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Fostering belonging for diverse ICT students by reconceptualising the imagined student

Karla Coutts; Elicia Lanham; Sophie McKenzie
School of Information Technology, Deakin University[a]
Corresponding Author Email: kwellsduerr@deakin.edu.au

ABSTRACT

CONTEXT

Belonging has been demonstrated to support student success and retention. Existing belonging literature has documented that diverse students have difficulty belonging. Educators can be increasingly disconnected from who the student cohort is due to the lack of visibility in online learning and rely on how they imagine the student cohort to be. Educators can design learning based on how they imagine students such as being secondary school leavers or having certain goals and values. However, these educational designs may not foster belonging for diverse students. Drawing on this longitudinal grounded theory study of Information Communication Technology (ICT) student belonging we consider how educators can design their online learning environments for broader imaginings of their diverse student cohorts.

PURPOSE OR GOAL

While there is extensive literature on belonging, many aspects of fostering belonging online remain unclear. Further to this ICT student attrition is consistently higher than other disciplines and online students are twice as likely to leave early than students studying face-to-face. There is a link between student retention and their sense of belonging. The research questions for the larger study that this topic draws from are to find the process of belonging for undergraduate students studying online for ICT degrees and the effects on this process for these students. From these findings, the purpose of the study was to better understand how to foster student belonging in ICT.

APPROACH OR METHODOLOGY/METHODS

In this longitudinal grounded theory study participants included 19 ICT first year students, eight of their lead educators and four of their support educators from an Australian university. Over 60 semi structured interviews were conducted over the students' first year of study. Data was analysed through cumulative concurrent comparative analysis over the year creating a trajectory of student belonging using storyline narratives and a progressive visual model. Using grounded theory methods, an abstract theory was developed that was grounded in the data.

ACTUAL OR ANTICIPATED OUTCOMES

One aspect of the findings was of how educators draw meaning from their interpretations of student's actions, and how they imagine them, affects the students experience of belonging. This finding was drawn from a four-stage process of belonging online and the associated teaching and learning principles for fostering belonging online. This paper discusses how the imagined student relates to fostering belonging online for diverse students. The imagined student describes the way educators interpret and imagine student characteristics, their preferences, and general course goals, when unable to interact with individual students online.

CONCLUSIONS/RECOMMENDATIONS/SUMMARY

This study found educator decisions based on the imagined student profile affects diverse students' ability to connect in the course. While other studies have identified a lack of belonging for some diverse students, none discuss the interactions between educators and students and the dynamics that can contribute to disconnection for students with diverse needs and characteristics. This study found that if educators broaden the way they imagine students, they could better foster student belonging experiences, and ultimately student success and retention in ICT.

KEYWORDS

Higher education, belonging, ICT

Fostering belonging for diverse ICT students by reconceptualising the imagined student

Introduction

While literature shows the importance of student belonging, less is known about how educators' online practices influence how they foster belonging. We know educators' interactions with students can impact student belonging. However, we still need an evidence-based approach to delivering online education effectively (Stone, 2022). Educators face challenges such as a lack visibility online of their student cohort (Tice et al., 2021). With the potential of educators having limited access to understand their online students, educators can rely on how they imagine their students' cohort to be.

There is a pressing need to foster belonging for ICT students studying online. In Australia, students' retention in ICT is less than in many other disciplines (Higher Education Statistics, 2024). This is compounded by studying online, where all students have double the rate of attrition than on campus students (Higher Education Statistics, 2024). Existing literature demonstrates that students are more likely to leave online courses than students studying face-to-face (e.g.: Muljana & Luo, 2019; O'Shea, Stone, & Delahunty, 2015). The situation is compounded for many diverse and underrepresented students who have more difficulty staying in their courses in all modes of study (Higher Education Statistics, 2024). However, students' sense of belonging has been demonstrated to support their success and retention (e.g.: Pedler, Willis, & Nieuwoudt, 2021; Thomas, 2012). The difficulty students can have belonging is well documented in existing belonging literature. It has been found that mature aged students of different races, genders and classes feel like they are on the periphery of higher education (Thomas, 2015). Underrepresented students can have difficulty belonging (Rainey et al., 2018). The difficulty students have belonging and the potential effect on their retention during online learning raises questions about how educators foster belonging for the inclusion of diverse students and the potential of leveraging online learning environments to do so (DiGiacomo et al., 2023). This study draws on the process of belonging to examine how educators can foster belonging and retention online for all students by considering how educators can reconceptualise students through their interactions.

Purpose

While there is extensive literature on the link between belonging and retention, the practicalities of how educators interact with students online to foster belonging remains unclear. This study showed that educators have difficulty imagining who the students are online, as they have a lack of visibility of them. The role educators play in student belonging interactions is challenging but clearly important. Educators interpret the students' behaviour online to try to cater for their needs. Due to a lack of visibility, educators need to make assumptions based on the information they are able to gather including from the students' year levels, course of enrolment, and their interactions. Through drawing meaning from these interpretations, educators imagined student characteristics, goals, and motivations. In this study, the way educators imagine the students influenced the education design in courses as they attempted to design learning experiences that were appropriate for their cohort. These educational design decisions directly affected students' ability to interact online and to connect. The research questions from the larger study sought to find what the process of belonging was for undergraduate first year students studying online in ICT courses and the effects on this process for these students. From these findings, the purpose of the study was to better understand how to foster belonging for ICT students by first developing an understanding of the process of belonging. Drawing on the original findings of this study we developed principles for improving teaching and learning to foster student connection. This paper

discusses one aspect of these principles: how educators can reconceptualise the imagined student to foster belonging for diverse students. These principles were informed by the experiences of both educators and students across students first year of undergraduate study. It is important to hear from students about the educational design that helps them to develop a sense of belonging and connection. It is equally important to speak to educators about their approaches to belonging in their roles. Examining the interactions between educators and students allowed the examination of micro aspects in the dynamics of the process of belonging, with a view to determine implementable strategies for improving the retention of all ICT students. This paper aims to support educators in fostering belonging interactions through evidence-based principles and recommendations for practice.

Methodology

This study employed a longitudinal grounded theory research design. Grounded theory is one of the most extensively used research designs across the world (Birks & Mills, 2023). Grounded theory involves generating an abstract theory that is grounded in data (Clarke, Friese, & Washburn, 2018). The study employed Strauss's approach to grounded theory, that is pragmatic and was anchored in symbolic interactionism (Blumer, 1969; Strauss, 1987, 1993). In this study participants included 19 ICT first year students, eight of their lead educators and 4 of their support educators from an Australian university. Over 60 semi structured interviews were conducted over the students first year. Students were interviewed three times, commencing 6 weeks into their courses and culminating 6 weeks into their second year. Students who withdrew from their course earlier were invited for a final interview and this data was included in analysis. Data was analysed through grounded theory methods including cumulative concurrent comparative analysis over the year, as well as employing situational analysis mapping and by creating trajectories of student belonging using storyline narratives and a progressive grounded theory model (Birks & Mills, 2019; Clarke, Friese, & Washburn, 2018). Data was coded and mapped. The codes were used to create a process of student belonging online.

A sociological lens is employed to understand belonging interactions. Belonging is conceptualised as relational, processual and situated (Gravett & Ajjawi, 2022; Guyotte, Flint, & Latopolski, 2021). That is, something that occurs over time in relations between people and technology. In this study the interactions were framed as relating to their course. Rather than categorise students by their demographics, this study was based on the assumption that student belonging experiences are individual, and all students' experiences are equally valid. Taking a sociological view of the dynamics of belonging online using a symbolic interactionist lens, we considered student and educator interactions, their interpretations, how the actors find meaning, and how they make up the situations of belonging over time (Blumer, 1969; Clarke, Friese, & Washburn, 2018; Strauss, 1993). 'Actors' are the people who are part of interactions in a situation. This methodology was used to develop a theory of the process of belonging online for first year ICT students, and to draw from this process principles for designing teaching and learning experiences that foster belonging for diverse students. This paper draws on one aspect of the principles of fostering the process of belonging in relation to how educators conceptualise students when interacting with them.

Results

The four-stage process of belonging

Through the longitudinal grounded theory study, we developed a four-stage process of belonging online. The process highlighted the importance of reciprocal signalling and the role of student signalling preferences in the stages. The visual model of the process was developed using constant comparative analysis and through storyline analysis that included over 30 narrative

versions and 65 progressive grounded theory models. The properties and dimensions of codes were analysed (Strauss, 1987). Figure 1 visually depicts the process students go through including orientating to signalling (including acquiring signalling skills and choosing their preferred ways to signal); adjusting and matching their preferred signals; demonstrating effective signalling; and their commitment to connection. Student agency played a role in student's ability to maintain connection through their ability to use their preferred signalling. The process involves students:

- **orientating** to the course through learning ways to operate in the course and connect,
- they would then work to **adjust** with others in the course as they signalled with others,
- they would **demonstrate** effective signalling skills that worked for them to connect,
- before being able to **commit** to connecting in their preferred way and find it easier to reconnect when disconnected.

The students could move back and forth between stages and fluctuate between connecting and disconnecting at any time. Students sought to maintain connection in some form and worked towards this, leaving the course to reconnect it if necessary.

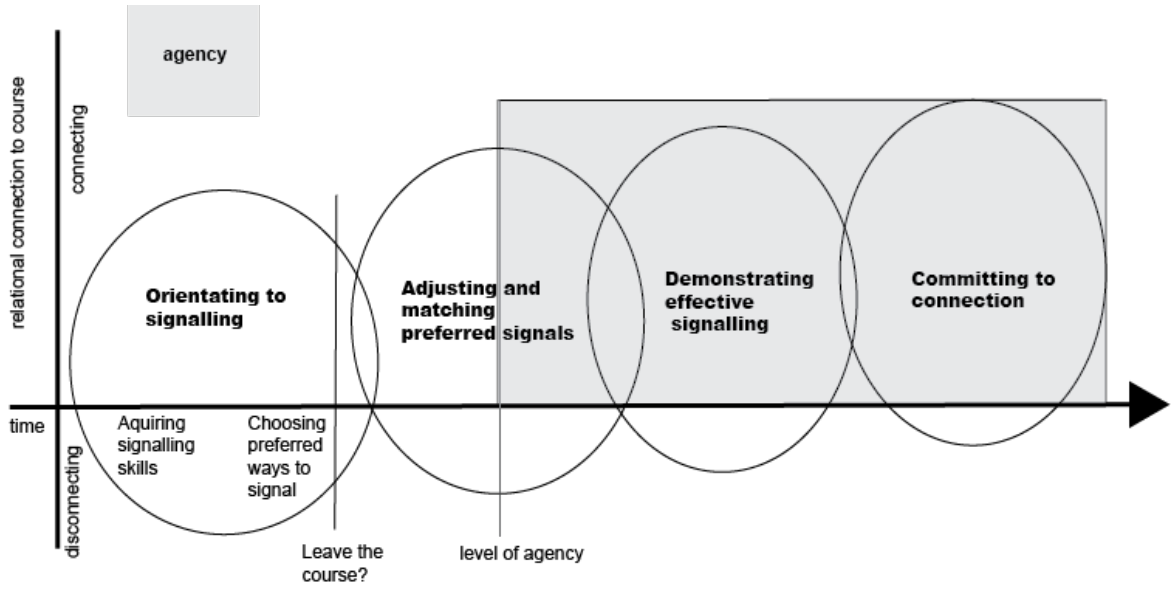

Figure 1: The four-stages of belonging online

Signalling in this process describes the virtual interactions and communications between students and others that they find meaningful, are synchronous and asynchronous, intentional and not intentional. Signals are virtual representations of actions that students use to operate in the online environment. Actors in the online learning environment read into each other's signals. Examples of signalling include students completing as task and interpreting themselves as being capable, peers talking in a break-out room, educator body language when delivering a lecture, whether their preferred interaction option is available in a class, the topics that educators devote the most time speaking about in a class, an announcement in a unit site for the whole class, and posts in discussion forums. Signals are ingrained in all the online interactions in the course. The signalling skills needed by educators and students can depended on the situation. Students chose their preferred ways to signal in a course, for example it could be online discussions or rather working alone watching videos. The more agency students had to signal in their preferred method or mode, the more agency they had to maintain their connection within the course. Student agency was enhanced through having signalling options, the way signals matched with their preferences and their interpretations of them.

The imagined student in the process of belonging

The influence of the imagined students occurred in all stages of the process of belonging but particularly in orientating and aligning and matching, where educators signalled actively with students and responded to their signals. These responses were based on how the educator interpreted and drew meaning from student interactions and characteristics. When teaching online, educators described the difficulty seeing and knowing the student cohort, with few small group interactions and many students opting to have their cameras off. Students and educators could be disconnected through this lack of visibility. In these stages educators were making decisions about the students' motivations and backgrounds and curating their signalling to work with what they thought the students needed. The imagined student describes the assumptions educators made when interpreting student characteristics, goals, and preferences online. Educators based their imaginings on the limited information they had about students. They made efforts to understand and meet student needs.

> *When teaching first year students as a lecturer we need to… know these guys. [They] are just getting out of high school and then just getting into the university. So, it may be completely different for them, and we need to adapt our teaching to them, right? …But we are talking to some students who are not necessarily familiar with all these concepts. (Lead educator G, he/him)*

With a lack of ways to find out who the students were, educators could imagine what the group was like, as being a group of high school leavers with little experience in the discipline. The educators imagine the student needs affected their ability to foster student connection. The educators imagine the cohort based on the knowledge they could gather through their experience including in class and assessment submissions. However, students had individual needs, ways of connecting and influences on their disconnections. Students described varying experiences of connection between their different units, with some more effective than others. Educators could inadvertently assume the motives, characteristics, and needs of each cohort and signal accordingly.

Imagined student assumptions

One common imagined student assumption was of first-year undergraduate students being secondary school leavers who had a previous interest in ICT, were living at home and had unlimited time for their studies. This did not represent many of the students in the study. Unlike educational design for secondary school, higher education educators do not know where the cohort was coming from in terms of previous study, skills, age, digital literacy skills, previous experience studying online, and outside commitments. In higher education, students have diverse backgrounds, joining university as international students, mature aged, coming through course transfers, having completed previous degrees, from TAFE, straight from year 12, having no previous interest in the discipline, or being interested in the discipline since they were young. Students in the study had a range of abilities and backgrounds in ICT in their first year that affected their interactions. For example, students with little background in the discipline topic were sensitive to signals from educators that students with expertise were more valued, such as noticing how long educators spent speaking with the advanced students in class. While educators described designing their teaching for beginners, some students described there being no safe place to get help, their skill level being unwelcome in the class, or responses to requests coming too late, as they fell behind and became disconnected. The diverse ways first year students were comfortable interacting and signalling were not always available as options.

Another assumption was of students' goals, aims, and values. For example, educators could imagine many students belonging through completing assessments successfully. For the majority of the students in this study, learning played a central role in their process of belonging. Students

described the connecting moments of learning or achieving a task in their belonging experiences, not in terms of meeting assessment requirements but of learning a new skill. One international student said they were trying to learn enough skills to get a good job and that they didn't care about the qualification.

> *Personally, for me, the whole point of an education is just to be able to cover my basic needs…my level of what I need cared for and what I need to attain…if I do get a good job prior, I don't know if I would continue with the course. Cause I've I mean I would have reached my goal a lot sooner…And I find that especially in today's day and age, while having a piece of paper is great…It doesn't match experience. (Student R, she/her, first trimester second year)*

This student found motivation to persist in their course because of the additional experiences on offer, like job placements. This student's belonging experience was mirrored by others who were driven by the experiences of learning to maintain a sense of connection in their course. Some students had varied goals and preferences such as valuing learning but also valued finishing the degree or achieving assessments.

Effect of the imagined student on educators

Educators provided signalling opportunities based on university provisions, policies, personal preferences, and their perceptions of student preferences. The way educators imagined the students' needs could impact how they signalled with them, their decisions about the signalling options available and their signalling responses. These signalling decisions had an impact on student belonging and so their success and retention. In the first stage of orientating to signalling, students chose their preferred way of signalling. Where they could not find a signal that worked for them, some left the course. Many of the common interaction options available were not connecting for students. Many students described not being able to ask questions in large scale classes in case they were embarrassed publicly. A female student who withdrew from her course said:

> *It was more nerve racking online...because in person you can put your hand up and they come to you, online you don't really want to reach out because everyone's listening... in front of 100 people... [it] would have been better if you had another person that you could have just talked about things with (Student E, she/her, withdrew trimester 1 first year).*

When teaching online, educators made assumptions about what was relevant to students when designing how to deliver the content. These assumptions were affected by the ideas of what the students know, what they need, how much time they have, what they value, and the course requirements. They planned interactions to work efficiently for the whole student cohort; however, these plans did not always work for their students with diverse goals and needs. Students in the study expressed their connection in a variety of ways, depending on their signalling preferences and alignments.

The way educators imagined student characteristics affected students moving through the process of belonging. In the first stage students needed support to develop signalling skills. Educator's efforts to orientate students were based on the skills they imagined they came with. In the adjusting and matching stage, educators made efforts to align with the unseen students based on their assumptions of what students need, want, and could do, with the time they had available. Students needed not only to have signalling options but also responses that adjusted to their preferences. In the demonstrating effective signalling stage, part of the educator's role was to recognise in students when they are signalling effectively. For example, educators in the study judged whether students were being effective in different ways, usually by whether the educator received responses from students. Educators could become frustrated by not being able to see if students were listening.

> *Sometimes it is bit discouraging because I talk to students and then they I don't know whether they are actually listening to me. So, I'm teaching there. I'm saying all these things and spending time explaining stuff to them and then and then I'm not getting that real feedback from them, whether they understood it or not. (Support Educator C-1, he/him)*

These judgements of which student signals to recognise were based on how the educator imagined effective student signalling to be. Students and educators could become disconnected when student signals did not align with the ideal imagined student. However, some educators recognised online students can be engaged out of the educators' view. One educator called it "the invisible connection" (Lead educator A, he/him). Unseen students were still reading into educator signals. The student's signalling preferences did not always align with the educators.

Recommendations

In this study, the way students are imagined by educators did not always represent many of the students who participated. This study found online teaching and learning interactions affect diverse students' ability to connect in their course. There are a range of studies that consider how diverse and underrepresented students' connection in higher education. Thomas (2015) found that belonging is affected by identity for part time, mature aged students. Similarly, Thomas, Herbert and Teras (2014) described how underrepresented students can have the same challenges belonging online as in face-to-face study. A recent study by Crawford et al. (2023) focuses on how a lack of belonging is experiential. This study mirrors these latter findings however the belonging experience was complicated by individual students with diverse interests and needs looking for alignments of their preferences with educators. Drawing on the analysis as part of the longitudinal grounded theory study of ICT student belonging we considered how educators can design their online learning environments for broader imaginings of their diverse student cohorts.

The first recommendation is rather than educators being guided primarily by how they imagine a cohort to be, it is productive to assume a need for individual and various signalling opportunities, styles, and responsiveness to students diverse signalling preferences both synchronous and asynchronous. It is important for educators to be aware that students are not homogenous (Ajjawi et al., 2025). How an educator imagines a student affects not only their interactions but the provision of flexible education design for belonging. For example, if an educator only provides one option for seeking help during working hours, students working full time can become disconnected. Educators need to assume students are diverse, including their ages and experience. Age assumptions lead to presumptions of the imagined student's body of knowledge, academic skills, digital literacy, and lifestyle. With limited experiences of the cohort, strategies for fostering belonging could mean creating new interaction opportunities to try or look for signals through the learning management system analytics. Educators can make dynamic decisions about how to signal with students, and to be aware of how their signals could be read by students with different motivations, values, and progress.

The second recommendation calls for educators to reconsider the assumption that students connect more through achieving grades than having learning experiences. While assessment is important to both educators and students it is not the whole story of belonging online. In this study, the majority of students had belonging experiences while learning, not while achieving grades. With educators imagining students as belonging through assessment, there is the potential for learning experiences to become tokenistic. A commonly utilised education design model, constructive alignment, asks educators to design all educational content and experiences to build towards assessment (Biggs, Tang, & Kennedy, 2022). This model focuses all educational design to align with learning outcomes to ensure that learning experiences are relevant to assessment. While it is essential to prepare students for assessment, to foster belonging, educational design needs to prioritise diverse and multiple learning experiences. Student learning experiences were at the core of their success and retention through their ability to adjust and match signals. For

example, students could need to find meaning and relevance in how the topics related to their life goals.

The third recommendation is that educators critically consider why they have their assumptions of students signalling skills and goals. Educators in the study found it difficult to have a sense of who a student cohort was and sometimes empathised by considering their own experience as a student. Generational gaps between educators and students can lead to assumptions about students (Mills & Birks, 2014). This generational gap can occur in both directions, where students can be younger than the educator, but students can also be older. Generational gaps can lead to assumptions about how digitally proficient students are. However, students have different levels of digital literacy (Coldwell-Neilson & Cain, 2019). Digital proficiency is part of a student's signalling skills including being able to communicate online meaningfully and effectively but students have diverse needs for digital skill support.

Concluding statement

The way educators imagine student characteristics, values, and goals affects the student's experience of belonging. Reconceptualising the imagined student increases student agency so their signals are seen, responded to with meaning, and interaction opportunities are created so students can succeed and persist. From speaking with students in this study, we found that they were trying to connect and reconnect. Where educators were not responsive to students signals or provided few signalling opportunities, students could struggle to belong. These students are capable of completing their degrees but face barriers to maintaining belonging. If educators can reconceptualise how they are interpreting student characteristics and interactions, they can better align with student needs. When educators focus on student signals, they can foster belonging and success. These recommendations indicate a need for online learning to be better resourced to assist educators to foster belonging for students. These recommendations can give educators a way forward to fostering belonging online in a teaching and learning environment that is fraught with barriers, challenges, and invisibilities.

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Copyright statement

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