



Capturing meaningful moments: a narrative analysis of selfies in medical student portfolios

Jenny McDonald

Western Sydney University, Australia

Wendy Hu

Western Sydney University, Australia

Sylvia Heeneman

Maastricht University, The Netherlands

Abstract

Portfolios are designed to promote self-regulated learning and reflective practice through guided reflection on collections of artefacts. However, many medical students are reluctant to write reflections. On social media and in social research, photographic self-portraits (selfies) document experiences, relationships, and identity. Therefore, selfies may present an unexplored alternative to written reflections. We explored how selfies in student portfolios might support reflection on learning and professional identity development (PID) during the first two years of medical school.

Our longitudinal qualitative study analysed 200 selfies, including individual and group photos or videos created by 37 students over 14 months between May 2020 and July 2021. These selfies were included in student presentations alongside other artefacts for interviews with portfolio advisors. The student sample was purposefully selected from a cohort of 147 first-year medical students. Visual narrative analysis identified recurring stories about the participants' clinical and social learning.

Selfies documented classwork, social activities, and clinical learning associated with stories related to *Beginning*, *Connection*, *Shared Activities*, and *Belonging*. Viewed in combination, the stories revealed narratives of *Integration*, *Competence*, and *PID* consistent with the stages described in situated learning theory.

Selfies can offer an alternative or addition to written reflections for engaging and supporting medical students' reflections on some aspects of their learning experiences. Selfies are relevant to team-based and clinical learning and PID, complementing evidence of academic achievements. Ethical guidelines for their use and further studies on their use in other educational contexts are needed.

Keywords: portfolios; selfies; longitudinal qualitative study; professional identity; situated learning theory.

Introduction

Reflection supports learning in higher education, and is best encouraged through sustained practice, reflecting with others, and when a range of activities are offered (Guo, 2022; Jones et al., 2024). In medical education, portfolios are designed to support reflection on experience (Van Tartwijk and Driessen, 2009) to promote clinical competence and reflective practice (Slepcevic-Zach and Stock, 2018). A collection of artefacts and or written reflections in portfolios allows students to reflect on areas of achievement, areas for improvement, study purpose, and professional identity. This in turn can support informed self-assessment, self-regulated learning, professional identity development, and the practice of reflection on experience for learning (Van Tartwijk and Driessen, 2009; Englander et al., 2017; Hall et al., 2021).

Although portfolios support reflection (Lu, 2021; van der Gulden et al., 2022; Tan et al., 2022), many medical students are reluctant to write reflections for their portfolios, complaining the process is time-consuming, feels contrived (Driessen, 2017), and demands uncomfortable disclosure of shortcomings (Arntfield et al., 2016). This student reluctance is matched by an increasing uneasiness about the use of written reflections to support reflection skills (Tight, 2023). Written reflections can be both performative and formulaic (Macfarlane and Gourlay, 2009; De la Croix and Veen, 2018). This means innovative approaches are needed to engage and nurture authentic reflection skills in medical students (De la Croix and Veen, 2018; MacAskill et al., 2023). Unless students are offered alternatives to written reflections, they will miss opportunities to review and learn from experiences.

A potential alternative to written reflections in portfolios is photographic self-portraits (selfies). In an era of digital communication and omnipresent smart phones, selfies have emerged as a popular and powerful means of self-expression. Selfies have evolved to encompass more than photographs of the self, taken at extended arm's length with a smart phone (Faimau, 2020). Building on the tradition of painted self-portraits, selfies are used to seek approval and to document identity, skills, relationships, and experiences on social media (Gorichanaz, 2019). As photos or short videos, of individuals or groups, selfies capture meaningful moments for sharing. A selected image is used as self-presentation, communication, and connection (Diefenbach and Christoforakos, 2017; Faimau, 2020). Similar to written reflections, selfies are constructions created for an intended audience and purpose (Bullingham and Vasconcelos, 2013). Georgakopolou (2006, p.123) calls the experiences captured by selfies and shared on social media 'small stories'. Serial posts of these small stories represent fragments of conversations and create narratives over time (Georgakopoulou, 2017). By capturing personal experiences, selfies enable self-expression and storytelling through their composition, framing, editing, and presentation, and can also prompt self-reflection (Suler, 2015). Selfies may therefore provide an alternative means for documenting experiences, relationships, and identity.

In health and social research, photovoice, using participant generated images (Suprpto et al., 2020), and digital storytelling, using compositions of photos and videos (De Jager et al., 2017), have been used to support expression and reflection. In health professions education, digital storytelling supported medical student reflection on their first patient encounter (Sandars and Murray, 2009) and supported nurses' transitions to working in healthcare environments (Stacey and Hardy, 2011). In other educational settings, selfies in combination with written reflections provided insight into shifts in students' engagement, anxieties, and sense of belonging in media studies (Jackson, 2019). Photo collections including selfies supported teacher trainees' reflections on their professional identity development (PID) (Hahl, 2021). This research suggests selfies or collections of selfies have the potential to support reflection during periods of transition, and for PID. However, whether selfies can be used as an alternative for documenting experiences to support reflection, or as an adjunct to written reflections in medical student portfolios has not been investigated.

In this study, we aimed to explore how selfies in portfolio presentations might support reflection during the early phases of medical school.

Our research questions were:

1. How are selfies used to document experiences in portfolios during the first two years of medical school?
2. How do collections of selfies in portfolios document learning and PID during the first two years of medical school?

Methods

Our study employed a longitudinal, qualitative design using visual narrative analysis (Riessman, 2008). Narrative analysis explores the meaning of narratives, described as the 'consequential linking of events or ideas' (Riessman, 2005, p.7). Narratives are used by individuals or groups to construct identities, foster belonging, make sense of experience, motivate, entertain, or mislead. They must be considered in context and with consideration for the audience (Riessman, 2005). We therefore adopted a constructionist perspective recognising that knowledge, meaning, and identity are constructed according to context and shaped through dialogue (Harré, 2002; Byrne, 2022). The selfies that were analysed were chosen by participants to express, represent, and share aspects of their learning.

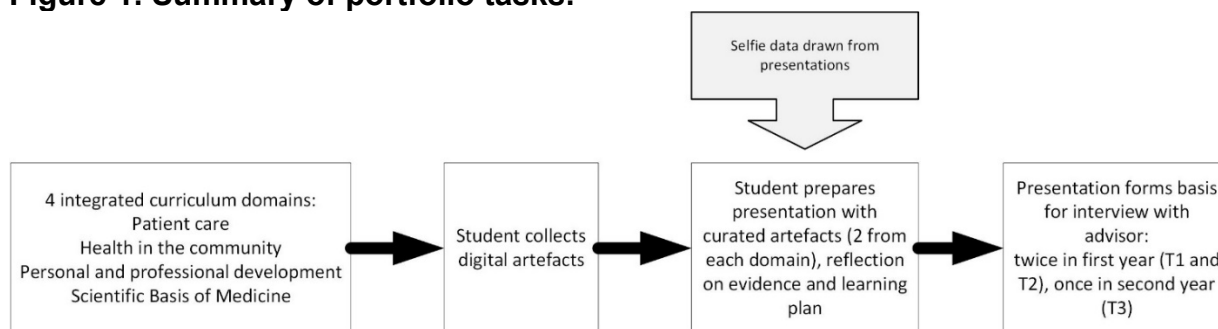
Setting

The setting for our study was the undergraduate medical programme at Western Sydney University School of Medicine (WSU). At WSU, the portfolio is designed to support reflection on learning experiences and study planning and was introduced in 2019. First- and second-year students prepare a presentation and a brief oral commentary as the basis for discussion about their learning with a portfolio advisor, twice in first year and once in second year. For their presentations, students select and curate images and documents using MyKnowledgeMap (MKM) e-portfolio software (MyKnowledgeMap, 2019).

Students must include in their presentations two digital artefacts (either visual or textual) supported by a written reflection to represent each of the four curriculum domains (patient care, community health, personal and professional development, and the scientific basis of medicine), together with a future learning plan. Students have autonomy in their artefact choices and often include written assignments and evidence of classwork, such as photos of notes and student drawn concept maps on whiteboards. Students are not explicitly directed to include selfies. However, during portfolio training workshops in first year they are shown example presentations that include group and individual photos.

The artefacts are not assessed but are used to represent meaningful experiences to facilitate the student’s written reflection and a reflective dialogue.

Figure 1. Summary of portfolio tasks.



Sample

A purposeful sample of 37 participants from the 2020 WSU cohort of 147 students was selected to ensure maximum variation in demographic background and academic achievement. The sample was selected and de-identified by an assistant from outside the medical programme who was not involved in the analysis. Aggregated participant details are provided in Table 1.

Table 1. Participant characteristics.

n=37		n (%)
Gender	Male	20 (54)
	Female	17 (46)
Prior study	Secondary school leavers	23 (62)
	Prior university study	18 (38)
Residency	Domestic	29 (78)

	International	8 (22)
Median age at enrolment	Years (range)	21.0 (18-49)
Academic performance at end of first year in biomedical science examinations	Fail	3 (8.1)
	Pass	16 (43.2)
	High performance (Credit, Distinction, or High Distinction)	18 (48.6)

For our study, a selfie was defined as an individual or group photo or short video taken for the purpose of documenting personal experience. We included images and videos taken at extended arm's length or in mirror reflections, as well as images taken from a distance, by others or using the camera shutter delay. Class screenshots taken during online classes were also included.

The sample for analysis included all selfies included in the portfolio interview presentations at three timepoints in first and second year: May 2020 (Time 1), September 2020 (Time 2), and July 2021 (Time 3), see Figure 1. The selfies represented 24% of all artefacts in the student presentations and were included in at least one presentation by all 37 participants. We considered our sample size sufficient in information power to address our exploratory study aim and research questions because we had ensured maximum participant variation through purposeful sampling, and we used cross-case comparison and an established theory as our interpretive lens (Malterud et al., 2016).

Theoretical lens

Situated learning (SL) theory (Lave and Wenger, 1991) was used as an interpretive lens to explain our findings. SL theory posits that vocational training is a developmental and social process that emerges through the interaction between students and their social and physical environments. Novices are welcomed into a community of practice by observing and performing simple tasks. 'Legitimate peripheral participation' occurs (Lave and Wenger, 1991, p.29) when relationships form and expertise develops. This leads to identity change for the individual and a regeneration of community through changing membership. Thus, SL theory (Lave and Wenger, 1991) provided a developmental framework to support our interpretation of the meaning of experiences represented by

selfies and series of selfies during the participants' first two years of, and their transition into, a medical programme.

Analysis

Participants' names were replaced with anonymised codes prior to analysis by the research team. Faces were not obscured to allow analysis of emotional expressions and gaze direction. The selfies were uploaded into NVivo Version 12 software for analysis (Lumivero, 2020).

We adopted the three-step method described by Riessman (2008) for visual narrative analysis. JM undertook the first step to provide familiarisation with the data. In this step, the selfies were coded for content and composition following an approach described by Rose (2016). The content of selfies was coded for subjects (who was photographed), subjects' roles, actions, emotional expressions, gestures, props, and attire. Compositional features coded included camera angle, subject position, cropping, candid or formal, and setting.

The second step allowed us to answer our first research question: how are selfies used to document experience in portfolios during the early phase of medical school? For this step, the selfies were recoded inductively and annotated, focusing on the small stories (Georgakopoulou, 2017) represented by the content and composition of individual selfies. Where the content, context, or activity was unclear, the descriptive component of the participants' accompanying written reflections was reviewed, and the selfie discussed with the research team to reach an agreed meaning of the story. Similar small stories were grouped into categories according to meaning, and variations within and between categories were noted and clarified.

The final step of our analysis allowed us to answer our second research question: how do collections of selfies in portfolios document learning and professional identity development during the first two years of medical school? For this step of the analysis, narratives were constructed by linking small stories with similar content at a particular time point, or series of related small stories at different time points (Riessman, 2008). Our interpretation of these narratives was informed by the stages of participation described in SL theory (Lave

and Wenger, 1991). Narrative construction was supported by mapping small stories and the content of representative selfies in a graphical display.

Reflexivity

The research team consisted of three medical education academics (JM, WH, SH) with experience in qualitative research. Two researchers (JM, WH) are medically trained, and worked within the study setting, allowing insights into the curricular and geographical learning context of the selfies. With her biomedical science background, SH offered a complementary perspective, being familiar to medical student portfolios in a different educational system. Our different perspectives, professional backgrounds, experience, and roles as educators in different contexts allowed richer analysis and interpretation through iterative discussions and debate during the process of coding, narrative construction, and interpretation.

Ethical considerations

Western Sydney University Human Research Ethics Committee (ID No. H9989, amendment 8385) granted approval for this study. The data was used with participant consent and only after assessment decisions were made. Only the researchers had access to the selfies, which were stored on a password-protected computer drive. Aggregated findings are presented to protect participant privacy, except for the example selfie provided (Figure 2) for which permission to publish was obtained from all students in the photo.

Results

We extracted 200 selfies (197 photos and 3 videos) from 109 presentations including three time points: May 2020 (T1), September 2020 (T2), and July 2021 (T3). Activities presented in the selfies were classwork (38%), clinical learning (36%), social activity or self-care (20%), homework (4%), and community-based learning (2%). The mean number of selfies per participant was 5.4 with a range of 1-14. Over time, group photos decreased in frequency (see Table 2).

Table 2. Sample at three time points.

Selfies	Time 1	Time 2	Time 3	All
Group	61	37	30	129
Individual	25	14	33	71
Total	86	51	63	200

The small stories documenting the meanings of common experiences interpreted from individual selfies, and the narratives, constructed from collections of small stories interpreted using situated learning theory (Lave and Wenger, 1991) as our theoretical lens, are described below.

The small stories

The small stories represented the meanings of experiences documented by individual selfies. Selfies at T1 revealed small stories of *Beginning*, *Connection*, *Shared activities*, and *Belonging*. Examples are provided below.

Beginning stories were represented by selfies of orientation activities or selfies taken at the doorways of campus buildings and clinical schools signifying entry to the programme. *Connection* to place and people stories were indicated by backdrops of campus, clinical, or community settings, or class photos or social groups.

Figure 2. Selfie example included in a presentation at T2.

This selfie shows three students standing shoulder to shoulder in morning sunlight in the doorway of a clinical school. The students have matching business attire, mirrored postures and are smiling directly at the camera. The photograph is taken from a distance, at eye level, and the subjects are central. The hospital, car park, and a construction crane can be seen in the window reflection.

Shared activities were represented by group photos on social outings, practising clinical skills and engaged in classwork.

Belonging was represented by similar attire such as scrubs, mirrored postures or hand gestures, affectionate gestures such as arm over shoulder, and joint attention with shared direction of gaze.

The stories of **Connection** at T1 when social relationships were developing mirrored the early predominance of group photos. The occasional exception were selfies suggesting the participant was an *outsider or observer*, rather than a participant, particularly during the period of online learning at T2.

The example selfie provided (Figure 2) demonstrates the small stories: *Beginning* (standing at the entrance to a clinical school) and *Connection* to place and people (background and mirrored postures). Figure 3 presents a map of the small stories.

The narratives

Narratives of Integration, Learning, and Professional Identity Formation were identified by mapping the small stories and their representative selfies against the stages of participation in a community of practice (Lave and Wenger, 1991). These narratives were constructed by linking series of small stories with similar content (subject, activity, location) at different time points. Examples of the selfies and the compositional elements that characterised the series of 'small stories' within narratives are described below. See Figure 3.

Integration

The integration narrative was identified in the series of *beginning* and *connection* stories. For example, there was a change in the group photos from formal class photos at T1, composed with students in a line facing the camera, to informal group photos in class and social settings by T2 and T3 with matching postures, gestures, and attire to indicate group integration through joint attention, a common language, and uniform.

Competence

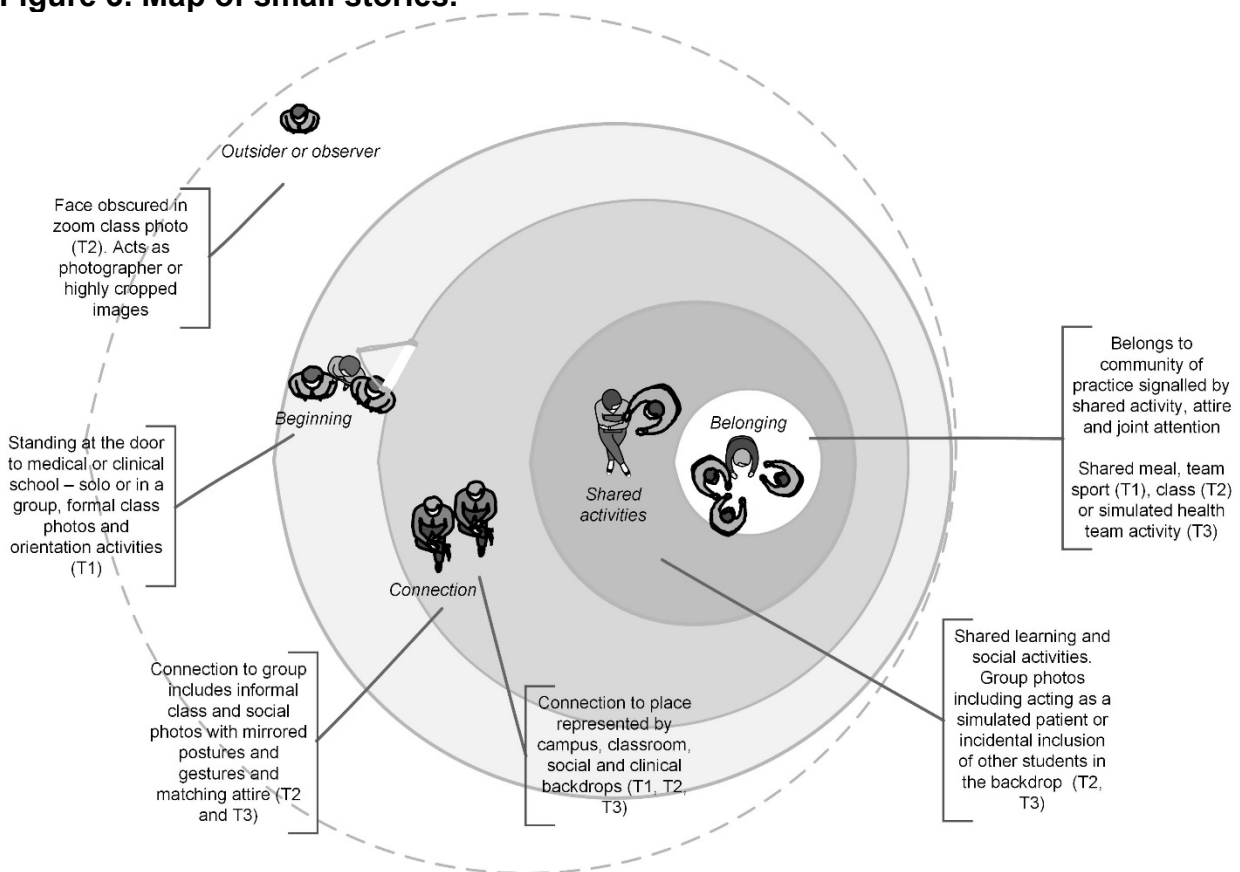
Competence was documented in the sequence of stories about *shared activities* related to classwork and clinical skills. There was a sequence evident in clinical skills learning. From cheerful orientation activities with matching plastered forearms proudly brandished on campus at T1; early skills acquisition documented as cropped photos of a cannula-in-situ in clinical simulation laboratories; or a pulse being taken on a family member (an individual achievement); to photos of role-playing of clinical examinations (*shared activity*) at T2. By

T3, simulated clinical teamwork exercises showed groups of students in clinical gowns, focused on a *shared activity* (joint attention) engaged in collective learning and teamwork.

Professional identity development

Professional identity development (PID) was indicated by the stories in sequence from Beginning to Connection, Shared activities, and Belonging. This was indicated by the changes in the composition of selfies from symbolic elements such as campus doorways and props such as medical textbooks; university (jeans and hoodies) to clinical attire (gowns, stethoscopes, and badges); orientation activities to classwork to clinical work; from cheerful to more serious task-focused expressions during clinical activities; and changing choice of backdrop or location from campus and social, to hospital.

Figure 3. Map of small stories.



Map of Small Stories with descriptions of representative selfies. Created with Microsoft® Visio® 2019. The grey shaded circles represent stages of participation in a community of practice (Lave and Wenger, 1991), from the periphery (*Outsider*) to the innermost circle (*Belonging*). Abbreviations: T1 (Time 1), T2 (Time 2) and T3 (Time 3).

Discussion

Our findings show that individual selfies document social relationships, teamwork, and clinical skills, and that collections of selfies show developing competence and professional identity in medical student portfolios. These findings build on the findings in social research (De Jager et al., 2017; Suprpto et al., 2020) and other higher education fields that photographs can be used to document and tell stories about experience (Stacey and Hardy, 2011; Jackson, 2019; Hahl, 2021). As an inherently personal and creative record of experience, selfies enable expression beyond what may be consciously intended (Kumagai, 2012). For example, the predominance of group photos in first year (T1 and T2) highlighted the significance of relationships and shared experiences for learning and a successful transition into medicine. Exceptions were identified where students appeared as outsiders in their group photos and zoom classes. For example, a participant included a zoom class shot from the period of online learning where their face was obscured. Regardless, group photos supplied the opportunity for students to reflect upon, or be supported to reflect on, their transition into a medical programme during their portfolio interviews.

The narratives constructed from small stories detailed increasing participation, competency, and integration into a community of practice as described in SL theory (Lave and Wenger, 1991). The focus of selfies shifted from early friendships in first year to clinical simulation activities in second year, creating narratives of integration, competence, and an emerging professional identity. Thus, selfies broadened the scope for reflection beyond scientific knowledge and academic skills towards social learning, teamwork, and professional identity. This answers the call to give greater focus to personal and professional development in medical programmes (Jarvis-Selinger et al., 2012; Kim et al., 2024), and presents an avenue for personal and guided reflection to support PID (De la Croix and Veen, 2018; Farrell and Ajjawi, 2023).

PID represents acquisition of knowledge and skills and acceptance of values, roles, and responsibilities of a professional group (Ajjawi and Higgs, 2008). PID has been shown to be an important determinant of study motivation (Jensen and Jetten, 2016), supporting self-regulated learning (Zimmerman and Moylan, 2009) and future employment in higher

education students (Tomlinson and Jackson, 2021). PID is supported through familiarity with a future workplace through workplace-based learning or employment, social networks within the profession, and specialised skills and knowledge (Tomlinson and Jackson, 2021). In this study, selfies documented early clinical experiences in hospital settings, new clinical skills, and connections with future colleagues.

Whereas some students may intuitively reflect on the significance of selfies for their learning or professional development, for other students a reflective discussion might be needed to deepen understanding. For example, a selfie of a group gathering at a restaurant might signal social connection through shared experience, cultural awareness, or an opportunity to discuss the balancing of life's priorities. A selfie of a simulated patient resuscitation exercise might provoke discussion about communication, leadership, feedback, protocols in emergency care, or approaches to airway management.

Just as in reflective writing where students favour descriptions of success over failure (McGarr and Ó Gallchóir, 2020), the selfies included in portfolio presentations only showed social and academic achievements. This mirrors the predominance of positive self-presentation reported in selfies on social media (Diefenbach and Christoforakos, 2017). For example, we did not identify any selfies or narratives related to academic struggles or emotional distress, both common features of medical student experience (Bergmann et al., 2019). This tendency towards positive impression management in portfolio collections potentially perpetuates failure avoidance and opportunities for growth (Dang et al., 2020). This may represent a caution for the use of selfies in portfolios and reinforces the importance of mentoring for portfolios to guide critical reflection (Driessen, 2017). Alternatively, there is increasing recognition that insisting on honesty in reflective exercises is unnecessarily intrusive (Veen et al., 2020) and creates resentment and resistance (Hobbs, 2007). Enforcing self-disclosure can also lead to an alternative form of impression management as self-criticism (McGarr and Ó Gallchóir, 2020).

There are other ethical considerations in using selfies. Care is needed to protect privacy and confidentiality; peer, and in this setting patient-identifying details, may be incidentally included, for example. This can be managed by clear guidelines for students (Siddiqui et al., 2023), restricting the access to portfolio collections (Rose, 2016) and workshops to guide ethical portfolio collections. Increasingly, digital photos can be manipulated and created using artificial intelligence (AI), potentially reducing authenticity and originality in

the same way that text generative AI threatens the validity of written reflections. If digital visual and audio formats are to be used in portfolio collections, students need guidance on their ethical use, educators need ways to ensure their legitimacy, and portfolio advisors need training in how to engage students in reflective dialogue about the meaning of experiences to enhance their learning and professional development.

Strengths, limitations, and suggestions for further research

This study, to the best of our knowledge, is the first study of the use of selfies in medical student portfolios. Our study provides empirical and theoretical support for incorporating selfies in portfolios to enhance reflection on professional relationships and identity. Our interpretation of the data was supported by the combination of visual narrative analysis and mapping. SL theory guided our interpretation of the relevance of the selfie stories to student experience and professional identity.

A potential limitation of this study was the use of assessment tasks and that students may have felt pressure to take part. However, the study design, including the timing of the analysis and the presentation of results, aimed to minimise this impact on participants. Our study was from a single educational context and portfolio design limiting transferability of our findings to other settings. Our study was conducted during the coronavirus pandemic which meant more online learning experiences and less opportunity for social activity.

Research is needed to understand the role of selfies as a means for reflection in other educational contexts. For example, in the setting of a medical school, the popularity of selfies to document clinical skills raises the prospect that photos and videos may be useful to support clinical learning on the wards, notwithstanding ethical considerations of consent and confidentiality. Building on research in social media (Bullingham and Vasconcelos, 2013; Gómez Cruz and Thornham, 2015) and higher education (Sandars and Murray, 2009; Stacey and Hardy, 2011; Hahl, 2021), further analysis of the compositional elements and relationship with accompanying written or oral reflections would help to further understand the intention, meaning, and educational impact of selfies in higher education. Alternatives as described elsewhere: video-recorded oral reflections to support trainees' reflection on performance (Tulgar, 2017), voice memos using smart phones, or collaborative reflection in online forums (Gillingham et al., 2020) could also be alternatives to written reflections worthy of future research.

Conclusion

Selfies are a personal, creative, and accessible means to engage students in documenting and reflecting on experiences and change. They can provide an acceptable alternative or addition to written reflections, especially if used as the focus for further discussion for supported reflection with mentors. Selfies, as photographic self-portraits, differ from other photographs in portfolios as they illustrate social aspects of learning and PID, complementing reflection on academic aspects of learning. This is important for study motivation and goal setting. Hence, our study provides evidence for an innovative and contemporary alternative to written reflections to engage students in the practice of reflection on experience. Further research is needed to develop guidelines for their ethical use, to understand and to explore their application in different higher education contexts, and to capitalise on new digital formats afforded by smart phones to engage students in reflection.

Acknowledgements

The authors are grateful to Samantha Ryan for her work in drawing a sample from the cohort and removing all names from the data.

The authors have no conflict of interest.

The authors did not use generative AI technologies in the creation of this manuscript.

References

- Ajjawi, R. and Higgs, J. (2008) 'Learning to reason: a journey of professional socialisation', *Advances in Health Sciences Education*, 13(2), pp.133-150. Available at: <https://doi.org/10.1007/s10459-006-9032-4>
- Arntfield, S., Parlett, B., Meston, C. N., Apramian, T. and Lingard, L. (2016) 'A model of engagement in reflective writing-based portfolios: interactions between points of

vulnerability and acts of adaptability', *Medical Teacher*, 38(2), pp.196-205. Available at: <https://doi.org/10.3109/0142159x.2015.1009426>

Bergmann, C., Muth, T. and Loerbroks, A. (2019) 'Medical students' perceptions of stress due to academic studies and its interrelationships with other domains of life: a qualitative study', *Medical Education Online*, 24(1). Available at: <https://doi.org/10.1080/10872981.2019.1603526>

Bullingham, L. and Vasconcelos, A. C. (2013) 'The presentation of self in the online world': Goffman and the study of online identities', *Journal of Information Science*, 39(1), pp.101-112. Available at: <https://doi.org/10.1177/0165551512470051>

Byrne, D. (2022) 'A worked example of Braun and Clarke's approach to reflexive thematic analysis', *Quality and Quantity*, 56(3), pp.1391-1412. Available at: <https://doi.org/10.1007/s11135-021-01182-y>

Dang, S. S., Quesnel, D. A., Hewitt, P. L., Flett, G. L. and Deng, X. L. (2020) 'Perfectionistic traits and self-presentation are associated with negative attitudes and concerns about seeking professional psychological help', *Clinical Psychology and Psychotherapy*, 27(5), pp.621-629. Available at: <https://doi.org/10.1002/cpp.2450>

De Jager, A., Fogarty, A., Tewson, A., Lenette, C. and Boydell, K. M. (2017) 'Digital storytelling in research: a systematic review', *The Qualitative Report*, 22(10), pp.2548-2582. Available at: <https://doi.org/10.46743/2160-3715/2017.2970>

De la Croix, A. and Veen, M. (2018) 'The reflective zombie: problematizing the conceptual framework of reflection in medical education', *Perspectives on Medical Education*, 7(6), pp.394-400. Available at: <https://doi.org/10.1007/s40037-018-0479-9>

Diefenbach, S. and Christoforakos, L. (2017) 'The selfie paradox: nobody seems to like them yet everyone has reasons to take them. An exploration of psychological functions of selfies in self-presentation', *Frontiers in Psychology*, 8. Available at: <https://doi.org/10.3389/fpsyg.2017.00007>

Driessen, E. (2017) 'Do portfolios have a future?', *Advances in Health Sciences Education*, 22(1), pp.221-228. Available at: <https://doi.org/10.1007/s10459-016-9679-4>

Englander, R., Frank, J. R., Carraccio, C., Sherbino, J., Ross, S., Snell, L. and ICBME Collaborators (2017) 'Toward a shared language for competency-based medical education', *Medical Teacher*, 39(6), pp.582-587. Available at: <https://doi.org/10.1080/0142159x.2017.1315066>

Faimau, G. (2020) 'Towards a theoretical understanding of the selfie: a descriptive review', *Sociology Compass*, 14(12), pp.1-12. Available at: <https://doi.org/10.1111/soc4.12840>

Farrell, L. and Ajjawi, R. (2023) 'The power of stories: supporting professional identity transitions through longitudinal coaching', *Medical Education*, 57(7), pp.598-600. Available at: <https://doi.org/10.1111/medu.15078>

Georgakopoulou, A. (2006) 'Thinking big with small stories in narrative and identity analysis', *Narrative Inquiry*, 16(1), pp.122-130. Available at: <https://doi.org/10.1075/ni.16.1.16geo>

Georgakopoulou, A. (2017) 'Small stories research: a narrative paradigm for the analysis of social media', in L. Sloan and A. Quan-Haase (eds) *The SAGE handbook of social media research methods*. Sage Publications, pp.266-281. Available at: <https://doi.org/10.4135/9781473983847>

Gillingham, K., Eggleton, K. and Goodyear-Smith, F. (2020) 'Is reflective learning visible in online discussion forums for medical students on general practice placements? A qualitative study', *Teaching and Learning in Medicine*, 32(4), pp.434-441. Available at: <https://doi.org/10.1080/10401334.2020.1730184>

Gómez Cruz, E. and Thornham, H. (2015) 'Selfies beyond self-representation: the (theoretical) f(r)ictions of a practice', *Journal of Aesthetics and Culture*, 7. Available at: <https://doi.org/10.3402/jac.v7.28073>

- Gorichanaz, T. (2019) 'Self-portrait, selfie, self: notes on identity and documentation in the digital age', *Information*, 10(10). Available at: <https://doi.org/10.3390/info10100297>
- Guo, L. (2022) 'How should reflection be supported in higher education?—A meta-analysis of reflection interventions', *Reflective Practice*, 23(1), pp.118-146. Available at: <https://doi.org/10.1080/14623943.2021.1995856>
- Hahl, K. (2021) 'Student teachers' experiences of using photos in teacher reflection', *Reflective Practice*, 22(1), pp.115-127. Available at: <https://doi.org/10.1080/14623943.2020.1854212>
- Hall, J., Oswald, A., Hauer, K. E., Hall, A. K., Englander, R., Cheung, W. J. and ICBME Collaborators (2021) 'Twelve tips for learners to succeed in a CBME program', *Medical Teacher*, 43(7), pp.745-750. Available at: <https://doi.org/10.1080/0142159X.2021.1925233>
- Harré, R. (2002) 'Public sources of the personal mind: social constructionism in context', *Theory and Psychology*, 12(5), pp.611-623.
- Hobbs, V. (2007) 'Faking it or hating it: can reflective practice be forced?', *Reflective Practice*, 8(3), pp.405-417. Available at: <https://doi.org/10.1080/14623940701425063>
- Jackson, H. (2019) 'Self[ie] reflective practice: revealing student engagement through the photographic performance of the self', *Learning, Media and Technology*, 44(2), pp.144-161. Available at: <https://doi.org/10.1080/17439884.2018.1563107>
- Jarvis-Selinger, S., Pratt, D. D. and Regehr, G. (2012) 'Competency is not enough: integrating identity formation into the medical education discourse', *Academic Medicine*, 87(9), pp.1185-1190. Available at: <https://doi.org/10.1097/ACM.0b013e3182604968>
- Jensen, D. H. and Jetten, J. (2016) 'The importance of developing students' academic and professional identities in higher education', *Journal of College Student*

Development, 57(8), pp.1027-1042. Available at:

<https://doi.org/10.1353/csd.2016.0097>

Jones, A., Cobb, K. and England, G. (2024) 'A scoping review on the use of reflection and reflective portfolio learning in veterinary education', *Veterinary Record Open*, 11(1).

Available at: <https://doi.org/10.1002/vro2.79>

Kim, D. T., Applewhite, M. K. and Shelton, W. (2024) 'Professional identity formation in medical education: some virtue-based insights', *Teaching and Learning in Medicine*, 36(3), pp.399-409. Available at: <https://doi.org/10.1080/10401334.2023.2209067>

Kumagai, A. K. (2012) 'Perspective: acts of interpretation: a philosophical approach to using creative arts in medical education', *Academic Medicine*, 87(8), pp.1138-1144.

Available at: <https://doi.org/10.1097/ACM.0b013e31825d0fd7>

Lave, J. and Wenger, E. (1991) *Situated learning: legitimate peripheral participation*.

Cambridge, England: Cambridge University Press.

Lu, H. (2021) 'Electronic portfolios in higher education: a review of the literature', *European Journal of Education and Pedagogy*, 2(3), pp.96-101. Available at:

<https://doi.org/10.24018/ejedu.2021.2.3.119>

Lumivero (2020) *NVivo* (Version 12) [Computer program]. Available at:

<https://lumivero.com/products/nvivo/> (Accessed: 17 February 2023).

MacAskill, W., Chua, W. J., Woodall, H. and Pinidiyapathirage, J. (2023) 'Beyond the written reflection: a systematic review and qualitative synthesis of creative approaches to reflective learning amongst medical students', *Perspectives on Medical Education*, 12(1), pp.361-371. Available at: <https://doi.org/10.5334/pme.914>

Macfarlane, B. and Gourlay, L. (2009) 'The reflection game: enacting the penitent self', *Teaching in Higher Education*, 14(4), pp.455-459. Available at:

<https://doi.org/10.1080/13562510903050244>

- Malterud, K., Siersma, V. D. and Guassora, A. D. (2016) 'Sample size in qualitative interview studies: guided by information power', *Qualitative Health Research*, 26(13), pp.1753-1760. Available at: <https://doi.org/10.1177/1049732315617444>
- McGarr, O. and Ó Gallchóir, C. (2020) 'The futile quest for honesty in reflective writing: recognising self-criticism as a form of self-enhancement', *Teaching in Higher Education*, 25(7), pp.902-908. Available at: <https://doi.org/10.1080/13562517.2020.1712354>
- MyKnowledgeMap (2019) *MyShowcase.me* (Version 6.7) [Computer program]. Available at: <https://www.myknowledgemap.com> (Accessed: 17 February 2023).
- Riessman, C. K. (2005) 'Narrative analysis', in N. Kelly, C. Horrocks, K. Milnes, B. Roberts and D. Robinson (eds) *Narrative, memory and everyday life*. University of Huddersfield, pp.1-7. Available at: <https://eprints.hud.ac.uk/id/eprint/4920/> (Accessed: 3 December 2021).
- Riessman, C. K. (2008) 'Visual analysis', in C. K. Riessman (ed.) *Narrative methods for the human sciences*. First edition. Los Angeles: SAGE Publications Ltd, pp.141-182.
- Rose, G. (2016) *Visual methodologies: an introduction to researching with visual materials*. 4 edn. London, UK: SAGE Publications
- Sandars, J. and Murray, C. (2009) 'Digital storytelling for reflection in undergraduate medical education: a pilot study', *Education for Primary Care*, 20(6), pp.441-444. Available at: <https://doi.org/10.1080/14739879.2009.11493832>
- Siddiqui, Z. S., Fisher, M. B., Slade, C., Downer, T., Kirby, M. M., McAllister, L., Isbel, S. T. and Christine Brown, W. (2023) 'Twelve tips for introducing e-Portfolios in health professions education', *Medical Teacher*, 45(2), pp.139-144. Available at: <https://doi.org/10.1080/0142159X.2022.2053085>
- Slepcevic-Zach, P. and Stock, M. (2018) 'ePortfolio as a tool for reflection and self-reflection', *Reflective Practice*, 19(3), pp.291-307. Available at: <https://doi.org/10.1080/14623943.2018.1437399>

- Stacey, G. and Hardy, P. (2011) 'Challenging the shock of reality through digital storytelling', *Nurse Education in Practice*, 11(2), pp.159-164. Available at: <https://doi.org/10.1016/j.nepr.2010.08.003>
- Suler, J. (2015) 'From self-portraits to selfies', *International Journal of Applied Psychoanalytic Studies*, 12(2), pp.175-180. Available at: <https://doi.org/10.1002/aps.1448>
- Suprpto, N., Sunarti, T., Suliyanah, Wulandari, D., Hidayaatullaah, H. N., Adam, A. S. and Mubarak, H. (2020) 'A systematic review of photovoice as participatory action research strategies', *International Journal of Evaluation and Research in Education*, 9(3), pp.675-683. Available at: <https://doi.org/10.11591/ijere.v9i3.20581>
- Tan, R., Qi Ting, J. J., Zhihao Hong, D., Sing Lim, A. J., Ong, Y. T., Pisupati, A., Xin Chong, E. J., Chiam, M. et al. (2022) 'Medical student portfolios: a systematic scoping review', *Journal of Medical Education and Curricular Development*, 9, pp.1-15. Available at: <https://doi.org/10.1177/23821205221076022>
- Tight, M. (2023) 'Reflection: an assessment and critique of a pervasive trend in higher education', *European Journal of Higher Education*, 14(2), pp.324-342. Available at: <https://doi.org/10.1080/21568235.2023.2193345>
- Tomlinson, M. and Jackson, D. (2021) 'Professional identity formation in contemporary higher education students', *Studies in Higher Education*, 46(4), pp.885-900. Available at: <https://doi.org/10.1080/03075079.2019.1659763>
- Tulgar, A. T. (2017) 'Selfie@ sassessment as an alternative form of self-assessment at undergraduate level in higher education', *Journal of Language and Linguistic Studies*, 13(1), pp.321-335. Available at: <https://www.jlls.org/index.php/jlls/article/view/616> (Accessed: 10 May 2023).
- van der Gulden, R., Timmerman, A., Muris, J. W., Thoonen, B. P., Heeneman, S. and Scherpbier-de Haan, N. D. (2022) 'How does portfolio use affect self-regulated learning in clinical workplace learning: what works, for whom, and in what

contexts?', *Perspectives on Medical Education*, 11(5), pp.1-11. Available at:

<https://doi.org/10.1007/s40037-022-00727-7>

Van Tartwijk, J. and Driessen, E. W. (2009) 'Portfolios for assessment and learning: AMEE Guide no. 45', *Medical teacher*, 31(9), pp.790-801. Available at:

<https://doi.org/10.1080/01421590903139201>

Veen, M., Skelton, J. and de la Croix, A. (2020) 'Knowledge, skills and beetles: respecting the privacy of private experiences in medical education', *Perspectives on Medical Education*, 9(2), pp.111-116. Available at: [https://doi.org/10.1007/s40037-020-](https://doi.org/10.1007/s40037-020-00565-5)

[00565-5](https://doi.org/10.1007/s40037-020-00565-5)

Zimmerman, B. J. and Moylan, A. R. (2009) 'Self-regulation: where metacognition and motivation intersect', in D. J. Hacker, J. Dunlosky and A. C. Graesser (eds) *Handbook of metacognition in education*. New York, NY: Routledge, pp.299-315.

Author details

Jenny McDonald is a Senior Lecturer in the School of Medicine at Western Sydney University. Her research and teaching interests build on her experience as a developmental paediatrician.

Wendy Hu is Professor of Medical Education and Associate Dean in the School of Medicine at Western Sydney University. Her research interests include medical and health professions education research, scholarship, and research translation.

Sylvia Heeneman is a Professor of Medical Education in the Faculty of Health, Medicine and Life Sciences (FHML), School of Health Profession Education (SHE), Maastricht University, Maastricht, The Netherlands. Her research interests are (programmatic) assessment in undergraduate and post-graduate medical education, and mentoring.

Licence

©2025 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/4.0/>. Journal of Learning Development in Higher Education (JLDHE) is a peer-reviewed open access journal published by the Association for Learning Development in Higher Education (ALDinHE).