

Radiography community involvement in the professional socialisation of diagnostic radiography students

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ABSTRACT

Introduction: Professional socialisation entails acquisition and internalisation of knowledge, skills, and values necessary to become members of a chosen profession. In the healthcare professions, the process is initiated during undergraduate academic and clinical learning, with clinical learning considered as more significant. This suggests that clinical radiographers play a key role in socialising students into the radiography profession. Based on communities of practice, a theory of social learning, professional socialisation of diagnostic radiography students would involve different members of the radiography community. Limited knowledge exists on the professional socialisation of diagnostic radiography students.

Aim: This study aimed to explore how diagnostic radiography students are socialised in the clinical environment with a focus on the role of communities of practice.

Methods: Qualitative, exploratory, and descriptive research was conducted. Data was collected through unstructured interviews and focus groups. Interview recordings were verbatim transcribed, and framework analysis was used to analyse data.

Findings: Data analysis resulted in the identification of a key theme, radiography community involvement, with four subthemes: shared responsibility for learning and teaching, critical reflection and life-long learning, interpersonal skills, and empathy and consideration for students.

Conclusion: Effective professional socialisation of diagnostic radiography students is essential to develop radiography knowledge, skills, and values. The findings presented in this paper highlight the importance of the radiography community involvement in the professional socialisation of students because the various members of this community have valuable knowledge to share and a role to play.

Implications for practice: The findings can guide development of initiatives to support radiography community members in their role as facilitators of student professional socialisation, which in turn will enable effective professional socialisation for the students.

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Introduction

Professional socialisation is described as the process through which individuals acquire and internalise the knowledge, skills, and values necessary for membership in a specific profession.¹ This means professional socialisation fosters professional development and formation of a professional identity,^{2,3} cultivating clinically competent healthcare students for future practice.^{1,2} There are two stages of professional socialisation, namely the anticipatory

socialisation stage and formal professional socialisation stage.⁴ The anticipatory stage is characterised by preconceived expectations about the future profession with which the student enters the education program. Formal professional socialisation begins after the individual enrolls for the professional course at a higher education institution.⁴ During this second stage the student starts viewing the profession from the inside, with expectations of future roles guided by members of the profession,⁴ e.g., academic educators and clinical radiographers. For health professions students, formal professional socialisation takes place through academic and clinical learning, with clinical learning playing a key role as much of it takes place in a real-world clinical environment or workplace.^{2,5,6} This stage of professional socialisation does not end when the student graduates but is a lifelong process that continues into professional practice.²

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Communities of practice involve a group of people who have a common interest and passion on a particular subject, domain, or profession. Through continuous, mutual interactions members of the community collaboratively learn with and from each other.⁷ Within these communities, newcomers are allowed limited participation (peripheral participation) and with time they acquire knowledge and skills which moves them to full participation.² In line with the communities of practice theory, diagnostic radiography students first learn by observing clinical radiographers in practice, and with time they move to direct participation where they perform imaging examinations under supervision.⁸

In the clinical environment, diagnostic radiography students interact with patients and various healthcare professionals.⁹ They are exposed to authentic situations with diverse cases and patient populations, and importantly, they get the opportunity to observe qualified healthcare professionals in practice.¹⁰ This setting is also important because it puts students in a position where their decisions and actions, and those of qualified professionals around them, have real-life consequences which broadens their understanding of what professional practice involves.^{2,5} Clinical radiographers support student learning and teach clinical skills, including patient care and effective communication.¹¹

Due to the crucial role of diagnostic radiography in patient diagnosis, most hospital patients, both in-patients and out-patients, undergo medical imaging at some point. Furthermore, in low- and middle-income countries like South Africa, there are high numbers of critically ill or seriously injured patients admitted for trauma and emergency¹² who require imaging. As a result, diagnostic radiographers and radiography students often encounter patients who are experiencing elevated levels of pain, stress, or anxiety due to their symptoms and potential diagnosis. This compels radiographers to deliver high-quality patient care to alleviate the patient's anxiety and stress.⁹ Additionally, in the patient-centred healthcare approach, effective engagement and good patient care by radiographers and radiography students are vital.^{13,14} Yet, radiography students find engaging with patients in critical conditions stressful, which might limit their ability to provide effective patient care.¹⁵ Therefore, students require professional skills for effective clinical engagements, which can be developed as a component of professional socialisation.¹⁶

Previous studies have explored the importance of professionalism in radiography, examining the professional values and skills of diagnostic radiographers.^{6,8,16–19} Naylor et al. investigated the transition from radiography student to practitioner, highlighting aspects of professional socialisation,³ while Al-Maslahi focused on the professional socialisation of radiographers.²⁰ Another study examined experiences of radiography students transitioning from the classroom to their first clinical placement, focusing on their early professional socialisation.²¹ To the authors' knowledge, no prior research has investigated the professional socialisation of diagnostic radiography students throughout their study period from first to final year. Thus, this research aimed to explore how diagnostic radiography students are socialised in the clinical environment with a focus on the role of communities of practice.

Methods

This was a qualitative, exploratory, and descriptive research study conducted to gain understanding of the professional socialisation of diagnostic radiography students in the clinical environment with a focus on the role of communities of practice, from the perspectives of qualified clinical radiographers and final year students.

Research context

The study was conducted at a higher education institution in South Africa. The institution offers four-year undergraduate Bachelor of Science (BSc) programs in the four categories of radiography: diagnostic radiography, radiation therapy, diagnostic ultrasound, and nuclear medicine technology. The radiography qualification is a four-year Professional bachelor's degree, combining academic and clinical learning through a pedagogical approach of work-integrated learning (WIL).²² Diagnostic radiography students undertake clinical learning at various clinical sites, approved by the Health Professions Council of South Africa (HPCSA) from the first year of their studies.

Research population and sample

Because this study focused on the professional socialisation of students in the clinical environment, the population included qualified clinical diagnostic radiographers (diagnostic radiographers who have a formal qualification in diagnostic radiography and are in clinical practice) and fourth year diagnostic radiography students. Students who were invited to participate were registered at the higher education institution and on clinical placement, while the qualified radiographers who participated were working at medical imaging departments where students undertook clinical learning. Qualified radiographers not involved in student clinical training were excluded.

Data collection

Data was collected through three focus groups, which consisted of five to six students per group, and seven individual (one-on-one) interviews with qualified radiographers. All focus groups were conducted online via Zoom while interviews were conducted face to face at various locations based on participants' preferences, outside their working hours to avoid interfering with their work. Both the focus groups and interviews were unstructured, incorporating a single open-ended question to promote open discussions. This format allows for in-depth exploration of participants' views and experiences, probing when necessary, resulting in the collection of information-rich data.²³ Discussions started with an explanation of what is professional socialisation to ensure participants understood the meaning of the term for relevant discussions. For focus groups, the central question was, "Can you tell me about your experiences of being socialised into the diagnostic radiography profession?" For interviews, the central question was "Can you tell me about your experiences of socialising diagnostic radiography students into the profession?" All interviews and focus groups were audio recorded and transcribed verbatim by an independent transcriber.

Data analysis

Data analysis occurred concurrently with data collection to determine the end point to data collection.²³ The data was thematically analysed²⁴ using the framework approach which allowed for the identification and interpretation of themes across the two data groups.²⁵ The analysis process involved seven steps:²⁵

- 1) Transcription: Focus group and interview data was transcribed verbatim.
- 2) Data Familiarisation: Transcripts, audio recordings, and field notes were repeatedly reviewed to gain familiarity with the data.
- 3) Coding: Initial codes were generated from interview data, refined, and combined to create subthemes and themes.
- 4) Analytical Framework Development: An analytical framework was constructed using the developed subthemes and themes.

- 5) Application of the Analytical framework: The analytical framework was applied to the separately coded focus group data.
- 6) Data charting: Data was organised within the analytical framework by themes and participant groups; appropriate verbatim quotes were attached.
- 7) Data Interpretation: Subthemes and themes were described to facilitate the interpretation and comprehension of the data.

Trustworthiness

The four principles of trustworthiness were employed: credibility, dependability, transferability, and confirmability.²⁶ Credibility was ensured by using methods such as triangulation between field notes and interview data and member checking, which involved summarising and paraphrasing participants' statements during interviews to confirm correct understanding.²⁶ In addition, member checking also guaranteed confirmability of findings. Dependability was achieved by employing reflexivity and bracketing, and providing verbatim quotations of participants.²⁶ Finally, an audit trail (a detailed description of the research process, participants, and setting) was kept, ensuring confirmability and transferability.²⁶

Ethical considerations

This study received ethical approval from the research ethics committee of the relevant higher education institution (HW-REC 2021/H35). All participants provided voluntary informed consent for participation in the study and recording of interviews. Additionally, focus group participants and the independent transcriber signed confidentiality agreements. Participants were reminded of their right to withdraw from the study at any point without consequences, even after granting informed consent. To safeguard participants' privacy, personal identifiers revealed during the interviews were removed from the collected data, and a unique code was assigned to each participant. All data was stored on a password-protected computer.

Findings

Sixteen diagnostic radiography students and seven clinical diagnostic radiographers participated in the study. Table 1 provides details of the interviews and focus groups.

A key theme that was generated from the data was radiography community involvement, with four subthemes: shared responsibility for learning and teaching, critical reflection and

Table 1
Interview and participant information.

Interview/ focus group	Duration in minutes	Participant information Participant/s (P); Male (M); Female (F)	Number of years of clinical experience
Interview 1	29	F	2
Interview 2	44	F	>20
Interview 3	24	M	2
Interview 4	28	F	>20
Interview 5	28	F	13
Interview 6	37	F	10
Interview 7	29	F	4
Focus group 1	47	5 P (2 M & 3 F)	4th-year students
Focus group 2	57	5 P (3 M & 2 F)	4th-year students
Focus group 3	56	6 P (0 M & 6 F)	4th-year students

lifelong learning, interpersonal skills, and empathy and consideration for students (Fig. 1). The radiography community involvement theme portrays the participants' perspectives regarding the involvement of all individuals within the radiography community in facilitating students' professional socialisation. In the context of this research, the radiography community includes clinical radiographers, radiography lecturers (academic educators), clinical instructors, radiologists, and radiography students. Participants emphasised the value of involving all community members to nurture students' growth and development.

The subthemes are presented with supporting verbatim quotes from the participant data. Verbatim quotes from interview participants are indicated by the "IP" code followed by a participant number, while quotes from the focus group participants are indicated by the "FG" code followed by a focus group and participant number.

Shared responsibility for learning and teaching

The current study participants perceive diagnostic radiography as a profession that necessitates teamwork. Consequently, the socialisation process for students also requires a collective effort with everyone, including students themselves, having a role to play.

"It is important for them [students] to learn from everybody because they're learning a technique but then they're also learning how individuals treat patients, or they speak to like doctors or nursing staff" (IP1).

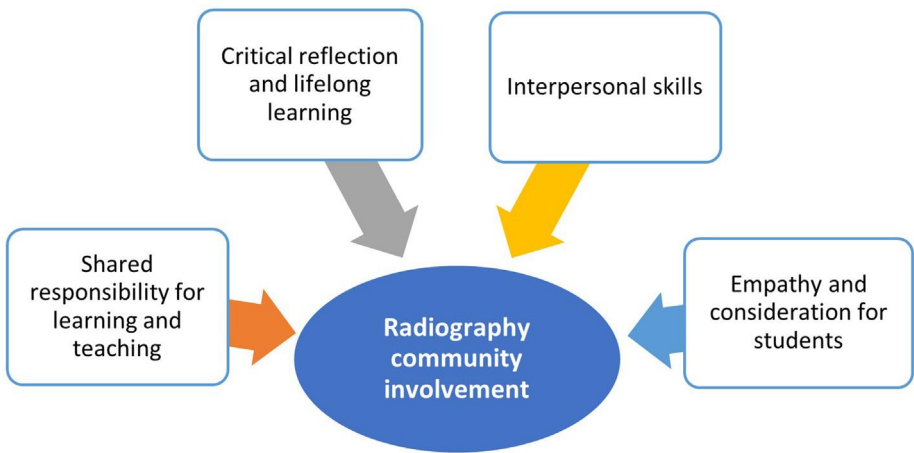


Figure 1. Subthemes under the “Radiography community involvement” theme.

"I felt like it's my responsibility now to go after the radiographers in the hospital to ask them, can you show me how to do these?" (FG1P4).

Critical reflection and lifelong learning

The current study found that students reflect on and analyse their actions and those of health care professionals around them (here interpreted as critical reflection) to distinguish right from wrong and resolve to learn and internalise only the right skills which they will carry into professional practice.

"I can differentiate also amongst the staff members if they are doing what's right or what's wrong (FG2P1)

"So only when you get to fourth year you actually start deciphering for yourself that this is the right way, and this is maybe not the correct version of doing it. So, then you start building the confidence, okay let me start doing it the proper way instead of just watching what others are doing and doing that" (FG3P1)

The data under this subtheme further revealed that participants regard healthcare generally and radiography more specifically as an ever-changing profession which requires radiographers to engage in continuous lifelong learning to keep up to date with the changes. As future radiographers, students should become lifelong learners.

"... healthcare is always evolving, information and things change, and therefore, one should be flexible to accept new information that comes through, always be open to accept that, okay, things are changing, and this is how we are doing things now." (IP6)

"Even now, as qualified radiographers – we are still learning every day so, our profession is not a, I'm a qualified radiographer. Now I'm finished learning". (IP2)

Interpersonal skills

According to the participants, effective engagements in the radiography community involve interpersonal interactions between patients, radiographers, students, and other healthcare professionals. These interactions necessitate interpersonal skills such as communication (including listening skills) and respect.

"One other thing we were taught in theory, and we had to practice it in the clinical, was how to work with staff members from different fields, not just radiographers, and be able to communicate" (FG1P2)

"Other skills that students would need to encompass as radiographers is listening - listening skills ..." (IP6)

"We are all basically a team because you can have the dynamic of 'You are the student, and you just need to do what I say.' That is not going to help everybody [...]. Respect each other." (IP5)

The following quotes suggest that additional training is needed despite students being taught interpersonal skills.

"I think students need to get taught how to deal with superiors because when it comes to these clinical situations ... if you are a student and especially in first year you don't know if it is in your right to say something" (FG3P1)

"... we were not prepared for dealing with "psych" patients. I think if that could also be incorporated into the modules from

first year it would be nice because I think until third year, I was personally very scared to deal with psych patients because I didn't know what to expect." (FG3P2)

Empathy and consideration for students

The data under this subtheme indicated that some clinical radiographers are considerate of students' situations and circumstances. These radiographers understand the students' need to learn and have patience with them. They show empathy and make students feel comfortable.

"You need to let the students understand that they can ask you even if they've done it 50 times, if they're unsure they must be able to come ask you. They must be able to tell you and if there's anything, for instance, that may interfere with them being able to do it, they must be able to feel free to talk to you" (IP3)

"... interacting with the radiographers and the other students was also a bit of work at first, because you have to get used to their work ethics and the way they like things to be done. [...] some people were really patient with me" (FG2P3)

"I've noticed as of late, there's a lot of students that are coming through that have mental health issues like anxiety, and you can see that it does put them at the back foot of the other students, [...] those are the students that I kind of try and take under my wing and try and make them comfortable with the procedures in the department." (IP5)

However, the following quote revealed that radiographers are not always empathetic and considerate towards students:

"So, this staff member was asking me questions about the contrast media, all the procedures they do there, and at that time, I didn't know and we had not yet covered that section in the theory work [...] and then when I didn't know, she kind of lashed at me, she wasn't happy, she was like I don't belong there" (FG1P2)

Discussion

This study investigated the professional socialisation of diagnostic radiography students in the clinical environment with a focus on the communities of practice. These communities consist of individuals who share common interests and passions in specific subjects or professions. Participation in such communities fosters the development of identities and a sense of belonging.⁷ Through ongoing, mutual interactions, members collaboratively learn with and from one another.⁷ Effective learning in these communities depends on strong relationships, which facilitate the sharing of tacit or experiential knowledge—skills and abilities gained through experience that are often difficult to communicate verbally or in writing.²⁷

The study findings demonstrated the key role of the various members of the radiography community in the professional socialisation of diagnostic radiography students and this discussion expands on the aspects of this community involvement.

Shared responsibility for learning

Diagnostic radiography education in South Africa is regulated by the Health Professions Council of South Africa (HPCSA). All radiographers must be registered with the HPCSA to practice in South Africa. According to the HPCSA's Scope of Practice for Diagnostic

Radiographers, student training and clinical supervision are among the professional duties of radiographers.²⁸ Consequently, all clinical radiographers at hospitals affiliated with the research site supervise students while also performing routine radiographic tasks. This dual responsibility creates competing demands between providing high-quality patient care and dedicating sufficient time to teaching students, especially during periods of high workload, often to the detriment of student learning.²⁹ For example, a study conducted in Australia found that radiographers often resort to having students learn through observation during busy periods as there is insufficient time for direct teaching.³⁰

The current study found that all radiographers at the different clinical sites to which students rotate for their clinical learning were engaged in the clinical supervision of students. Learning under the supervision of various supervisors has been reported to negatively affect student learning.²¹ This could be due to varying teaching styles and expectations. Being supervised and taught by different clinical radiographers can also hinder trust relationships between students and clinical radiographers³¹, which are considered critical aspects of clinical learning.²⁹ Conversely, Patel posits that everyone, including lecturers, clinical radiographers, students, and patients, has valuable knowledge to share.³² The above sentiments were echoed in a study which found that students learn from qualified radiographers, senior students, and patients.³³ Through interactions with patients, students develop professional skills like effective communication and patient care.¹⁰ These studies^{32,33,10} demonstrate that professional socialisation of diagnostic radiography students involves a shared responsibility between different members of the radiography community, in alignment with the findings of the current study.

Teamwork is a crucial component of professional practice in both nursing and radiography.^{34,35} In radiography, effective teamwork can ensure that radiographic examinations are conducted safely and efficiently, particularly in complex situations.³⁴ For instance, a study by Mankanjee et al. revealed that discussing examination approaches with colleagues allows radiographers to receive valuable feedback for improving task execution.³⁴ Beyond its importance in professional practice, teamwork is also essential for the professional socialisation of nursing students³⁵. This aligns with the current study's findings and Patel's assertion on the value of shared experiences among students and diverse radiographers, as everyone possesses valuable insights.³² While different members of the radiography community contribute to the socialisation of students in various ways, it is the students' active involvement, motivation, and enthusiasm for learning that plays a crucial role in their professional socialisation.^{29,36} Previous studies reported that radiography and nursing students value opportunities to participate in a team; they find this participation to be motivational and instrumental for their learning in clinical practice.^{33,35,37,38} The current study also uncovered that students were eager to learn and actively participated in their learning, which is fundamental for effective professional socialisation.

Critical reflection and lifelong learning

Shin et al. define critical reflection as an ongoing process that allows healthcare professionals to think critically about and reflect on their behaviours and experiences to improve future practices.³⁹ Radiographers employ critical reflection to resolve difficult clinical situations.⁴⁰ In addition, radiography students use critical reflection to examine their experiences in the clinical environment and, from this, determine best or future actions. This enhances their professional skills and competencies.⁴¹ Critical reflection can also help students navigate past the challenges associated with the adverse effects of hidden curricula, such as negative role modelling⁴², thus enabling effective professional socialisation. Student participants of

the current research described employing critical reflection to determine correct behaviour.

Critical reflection fosters continuous professional development (CPD) and lifelong learning, ensuring that radiographers remain professionally competent and relevant.³⁶ Lifelong learning and CPD are indispensable in diagnostic radiography considering the rapid technological advancements in the profession.⁴³ Moreover, radiographers who exemplify a commitment to lifelong learning play a crucial role in facilitating the acquisition of appropriate professional behaviour among students.⁴⁴ Radiographers recognise the significance of CPD, as an example, previous studies carried out in South Africa and England demonstrated that most radiographers regarded CPD as essential for the ongoing enhancement of their knowledge base.^{45,46} Similarly, participants of the current study acknowledged the importance of continuous professional development or lifelong learning in diagnostic radiography. This data implies that critical reflection and lifelong learning are essential in the professional socialisation of diagnostic radiography students.

Interpersonal skills

Interpersonal interactions are at the core of healthcare professions, including diagnostic radiography. They promote patient-centred care, student learning, and continuous professional development.^{9,10,47,48} These interactions require interpersonal skills such as effective communication (which includes listening, observation, and imitation skills) and respect.³² In diagnostic radiography, effective communication is central to building a good relationship in the short time that is usually spent with a patient.^{9,10} Radiography students learn how to communicate with patients by observing and listening to radiographers in practice.^{18,32} As such, good interpersonal skills are considered agents of professional socialisation.³⁵

A study conducted in Ghana found that radiography students regard effective communication and showing respect towards patients, radiographers, and their peers as key indicators of professionalism.⁴⁸ In another study, patients indicated that they appreciated being listened to and treated with respect.⁹ They reported elevated levels of comfort and confidence in a radiographer's abilities when effective communication is employed.⁹ These studies highlight the need for students to develop good interpersonal skills for effective engagements with patients and other healthcare professionals and for their effective professional socialisation.

Empathy and consideration for students

Empathy can be defined as the ability to show sensitivity and understanding towards other people's situations and difficulties.⁴⁹ It is one of the foundations for positive interpersonal interactions.⁴⁷ Therefore, empathy enhances relationships between patients, radiographers, and students.⁴⁷ Furthermore, a caring relationship between radiography students and clinical supervisors promotes a conducive environment for student learning.⁵⁰ This aligns with the communities of practice theory which posits that good relationships between members of a community are essential for effective learning.⁷

Previous studies revealed that radiography students regard empathy, caring, approachability, friendliness, understanding of students' backgrounds, and patience with students as desirable qualities of an ideal clinical instructor.^{50–53} Similarly, clinical radiographers in a study conducted by Thompson and Taylor listed empathy and friendliness as important traits that clinical supervisors should possess.³⁰ Another study found that clinical radiographers were accommodating towards students with learning difficulties and offered support to those with social problems and learning difficulties.⁵⁴ These studies indicate that empathetic

clinical radiographers are crucial in the professional socialisation of students.

Limitations

This study, conducted at a single institution in South Africa, provides foundational information on the roles of members of the radiography community in the professional socialisation of diagnostic radiography students. The findings may only be transferrable to similar contexts.

Conclusion

The findings highlighted the crucial role of the radiography community in facilitating effective professional socialisation of diagnostic radiography students. To be effectively socialised, students must be actively engaged in their learning. A supportive learning environment created by lecturers and clinical radiographers could motivate students to play an active role in their socialisation process. Students should also be encouraged to become reflective practitioners to enhance their professional competence and socialisation.

Recommendations

Clinical radiographers play a vital role in the clinical supervision and professional socialisation of diagnostic radiography students. Therefore, it is recommended for higher education institutions that offer radiography qualifications to support these radiographers in acquiring skills that will enhance their clinical teaching and enable optimal socialisation of students. The support can be in the form of online teaching development and mentorship workshops and yearly induction.

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Conflict of interest

There is no conflict of interest to declare.

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