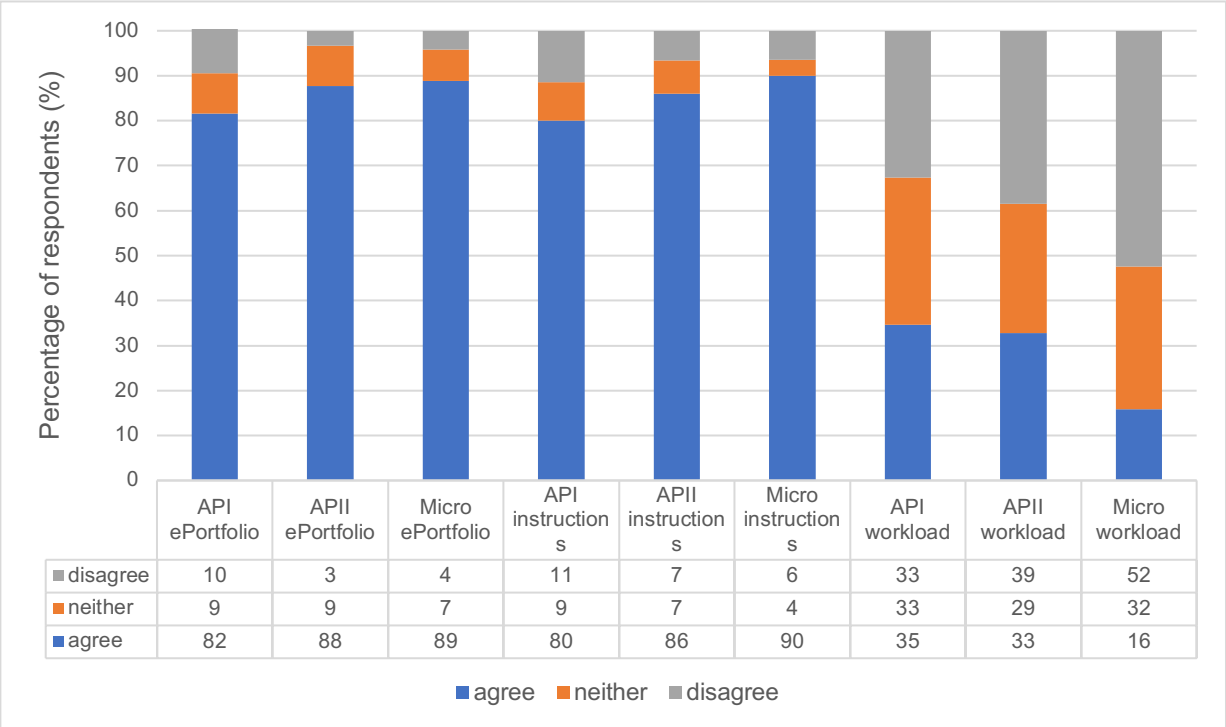
Table 1

Survey Items Assessing Perceptions of the ePortfolio Experience

Question no.	Survey statement	Response scale
1	The instructions for each page were clear.	1 = *disagree*, 2 = *neither*, 3 = *agree*
2	The workload for the pages was too much.	1 = *disagree*, 2 = *neither*, 3 = *agree*
3	The pages allowed me to be creative.	1 = *disagree*, 2 = *neither*, 3 = *agree*
4	The pages allowed me to demonstrate personal growth.	1 = *disagree*, 2 = *neither*, 3 = *agree*
5	The pages allowed me to demonstrate professional growth.	1 = *disagree*, 2 = *neither*, 3 = *agree*
6	The feedback I received helped me to improve the pages for the future.	1 = *disagree*, 2 = *neither*, 3 = *agree*
7	I know what an ePortfolio is.	1 = *disagree*, 2 = *neither*, 3 = *agree*
8	I see the benefits of an ePortfolio to enhance my digital communication skills to highlight my achievements.	1 = *disagree*, 2 = *neither*, 3 = *agree*
9	I plan to continue to use my ePortfolio in the future.	1 = *disagree*, 2 = *neither*, 3 = *agree*
10	I recommend this activity for future classes.	1 = *disagree*, 2 = *neither*, 3 = *agree*
11	Reflect on some things that you learned about yourself by doing the ePortfolio project in this class.	Open-ended response
12	(Microbiology only): During the course of this assignment, did your perception of your career choice change? If so, how?	Open-ended response

Figure 3

Percentage of Respondents Across Courses for the Questions 7, 1, and 2



	API ePortfolio	APII ePortfolio	Micro ePortfolio	API instructions	APII instructions	Micro instructions	API workload	APII workload	Micro workload
disagree	10	3	4	11	7	6	33	39	52
neither	9	9	7	9	7	4	33	29	32
agree	82	88	89	80	86	90	35	33	16

Note. The full text of the questions follows: ePortfolio = I know what an ePortfolio is (Question 7); instructions = The instructions for each page were clear (Question 1); workload = The workload for the pages was too much (Question 2). API = Anatomy & Physiology I course; APII = Anatomy & Physiology II course; Micro = Foundations of Microbiology course.

Students across all three courses reported that the ePortfolio pages allowed them to be creative (Table 1, Question 3; 72% averaged across the three courses of all three semesters) and demonstrate growth personally (Table 1, Question 4; 79% averaged across the three courses of all three semesters) or professionally (Table 1, Question 5; 80% averaged across the three courses of all three semesters), although the average for API was consistently lower than for APII and Microbiology (Figure 4). Students increasingly reported that the ePortfolio pages enhanced their digital communication skills (Table 1, Question 8; 59% for API, 75% for APII, and 82% for Micro; Figure 4).

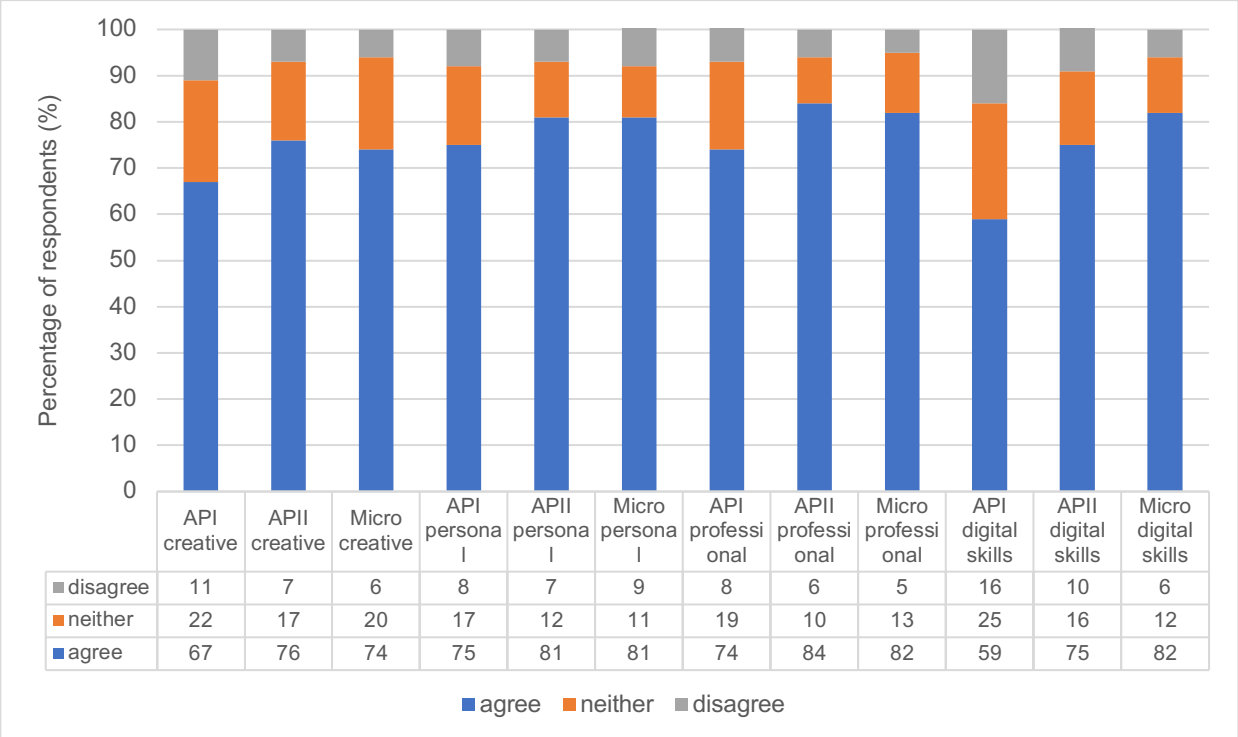
Fewer than 60% of students, averaged across all three courses of all three semesters (59%), reported that the feedback given by instructors helped them improve the pages for the future (Question 6; Figure 5), although fewer API (53%) students agreed than APII (63%) and Microbiology (64%) students. Two-thirds of the students (when averaged across all three courses) reported that they recommended the assignment be used in future classes (Table 1, Question 9) and approximately 60% of the students (when averaged across all three courses) reported that they themselves planned to continue to use the ePortfolio in the future (Figure 5).

Students were asked to reflect on the open-ended question: "Reflect on some things that you learned about yourself by doing the ePortfolio project in this class" (Table 1, Question 11). While a few students expressed concerns about the project's impact on their time for course material, most responses across all three courses were positive. Students highlighted valuable insights about themselves, including personal growth, achievements, and a deeper understanding of their learning journey.

Students in API (Table 2) provided positive comments on the development of a resume and the realization that to be competitive, more accomplishments would need to be on the resume. Students commented that they learned how to write about themselves and that it helped with self-confidence when speaking about themselves in a professional setting. Overall, the comments reflected the theme of learning to articulate their successes and accomplishments and focusing on where they needed to enhance their skills, accomplishments, and mission to be competitive. One student noted, "it gave me the opportunity to sit and reminisce on my 'why'," which summarized the most common student response. A subset of respondents, however, felt that the assignments

Figure 4

Percentage of Respondents Across Courses for Questions 3, 4, 5, and 8



	API creative	APII creative	Micro creative	API personal	APII personal	Micro personal	API professional	APII professional	Micro professional	API digital skills	APII digital skills	Micro digital skills
disagree	11	7	6	8	7	9	8	6	5	16	10	6
neither	22	17	20	17	12	11	19	10	13	25	16	12
agree	67	76	74	75	81	81	74	84	82	59	75	82

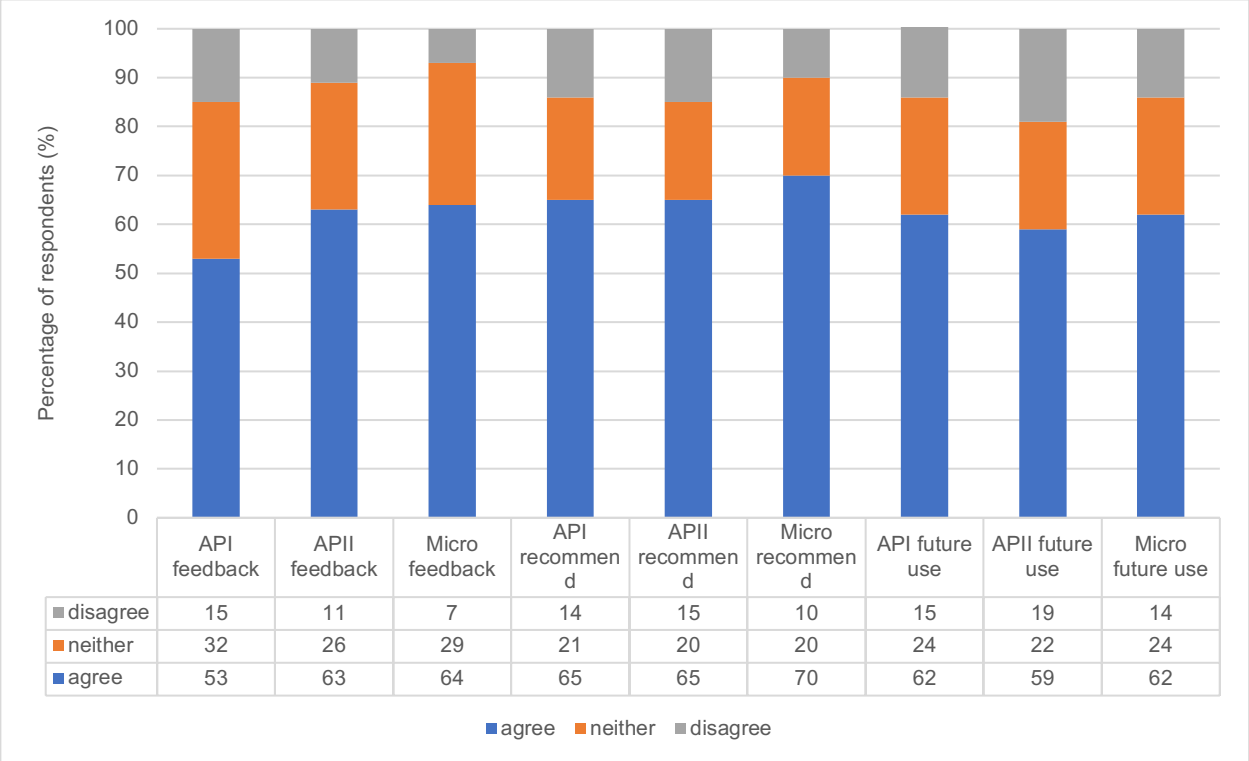
Note. The full text of the questions follows: creative = The pages allowed me to be creative (Question 3); personal = The pages allowed me to demonstrate personal growth (Question 4); professional = The pages allowed me to demonstrate professional growth (Question 5); digital skills = I see the benefits of an ePortfolio to enhance my digital communication skills to highlight my achievements (Question 8). API = Anatomy & Physiology I course; APII = Anatomy & Physiology II course; Micro = Foundations of Microbiology course.

Table 2

Anatomy and Physiology I ePortfolio Assignment Pages

Page no.	Page title	Brief description
1	Introductory page	Students created a picture gallery of up to six professionally appropriate pictures to introduce themselves (e.g., family, pets, hobbies, educational goals) and wrote a description of what the pictures meant to them.
2	Mission statement page	Students wrote a well-constructed paragraph essay (approximately 1–2 pages) describing life experiences and/or people that shaped their personal and/or professional philosophy, using guiding questions: • Who are the people who have the most influence in your life? • Why did you choose your major? • What are your strengths related to school? • What do you want to do with your degree? • How has personal experience influenced your desire to go into your chosen profession? • What challenges have you faced to get to where you are?
2	Mission statement page cont.	Do you have any specific quotes that are important to you or explain your personal mission statement?
3	Work ethic characteristics page	Students reflected on work ethic characteristics (e.g., reliability and dependability, dedication to a task, productivity, cooperation, self-discipline, initiative) by providing written descriptions and supporting artifacts.

Figure 5
Percentage of Respondents Across Courses for Questions 6 and 9



	API feedback	APII feedback	Micro feedback	API recommend	APII recommend	Micro recommend	API future use	APII future use	Micro future use
disagree	15	11	7	14	15	10	15	19	14
neither	32	26	29	21	20	20	24	22	24
agree	53	63	64	65	65	70	62	59	62

Note. The full text of the questions follows: feedback = The feedback I received helped me to improve the pages for the future (Question 6); recommend = I recommend this activity for future classes (Question 9); digital skills = I see the benefits of an ePortfolio to enhance my digital communication skills to highlight my achievements. API = Anatomy & Physiology I course; APII = Anatomy & Physiology II course; Micro = Foundations of Microbiology course.

took away from time spent on course materials and did not provide anything for them, indicating that some students did not have a personal interest in the ePortfolio and did not see the value as a career tool.

Students in APII (Table 3) reaffirmed this finding with comments noting the difficulty in identifying essential skills to improve as well as the challenge in writing about themselves and their accomplishments. It should be noted that some students recognized through the exercise that they had accomplished more than they had thought. Additionally, it gave them the opportunity to reflect on leadership and critical thinking skills as well as further developing writing skills.

Students in Microbiology commented that they "still were uncomfortable 'bragging' about self" but did learn how their interests, strengths, and/or challenges matched their career choices (Table 4). The comments focused on how the ePortfolio pages either solidified career choices or enabled them to recognize that there may be other career choices that they had not considered previously. One student noted, "I am thankful for the careers project we did. It was very helpful in me exploring other career options and helped me find an alternate path that I want to take in my career." In fact, this "thankfulness" was a common theme. The comments also indicated that students recognized they had learned valuable skills from academic courses that are necessary for their careers

Discussion

By completing an ePortfolio in the pre-nursing program, students actively engaged in their personal growth by demonstrating their individual creativity and prowess in digital communication skills. We contribute to the ePortfolio literature by extending prior single-course implementations, demonstrating how intentionally scaffolded ePortfolio practices across multiple sequential courses promote student persistence through sustained engagement and reflective development, while also supporting preparation for future employment and professional school applications.

Although this ePortfolio was initiated in the API course, many students reported having completed an ePortfolio previously, indicating that students were already familiar with an ePortfolio. Most students found it easy to complete an ePortfolio, with over 80% stating that the instructions were clear. From Fall 2023 to

Table 3
Anatomy and Physiology II ePortfolio Assignment Pages

Page no.	Page title	Attitude/element	Brief description
4	Critical thinking page*	Analysis	Students described and provided artifacts showing how they gather, understand, and interpret data and other information.
4	Critical thinking page cont.	Inference	Students described and provided artifacts showing how they draw conclusions based on relevant data, information, and personal knowledge and experience.
4	Critical thinking page cont.	Problem solving	Students described and provided artifacts showing how they gather, analyze, and communicate information to identify and troubleshoot solutions.
4	Critical thinking page cont.	Independence of thought	Students described and provided artifacts demonstrating open-minded examination of beliefs under new evidence and awareness of how prejudices, social pressures, and habits may affect professional judgment.
4	Critical thinking page cont.	Integrity	Students described awareness of the limits of their own knowledge and how they respond when they do not know something.
4	Critical thinking page cont.	Perseverance	Students described and provided artifacts illustrating resistance to choosing quick, simple answers to avoid uncomfortable situations.
5	Leadership page	—	Students provided written descriptions and artifacts of what leadership meant to them, considering formal and informal leadership positions, leaders they admired, and leadership skills or positions they aspired to obtain.

Note. *Based on the National League for Nursing Accreditation Commission attitudes that foster critical thinking (Berman et al., 2015).

Table 4
Microbiology ePortfolio Assignment Pages

Page no.	Page title	Brief description
6	Career exploration page	Students investigated requirements for their professional goals (e.g., prerequisite courses, observation and volunteer hours, interviews), curated a list of key websites (schools, companies, professional organizations), drafted a personal statement, and reflected on backup plans.
7	Alternative health-related career plan page	Students investigated two alternative healthcare careers, completed a report sheet for each (salary, work environment, educational requirements, personal strengths and challenges), and created a PowerPoint presentation on one career to share findings with the class.

Spring 2024, there was an increasing number of students who used ePortfolios, as many students in APII and microbiology had already completed one in API or other courses. As new programs introduce ePortfolios into the curriculum, such as the Introduction to Computing course that most students complete in the first year, familiarity will increase at our institution.

In assessing student perceptions of ePortfolios, Gerbic et al. (2009) reported that the greatest challenge was the use of technology. Birks et al. (2016) also demonstrated that health science students did not see the ePortfolios as a positive experience due to dissatisfaction from practical and technical challenges. However, Muin et al. (2021) did not observe these issues; rather 81% of the respondents agreed that the ePortfolios were easy to use and that they were "able to use [the software] independently after the first instructions" (p. 501). We found that over 80% of students reported that the instructions were clear and the majority saw "benefits of an ePortfolio to enhance my digital communication skills to highlight my achievements" (59% in API, 75% in APII, and 82% in Micro). It is possible that with the increased opportunities for online activities during and following the COVID pandemic, students feel much more comfortable with learning and using online platforms.

Gopika and Rekha (2023) observed that students' digital learning usage and knowledge of digital learning increased following the COVID-19 outbreak significantly in Indian school children. Many schools started to depend on e-learning technologies and tools after the COVID-19 outbreak (Qiao et al., 2021), and ePortfolio use was following that trend during the outbreak (Fabriz et al., 2021) and after the pandemic.

Additionally, as ePortfolios become more of a norm, students may view them more positively as shown by Gerbic et al. (2011) where the negativity of ePortfolios decreased over time in undergraduate Education students. Gerbic et al. (2011) also recommended embedding ePortfolios early in academic programs to get students acculturated to their use. This may explain the increased positive perceptions, especially in benefits for digital communication and recommendation for future classes since we used ePortfolios over a three-course sequence and over three semesters of data.

For courses that participated in this project, laboratory notebooks and catalogues were used to document projects as indicated by Avraamidou and Zembal-Saul (2002), who defined a portfolio as a portable case for carrying a loose collection of papers and materials. Students in the pre-nursing program moved from having the burden of carrying bags of heavy papers to a digitalized collection of their artifacts to show their best work using a web-based interface.

Many students request letters of recommendation from the faculty for their nursing program applications. These letters are usually based on the faculty personal or mentoring relationship with the student. With the ePortfolio, it would be easy for any faculty member to consult a requester's ePortfolio and write based on the work done during the entire academic journey. It allows faculty to see concrete examples of the student's work, such as research projects, built models, presentations, and reflections, which can help them write a more detailed and personalized recommendation.

While reflective and presentation ePortfolios are often completed as part of a capstone course or capstone project, their integration and use throughout a course of study is gaining interest (Morreale et al., 2017). We assigned portions of the ePortfolio in three prerequisite courses for nursing programs that are usually taken in sequence. Students who have been exposed to an ePortfolio before taking API are consciously aware of their academic development as it is happening to allow them to perform according to their academic goals. Based on our most recent survey data, at least half (54% of API students in Spring 2024) of our respondents can build from previous courses because they have already developed an ePortfolio. Instead of waiting until the end of their academic experience to recall all the work done during the last few years, students learn to document the knowledge and skills they develop as the experiences occur, building the ePortfolio as they progress through their course of studies, with the presumptive intention to continue archiving artifacts as evidence of additional skill development.

As Ciesielkiewicz (2019) pointed out, an ePortfolio can be utilized as (a) a learning tool, (b) assessment in the classroom in lieu of standardized tests and for program-wide assessment as well as in the professional setting for "standards of performance & competency" (Strivens et al., 2009, p. 652), and (c) a tool for career development and employment. In this study, we focused the ePortfolio on the latter utilization as it was designed to provide students with pages that will be used for professional school and/or job applications. In surveying students' perceptions of the ePortfolio, Ciesielkiewicz (2019) found that the highest ratings (51% very true, 5% true of me, 6% somewhat true of me) were observed when asked, "I believe that this activity could help me in my professional career and help me do a better job" (p. 658). No student answered negatively to this question. We also asked students about using ePortfolios in the future. Favorable scores were approximately similar (65% for API, 59% for APII, and 61% for Microbiology) to those reported by Ciesielkiewicz (2019), but a subset of students in our study disagreed with the statement (15% for API, 19% for APII, and 10% for Microbiology) whereas Ciesielkiewicz (2019) found no students disagreed.

Bolliger and Shepherd (2010) and Lin (2008) observed benefits around the learning processes and validated benefits of ePortfolios in support of reflection which is fundamental to the construction of knowledge. By completing pages about a mission statement, critical thinking skills, and leadership qualities, students evaluated their progress by focusing on their strengths and challenges. Students in our survey seemed to appreciate the tracking process—they recognized personal and professional growth exhibited through the reflection pieces in the ePortfolio within all three courses. This growth was particularly evident in the qualitative comments that students made regarding what they learned about themselves by building the ePortfolios. For example, students reflected that they learned how to write about themselves and that it helped with self-confidence when speaking about themselves in a professional setting. Muin et al. (2021) observed positive benefits of ePortfolios as well related to increasing motivation and self-efficacy.

Because ePortfolios are used to catalogue learning experiences and career skills, students are encouraged to continue using their ePortfolios beyond their academic experience, with many factors contributing to the persistence of using it (Thibodeaux et al., 2017). While our students surveyed felt the assignments allowed them to demonstrate personal and professional

growth (79% and 81% averaged across all three courses, respectively), students saw less value in persistent use of ePortfolios, with 65% recommending the assignment be used in future courses and only 60% responding that they planned to continue using the ePortfolio in the future. These results suggest that there is a disconnect between the value that students perceive in using the ePortfolio and their desire to continue using the ePortfolio or recommending the assignment to others. One recommendation for continued use and promoted value, as ePortfolios become more commonplace within the overall curriculum, would be utilization of ePortfolios in upper division (3000/4000 level) courses prior to capstone experiences.

Thibodeaux et al. (2017) investigated factors that contributed to discontinued use of ePortfolios. The top reasons for discontinued use were (1) time, (2) personal interest, (3) ePortfolio management system, (4) choice of platform, and (5) proprietary availability. In comparing our data to Thibodeaux et al. (2017), most of our respondents saw value in the time utilized to produce ePortfolios. A subset of our respondents, however, did feel that the assignments took away from time spent on course materials and did not provide anything for them, indicating that some students did not have a personal interest in the ePortfolio and did not see the value as a career tool. While Thibodeaux et al. (2017) found that the ePortfolio management system can be both a factor for continued or discontinued use, our program did not allow for any choice in ePortfolio management system. Overall, the SL&L system instructions did not seem to be a barrier (over 80% across all three courses agreed that the instructions were "easy to use"). Ways to further promote the ePortfolio management system could include additional tutorials or handouts that describe how to edit the ePortfolio and/or incentivize personalization as part of the assignment. Thibodeaux et al. (2017) found that students desired more guidance on how the ePortfolio can be used beyond the online Educational Technology Leadership master's program and its application to their lives. Our results suggest that increased instruction and focus on applicability in their professional growth may enhance students' perception of continued use and value. In addition to providing guidance on the future ePortfolio management system, graduates' interest can be enhanced by providing a variety of discreet professional and personal possibilities for use of the ePortfolio post-course completion. In this work, we used SL&L as the only platform, and students will continue to have access to this platform if the institution maintains the subscription which includes postgraduation access. Enhancing personal interest, and allowing more personalization, as well as consistent feedback could promote more student buy-in and enhance student perceptions of continuing ePortfolio use in the future. In our study, 59% of respondents felt "the feedback [they] received helped [them] to improve the pages for the future," suggesting that improving consistent and helpful feedback across all courses may be one avenue to increasing persistent use.

Conclusion and Recommendations

We investigated student perception on the use of reflective ePortfolios across three pre-nursing science courses. Most respondents found value in ePortfolio assignments, appreciated the ability to demonstrate creativity, document personal and professional growth, and enhance digital communication skills. However, a minority did not recommend the assignment for future classes and did not plan to continue using them after graduation. Our proposed recommendations include ways to increase student perception on how ePortfolios can be used as part of their career advancement before and after graduation.

Creating a continuous need and value for students to update and return to their ePortfolios is essential to maintain engagement. Presenting the benefits of the ePortfolio system to students in a more significant way and developing assignments that allow ease of use as a professional tool will encourage student motivation to continue using their ePortfolio. Students should be encouraged to discuss the ePortfolio with a mentor, and it could be included as part of the assignments. This continued engagement could also be achieved by requiring an ePortfolio for various activities, such as job applications, internships, and clinical placements. Additionally, to promote awareness, faculty members should be encouraged to request ePortfolio links when writing letters of recommendation, and this requirement should be included in course syllabi to promote its use among students.

Future studies should examine whether and why students persisted in using their ePortfolio by surveying alumni. Additionally, revisions to the ePortfolio template focusing more on learned skills necessary for professional schools and/or employment may provide increased persistence in the use of ePortfolios. The use of social media as a platform for ePortfolios may also warrant further investigation, given the rise in social media use amongst college students. Lastly, the use of ePortfolios by professional schools and/or employers may drive future student persistence as well.

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