Educational Process, Issue, Trend

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The effectiveness of badging systems in engaging, motivating, and incentivizing students in the mastery of nursing licensure materials

https://doi.org/10.1515/ijnes-2023-0078
Received August 1, 2023; accepted December 28, 2023; published online March 5, 2024

Abstract

Introduction: Integrating gamification methods into undergraduate nursing programs has prepared students to pass the nursing comprehensive predictor test and the licensure examination.

Literature review: Research demonstrates that the motivational factors of game elements like badging and leaderboards are of great value and utility to student engagement and motivation. The badges symbolize achievement, authority, and belonging, whereas leaderboards rank students based on different levels of course engagement.

Discussion: This paper explores the benefits, challenges, and strategies of incorporating digital badges and leaderboards in the undergraduate program. Immersion courses preparing students for professional practice are usually one of the last didactic courses offered in the undergraduate curriculum, designed to integrate all knowledge gained from the nursing program.

Implications for an international audience: The digital badging system can encourage nurse educators globally to engage, motivate, and power students to achieve professional goals. Furthermore, nursing programs worldwide can benefit from adding digital badges and leaderboards to final semester preparatory courses or any nursing course with the same emphasis.

Conclusions: Digital badges and leaderboards engage and motivate students to integrate knowledge and skills learned in the nursing program and successfully master nurse licensure materials.

Keywords: gamification; student engagement; test anxiety; badges; licensure examination

Introduction

Nursing students face many stressors that can hinder goal achievement or dissuade them from pursuing their professional aspirations. Such stressors become most apparent when students approach the end of the nursing program, where pressure and anxiety increase and adversely impact student motivation, engagement [1–3], and preparedness for the nurse licensure exam such as the National Council Licensure Examination (NCLEX®). The NCLEX® is a rigorous, highly regulated test developed and governed by the National Council of State Boards of Nursing [4]. It is considered one of the most significant assessments for nursing capability and licensure in the United States and Canada [5–7], and all graduate nurses seeking to work in these countries must pass the exam.
In 2023, the NCSBN introduced a new testing format called the Next Generation NCLEX® (NGN), which was developed to better prepare new nursing graduates to meet the challenges of working in health care [6]. While the primary goal of the licensure examination is to gauge individual knowledge and skill in providing safe care [4], the NGN focuses on applying clinical judgment and critical thinking. While each nursing school in the United States and Canada offers a designated program to prepare senior nursing students for taking and passing the NGN [8], the NGN’s new question types intensify the stress placed on senior nursing students. The NGN incorporates case studies, fill-in-the-blank charts, treatment rationales having multiple approaches, the identification of potentially life-threatening issues, and other standalone items [4]. To reduce student stress and support success, nursing educators worldwide should introduce gamification initiatives such as a digital badging system that promote engagement and motivation [9, 10].

A digital badging system consists of the gamification elements of badges and leaderboards. Badges are defined as visual representations of achievements and skillsets in the form of colorful, well-designed digital patches or emblems [11–16]. Digital badges contain metadata, the criteria students must complete or the mastery they must demonstrate in order to earn the badge, that can be verified by other institutions and prospective employers across the globe [17, 15]. Leaderboards are defined as a system for ranking students’ participation and accomplishments based on the number of badges earned [18–20]. Educators around the world have employed badges and leaderboards as incentives with which to engage students, motivate them to perform at elevated levels [12–14, 18], and to “confirm evidence of essential workplace competencies” [47]; (p. 40).

**Literature review**

**Digital badges and leaderboards in higher education**

Gamification is the application of schemes like competition or rewards to quantify individual achievements in non-gaming domains like work, productivity, and fitness [21]. In nursing education, gamification incentivizes learning through game activities. [22] found that the utility of game elements such as badges and leaderboards for motivation depends on the student’s perception of those elements. For instance, badges are an outward symbol of individual achievement, authority, and belonging [15, 23], whereas leaderboards rank students by showing the different levels of course engagement [19].

In higher education, digital badges visually exemplify achievements and skillsets obtained by mastering specific course content [9, 11, 14, 16, 24] and completing activities at a designated level [25, 26]. These badges are created using an online learning management system and are embedded with information from the badge issuer and institution, including the criteria that must be met before the badge is awarded [22, 27]. While the badges are digital, they are available for different teaching modalities, like online, hybrid, and face-to-face learning. When a badge is awarded, prospective employers can verify the badge’s embedded metadata [15, 17], which reflects the nurse’s skill in a field. Nevertheless, for digital badges to be effective, [10, 27] stress the need for all course badges to link directly to the learning objectives.

In conjunction with badges, leaderboards induce students to set and pursue personal scholastic objectives [28–30]. In nursing education, a leaderboard is defined as a ranking system that identifies students (usually via creative pseudonyms) and their standing relative to other students based on the number of badges earned, with those who have earned the most badges rising on the leaderboard. [19, 20] demonstrate that even students at the bottom of the leaderboard use their position as motivation to work harder to shrink the gap between them and higher-ranked classmates. Furthermore, research shows that leaderboards can promote social standing and self-esteem [31].

While digital badges and leaderboards have become strategic components in higher education gamification for many nations [18, 26, 32–34], courses do not need to be gamified to employ badges and leaderboards as incentives for academic performance at elevated levels [14, 27]. For example, [35] note that sharable (portable) badges furnish tangible evidence of competency-based learning (CBL) and verify 21st-century skills and abilities not customarily acknowledged as part of the learning process [32]. [11] explored the effects of badges and...
leaderboards on students’ academic performance and motivation. Their study revealed that badging and leaderboards did not significantly impact academic performance but increased academic motivation. Furthermore, [35] acknowledge that digital badges and CBL effectively promote personalized learning in higher education. These badges also helped students visualize their learning, advance toward mastery, and achieve their personalized professional goals [35].

Nevertheless, gamification through badges and leaderboards can pose challenges. In focus groups with students [14] noted that badges and leaderboards do not up the motivational factor for already highly motivated students. Furthermore, one student in the study who had earned few badges expressed dissatisfaction with the badges and suggested that attaching point values directly to badges could provide a better incentive to pursue the badges [14]. [13] posited that when a public display of badges and leaderboards with students’ actual names, rather than pseudonyms, could harm some students’ motivation. [36] observed that in nursing courses poorly planned and implemented gamification can also contribute to a loss of student engagement.

Growing up as digital natives, current nursing students insist on active learning and creative connections to technology [9]. Using technology to aid learning is effective for visual and auditory learners, who tend to comprehend faster and retain information better through this approach. Therefore, proactive nursing educators who adopt game elements such as digital badges and leaderboards can readily satisfy student learning strategies [27].

**Badge types and purposes**

According to [22], there are four badge types: goal setting, social, encouraging, and informing. [17] see metadata-rich digital badges as a significant “pedagogical tool” (p. 190) when combined with goal setting. Thus, badges for goal setting motivate learners to pursue their professional achievements by earning badges and climbing the leaderboard [15, 31, 35]. Similarly, social badges represent outward symbols of achievement, authority, and belonging [15]. Students post digital badges on their social media to visibly depict their skills [9], showing professional accomplishments and promoting ranking among peers [27, 35]. Likewise, badges of encouragement drive students to work harder to meet the standards set in the badge criteria [22]. Finally, informing badges document student progress in achieving mastery of course material [17, 37].

Research suggests that the appearance and purpose of the badge drive the motivation that alters the student’s academic performance. This shift can be attributed to the determination to accomplish course learning objectives in pursuing the badge [22]. Nevertheless, [22] warn that some students are determined to collect as many badges as possible, sacrificing mastery of course content for “shallow learning techniques” (p. 68) and weakening the educational value of those badges. Intentional instructional design, however, can minimize this outcome by crafting badges to assess targeted competencies and achievements rather than awarding them for completing a task or activity [27, 38]. By extension, [29] found that badges awarded for participation carried less significance for students than badges designed to provide evidence of mastery. [37] also used badges to provide effective student performance feedback. Overall, encouraging students to pursue badges can inspire student agency, self-motivation [39], and personal goal-setting behavior [17].

**Badges and leaderboards as extrinsic and intrinsic motivation**

Students earn badges for both extrinsic and intrinsic reasons. When students choose to pursue badges for the status, achievement, and reward associated with top-notch performance, *badgification* becomes a powerful extrinsic motivator [22, 37, 40]. In contrast, when students choose to pursue badges as a visual symbol of goal progress or achievement [37], *badgification* becomes an effective intrinsic motivator [41]. Whether intrinsic or extrinsic, these motivating factors can increase academic rigor, leading to content and skill proficiency and increased employment possibilities [24, 35].
Badges in competency-based learning (CBL)

Badges have also been useful in nursing curricula through CBL, which stresses a student-centered approach for “the acquisition of specific knowledge and skills” [42]; (p. 129). CBL helps students succeed by concentrating on competencies that require mastery, which necessitates instructors to support student learning in authentic contexts and build connections between knowledge and practice [43–45]. Nursing education has embraced CBL to create consistency in graduate outcomes that influence the learning experience and demonstrate professional behavior and identity [43], and digital badges support CBL by substantiating student academic accomplishments, career growth and advancement, and successful attainment of professional skills, proficiencies, and practical experience [9, 27, 43, 46]. For nursing students, CBL badge leaderboards can also illuminate areas where learners need improvement.

Gamification and predictor examination

Introducing gamification into the curriculum is one way of encouraging students to fully engage with course content [10, 26, 27]. While research indicates that badging and leaderboards act as practical tools for motivating students [31–34], a gap exists in the research concerning the direct impact of badging and leaderboards in mastering NCLEX® materials. Badging can be easily integrated into NCLEX preparatory courses through nursing-centered programs that use high-stakes exams (e.g., Assessment Technologies Institute [ATI®], Health Education System Incorporated [HESI®], Kaplan, UWorld). For instance, at our university, we use the ATI® (2023) to deliver the NCLEX preparatory course, which also helps prepare nursing students by providing an extensive review of licensure examination content, ascertaining student strengths and weaknesses, and preparing students to take and pass the NGN on the first try. Additionally, the nursing preparatory courses at our university incorporate high-stakes examinations that predict NCLEX success rates on the first attempt [47, 48]. To reduce the stress of these tests and increase student achievement, [47] insist that nursing educators employ innovative teaching and learning strategies, including gamification and game elements like badges and leaderboards [27, 1].

Discussion

One of the best parts of the nursing curriculum is incorporating digital badges in the undergraduate immersion course. Most immersion courses in many undergraduate nursing programs focus on preparing students for professional practice and integrating knowledge and skills learned in the program. Also included in the immersion courses are opportunities to evaluate student learning and enhance their accountability through planning and implementing patient care across the health continuum [49]. Therefore, nursing immersion courses are usually the last didactic courses in the undergraduate curriculum. Because of the new testing format in nurse licensure exams in the United States and Canada (i.e., NCLEX), many current undergraduate programs use the new NGN format to deliver these immersion courses. Integrating digital badges and leaderboards in immersion courses can incentivize students to master key content areas [11, 24, 27, 35, 37], preparing them for professional practice and success with licensure exams. Additionally, digital badging provides nurse educators a structure to assist students in setting goals, developing daily activities to prepare for the licensure examination, and mastering preparatory materials for licensure exams [27, 20, 10].

In [50] nursing immersion course, we use nine badges to incentivize mastery of the core nursing concepts. Each badge corresponds to a clinical course: adult medical surgical, maternal newborn, mental health, fundamentals of nursing, nursing care for children, pharmacology, leadership, community nursing, and nutrition. These categories mirror the NCLEX preparatory course integrated into the nursing immersion course.

[51] senior NGN coaching model, designed to help students prepare for the test, includes student self-assessments in setting exam-related academic goals, developing study plans and guides, and reviewing content
based on a proctored examination score through “continuous feedback and support” (p. 250). Thus, the nine
digital badges provide added enticement for completing the elements of Schlairet and Rubenstein’s model.

In implementing the nine digital badges in the immersion course, we help students develop a weekly plan
containing a sequence of daily study activities to pass that week’s proctored session. Visualizing a daily to-do list
encourages setting and committing to academic goals and promotes student accountability. The weekly study
guide assists students in concentrating on specific nursing core concepts and resources. For example, for the week
covering the fundamentals of nursing, the weekly plan includes the concepts and number of daily review
questions, and the study guide covers the content for the week’s concentrated review, such as infection control,
hematologic disorders, bowel elimination, hemodialysis, and acid-based imbalances. The guide also includes
skills modules such as oxygen therapy, enemas, personal hygiene, wound care, vital signs, and urinary catheter.

In the immersion course in our undergraduate program, we include nursing assessments in all nine clinical
areas (i.e., infection control, hematologic disorders, bowel elimination, hemodialysis, and acid-based imbalances;
it also includes skills modules such as oxygen therapy, enemas, personal hygiene, wound care, vital signs, and
urinary catheter). The nursing assessments provide individual scores indicating a self-assessment of the student’s
ability to apply concepts. Students must achieve a minimum score of 65 percent to obtain a digital badge.
Furthermore, as leaderboards visualize student progress [20, 31], the pursuit of badges and placement on the
leaderboard contribute to students’ willingness to adhere to their weekly plans and study guides, creating a win-
win situation for instructor and student. The awarding of a badge prompts students to cognitively engage more
[10] with the core nursing concepts needed to reach the appropriate benchmarks while delivering tangible
“evidence of competency” [52]; (p. 18). In return, students earn more badges and gain confidence [52] in the
content necessary to pass the NGN on the first attempt.

Implications for an international audience

Nursing programs worldwide can benefit from using digital badges and leaderboards in preparatory immersion
courses. Research demonstrates that gamification elements such as badges and leaderboards reduce stress levels
[1], support personalized learning objectives [35, 29], encourage goal setting and achievement [10], motivate
students to work harder [20], provide timely feedback on performance [37, 51], and supply tangible confirmation
of professional-level nursing skills [27].

Furthermore, badges and leaderboards can initiate cognitive engagement and accountability in reviewing
core nursing concepts, which are essential values that drive student success in immersion courses. Other pur-
poses of badging, like encouraging and informing, influence academic motivation and performance because they
can empower learning strategies [10]. Incentivizing work ethic also expands students’ knowledge, enhancing
their confidence in mastering core nursing concepts. Thus, badges and leaderboards can be effective in
contributing to student success [27, 53, 22].

Badging and leaderboards can also initiate social accomplishments and attain personalized professional goals.
Professional goals are crucial standards that could measure academic progress. The extrinsic and intrinsic moti-
vating factors of gamification increase academic performance and motivation [37], facilitating student success.
Finally, research on badging and leaderboards influenced nursing student proficiency, especially concerning the
first-attempt passing rates of the licensure examination. These strategic gamification elements can be applied
worldwide in any nursing program or other nursing courses with the same emphasis on coaching students to
prepare for any assessments. Badges represent the tangible symbol of achievement, authority, and belongingness
[15]; they can also be added to a student’s portfolio and shared with others, including future employers.

Conclusions

Nursing educators worldwide face the challenge of preparing students to succeed [8]. By implementing a badging
system and leaderboard in the nursing immersion course, students strive to collect badges and rise in status,
positively influencing their academic performance. Adding badges and leaderboards can also increase student commitment to effectively prepare for the final comprehensive test and nursing licensure examination by incentivizing student performance and encouraging proficient study habits to achieve academic and career goals [11, 24, 27, 35, 37]. Students who gain confidence, expand their knowledge of core competencies, and cultivate application skills are more likely to successfully pass end-course examinations [51].

By engaging and motivating students to master nursing licensure materials [9, 11, 24, 35], the course’s badging system contributed to students’ successful pass rates. Thus, nursing educators worldwide should consider multifaceted and innovative teaching strategies such as gamification [11] with the use of badges and leaderboards as a way to express students’ achievements and skillsets [12, 27].

Future areas of research include exploring the effect of digital badging and leaderboards on nursing licensure exam passing rates across multiple nursing programs, the impact of the student’s portfolio containing badges on job acceptances rates of students after graduation, and the effect of badges on specific measures of knowledge and skills (e.g., self-efficacy, motivation, cultural competence). Lastly, qualitative research on the use of digital badging on immersion courses is needed to explore the specific strategies and processes of enhancing learning through digital badges, the cultural factors affecting the use of digital badging, and the lived experience of students and nurse educators on the implementation of digital badging in immersion courses.

Acknowledgments: The authors acknowledge the support of the family members and some colleagues.

Research ethics: The local Institutional Review Board deemed the study exempt from review.

Informed consent: Informed consent was obtained from all individuals included in this study.

Author contributions: All authors have accepted responsibility for the entire content of this manuscript and approved its submission.

Competing interests: Authors state no conflict of interest.

Research funding: None declared.

Data availability: Not applicable.

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