CROSS-NATIONAL STUDENT PERSPECTIVES ON VIDEO SELF-MODELLING IN NURSING EDUCATION: FINDINGS FROM THE CLINICAL MODELLING PROJECT

Goreti Marques
Santa Maria Health School, Porto
RISE-Health
Beatriz Edra
Santa Maria Health School, Porto
RISE-Health
Eduardo Batalha
Santa Maria Health School, Porto
Joana Martins
Santa Maria Health School, Porto
Vanessa Sousa
Santa Maria Health School, Porto
Abílio Teixeira
Santa Maria Health School, Porto
RISE-Health

SABER & EDUCAR 34(1) 2025 — CADERNO TEMÁTICO: O LUGAR DA(S) INTELIGÊNCIA(S) – ENTRE O RELACIONAL E O ARTIFICIAL

Abstract:

This study, explores nursing students' experiences with video self-modelling (VSM) using smart glasses in simulated clinical training. VSM involves students recording their performance during clinical simulations and later reviewing the footage to identify errors, reflect on their practice, and receive personalized feedback. The method aims to enhance self-awareness, skill retention, and self-efficacy in nursing education.

Eleven undergraduate and postgraduate nursing students from Portugal, Spain, Slovenia, and Poland participated in a qualitative focus group after completing training with smart glasses. The researchers analyzed data using Creswell and Poth's (2018) qualitative spiral method. Three main domains emerged from the content analysis: learning impact, technical constraints, and emotional/pedagogical experience.

In terms of learning impact, students highlighted improved self-assessment, reflective thinking, and skill transfer to real clinical settings. Reviewing their own recordings helped them recognize subtle mistakes, retain procedural memory, and improve performance. Personalized feedback based on the videos was seen as more meaningful than traditional methods.

However, technical constraints were noted, including issues with device comfort, fit, weight, and recording reliability. While most students adapted quickly to the technology, concerns were raised about the smart glasses' ergonomics and occasional malfunctioning of voice commands or camera angles. Emotionally, students initially felt nervous and self-conscious being recorded, but this discomfort lessened over time. Many reported increased motivation and confidence as they observed their own progress. Participants expressed strong support for expanding VSM into broader areas of nursing education, suggesting it be integrated into curricula for both technical and communicative skills. Cultural differences also influenced perceptions; for example, Polish and Slovenian students focused on precision, while Portuguese and Spanish students emphasized emotional aspects. Despite some technical limitations, the study concludes that VSM with smart glasses is a promising, learner-centered strategy for clinical education, fostering reflection, autonomy, and skill development.

The authors recommend further research into long-term impacts, scalability, and technological improvements to maximize the method's effectiveness across diverse healthcare training contexts.

DATA DE SUBMISSÃO: **30/05/2025**
DATA DE ACEITAÇÃO: **23/07/2025**

Introduction

The *ClinicalModelling* project (Grant Agreement no. 101111665), funded by the European Union through the Erasmus+ Programme – Alliances for Innovation, proposes an innovative approach to integrating emerging technologies into health education, with a focus on nursing training. The project aims to develop, implement, and scale a pedagogical methodology that combines the use of smart glasses, clinical simulation, and video self-modelling (VSM), as a response to persistent challenges in practical skills training in nursing education across diverse European contexts.

Video self-modelling is a pedagogical strategy based on the recording of students' performance during simulated clinical scenarios, followed by a reflective analysis of their own behaviour. According to Calubayan and Ofrin (2023), this method promotes self-observation and metacognitive engagement, allowing students to identify both strengths and areas for improvement. By reviewing their own performance, students gain greater awareness of their execution of technical nursing procedures and are motivated to improve them. This reflective process fosters the development of self-efficacy, understood as the belief in one's ability to perform specific tasks successfully (Araújo & Moura, 2011), and supports the development of self-regulated learning competencies. As Koçan et al. (2024) highlight, students who engage in this strategy are better able to monitor their progress, set personal learning goals, and adapt strategies for improvement.

The literature consistently identifies self-efficacy as a key factor in the acquisition of technical skills, particularly in clinical education, where confidence, precision, and autonomy are essential (Lauermann & Hagen, 2021). Observing and reflecting on one's own performance contributes to the internalization of effective clinical behaviours, consolidating learning and enhancing intrinsic motivation for continuous development. Furthermore, the ability to revisit one's own performance over time offers a valuable tool for the development not only of technical competence but also of socio-emotional skills, such as communication, emotional regulation, and decision-making under pressure (Hung et al., 2021).

VSM aligns with current learner-centered educational paradigms that value active participation, autonomy, and formative feedback. It provides a more personalized learning experience and encourages reflective practice, which is central to the development of professional identity in nursing. The integration of smart glasses, which allows the capture of first-person perspective video, adds a layer of immersion and realism that enhances students' situational awareness and cognitive processing of clinical actions. This technological integration also facilitates more accurate self-assessment and supports asynchronous learning opportunities, particularly in contexts where access to clinical placements is limited.

The present study is embedded within the ClinicalModelling project and is structured around a formative intervention involving undergraduate and postgraduate nursing students from four countries: Portugal, Spain, Slovenia, and Poland. It explores the educational potential of video self-modelling supported by smart glasses in the context of simulated clinical practice.

At a time when nursing education faces increasing demands for pedagogical innovation, standardization of competencies, and responsiveness to technological change, video self-modelling emerges as a promising educational strategy. It promotes a shift from passive to active learning, fosters self-directed development, and reinforces the integration of cognitive, psychomotor, and affective domains of learning. The insights generated by this study will contribute to the evidence base on technology-enhanced learning in nursing and inform future strategies for curricular innovation in healthcare education. Despite growing interest in technology-enhanced learning, there is a notable gap in empirical research combining smart glasses and video self-modelling in nursing education, particularly in simulation-based contexts. This study aims to address this gap at a time when nursing education faces increasing demands for pedagogical innovation, standardization of competencies, and responsiveness to technological change. Video self-modelling emerges as a promising educational strategy. It promotes a shift from passive to active learning, fosters self-directed development, and reinforces the integration of cognitive, psychomotor, and affective domains of learning. The insights generated by this study will contribute to the evidence base on technology-enhanced learning in nursing and inform future strategies for curricular innovation in healthcare education.

Method

This study aimed to understand nursing students' perspectives on their experience with the video self-modelling methodology. Specifically, it sought to: (i) describe their experiences with the use of this approach; (ii) identify perceived benefits and challenges associated with its implementation; and (iii) explore their views regarding its potential for future application.

Study Design and Participants

This study followed a qualitative, exploratory design aimed at gaining insight into students' perspectives of the video self-modelling methodology. Participants were nursing students enrolled in undergraduate or postgraduate programs at four higher education institutions across Slovenia, Spain, Poland, and Portugal. To be eligible, students had to be enrolled in a nursing degree (bachelor's or postgraduate level) and have taken part in a training session that included the use of the video self-modelling methodology.

Data Collection Procedures

Ethical approval for this study was granted by the Ethics Committee (approval code: 2025-02). Following approval, authorization was obtained to contact nursing students enrolled in both undergraduate and postgraduate programs who had participated in training sessions incorporating the video self-modelling methodology.

Recruitment was conducted through institutional email invitations sent to students across all academic years of the nursing programs at the participating institutions. The invitation included a comprehensive description of the study's objectives, an explanation of the data collection method, a single semi-structured focus group, and information regarding ethical principles, voluntary participation, and data confidentiality.

Data collection consisted of a sociodemographic questionnaire followed by one online semi-structured focus group interview conducted via Microsoft Teams. To accommodate the cross-national composition of the sample, the session was held in English. Prior to participation, informed consent was obtained electronically through a online form. This process detailed the study purpose, participants' rights including voluntary involvement and the option to withdraw at any time without penalty, as well as the safeguards in place to ensure anonymity and confidentiality of collected data.

The sociodemographic questionnaire gathered information on variables considered relevant to the study, including gender, current level of education, previous experience with the video self-modelling methodology, and the clinical procedure during which the methodology was applied.

The focus group, used as a qualitative data collection method, provided an opportunity for an in-depth exploration of participants' views. The session was guided by a semi-structured interview protocol specifically developed for this research. This protocol consisted of three open-ended questions aimed at capturing participants' perceptions of the methodology. The focus group was moderated by a project researcher.

The main questions were: "*How would you describe your experience with this methodology?*", "*What advantages and challenges did you encounter?*", and "*How would you like to continue working with this methodology in the future?*".

Prior to data collection, the interview protocol was pilot tested with two individuals matching the characteristics of the target population to evaluate clarity and relevance. After the pilot session, verbal feedback was collected regarding the appropriateness and comprehensibility of the questions. Given the positive feedback, no changes were made to the interview guide.

Data Analysis Procedures

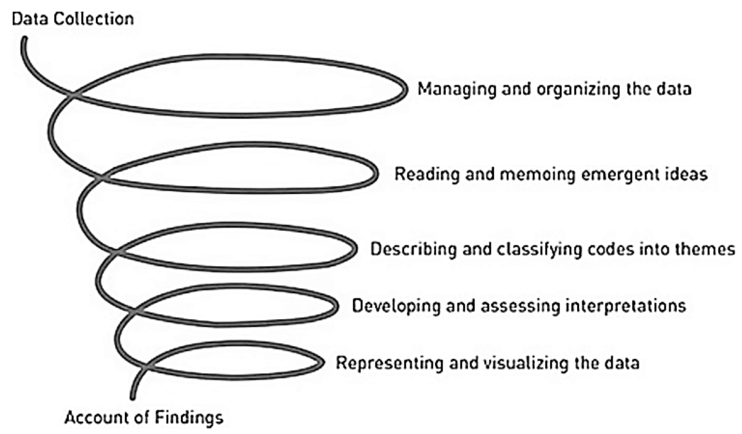
Following the focus group session, a full transcription was produced to ensure maximum fidelity to the participants' discourse. This transcription facilitated an in-depth engagement with the data, enabling detailed analysis and interpretation. Participants were coded according to their country of origin, as observed in Table 1.

Table 1. Participants coding for the focus group.

Country	Participant Codes
Poland (PL)	1–3
Portugal (PT)	4–5
Slovenia (SI)	6–9
Spain (ES)	10–11

A deductive approach to data analysis was adopted, guided by the model proposed by Creswell and Poth (2018). This model recognizes that the phases of qualitative data collection, analysis, and reporting are not linear or discrete but rather interconnected and often concurrent. The "*data analysis spiral*" framework (Creswell & Poth, 2018, p. 255) provides a dynamic process through which the researcher cycles iteratively through analytical steps instead of following a strictly hierarchical sequence.

Figure 1. Content analysis process in qualitative research



Source: Creswell and Poth (2018)

The process begins with raw data (text or images) and culminates in the development of a detailed description or interpretative report. Throughout this progression, the researcher continuously engages with multiple levels of analysis. Initially, the transcripts were read to gain an overall understanding of the content, followed by the construction of a coding matrix.

Specifically, and in accordance with Creswell and Poth's (2018) framework, the analysis followed a six-phase spiral process: (1) managing and organizing the data, which included transcription, formatting, and systematic storage; (2) reading and memoing emergent ideas, through immersive engagement with the transcripts to grasp initial meanings and impressions; (3) describing and classifying codes into themes, by developing categories and subcategories based on participants' narratives and the evaluative dimensions outlined in the interview guide; (4) developing and assessing interpretations, through the identification of broader patterns and connections across themes; (5) representing and visualizing the data using coding matrices and diagrams to enhance transparency and analytical clarity; and (6) producing a coherent narrative of the findings that encapsulates nursing students' perceptions of the video self-modelling methodology. To enhance the credibility of the analysis, double coding was performed by two researchers independently, followed by peer debriefing to resolve discrepancies. Thematic saturation was considered achieved when no new categories emerged during coding.

Results

This section presents the results obtained from the sociodemographic questionnaire and the content analysis of the focus group.

Sociodemographic Characterization of the Participants

Table 2 presents the sociodemographic characteristics of the participants included in this study. A total of 11 higher education nursing students participated in the focus group. As shown in Table 2, the majority were female (63.6%), while male participants accounted for 36.4%. Most participants were enrolled in pre-graduate nursing programs (90.9%), with only one student at the post-graduate level (9.1%).

Table 2. Sociodemographic characteristics of the participants.

Characteristic	Categories	N = 11	%
Gender	Male	4	36.4
	Female	7	63.6
Educational Level	Pre-graduate	10	90.9
	Post-graduate	1	9.1
Procedure Tested with VSM	Basic Life Support Training	2	18.2
	Surgical Hand Washing	3	27.2
	IV Cannula Placement	4	36.4
	Peripheral Vein Cannulation	2	18.2
Country	Poland	3	27.2
	Portugal	2	18.2
	Slovenia	4	36.4
	Spain	2	18.2

Regarding the clinical procedure tested through the video self-modelling (VSM) methodology, participants engaged in three different types of skills training. Surgical hand washing was the most frequently tested procedure (45.5%), followed by intravenous (IV) cannula placement (36.4%) and peripheral vein cannulation (18.2%). This variation indicates the applicability of the VSM approach across distinct and relevant clinical tasks.

The focus group included students from four countries, underscoring the international scope of the study. Participants were predominantly from Slovenia (36.4%) and Poland (27.3%), with additional representation from Spain (18.2%) and Portugal (18.2%). This diversity contributes to a broader understanding of the experiences and perceptions of students from different educational and cultural contexts.

The qualitative analysis identified three main domains, each with specific categories and subcategories, as shown in Table 3.

Table 3. Domains, categories, and subcategories of analysis

Domain	Category	Subcategory
I. Learning Outcomes	a. Self-assessment	– Error recognition – Reflective thinking
	b. Feedback integration	–Feedback through video –Personalized learning
	c. Learning transfer	– Application in clinical practice – Knowledge retention
II. Technical Constraints	a. Usability and adaptation	– User comfort – Hands-free operation
	b. Ergonomics and stability	– Comfort of use – Device fit – Device weight – Camera alignment/ stability
	c. Technical malfunctions	– Voice commands functionality – Recording activation – Device interference
III. Emotional and Pedagogical Experience	a. Emotional response	– Initial discomfort – Stress or nervousness
	b. Confidence and motivation	– Increased self-efficacy – Sense of empowerment
	c. Pedagogical potential	– Broader use in nursing education – Suggestions for future integration

Thus, content analysis enabled the identification of three core domains emerging from the participants' narratives: (1) Learning Outcomes, (2) Technical Constraints, and (3) Emotional and Pedagogical Experience.

The first domain, Learning Impact, includes three categories: (a) Self-assessment, with subcategories related to the recognition of errors and reflective thinking; (b) Feedback integration, referring to the use of recordings for personalized feedback; and (c) Learning transfer, encompassing memory retention and the application of skills in clinical contexts.

The second domain, Technical Constraints, comprises three categories: (a) Usability and adaptation, which addresses participants' ability to adjust to the smart glasses and their hands-free benefits; (b) Ergonomics and stability, including the comfort and physical usability of the device; and (c) Technical malfunctions, related to issues such as voice command reliability and device interference.

Lastly, the third domain, Emotional and Pedagogical Experience, encompasses three categories: (a) Emotional response, highlighting participants' initial discomfort and stress; (b) Confidence and motivation, referring to increased self-efficacy and empowerment; and (c) Pedagogical potential, which reflects the perceived educational value of video self-modelling and suggestions for its broader integration in nursing education.

In the following sections, these domains, categories, and subcategories are described in detail, illustrated with representative quotations from the participants to enrich understanding and contextualize the findings.

I. LEARNING OUTCOMES

a. Self-assessment

Errors Recognition

Students reported that reviewing their recordings enabled them to identify subtle procedural errors:

"*When I watched myself, I immediately saw where I went wrong with the hand positioning. I hadn't noticed that during the actual practice*." (ES10)

This process helped students become more aware of their technical details, fostering precise self-evaluation. Such awareness appeared to be a critical step toward deeper learning.

Reflective Thinking

This recognition promoted deeper critical thinking:

"*Seeing yourself forces you to think not just about the technique, but why you're doing each step*." (PL1)

Thus, the visual feedback encouraged not only recognition of errors but also a more reflective approach to learning.

b. Feedback Integration

Feedback Through Video

Video analysis facilitated a more grounded feedback process with teachers:

"*It's not just the teacher saying 'you did it wrong,' you see it and feel it yourself, and that makes the feedback stick*." (SI7)

By involving students directly in the feedback process, this method appeared to increase engagement and understanding.

Personalized Learning

Each student could focus on their individual strengths and weaknesses:

"*I could pause, rewind, and really focus on what I needed to improve—not just general advice*." (PT5)

This individualized attention allowed learners to tailor their practice more effectively, enhancing the overall learning experience.

c. Learning Transfer

Application in Clinical Practice

Students described long-term impact on their professional performance:

"*In my internship, I remembered exactly how I placed the needle wrong in the video… and I fixed it.*" (PL2)

These accounts suggest that video self-modelling contributed to improved clinical skills beyond the training setting.

Knowledge Retention

Video self-modelling seemed to reinforce procedural memory:

"*I remembered the movement better after seeing myself do it—it stayed with me longer*." (SI8)

Therefore, the use of video recordings may support lasting retention of critical skills.

II. TECHNICAL CONSTRAINTS

a. Usability and Adaptation

Learning Curve

Most participants adapted to the technology within one session:

"*At first I felt weird, but after 5 minutes it felt natural, and I could concentrate fully*." (SI6)

This quick adaptation was essential to minimize distractions and maximize learning time.

Hands-free Operation

The device allowed students to remain focused on their task:

"*I liked that I didn't have to touch anything, just perform, and it recorded everything from my eyes*." (PT4)

The hands-free design was particularly appreciated, facilitating a more seamless experience.

b. Ergonomics and Stability

User Comfort

Opinions varied regarding physical comfort:

"*It pressed too hard on my ears, especially with my glasses*." (SI9)

Comfort issues, however, emerged as a notable limitation for some users.

Device Fit

Adjustability was a concern:

"*It kept sliding down, and I had to fix it with my hand*." (PL3)

Such practical challenges could interfere with sustained use and focus.

Device Weight

Heavier models were distracting:

"*It felt heavy on my nose after a while*." (PT5)

The physical burden of the device was an obstacle that may affect usability over longer periods.

Camera Alignment and Stability

Some students were unsure if they were recording from the right angle:

"*I didn't know if the camera was capturing what I was seeing. I had no feedback during the recording*." (PL1)

This uncertainty highlights the need for improved real-time feedback or alignment indicators.

c. Technical Malfunctions

Voice Command Functionality

Recognition issues occasionally occurred:

"*Sometimes it just didn't understand my 'record' command, even after repeating it*." (ES2)

These glitches interrupted workflow and caused frustration.

Recording Activation

Difficulties confirming if the device was recording were common:

"*There was no beep or signal... I wasn't sure it was working*." (SI6)

Clearer indicators would be necessary to build user confidence in the device.

Device Interference

When used simultaneously, devices conflicted:

"*In the room, one student said 'record,' and suddenly my camera stopped*." (SI7)

This problem points to limitations in multi-user environments that must be addressed.

III. EMOTIONAL AND PEDAGOGICAL EXPERIENCE

a. Emotional Response

Initial Discomfort

Many students felt self-conscious at first:

"*I was very aware of the camera on me, and it made me nervous*." (SI9)

Such feelings were common and could affect initial engagement.

Stress or Nervousness

The pressure to perform while being recorded added anxiety:

"*It's like doing a test and being filmed at the same time, stressful at the beginning*." (PL3)

This additional stress highlights the need for strategies to ease learners into the experience.

b. Confidence and Motivation

Increased Self-efficacy

Over time, students reported feeling more capable:

"*After watching myself improve, I felt proud—I saw my own progress*." (PL2)

The process seemed to bolster students' confidence and sense of achievement.

Sense of Empowerment

Being in control of their own learning was motivating:

"*It's empowering to see your evolution, it's you, not someone else*." (SI7)

This autonomy may contribute positively to sustained motivation and engagement.

c. Pedagogical Potential

Broader Use in Nursing Education

Participants strongly recommended expansion to other procedures:

"*I would use this for wound care, injections, even communication training*." (PT4)

The versatility perceived by students supports wider implementation possibilities.

Suggestions for Integration

Some suggested systematic inclusion in curricula:

"*It should be part of every simulation, mandatory, even*." (PL1)

Such recommendations underline the perceived value and potential for institutional adoption.

Discussion and Conclusion

This study explored the experiences and perspectives of nursing students from four European countries (Portugal, Spain, Slovenia, and Poland) with the use of smart glasses and video self-modelling (VSM) in the training of clinical procedures. The students participated in practical sessions using smart glasses to record themselves performing selected tasks (basic life support, surgical handwashing, IV cannula placement, and peripheral intravenous catheter insertion), which were later used to create personalized feedback videos. Their reflections revealed relevant insights into the perceived value, usability, and pedagogical potential of this innovative training approach.

The domain of *Learning Outcomes* revealed that the opportunity to review personal performance supported students in recognizing errors and engaging in reflective thinking. These findings are consistent with existing literature suggesting that self-observation promotes metacognitive awareness and critical analysis of performance (Akcaoğlu et al., 2022; Sasson & Tifferet, 2024). Students' ability to integrate feedback based on their own recordings appears to increase the perceived relevance of the learning process, aligning with principles of self-regulated learning and personalized education (Mejeh et al., 2024). Furthermore, the potential for learning transfer identified in this study, particularly in the recall and correction of techniques during clinical placements, underscores the methodology's utility beyond simulated settings.

Despite these positive outcomes, the domain of *Technical Constraints* highlighted several limitations related to the use of smart glasses. While the hands-free design was seen as beneficial, issues concerning ergonomics, device stability, and technical malfunctions (e.g., unreliable voice commands) were frequently reported. These technical challenges mirror those described in prior studies using wearable technologies in healthcare education (Marino & Wayne, 2015), suggesting that while the integration of such devices is promising, further optimization is needed to ensure consistent functionality and user comfort. To mitigate these issues, future implementations should consider user-centered design improvements, including adjustable hardware, real-time recording feedback, and enhanced voice command calibration. Additionally, structured training sessions for students and faculty may help reduce usability-related frustration.

The third domain, *Emotional and Pedagogical Experience*, further reinforces the complexity of implementing VSM in clinical education. Although initial discomfort and stress were reported, particularly during self-viewing, students also described a sense of increased confidence and motivation following repeated exposure to the methodology. These emotional responses align with the notion that authentic performance feedback, though potentially uncomfortable, can be transformative in building self-efficacy and learner autonomy (Nakata et al., 2025). In addition, participants perceived VSM as having significant pedagogical value and expressed interest in its broader integration into nursing curricula. This resonates with current trends in nursing education that advocate for active, reflective, and technologically enhanced learning strategies (Altmiller & Pepe, 2022).

Overall, participants reported a highly positive experience, highlighting the benefits of watching themselves perform procedures as a means of increasing self-awareness, technical accuracy, and motivation to improve. Several students referred to the videos as a "mirror" that enabled them to identify subtle mistakes they were not previously aware of, thus contributing to a more reflective learning process. The use of smart glasses was generally perceived as intuitive and non-intrusive, although some students reported initial discomfort or technical limitations, such as image instability or battery concerns. Nonetheless, the majority emphasized the advantage of having a first-person perspective recording, which allowed for a more immersive review of their actions and hand positioning. This reinforces the potential of wearable technologies in providing authentic, real-time perspectives that conventional video recordings may not capture.

Cultural and contextual differences were also observed. For instance, Polish and Slovenian students expressed greater concern with technical precision, while Portuguese and Spanish students tended to focus more on the affective aspects of their performance, such as confidence and communication. These variations suggest that individual and cultural learning preferences should be considered when implementing VSM strategies across international settings. These differences may reflect broader cultural perspectives on learning, confidence, and the role of feedback. For instance, Southern European students may prioritize relational aspects of learning, while

Central or Eastern European students may emphasize technical mastery. Understanding such nuances is essential when designing and scaling pedagogical interventions across diverse cultural settings.

Importantly, participants noted that the approach not only supported their learning but also helped reduce anxiety related to performance assessment, as the videos enabled them to track their progress and prepare more effectively. Several students advocated for the integration of VSM with smart glasses into regular nursing curricula, suggesting its applicability in both undergraduate and postgraduate clinical training.

Despite the promising results, this study has limitations. The sample size was relatively small and may not be representative of all nursing students. In addition, the novelty of technology could have influenced participants' enthusiasm, potentially leading to a temporary "novelty effect" (Rodrigues et al., 2022). Future research should investigate the long-term impact of VSM using smart glasses on clinical performance, retention of skills, and student satisfaction across different healthcare disciplines and educational contexts.

In conclusion, the findings support the integration of smart glasses and video self-modelling as an effective and learner-centered method in clinical skills training. By promoting active reflection, increasing awareness of personal performance, and offering personalized feedback, this methodology may enhance the quality of clinical education and foster greater autonomy and confidence among future healthcare professionals. The transnational feedback gathered in this study reinforces the potential scalability of the approach within European health education systems. These findings contribute to the growing body of evidence supporting the integration of innovative, student-centered methodologies in healthcare training. Future research should further explore the long-term effects of VSM on clinical competence and confidence, as well as investigate ways to address technological limitations. Broader implementation studies across different nursing programs may also provide insight into its scalability and effectiveness in diverse educational environments.

References

Araújo, M., & Moura, O. (2011). Estrutura fatorial da General Self-Efficacy Scale numa amostra de professores portugueses. *Revista Laboratório de Psicologia, 9*(1), 95-105. https://doi.org/10.14417/lp.638

Akcaoğlu, M. Ö., Dirlik, E. M., & Külekçi, E. (2022). The mediating role of metacognitive awareness in the relationship between critical thinking and self-regulation. *Thinking Skills and Creativity, 47*, 1–11. https://doi.org/10.1016/j.tsc.2022.101187

Altmiller, G., & Pepe, L. H. (2022). Influence of Technology in Supporting Quality and Safety in Nursing Education. *Nursing Clinics of North America*, *57*(4), 551–562. https://doi.org/10.1016/j.cnur.2022.06.005

Calubayan, L. D., & Ofrin, D. O. (2023). Video Self-Modelling as an Interactive Learning Tool in enhancing Student's Engagement in Physical Activity. *International Journal of Multidisciplinary, 4*(6), 2117–2130. https://doi.org/10.11594/ijmaber.04.06.34

Creswell, J. W., & Poth, C. N. (2018). Qualitative Inquiry and Research Design: Choosing Among Five Approaches (4th ed.). Sage Publications.

Hung, C., C., Kao, H.-F. S., Liu, H.-C., Liang, H.-F., Chu, T.-P., & Lee, B.-O. (2021). Effects of simulation-based learning on nursing students' perceived competence, self-efficacy, and learning satisfaction: A repeat measurement method. *Nurse Education Today*, *97*(97), 104725. https://doi.org/10.1016/j.nedt.2020.104725

Mejeh, M., Sarbach, L., & Hascher, T. (2024). Effects of adaptive feedback through a digital tool – a mixed-methods study on the course of self-regulated learning. *Education and Information Technologies, 29*, 1–43. https://doi.org/10.1007/s10639-024-12510-8

Lauermann, F., & Hagen, I. (2021). Do teachers' perceived teaching competence and self-efficacy affect students' academic outcomes? A closer look at student-reported classroom processes and outcomes. *Educational Psychologist, 56*(4), 1–18. https://doi.org/10.1080/00461520.2021.1991355

Marino, D., & Wayne, J. (2015). The Technological Barriers of Using Video Modeling in the Classroom. *The Journal of Special Education Apprenticeship, 4*(1), 1–16. https://doi.org/10.58729/2167-3454.1040

Nakata, Y., Oga-Baldwin, W. L. Q., & Tsuda, A. (2025). Student perceptions of feedback and self-regulated language learning: A mixed-methods investigation. *System*, *131*, 1–14. https://doi.org/10.1016/j.system.2025.103654

Rodrigues, L., Pereira, F., Toda, A., Palomino, P., Pessoa, M., Carvalho, L., Fernandes, D., Oliveira, E., Cristea, A., & Isotani, S. (2022). Gamification suffers from the novelty effect but benefits from the familiarization effect: Findings from a longitudinal study. *International Journal of Educational Technology in Higher Education, 19*(1), 1–25. https://doi.org/10.1186/s41239-021-00314-6

Sasson, I., & Tifferet, S. (2024). Enhancing Undergraduate Metacognitive Awareness and Self- Efficacy: Effective Instructional Practices for Research Question Formulation. *European Journal of Education, 60*, 1–13. https://doi.org/10.1111/ejed.12888

Koçan, S., Kulakaç, N., Aktuğ, C., & Demirel, S. (2024). The Effect of Video-Based Simulation Training on Nursing Students' Motivation and Academic Achievement. *CIN: Computers, Informatics, Nursing, 42*(6), 440-447. https://doi.org/10.1097/cin.0000000000001117