ESSAY

Simulation for social integration

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ABSTRACT

Social integration may be divided into three categories: absorption of newcomers, merging of two or more groups and increased group cohesion. This essay presents four case studies which layer pertinent conceptual frameworks to explore how four immersive simulation programmes might influence social integration: the refugee doctors' programme, an interprofessional programme for trainee pharmacists and medical students, an internal medicine trainee bootcamp and an *in situ* simulation programme for primary care. It describes some of the features of immersive simulation that may be linked to improved social integration, such as attention to psychological safety, flattening of hierarchy, co-experience of positive affect, cultural compression, social learning and constructive alignment of intended learning outcomes. It is hoped that by presenting these theoretical concepts and making the links explicit, this essay may inspire further research targeting the potential for immersive simulation to both explore and enact social integration.

What this essay adds

- A new theoretical framework for types of social integration.
- An exploration of how immersive simulation might aid social integration.
- Four examples of immersive simulation promoting social integration.
- A description of the feature of immersive simulation programmes that align with the enablers of social integration.
- Theoretical concepts of social integration applied to simulation which may provide inspiration for future research.

Introduction

Scholars fail to agree on a clear definition of social integration. It has been variously described as the strength and extent to which people are socially linked [1–3], and as a **process** that can '*enable all people to participate*' [4], increase '*capacities for connectedness and citizenship*' [5] and '*make parts into a whole*' [6]. These excerpts provide a flavour of the various definitions available. Social integration is generally considered to be positive, and successful social integration is linked to improved mental health, to the extent that poor social integration is associated with an increased risk of suicide [7].

Most of the medical education literature concerning social integration is focused on workplace learning. Lave and Wenger originally described '*communities of practice*' [8], whereby people with a common interest learn together. They went on to describe '*legitimate peripheral participation*' [8], which emphasizes that

new team members can participate in low-risk duties in order to improve their social status. Building on this work, Dornan et al. produced a model of experienced-based learning, which theorized that active participation of medical students on the ward might increase their social status within the ward team [9]. At the highest level of participation, '*contributing to patient care*' helps medical students to build relationships with other healthcare professionals [10]. This research emphasizes the importance of participating within the workplace for increasing social status, and therefore improving integration into the team.

In contrast to workplace learning, simulation has not traditionally been recognized as beneficial for social integration. In this essay, we will present a new conceptualization of social integration, and discuss how it applies to simulation using four case studies from our own context.

A conceptual framework for types of social integration

When describing interventions for improving social integration, we find it helpful to divide social integration into three distinct categories, as shown in Table 1.

In the following case studies, we will layer additional conceptual frameworks to illuminate ways in which immersive simulation has the potential to promote the three types of social integration shown in Table 1. For each case study, we will present a description of the simulation programme, an appropriate social integration framework, a description and diagram explaining how the framework relates to our programme and a discussion of the features of simulation-based education (SBE) which may promote this type of social integration.

Case study 1: absorption of newcomers

Description of simulation programme
At the Scottish Centre for Simulation and Clinical Human Factors (SCSCHF), refugee doctors participate in an immersive simulation programme to aid their integration into the United Kingdom (UK) National Health Service (NHS). The course was developed in conjunction with the Bridges programme (a charity which helps refugees and asylum seekers) in Glasgow, UK [12] with guidance from the Vital Anesthesia Simulation Training (VAST) programme [13] in Dalhousie University, Canada. It incorporates six sessions including: an introduction to immersive simulation; development of a systematic approach to assessment and handover; collaboration with the multidisciplinary team; collaborative decision-making and two sessions devoted to assessing and treating acutely unwell patients.

Applicable conceptual framework
The Home Office is a UK government department responsible for immigration, security, law and order. Using the Home Office 'indicators of integration framework' [14], by Ndofor et al., created for understanding refugee integration, we can begin to understand how simulation has the potential to aid absorption of these newcomers into an established system. The report includes the following definition of integration:

Communities where people, whatever their background, live, work, learn and socialise together, based on shared rights, responsibilities and opportunities. [14]

The 'indicators of integration framework' includes four headings, each with between one and five domains. These include markers and means (work, housing, education, health and social care and leisure), social connections (bonds, bridges and links), facilitators (language, culture, digital skills, safety and security) and foundations (rights and responsibilities) [14]. Of these domains, we consider that several may be influenced by the simulation programme.

Applying the framework to the simulation programme
'Work' and 'education' are the areas in which the programme explicitly aims to help with integration. It provides education targeted at integrating refugee doctors into the NHS, and it aims to help them excel on work placements arranged with assistance from the Bridges programme.

Within the framework, 'social connections' include 'bonds' and 'bridges'. 'Bonds' are '*connections with others with a shared sense of identity*' [14]. During their time at the simulation centre, refugee doctors are connected through social media to other refugee doctors. They also form bonds with their colleagues during the simulation training. These bonds can be important in providing social support, a sense of their own identity and peers to help them rehearse for professional exams required for entry into UK medical training. 'Bridges' are '*connections with people of a different background*' [14]. Refugee doctors form bridges with the simulation facilitators, as well as other refugee doctors they may consider to be from a different background to themselves. These bridges may help when refugee doctors are looking for answers to questions about how the NHS works, and what they need to do to integrate.

Of the 'facilitators' described in the 'indicators of integration framework', improvement in language skills and a better understanding of NHS culture may be directly influenced by involvement in the simulation programme. Refugee doctors practice their verbal English speaking and comprehension skills during the course. One of the sessions includes an explicit discussion about language used in the UK healthcare system. Several of the simulations have learning objectives directly related to cultural expectations within the NHS, and more broadly within the UK, and discussion relating to cultural expectations features prominently within the debriefings.

The domains of the framework that may be directly impacted by involvement in the simulation programme are depicted in Figure 1.

Together with a team of researchers from both SCSCHF and Dalhousie University, we plan to explore these theoretical connections using qualitative research techniques, to better understand how the simulation programme might influence social integration in this group.

Features of SBE which may promote this type of social integration
Psychological safety: A qualitative study found that experienced debriefers attend to psychological safety [15].

Table 1: Depiction and description of three types of social integration (includes reference [11])
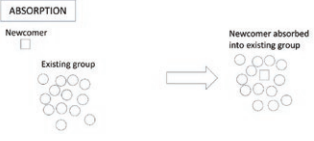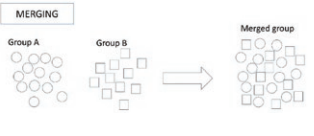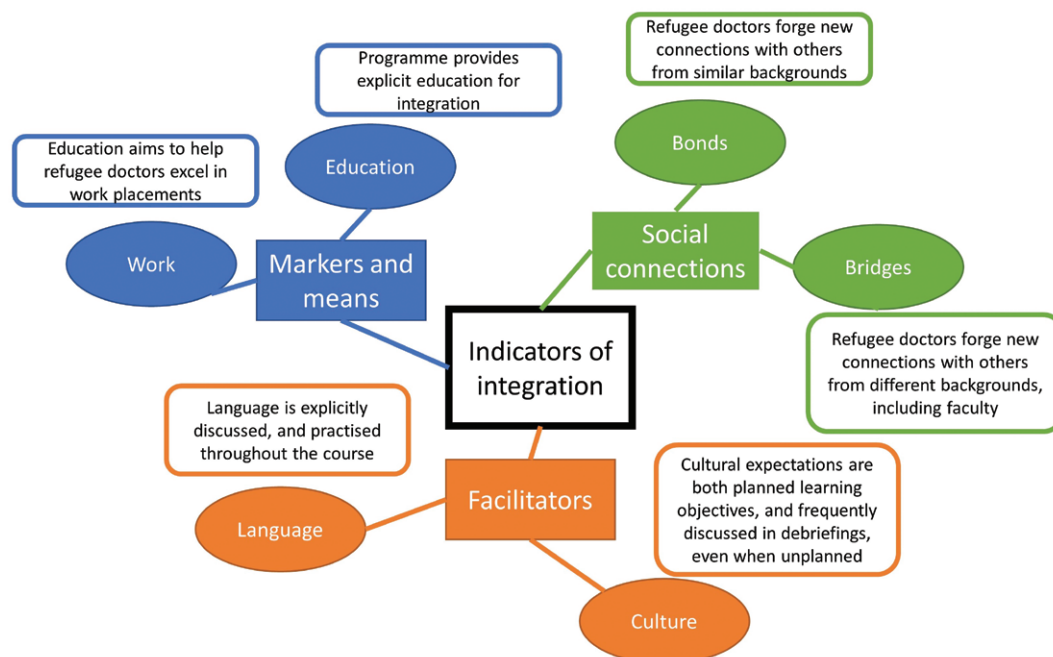
Type of social integration	Depiction	Description	Social integration definition	Real world example	Simulation example
Absorption of newcomers		An existing group absorbs newcomers	'*The process by which an individual is assimilated into a group*' [11]	A new pupil at a primary school is welcomed into a new friendship group	Using immersive simulation, refugee doctors are prepared for integration into the UK healthcare system
Merging of two or more groups		Two or more existing groups merge to become a new, larger group	'*The process by which separate groups are combined into a unified society*' [11]	Two local football teams, each with insufficient numbers of players, merge to form a larger team	Medical students and trainee pharmacists participate in acute care immersive simulations to learn how to work collaboratively
Increased group cohesion		Groups of disparate individuals join together to form a cohesive group	'*The extent to which individuals participate in a variety of social relationships, including engagement in social activities or relationships and a sense of communality and identification with one's social roles*' [2]	Online gamers playing separately at home join an online community and play together with others	During *in situ* simulations, doctors, nurses, receptionists and administrators in general practice work collaboratively to improve patient safety

Figure 1: Domains of the Home Office 'indicators of integration framework' that may be impacted by the refugee doctors' simulation programme.

Rudolph et al.'s description of the '*safe container*' for simulation, which describes a psychologically safe environment for learning when participating in simulation, recommends '*an environment where learners can enter a deep level of connection to their motivations, each other and the instructors*' [16]. They suggest that this can be achieved through facets such as '*thoughtful prebriefing*', a commonly used simulation tool. Immersive simulations that emphasize psychological safety, and consequent strengthening of social connections, may therefore improve social integration [14].

Cultural compression: It has been stated that simulation '*acts as a tool of cultural compression*' due to both the design of scenarios and the way that participants are positioned within them [17]. This means that simulation can reinforce '*social values, beliefs and practices*' [17]. These concepts may further explain how the use of simulation helps healthcare

professionals to understand the culture of their healthcare system, thus promoting social integration.

Constructive alignment: Texts describing the process of creating immersive simulation programmes emphasize the importance of constructive alignment of the intended learning outcomes with the scenario and debrief [18]. SBE therefore provides a potential space for intentional discussions about issues such as cultural differences, which can be explicitly explored through carefully crafted scenarios and thoughtful debriefing.

Case study 2: merging of two groups

Description of simulation programme
Together with the NHS Education for Scotland (NES) Pharmacy Directorate, the SCSCHF has supported the development of a new interprofessional immersive simulation programme for trainee pharmacists (post-graduate pharmacists in their first year of clinical practice) and final year medical students. The simulations are designed to encourage collaboration and involve complex decision-making, and include scenarios such as acute stroke, sepsis in a patient with Parkinson's disease, and exacerbation of asthma. Trainee pharmacists and medical students work together to assess the 'patient' (SimMan manikin), formulate an initial diagnosis and prescribe the necessary medications.

Applicable conceptual framework
A framework by Guillaume et al. [19] illuminates how the simulation programme helps these two distinct groups to merge. They define social integration as follows:

> A function of attachment with a given group, satisfaction with peers and job, and the quality of social relations. [19]

Guillaume et al.'s model describes, among other things, the effect of surface-level attribute and deep-level attribute dissimilarity on social integration, and the mitigating effect of team interdependence. Surface-level attributes are overt characteristics, including 'age, gender, ethnicity and tenure' [19]. Deep-level attributes include 'values, attitudes and personality' [19]. Dissimilarity of surface and deep-level attributes reduces social integration. However, in the case of surface-level attributes, the effects are mitigated by high levels of team interdependence. High team interdependence actually worsens the effects of deep-level attribute dissimilarity on social integration [19].

A non-medical example of dissimilarities may help to explain these concepts. Two rival football teams practice on the same sports pitch. Repairs are required to the stands, and a committee is formed involving representatives from both football teams. The main surface-level dissimilarity is the football team to which each committee member belongs. In order to achieve an action plan for the repairs, there is a high level of task interdependence. During discussions, if the deep-level attributes are found to be similar (e.g. all have the best interests of the players and supporters at heart), social integration will be improved by working on the task together. If the deep-level attributes of the members of each team are dissimilar (e.g. some members want the stand to

be merely functional, whereas others want to spend a lot of money to achieve a high-quality result), then working on the task together may reduce the social integration, as resentment between various factions builds.

Applying the framework to the simulation programme
In the case of our interprofessional simulation, there was a high degree of task interdependence; trainee pharmacists are unable to complete the initial assessment and diagnosis, but medical students are unlikely to be able to navigate the complex prescribing required alone. In managing the 'patient' together, we anticipated that trainee pharmacists and medical students were likely to find many levels of deep-level attribute similarity. For example, it is very likely that both want to do the best for their patient, have high levels of trust in each other's abilities and are motivated to work together to do a good job.

Tallentire et al. [20] explored the effects of the interprofessional simulation on the relationships between trainee pharmacists and medical students, through the lens of the social identity approach. This approach 'is a social psychology theory that articulates a conceptual approach to group behaviour based on self-categorization and group membership within a social context' [20,21]. Interviews with individuals from both groups revealed that the collaboration and joint decision-making involved in the immersive simulation had positive effects on social integration. However, 'social comparisons focussed on status remained prominent' [20]. According to Guillaume's framework, this may reflect a dissimilarity in the perceived deep-level attributes of the two groups. While profession is a surface-level dissimilarity, within healthcare professional title may be strongly associated with deep-level characteristics. Addressing these perceived dissimilarities may help improve social integration.

Guillaume's framework, as applied to the interprofessional simulation for trainee pharmacists and medical students, is shown in Figure 2.

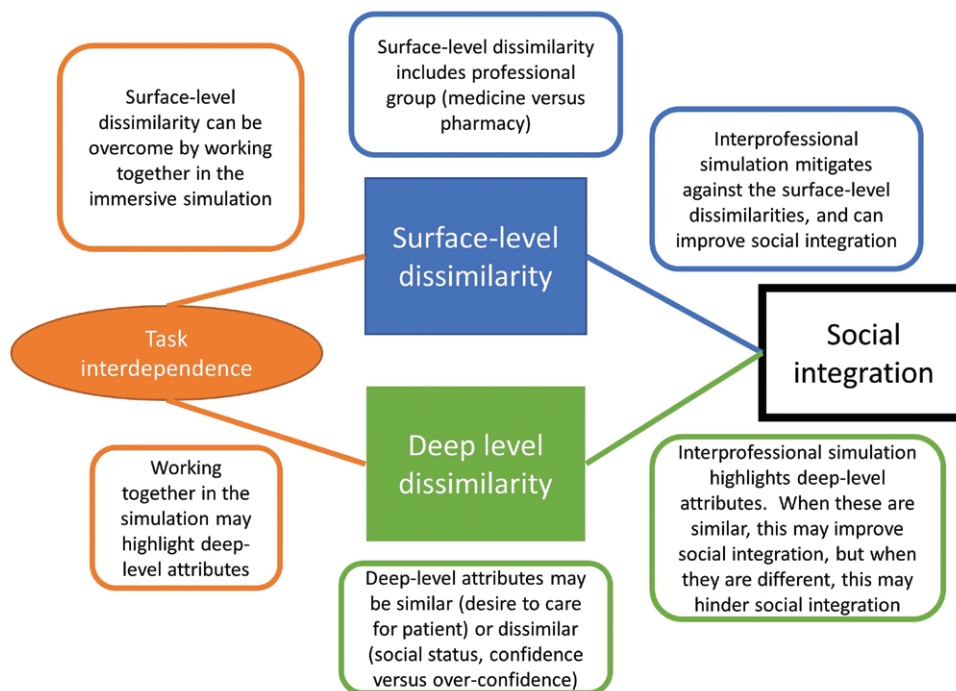### Features of SBE which may promote this type of social integration
Social learning: Simulation training is usually undertaken in small groups. Learning is therefore achieved both by participating and by observing others, aligned with social learning theory [22]. The fact that simulations involve social learning makes them an obvious means by which to explore issues related to social integration. For example, the learning objectives for a simulation might include addressing perceived deep-level dissimilarities.

Case study 3: increased group cohesion, geographically disparate group

Description of simulation programme
Each year, SCSCHF hosts a 'boot camp' for all first-year internal medicine trainees (IMTs—trainees who have been doctors for at least 2 years who wish to pursue internal medicine specialties) in Scotland. The boot camp includes immersive acute care simulations, communication workshops and simulation-based mastery learning of technical skills. IMTs are dispersed throughout different

Figure 2: Guillaume's conceptualization of the effects of task interdependence and attribute dissimilarity on social integration, as applied to the interprofessional simulation with medical students and trainee pharmacists.

medical specialties in different hospitals across the whole of Scotland. They are only formally taught together once per year, and the first occasion is at boot camp.

Applicable conceptual framework

Bollen and Hoyle's [23] conceptualization of perceived group cohesion may help to explain how the IMT boot camp may increase group cohesion. They define perceived group cohesion as follows:

> *An individual's sense of belonging to a particular group and his or her feelings of morale associated with membership in the group.* [23]

They propose that 'sense of belonging' and 'feelings of morale' are the two dimensions by which perceived group cohesion can be measured. They describe the close association between 'sense of belonging' and self-categorization theory, which articulates the thought processes leading to the social categorization of oneself and others [24], a component of the social identity approach discussed in case study 2. The second component of perceived group cohesion is 'feelings of morale'.

Applying the framework to the simulation programme

The IMT bootcamp brings together a disparate group, who share a sense of social identity [25] but who live and work in geographically distant areas. The General Medical Council (UK professional body for doctors) have identified a sense of belonging as one of the core needs for doctors' well-being [26]. During the Covid pandemic, reduced teaching sessions reduced IMTs' sense of belonging [27]. IMTs who took part in the boot camp noted in their feedback a sense of 'camaraderie' and an opportunity for 'networking', which was important to them. This may have improved their

sense of belonging, and according to Bollen and Hoyle's framework, this would have increased their group cohesion.

When asked to describe the bootcamp, IMTs used adjectives related to improved morale. These included: 'fun', 'sociable', 'uplifting', 'encouraging', 'motivating' and 'confidence-building'. Again, as per Bollen & Hoyle, this increased morale may have resulted in improved group cohesion. Bollen and Hoyle's two dimensions of group cohesion, as applied to the IMT bootcamp, are shown in Figure 3.
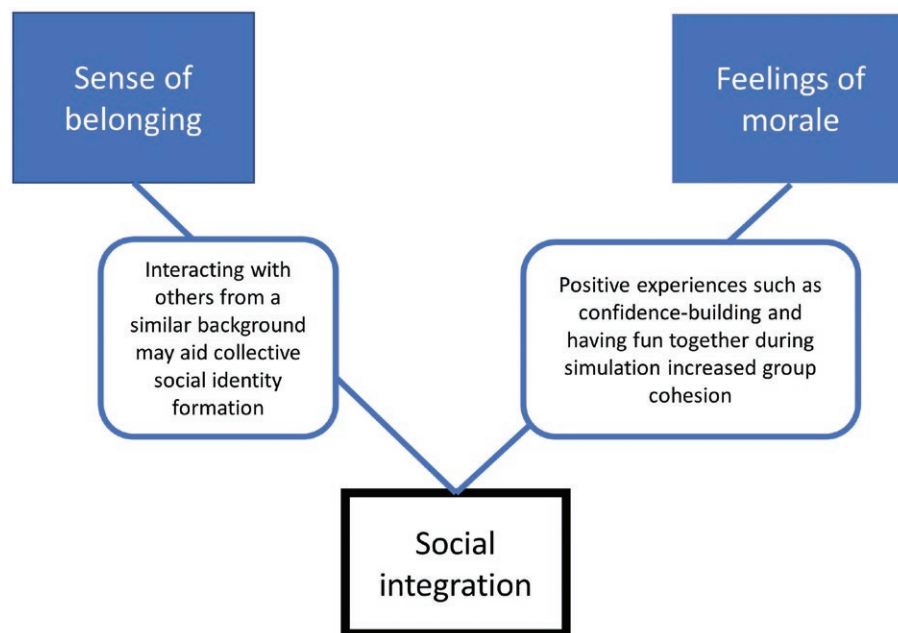
Features of SBE which may promote this type of social integration

Enjoyable: Countless studies have reported that their learners found their simulation sessions to be 'enjoyable'. '*Co-experienced positive affect*' is known to have a strengthening effect on social bonds [28]. This may further explain why bringing groups together for SBE may improve social integration. While it is possible that bringing the group together to undertake any group activity may have improved their sense of belonging and morale, other social activities would not have had the dual purpose of teaching them useful skills whilst improving group cohesion. It is possible that other types of teaching may have provoked similar results, but as with case study 2, it may be that the social aspects of learning in simulation were important in creating a sense of belonging and morale.

Case study 4: increased group cohesion, professionally disparate group

Description of simulation programme

SCSCHF has collaborated with CREATE Forth Valley (Community Resource for Education, Audit and TEam working) to develop a programme of *in situ* simulations

Figure 3: Bollen and Hoyle's two dimensions of group cohesion, as applied to the IMT boot camp.

for primary care. The immersive simulations aim to test systems, as well as promote enhanced behavioural skills. They utilize a member of faculty as a patient actor, to explore primary care team responses to acute care situations such as acute coronary syndrome, hypoglycaemia and seizure.

Applicable conceptual framework
A model of social integration which may be relevant in this case is the framework proposed by Ferguson [4]. She defines social integration as:

> *The process of promoting the values, relations and institutions that enable all people to participate.* [4]

Ferguson states that promotion of social integration '*requires attention to three different, but inter-linked, processes...*' [4]. These are 'recognition of diverse social groups', 'recognition of the political voice' and 'redistribution of socio-economic resources' [4]. This framework places a strong emphasis on social integration as a means of achieving equality and social justice. It is intended to be used to discuss inequality within society at large, but there are parallels with social inequality within healthcare teams. For example, many studies have commented on the negative effects of unequal power distribution within healthcare teams [25,29] and this framework therefore proves applicable within our context.

Applying the framework to the simulation programme
In the primary care teams, non-clinical staff are regarded as distinct from the medical and nursing teams. The use of simulation debriefing to flatten the hierarchy [15] may give the non-clinical staff a clearer voice in the running of the practice. This may result in redistribution of power, with greater power granted to non-clinical staff to make positive changes to the environment. For example, many of the suggestions for systems changes made during the debriefings came from non-clinical staff, who stated that they had not had the opportunity to raise such suggestions previously.

Ferguson's processes of social integration as applied to the primary care in situ simulation context are shown in Figure 4.

Features of SBE which may promote this type of social integration
Flattening of hierarchy: A qualitative study found that one of the goals of experienced simulation debriefers was to flatten hierarchy [15]. This shift in power dynamics may help to improve group cohesion, by giving a voice to those who may traditionally have found contributing difficult [4].
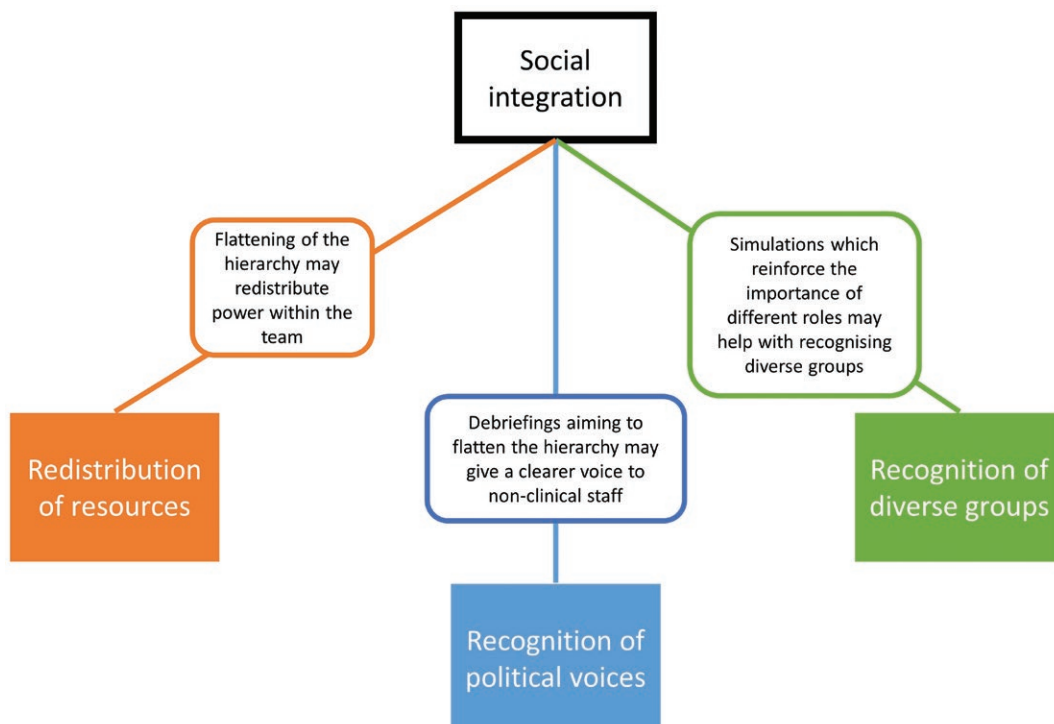
Simulation as a conduit for social integration

The four case studies above discuss theoretical ways whereby participation in simulation activities may aid three types of social integration; absorption of newcomers, merging of two or more groups and improving group cohesion (in both geographically disparate and professionally disparate groups). We have highlighted features of SBE which may promote the various forms of social integration. A summary of these concepts and their relationships with the conceptual frameworks used to inform the case studies is shown in Figure 5.

Justice, equity, diversity and inclusion

When considering group cohesion, we have presented examples of groups that are either geographically disparate or professionally disparate. We could also consider how simulation might act as a conduit for improving group cohesion when there are disparities related to groups marginalized on the grounds of race, age, class, gender, sexuality or ability. Marginalized groups may particularly benefit from the ability of simulation to flatten the hierarchy and shift power dynamics [4,15]. It may be possible to design simulation curricula that intentionally address, for example, racism in healthcare settings. In social work education, it has been suggested that critical race theory [30] can form a theoretical basis for informative discussions around race and racism [31]. Critical race theory is a theoretical framework

Figure 4: Ferguson's three processes for social integration, as applied to the social integration of a primary care team during *in situ* simulations.
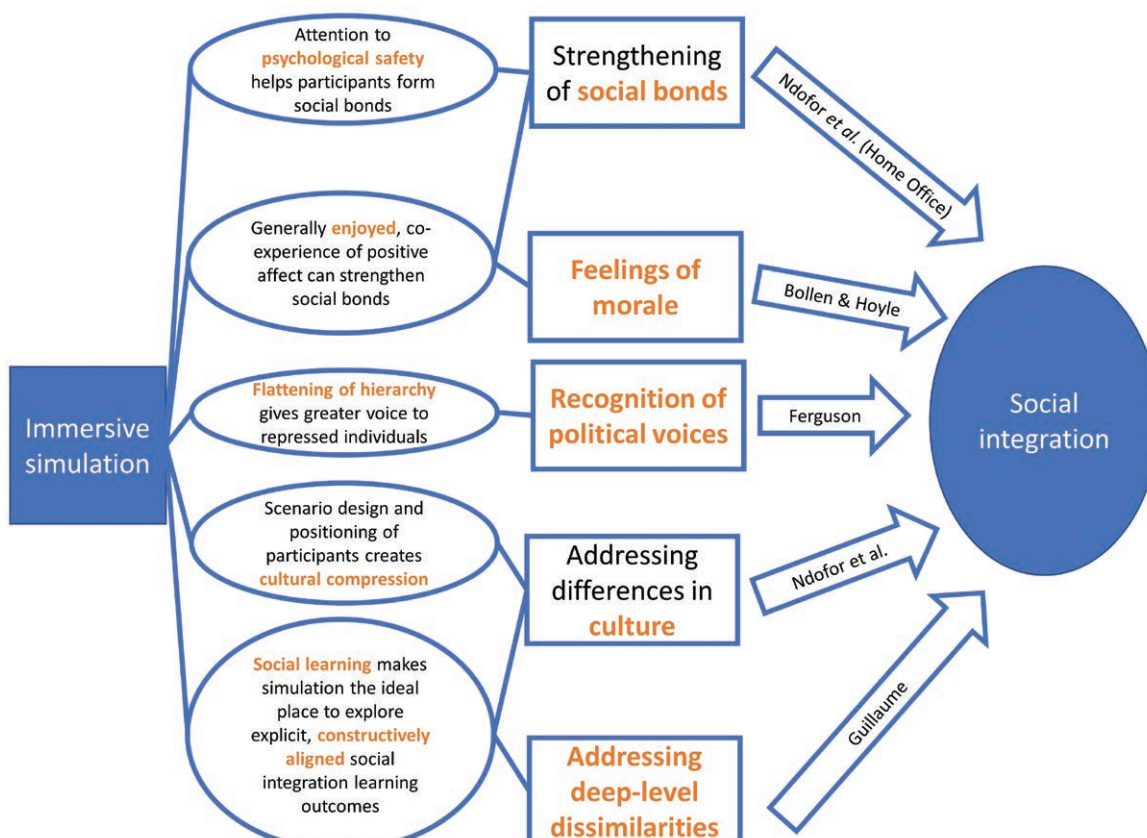

that simultaneously recognizes race as a social construct, but identifies racism as an ongoing, pervasive cultural practice within society [31]. Simulation debriefings, with their focus on psychological safety [16] and interruption of power imbalances [15] seem an ideal place to tackle this important issue.

Implications for research and practice

We hope that the ideas presented in this essay may provide a springboard for research on the topic of simulation for social integration. In particular, it would be valuable to explicitly study the effects of simulation on social integration through

Figure 5: Features of SBE which may promote social integration (incorporating a number of conceptual frameworks).

both discussion and observation, using constructivist or ethnographic techniques.

Regarding implications for practice, we would suggest that simulation programme designers consider social integration as a potential focus of their learning objectives. For example, learning objectives could include an improved understanding of the hospital culture. Simulations could be designed to improve role understanding between different groups, or intentionally place marginalized individuals in positions of greater power within a scenario. Design teams should ideally incorporate marginalized people as both designers and simulation facilitators. Simulation programme designers should be aware of the potential for simulation to act as a tool of cultural compression [17], and to carefully consider which social values, beliefs and practices that participation might encourage.

Simulation facilitators should be especially attuned to the risks faced by non-integrated groups when attending simulation together. Facilitators might improve the likelihood of integration by aiming to expose deep-level similarities [19] between groups and dispelling any misconceptions about dissimilarities. They should also be attuned to psychological safety [16], and recognize the power of this in helping participants to form connections and for ensuring that the experience is enjoyable (which is an important feature in improving social integration). Facilitators should also recognize the power of simulation debriefings to flatten the hierarchy [15], and in particular create an environment that makes it easier for marginalized groups to have their voices heard.

Simulation participants should be aware of the power of simulation to potentially influence social integration. They should be open to forging new relationships, and to gain a better understanding of the perspectives and beliefs of different groups. Those in positions of power should aim to be open and supportive to those who are marginalized, and those in marginalized groups should take the opportunity to make their voices heard in a psychologically safe space.

Conclusion

In this essay we have discussed our own conceptualization of the categories of social integration, as they relate to immersive healthcare simulation. We have layered conceptual frameworks from Ndofor et al., Guillaume, Bollen & Hoyle and Ferguson to help explain possible mechanisms by which immersive simulation might influence social integration within four different case studies. We have also described some of the common features of immersive simulation that make it an ideal conduit for both exploring and enacting social integration. Most of the concepts presented here are theoretical, and we hope that they provide inspiration for further research into this important component of healthcare education.

Declarations

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Authors' contributions

SS and VT discussed the concepts for inclusion. SS drafted the essay, which was critically reviewed by VT. Both authors approved the final version of the document.

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Competing interests

None declared.

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