



International student mobility in diagnostic radiography: Benefits and pitfalls

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ABSTRACT

Introduction: International student mobility (ISM) is increasingly utilised in higher education to allow students the opportunity to engage authentically with cultures outside their own, providing an opportunity for self-growth. These growth opportunities often extend skills such as cultural competency, academic learning and self-efficacy, all of which are important skills for diagnostic radiography graduates. This study explores the motivations, benefits and pitfalls of an ISM program and highlights key considerations for academics considering organising a program within their own university.

Methods: This study utilised a combination of individual and small group interviews to collect data about diagnostic radiography students' motivations, perceived benefits and pitfalls of undertaking ISM. Data were analysed using reflexive thematic analysis and overarching themes were developed.

Results and discussion: Three themes were developed from the data, challenges and uncertainty, personal growth, and support. Participants undertaking ISM faced challenges such as cultural differences, as well as feelings of uncertainty. Additionally, they highlighted the importance of organisation in mitigating these challenges. Despite the challenges faced, participants reported significant personal growth and success as a result of the program, integral to this success was the support of their peers and academic advisors.

Conclusion: ISM programs may lead to enhanced employability of diagnostic radiography graduates, with integral skills such as teamwork, communication cultural competence being enhanced in participants. The role of support during ISM is integral to the success of the program. It is imperative for academics organising ISM programs at their institutions to deliberately consider the way in which radiography students are supported both before and during the program to enhance the experience and ensure outcomes are maximised.

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Introduction

International student mobility (ISM) is the movement of students between institutions in different countries for the purposes of learning.¹ It may vary in duration and the nature of study however students are often motivated to undertake ISM to self-explore

and develop a broad range of skills. The increase in accessibility and affordability in recent years has resulted in substantial increases in ISM.² In terms of the student experience, it has previously been reported that ISM during higher education allows them an opportunity to authentically engage with culture in their host nation.³

ISM during higher education has many reported benefits, particularly in the development and acquisition of skills typically associated with graduate employability. These skills are diverse, ranging from increased language proficiency, social skills, self-efficacy, cultural awareness and competence.^{4–6} This skill development is integral to produce effective and holistic diagnostic radiographers.

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Such skill enhancement was demonstrated in a systematic review by Waibel et al.⁴ which showed an increase in student language proficiency, social and intercultural skills while others have found that students who undertake ISM report improved self-efficacy, cultural awareness, and competence.^{5,6} Furthermore, Huffman et al.⁷ described the development of both personal and professional identity during periods of ISM along with an increase in global citizenship.

Whilst students taking part in ISM during higher education are likely to be more upwardly mobile in their careers there is some suggestion that this may also be affected by the personality, social and academic traits of those that self-select in ISM programs.^{4,8,9} Zimmermann and Neyer¹⁰ found that students who elect to undertake ISM are typically extraverted, open, and conscientious. Additionally, undertaking ISM is associated with positive increases in openness and agreeableness as well as an associated decrease in neuroticism.

A previous study utilised a mixed-methods approach to report on the experiences of radiography students undertaking ISM and found that students gained professional knowledge, deepened their international perspective and developed personally.¹¹ Outside of this study, ISM programs in diagnostic radiography remain largely unexplored. This study seeks to build on current knowledge, exploring student motivation, and the benefits and pitfalls of international exchange in an undergraduate diagnostic radiography program. It will assist academics seeking to set up an ISM program within their own university, highlighting key considerations.

Methods

Qualitative approach and research paradigm

This study was approached from a social constructivist viewpoint. The authors believe that knowledge and learning are shaped by context and collaboration.¹² This lens fits particularly well given the nature of the subject material is innately related to the social context in which learning is occurring for participants.

Context

The study sites were two Universities, one located in Oslo Norway and one in Nova Scotia, Canada with an exchange program that was established in 2016. These sites were chosen due to their pre-existing and well-established ISM program. Data were collected in 2023 from students who undertook the program in 2021 and 2022. Each year Norwegian and Canadian students have participated in a 3-month exchange. During this time, students primary focus is the preparation of a thesis and some also participated in a short clinical placement.

Data collection and sampling strategy

To be eligible to take part in the study, participants were required to have undertaken the exchange program thus were purposefully selected and invited to be interviewed via email. To mitigate any perceived coercion, this contact was made by a member of the research team that was not linked to the exchange program.

This study explored the motivations, benefits, and pitfalls of an ISM program to highlight key considerations for organizing this program within their university. In our study, we predominantly used focus groups to allow the representation of multiple perspectives, while acknowledging possible key information or discrepancies between focus group members. The included participants were bound by their common experience of being in

an ISM program together, and the focus group data collection allowed them to discuss and share their individual experiences. However, some of the participants were not able to meet in groups and two of our participants were interviewed individually using the same semi-structured interview guide and interviewer.

Data were collected through a combination of individual and small group interviews (maximum 3 participants). A semi-structured interview template was developed (see Table 1) which aimed to explore students' experiences of exchange, from preparation to reflections on the experience. Two individual interviews and two group interviews were conducted by a team member, CT, who has not been involved in exchange program. Interviews were conducted via the video conferencing system Zoom in the spring and autumn of 2023 (June–August), in line with the internal guidelines for using Zoom in research interviews at Oslo Metropolitan University (OsloMet). By utilising a team member who was not involved in the exchange program, participants were able to speak freely about their experiences of the program. The interviews lasted approximately 45 minutes each. Audio from the interviews was recorded and the interviews were anonymized and transcribed by a professional external transcriber. The information was treated confidentially, and all recordings were deleted once transcribed.

Data analysis

Data were analysed using reflexive thematic analysis.¹³ Reflexive thematic analysis was chosen as it offered theoretical flexibility, allowing the data to be analysed in a manner that remained true to the authors epistemological viewpoint. The first author (LDM) undertook the process of data familiarisation by initially reading transcripts of the interviews several times.¹³ Codes were generated systematically from data segments and from these codes initial themes were explored. An iterative process was then undertaken whereby codes, segmented data and full transcripts were revisited and themes revised. Data were analysed utilising an inductive, latent approach to explore the truth within participants experiences and how these impacted on their education as diagnostic radiography students. In order to enhance trustworthiness of the data analysis, the first author (LDM) kept a reflexive journal to monitor the assumptions and to actively monitor reflexivity throughout the process.^{13,14}

Results and discussion

Table 2 describes the participant characteristics. All participants were student diagnostic radiographers who originated from either Norway or Canada and participated in an exchange program with the partner university prior to the interview. Each of the participants travelled to their host country in the final stages of their study program and worked on a project related to student thesis in partnership with students from their partner country. The students from Norway spent 3 months in Canada, whereas the Canadian students were in Norway for 1 month.

Three overarching themes were developed during data analysis: Challenges and uncertainty, personal growth, and support.

Challenges and uncertainty

This theme explored the challenges that participants faced when undertaking their ISM program, from basic organisational challenges to deep rooted feelings of uncertainty. They described their experiences of culture and language and the impact this had on their ISM program. Table 3 provides a summary of quotes representing this theme.

Table 1
Exemplar questions from semi-structured interview template.

Topic	
Understanding motivations	<ul style="list-style-type: none"> • Could you tell me a little about what made you decide to complete the exchange program? • What did you hope to get out of the program before starting?
Benefits of exchange	<ul style="list-style-type: none"> • What do you think was the biggest benefit in taking part in the program? • Now that you've completed the program are you happy with your decision to undertake it?
Potential pitfalls	<ul style="list-style-type: none"> • What advice would you give a student who is completing the program this year?

Table 2
Participant characteristics.

	Date of interview	No of Participants (n)	Female	Male	Exchange duration	Home country	Exchange country	Type of interview
Interview 1	June 2023	3	3	0	3 months	Norway	Canada	Group interview
Interview 2	August 2023	3	1	2	3 months	Norway	Canada	Group interview
Interview 3	August 2023	1	1	0	1 month	Canada	Norway	Individual interview
Interview 4	August 2023	1	1	0	1 month	Canada	Norway	Individual interview
Sum		8	6	2				

Participants unanimously described the importance of organisation and preparation with descriptions of both positive and negative experiences resulting from their individual preparation. This preparation included both practical organisation in terms of travel and additional preparation as it related to their thesis. They frequently emphasised the importance of preparation in response to the question “what advice would you give a student who is completing the program next year” further highlighting its perceived importance. Participants described the process of preparation as time consuming and found challenges when undertaking tasks such as finding appropriate accommodations and life skills like budgeting. Whilst exchange expenses were supported by the University as an equity measure, students were still responsible to ensure they budgeted appropriately for the duration of their stay.

Some participants reported feelings of anxiety, uncertainty and doubt often prior to the commencement or in the early phases of the ISM program. These feelings were often magnified by cultural differences and the absence of usual support networks and in some cases mitigated by supportive supervisors which will be further

discussed in the support theme. These included differences in the ways of learning and additionally of clinical practice.

The cultural differences reported by students included language difficulties for both spoken and written language which is consistent with literature on the topic.¹¹ Participants reported feelings of isolation due to their language difficulties and cultural differences and this was consistent among participants from both countries of origin. Additionally Norwegian students reported challenges particularly with academic writing in another language. Participants reported overcoming these challenges and the personal growth that is associated with their success, this is further explored in the personal growth theme.

Personal growth

This theme explored personal growth, both as a motivating factor for undertaking the ISM program and as a result. This theme is consistent with substantial literature in the field that reports short term outcomes such as enhanced personal enrichment, increased confidence, self-reliance, and self-efficacy.^{7,15,16} This

Table 3
Summary of quotes for challenges and uncertainty theme.

Category	Description	Quote
Organisation	Participants described organisation and preparation as integral to the success of the ISM program and described difficulties when sufficient preparation was not undertaken.	“if you're not organised it can be extremely difficult” – Participant G “Start early with everything. (Laughing) Because in terms of visas and tickets and housing, everything takes a lot more time than you think it will take.” – Participant A “look for housing as soon as possible and take a look at the budget” – Participant D “when we arrived it felt like we were – we felt more ready” – Participant A
Feelings of uncertainty	Participants reported feelings of uncertainty prior to and during the initial phase of the ISM program.	“everyone has doubts, you go to a foreign country, you think ‘oh no, everything is new, there's new people, you don't know anything, you don't know the rules, but you will eventually get used to it” – Participant B “when you're a student you're taught something, and you just think that's the way it is, but once I started this project, I realized how different it could be outside of what you're taught so for me, it made me think about, yeah, just about how different other hospitals could be and how much you can improve your department” – Participant H
Cultural differences	Participants described language difficulties and cultural differences that surprised them during the ISM program.	“I remember one of the professors talking in Norwegian and we're like ‘what are you saying? We can't speak Norwegian’ and it felt kind of isolating because we wanted to know what to do” – Participant G “One thing that was interesting was to see how Easter break is not really a thing in Canada, and in Norway you take a whole week off” – Participant F

personal growth has been linked to enhancing the transition between student and healthcare professional and often makes for more well-rounded graduates.¹⁷ Regardless of whether participants had identified personal growth as a motivator, most participants described personal growth attained through the opportunity to challenge themselves, travel and learn from others and described a sense of success after having completed the program. Table 4 provides a summary of quotes representing this theme.

Participants explicitly and implicitly described the desire to challenge themselves as a motivating factor for originally undertaking the ISM program. The nature of this challenge varied significantly between individuals and included tackling new social experiences, to academic challenges centred around learning in new environments to exploring at a deep level language and cultural differences. Consistent with existing literature, participants were widely open to tackling these challenges¹⁰ and described a sense of empowerment and enhanced multicultural effectiveness after doing so.^{18–20}

An openness to learning and to new experiences was clear from the participants. They described learning deeply in broad contexts during the ISM program and consistently described the positive effect of learning in these different environments. These experiences allowed participants to compare and contrast both academic learning and, in some cases, clinical practice utilising “the unfamiliar as impetus for learning” as described by Shoulian et al.²¹ Participants noted practical differences in the application of radiography techniques across the countries and described this exposure as beneficial to their growth as professionals. Findings of professional development have been well reported in ISM literature with one integrative review finding this a common theme amongst qualitative papers in the area.²⁰ The participants described feelings of pride over their personal successes resulting from their growth

throughout the duration of the project indicating that many succeeded in their goals.

The skills developed during the ISM program such as teamwork, communication, language and interpersonal skills are often linked with perceived employability.¹⁵ In addition, these professional skills are integral in the development of radiography students into well rounded professionals. These skills are arguably more important than pure technical skills and are often considered to be more difficult to teach.

Support

Participants described how important support was to their success in the ISM program. This support took on many forms with a deep sense of connectedness and comradeship apparent from students who had undertaken the program together. Further, participants described the importance of academic support both in their home country whilst undertaking preparation and in their host nation throughout their period of mobility. Table 5 provides a summary of quotes representing this theme.

As previously noted, many participants discussed feelings of uncertainty in the lead up and during their ISM program. Support was clearly identified by all participants as a significant mitigating factor and took many different forms in the absence of usual support networks. Participants described the nature of supervisory support as integral to the success of their program. Supervisory and structural support are imperative to the success of ISM programs.¹⁵ By effectively providing this support to students the program was able to produce positive outcomes that helped to develop these student radiographers into more well-rounded, connected professionals.

Table 4
Summary of quotes for the personal growth theme.

Category	Description	Quote
Challenging self	Participants described the concept of challenging themselves and personal growth.	<p>“At the time, sometimes it could get a little frustrating and challenging, but after completing it, it was like, I felt very accomplished.” – Participant H</p> <p>“I want to have the experience and kind of face off this kind of challenge. I personally framed it for myself, for my own part as a bit of a personal challenge and personal growth opportunity.” – Participant C</p> <p>“A little bit was the language part of it, I mean, we read and we write English a lot but rarely do we get to speak it that much so I felt like this was a chance to see how it is, talking in English every day, working with Canadian students and supervisors, kind of in a more professional setting, to see how that kind of challenge, how I was able to face that, so language was a part of it, definitely. And going abroad and spending enough time to get settled in, into kind of a daily rhythm and routine while working on a project, kind of immersing ourselves a little bit, both in the university setting and but also just in a completely different country.” – Participant C</p>
Learning from others	Participants described diverse learning experiences as a result of ISM with positive attitudes.	<p>“My motivation was the same, to experience something new and to experience a different country and how the system works and to participate in learning how different hospitals in the world operate.” – Participant F</p> <p>“in Nova Scotia, when we give contrast for a thorax CT, it's always based off weight, regardless of if the patient is muscular or overweight, so it made us realise that contrast can go through the patient's body differently ... I thought it was very beneficial, that I felt like I potentially could be a part of changing our department in the future.” – Participant H</p> <p>“we did write the paper in English, which the other groups didn't do but like we said, we had help from the other Canadian students to nail down the correct grammar and the wording, so they helped us a lot there.” Participant D</p> <p>“Probably the biggest benefit was just learning about other peoples' health care systems and the way that – we got to go to Norway, so being able to experience that and how their hospital works and learning about different protocols in different hospitals” – Participant H</p>
Personal success	Participants described pride in the work that they had completed and a sense of success.	<p>“It taught me how to engage with other professional individuals and how to time manage” – Participant H</p> <p>“just to be immersed in the culture and be able to present on a project that you worked so hard on was, like, an incredible opportunity that I will never have again in my lifetime, it's like a once in a lifetime opportunity” – Participant G</p>

Table 5
Summary of quotes for the support theme.

Category	Description	Quote
Supervisory support	Participants described the importance of support during the lead up to their period of ISM Participants described the benefits of supervisor support within their host nation during their mobility period. “they knew exactly what we needed to do and could help us answer any questions, because things would come up, practical things, admin stuff, so, yeah, we got a lot of help with that.” – Participant A	“she was always there to help us and gave us people to communicate with, so, I felt supported” – Participant H “we got a lot of help from the faculty, we attended the information meeting which was really helpful”- Participant A “when you're in a foreign country you don't know who you can lean on, you don't know the systems there, so that was really nice to know that there was someone there that was available to help if we needed anything.” – Participant C
Friendships		“it definitely made myself and (the student) that I did the project with closer and, yeah, at the end of it, it was like I was going on a trip with my best friend.” – Participant H “you always have someone else there that is going through the same thing as you, so that's nice to know that you have someone there so you're not going through it alone if you're starting to feel homesick or something, so, that was really nice to have you guys there, it was like, I can get through this.” – Participant C

Likewise, they discussed developing their own peer support networks that developed into meaningful friendships throughout the program. These friendship networks predominantly existed within groups of students undertaking their ISM program at the same time, as opposed to friendship formation with host nation students. This was potentially exacerbated by language and cultural differences reinforcing barriers to friendship formation and is quite common in ISM.^{22,23} Additionally, as students undertook the program in groups, this potentially impacts their decision to form social networks with co-nationals as these are formed quickly after arrival in a host country.²⁴ Potential strategies to mitigate this include training for host students and providing opportunities for meaningful interaction beyond the classroom, especially during the orientation phase of the program.²² By implementing these strategies, we help to form strong international partnerships within the field of diagnostic radiography, allowing for continuation of shared practices and professional discussions.

Study limitations

This study was limited by the small sample size which may limit the transferability of the findings to different populations. This limitation was a function of the small potential pool of eligible participants. Further research in broad setting will help to confirm whether the nature of these findings is reflective of a broader international experience.

Academic reflections and advice

Over the years the ISM program has evolved, iteratively improving based on the experiences of organisers and feedback from students. This section seeks to share some of these experiences to assist other academics that may wish to organise an ISM program at their university. When the ISM program was initially set up, acceptance criteria for students was based purely on academic scores. The use of a singular criterion for acceptance was deemed inadequate and was subsequently altered to admission via both academic score and an interview which has proven much more successful.

The experience of international co-supervision of students can be challenging and requires clear and open lines of communication to ensure success. Supervisors require flexibility, often working across time zones to ensure the success of the ISM program. Workload is at times heavy, and partners need to be mindful of communication styles and agree on a shared division of labour, leveraging each other's strengths. Shared value of the partnership

must also be present in order to support success of the project. Despite these challenges, the high levels of achievement and success seen amongst ISM participants is highly rewarding.

Additionally, the ISM program has established relationships and has created networks with academics internationally which have also been described in other literature relating to ISM.¹⁹ These relationships have fostered not only prolific collaborations but also developed global friendships with those working in a similar field internationally, allowing the organisers of the program opportunities to also travel and work together more broadly.

Conclusion

This study explored the benefits and pitfalls of an ISM program in an undergraduate radiography program. It found that students experienced challenges, particularly around culture and language, when undertaking the ISM program. Despite these challenges students rose to the occasion and as a result experienced significant personal growth and an increase in skills such as teamwork, communication and cultural competence, all of which are associated with increased employability. In order for ISM programs to be successful, the role of support is integral and must be considered carefully during the planning phases of the program to ensure that the benefits of the program may be enhanced.

Conflict of interest statement

None.

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