The use of ICT by second-year college students and its relation with their interaction and sense of belonging

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ABSTRACT
This study examines the use of technology for interaction by second-year college students in The Netherlands and its relationship with their integration and sense of belonging. The concepts of student integration and sense of belonging, as used in previous studies in The Netherlands, link student’s persistence to their social interactions. Our findings reveal that technology use for interactions is positively correlated with students formal and informal peer interactions and with their sense of belonging in the college environment. The findings however, show no disparities between majority and minority students concerning their interactions, sense of belonging or ICT use. The overall results confirm that the use of new technology for communication benefits the interaction of students in college with peers and teachers and therefore it is also an important component for the persistence of minority students in higher education.

1. Introduction

In the last decade, an increasing number of students with immigrant backgrounds found access to higher education in The Netherlands (Severiens & Wolff, 2008). CBS (2014) statistics showed that the number of ethnic minority students entering the universities of applied sciences in The Netherlands was more than doubled up to a total number of 45,500 students from 2000 to 2014. Yet, only a part of these students managed to persist to the second-year of college. Different studies showed that ethnic minority students on average have a slower study progress (Hofman & Van den Berg, 2003; Severiens & Wolff, 2008; Swail, Redd, & Perna, 2003) and lower persistence and completion rates, compared to majority students (Crul & Wolff, 2002; Hobson-Horton & Owens, 2004; Van Den Berg & Hofman, 2005; Wolff & Crul, 2003).

Determinants of student persistence in college can be found in the two related concepts in literature namely academic and social integration as introduced by Tinto (1993) and the sense of belonging of students (Berger, 2000; Thomas, 2002; Zepke, 2005). The concept of academic and social integration is related to student interaction with teachers and peers (Meeuwisse, Severiens, & Born, 2010; Severiens & Wolff, 2008; Tinto, 1975, 1993).
The sense of belonging indicates that students feel that their social and cultural practices are accepted and valued in the institutional culture. This means that the second-year students who already managed to persist in college most likely have attained a certain level of academic and social integration (Tinto, 1993) and have a feel of belonging within the university environment.

This study explores the interactions and sense of belonging of majority and minority students in their second year of college because it might reveal how these students managed to integrate. I will look at the interactions in the context of ICT use, since students more increasingly engage in new ways of interaction (Milne, 2007; O’Reilly, 2005; Prensky, 2001) by using technology such as smartphones for texting, video chats and by participating in social media networks (Dabbagh & Kitsantas, 2012; Ito et al., 2008). This study further examines whether these new ways of communication and social networking show a relationship with student interactions and their sense of belonging in the institutional environment and if these relationships are different for majority versus minority students.

In the following two paragraphs, I will first discuss the concept of student integration and sense of belonging based on a previous study by Meeuwisse et al. (2010) in The Netherlands followed by the use of ICT for interaction. Subsequently, I will cover the Dutch context of this study, the methodology used for collecting and analyzing the data followed by the results. The final paragraph discusses the main findings in the context of earlier studies and provides suggestions for application and further research.

2. Overview of the literature

Several studies investigating dropouts have shown that the prevailing atmosphere within an institution has an impact on student outcomes (Just, 1999; Swail et al., 2003; Zea, Reisen, Beil, & Caplan, 1997). An important indicator for the drop out of ethnic minority students is, that they felt they did not ‘fit in’ the institute. According to Zepke (2005), these students often have difficulties with making friends and ‘their lack of socialization’ cause them to feel that they do not belong. Moreover, Read, Archer, and Leathwood (2003) and his colleagues showed that the ‘non-traditional’ students in terms of class and ethnicity felt alienated by the academic culture itself.

2.1. Student integration

In international literature around the topic of academic progress and student attrition, the model of Tinto has been widely recognized and used (Tinto, 1975, 1993, 1997, 1998) Tinto distinguishes the university environment into an academic and a social system. He posits that students who wish to persist in college and graduate successfully are required to have a certain level of academic and social integration (Tinto, 1993). Students’ academic and social integration is further differentiated into formal and informal forms of integration. Academic integration refers to academic success [formal academic integration] and interaction with faculty [informal academic integration], whereas social integration concerns participation in extracurricular activities [formal social integration] and interaction with peers [informal social integration].

In the literature, we find different definitions and operationalization of the concepts academic and social integration (Beekhoven, De Jong, & Van Hout, 2002; Berger & Milem, 1999;
Braxton, Milem, & Sullivan, 2000; Cabrera, Nora, & Al, 1992; Eimers & Pike, 1997; Pascarella, Duby, & Iverson, 1983). For example, Cabrera et al. (1992) measure academic integration by students’ academic experience and performance and social integration by their friendship with peers. While Pascarella et al. (1983) make a distinction between academic integration that refers to interactions with faculty involving discussion and advice, and social integration that refers to non-classroom and informal interaction with faculty. Therefore, Tinto’s work and allied research suggest that student interactions with peers and teachers are positively connected to their persistence (Astin, 1984; Tinto, 1997).

In the Dutch context, Tinto’s concept is used by several researchers (Meeuwisse et al., 2010; Severiens & Wolff, 2008; Wolff, 2013). For example, studies by Severiens and Wolff (2008) and Meeuwisse et al. (2010) that adapt social and academic integration in the Dutch context make a distinction between formal and informal interaction among peers, and between peers and teachers. Here formal interaction refers to interaction on university and study-related matters, and informal interaction is related to interaction concerning personal matters.

The results of a qualitative study conducted in the Netherlands showed the significance of the quality of interactions with peers and teachers for obtaining good study results (Severiens, Dam, & Blom, 2006). A follow-up study by Severiens and Wolff (2008) showed similar results for minority and majority students on satisfactory relationships with peers and their poor relationship with teachers.

In this article, my use of academic and social integration is close to how Severiens and Wolff (2008) and Meeuwisse et al. (2010) have used it in their studies. In the empirical part, academic integration will be operationalized as students formal and informal interaction with teachers and social integration as their formal and informal interaction with peers.

The theoretical framework of Tinto (1975, 1993, 1998) emphasizes the importance of social integration. I especially want to look at the link between social integration and the sense of belonging of students. In other words, do students with higher levels of social integration in the university environment feel a higher degree of belonging in the institute (Johnson et al., 2007).

### 2.2. Student sense of belonging

To lower the risk of drop out from college, students need to feel that their social and cultural practices are accepted and their tacit knowledge is valued in the institutional culture and thus making them feel they ‘belong’ (Thomas, 2002; Zepke, Leach, & Prebble, 2006).

In the relation between students’ sense of belonging and persistence in college, some authors have introduced the concept of institutional habitus (Berger, 2000; Reay, David, & Ball, 2001; Thomas, 2002; Zepke et al., 2006). Institutional habitus can be understood as the impact of a cultural group or social class on an individual’s behavior as it is mediated through an organization (Reay et al., 2001; Thomas, 2002). They explain that students who already share routinized institutional behavior find it easier to make the adjustments necessary to fit in (Berger, 2000).

Furthermore, students with shared backgrounds and attitudes who embody the dominant majority on campus can adapt more easily to campus life, than minority students coming from different backgrounds (Berger, 2000). That is to say, minority students from a non-traditional background could have more difficulties with adapting to the
institutional culture if they do not belong to peer groups where their social and cultural habits are shared and valued. Studies in the US, for example, revealed that African American, Hispanic/Latino or Asian Pacific students feel a less strong belonging in a program than white American students (Hurtado, 1994; Hurtado & Carter, 1997; Johnson et al., 2007). These findings indicate that sense of belonging is vital for ethnic minority students.

To enhance students’ sense of belonging Johnson et al. (2007) argued that positive faculty and peer interactions make institutional environments feel more academically and socially supportive. A study by Hoffman, Richmond, Morrow, & Salomone, 2002 showed that supportive interaction with faculty in both academic and social environments are positively related to students feel of belonging. Furthermore, Hurtado and Carter (1997) demonstrated that engagement in campus communities and extracurricular activities make students feel they ‘belong’.

In the Dutch context where students do not live on campus, unlike the US residential campus setting, the sense of belonging could be determined slightly different. More emphasis in the Dutch context could be laid on the in and out of classroom interactions with teachers and peers since there are fewer opportunities to engage in campus communities. A study by Meeuwisse et al. (2010) in the Dutch setting showed positive relationships between formal teacher and peer interactions of minority students and their sense of belonging. In the case of majority students, only informal peer interactions were positively linked to their sense of belonging. This could suggest that the correlation between teacher and peer interaction, sense of belonging could be different for minority and majority students.

2.3. ICT use for interaction

Students are ‘connected’ online almost all the time. Smartphone penetration among college students reached 83% in the US and 90% in The Netherlands (CBS, 2014; Cossio et al., 2009). This large-scale use of technology by students instigates new ways of interaction with peers and teachers in a university environment.

Students interact, using different platforms in their daily lives: text messages, social media posting, e-mails, and other online media (Milne, 2007; Prensky, 2001). The most primary way of interaction for college students is by using smartphones and social media network sites such as Facebook, Twitter, Instagram (Helles & Media, 2013; Kato & Kato, 2015; Kim, Ha, Claire, & Gabay, 2016). The more recent study by Kim et al. (2016) showed that students’ use of smartphones for texting dominated over other forms of social media, e-mails or phone calls.

A study by Ahn and Shin (2013) shows that young people’s use of social media was significantly associated with their desire to be connected. Sometimes the fear of missing out or avoiding social isolation encourages students to use social media (Alt, 2015). By participating in social media networks, youth develop their personal identity, mediate their relationships with friends, and broader groups of peers (Dabbagh & Kitsantas, 2012; Ito et al., 2008). Through the social media networks, they find others with similar interests or backgrounds, with whom they share personal information or study related information when collaborating in learning (Bargh & McKenna, 2004; Gikas & Grant, 2013; Kirkwood & Price, 2005; Margaryan, Littlejohn, & Vojt, 2011).

Several studies have indicated that people can develop a feel of belonging through the use of social media networks. For example, Qin, Kim, Hsu, and Tan (2011) and Hwang
(2011) showed that people feel that they are involved in some groups or can bond with other people. Kim et al. (2016) found that students’ use of Facebook significantly predicted their involvement on campus.

As discussed in the previous paragraphs student interaction is closely related to their academic and social integration and sense of belonging in the institutional environment. In this study, new ways of daily interaction as adapted by sophomores in the institutional environment could reveal opportunities to enhance the integration and sense of belonging of all students, especially of the minority students.

3. Context of the study

This study was conducted in the fall of 2014 in the department of technology of The Hague University of Applied Sciences. As typical for the Dutch context, The Hague University has no campus for student residence. The participants, all second-year undergraduate students live at home or in lodgings and commute daily to the university for attending lectures, collaborating with peers on projects or for using different study facilities of the institute. The limited time students spend in the university environment with peers, suggests that social integration could develop differently than in the case of students living on a university campus.

In this context, students’ use of new technologies might benefit their interactions with peers and affect their sense of belonging. This explorative study on the use of technology by established students for interaction was guided by the following question: ‘Is the use of ICT by students in their second year of college related to their interaction and sense of belonging and does it show disparities between ethnic minority and majority students?’

I will look at: the interaction levels of second-year students and the possible relationship with their sense of belonging; if ICT use is connected with academic and social integration of students and their sense of belonging; what technology students prefer to use for interaction and if the results are different for minority versus majority students. With this study, I will make a first attempt to link the student integration based on Tinto’s model to the use of ICT for interaction.

An overview of the link between studied concepts is given in Diagram 1. The dashed line type (1) represents the possible relationships between students’ interaction and sense of belonging. The dashed line type (2) represents the possible relationship between students’ interaction and ICT use. The dashed line type (3) represents the possible relationships between students ICT use for interaction and their sense of belonging.

4. Methodology

In the second quarter of the academic year, the online survey was administered to 223 second-year students of the department of technology from the The Hague University of Applied Sciences. The students were invited to fill out the online questionnaires in four sessions scheduled directly after the regular classes in the first two weeks of the second quarter. For these sessions, a computer room was made available to the students. Two weeks after the initial request students received an e-mail reminder, giving them the opportunity to respond within a week. The response rate was 61%, i.e. 136 of the 223
students completed the online questionnaire measuring the type of interactions, sense of belonging and ICT use.

Selecting second-year students as the target group for this study had the advantage that their interaction behaviors could be more routinized because factors such as acclimatization to a new university environment and the effects of changing majors at the end of the freshman year are excluded (Kramer, Higley, & Olsen, 1994).

Definition of Statistics Netherlands (CBS) was used to make a distinction between majority and minority students. According to CBS, an individual belongs to an ethnic minority group if at least one parent was born outside the Netherlands. The ethnic minority subgroups were relatively small therefore these groups were not compared with each other.

Students’ formal and informal interactions with teachers and peers and their sense of belonging were measured by scales developed in previous studies by Severiens et al. (2006), Severiens and Wolff (2008) and Meeuwisse et al. (2010) within the Dutch context. Students rated each of the items on a 5-point Likert scale ranging from 1 (never) to 5 (very often). Table 1 shows the Cronbach’s alphas and item examples of the interaction and sense of belonging scales.

The respondents chose from a list of 25 ICT items, which one they used most frequently in daily interactions with peers and teachers. The ten choices consisted of three devices: PC/laptop, tablet and smartphone and seven ways of interaction using different applications: e-mail, texting, phone calls, video calls (Skype, FaceTime), file sharing (Dropbox, Google drive), video sharing (Youtube) and social media network sites (Facebook, Instagram). This list of ten ICT items was linked to each of the scales of formal and informal interactions.
interactions with teachers and peers. Students were asked to rate their use of each of the items on a 3-point Likert scale ranging from 1 (never) to 3 (often).

All data were analyzed using regression analysis. The relationship between the students’ ICT use and the formal and informal interaction with peers and teachers and their sense of belonging were investigated using Pearson’s correlation analyses. Independent samples t-tests were used to determine any disparities in students’ level of interaction, sense of belonging and ICT use due to ethnicity.

5. Results

5.1. Main findings

The respondents consisted of 136 second-year students of whom were 41 ethnic minority and 95 majority students. Participants’ demographics are found in Table 2.

In Table 3 the descriptive outcomes are shown for all respondents for the different interactions, the use of ICT for these interactions and the sense of belonging of students. A notable observation in Table 3 is that all means of interaction and sense of belonging are rated higher than 3 on a 5-point Likert scale ranging from 1 (never) to 5 (very often), whilst all means for ICT use are rated below 2 on a 3-point Likert scale ranging from 1 (never) to 3 (often). The low levels of technology use indicate that students generally interact face to face.

As anticipated, students’ formal and informal interactions with teachers and peers were all positively correlated with their sense of belonging. The positive correlations with the sense of belonging are: FTI \((r = .375, p < .001)\), ITI\((r = .170, p < .05)\), FPI \((r = .210, p < .05)\), and IPI \((r = .610, p < .001)\).
The informal interaction with peers (IPI) shows the strongest relation with students’ sense of belonging (SOB). IPI scores accounted for approximately 37% of the variance of SOB scores (IPI, \( r = .610, r^2 = .372 \)).

I further want to answer the question if ICT use by second-year students is related to the formal and informal interaction with teachers and peers and their sense of belonging? Students’ ICT use for peer interactions shows positive relation for both peer and teacher interactions and their sense of belonging. The positive correlation for students’ technology use for formal peer interactions (FPIict) are: FTI (\( r = .303, p < .01 \)), ITI (\( r = .268, p < .01 \)), FPI (\( r = .230, p < .01 \)), and IPI (\( r = .252, p < .01 \)) and (SOB, \( r = .187, p < .05 \)). The positive correlation for students’ technology use for informal peer interactions (IPIict) are: FTI (\( r = .229, p < .01 \)), ITI (\( r = .246, p < .001 \)), FPI (\( r = .221, p < .01 \)), and IPI (\( r = .244, p < .01 \)) and (SOB, \( r = .193, p < .05 \)).

Students’ ICT use for teacher interaction showed no significant relations with formal teacher interaction, peer interaction or sense of belonging. The only a positive relation was seen for informal teacher interaction (\( r = .194, p < .05 \)). These results show a clear relationship between higher ICT use and interactions and the sense of belonging of students. ICT use plays a less significant role in interacting with teachers compared to interacting with peers.

Table 2. Participants’ demographics.

|                | Frequency | Percent |
|----------------|-----------|---------|
| Gender         |           |         |
| Male           | 102       | 75%     |
| Female         | 34        | 25%     |
| Ethnicity      |           |         |
| Majority       | 95        | 70%     |
| Minority       | 41        | 30%     |
| Country of origin |       |         |
| The Netherlands| 92        | 68%     |
| Turkey         | 11        | 8%      |
| China          | 4         | 3%      |
| Iraq           | 4         | 3%      |
| Netherlands Antilles | 3   | 2%      |
| Surinam        | 3         | 2%      |
| Colombia       | 2         | 2%      |
| Morocco        | 2         | 2%      |
| Other (non) Western countries | 15 | 11%     |
| Total          | 136       | 100%    |

Table 3. The descriptive statistics for the four types of interaction, ICT use for each type of interaction and the sense of belonging.

|                              | N   | Mean | Std. deviation |
|------------------------------|-----|------|----------------|
| Formal teacher interaction (FTI) | 136 | 3.75 | 0.46           |
| ICT use for Formal teacher interaction (FTIict) | 136 | 1.47 | 0.17           |
| Informal teacher interaction (ITI) | 136 | 3.39 | 0.63           |
| ICT use for informal teacher interaction (ITIict) | 136 | 1.22 | 0.20           |
| Formal peer interaction (FPI) | 136 | 3.68 | 0.31           |
| ICT use for Formal peer interaction (FPIict) | 136 | 1.87 | 0.29           |
| Informal peer interaction (IPI) | 136 | 4.07 | 0.63           |
| ICT use for informal peer interaction (IPIict) | 136 | 1.22 | 0.20           |
| Sense of belonging (SOB) | 136 | 3.96 | 0.42           |
The second part of my research question was related to disparities between majority and minority students in the level of interaction, sense of belonging and ICT use. No significant differences were found in their formal and informal interaction levels with peers and teachers, their sense of belonging or ICT use. Table 4 shows the results of the independent-samples t-tests for ethnicity.

5.2. Technologies associated with interaction and sense of belonging

Since technology use predominantly plays a pivotal role in students peer interactions and sense of belonging, I also looked at the significant relations between the used technologies and the different types of interaction.

For informal teacher interaction (ITI) students prefer to use the PC/Laptop ($r = .288$ $p < .01$).

Students preference for the PC/Laptop ($r = .221$ $p < .01$) and file sharing applications ($r = .296$ $p < .01$) show positive connection with their study related interaction with peers (FPI), while texting ($r = .246$ $p < .01$), making phone calls ($r = .236$ $p < .01$) and file sharing ($r = .190$ $p < .05$) show positive connections with their sense of belonging.

For informal peer interaction (IPI) students mainly use the smartphone ($r = .248$ $p < .01$), for texting ($r = .350$ $p < .01$) and making phone calls ($r = .243$ $p < .01$). They visit the social network sites ($r = .245$ $p < .01$) using their PC/Laptop ($r = .202$ $p < .01$) as well as their smartphones. Their sense of belonging shows positive relations with the informal use of the smartphone ($r = .246$ $p < .01$) for texting ($r = .298$ $p < .01$), making phone calls ($r = .179$ $p < .05$) and visiting the social network sites ($r = .169$ $p < .05$).

5.3. Summary of the main findings

A summary of the main findings is presented in Diagram 2. The straight lines connect the significantly related components of the model. The corresponding $r$-values are given in boxes.

| Table 4. Results of the independent-samples t-tests for ethnicity. |
|---------------------------------------------------------------|
| **Background** | **N** | **Mean** | **Std. deviation** | **Sig.(2-tailed)** |
|----------------|-------|----------|--------------------|--------------------|
| Formal teacher interaction (FTI) | Minority | 41 | 3.78 | 0.4449 | 0.172 |
| | Majority | 95 | 3.67 | 0.4755 | | |
| ICT use for Formal teacher interaction (FTIict) | Minority | 41 | 1.49 | 0.2081 | 0.461 |
| | Majority | 95 | 1.52 | 0.2277 | | |
| Informal teacher interaction (ITI) | Minority | 41 | 3.42 | 0.5939 | 0.380 |
| | Majority | 95 | 3.31 | 0.7238 | | |
| ICT use for informal teacher interaction (ITIict) | Minority | 41 | 1.20 | 0.1585 | 0.063 |
| | Majority | 95 | 1.27 | 0.2776 | | |
| Formal peer interaction (FPI) | Minority | 41 | 3.69 | 0.3051 | 0.381 |
| | Majority | 95 | 3.64 | 0.3164 | | |
| ICT use for Formal peer interaction (FPIict) | Minority | 41 | 1.87 | 0.2523 | 0.541 |
| | Majority | 95 | 1.90 | 0.3402 | | |
| Informal peer interaction (IPI) | Minority | 41 | 4.06 | 0.6692 | 0.835 |
| | Majority | 95 | 4.09 | 0.5349 | | |
| ICT use for informal peer interaction (IPIict) | Minority | 41 | 1.71 | 0.3259 | 0.513 |
| | Majority | 95 | 1.75 | 0.3762 | | |
| Sense of belonging (SOB) | Minority | 41 | 3.96 | 0.4272 | 0.990 |
| | Majority | 95 | 3.95 | 0.4237 | | |

Note: Significance level: $p < 0.05$. 
6. Discussion

6.1. Discussion of the main findings

The above average levels of interaction and sense of belonging of students who managed to persist in the first year of college underscore the importance of Tinto’s model for student retention (Tinto, 1975, 1993, 1997, 1998). The high average level of sense of belonging further supports the concept of institutional habitus that students’ social and cultural practices need to be accepted and valued in the institutional culture to persist (Berger & Milem, 1999; Reay et al., 2001; Thomas, 2002; Zepke, 2005). The similarity in interaction levels and sense of belonging of established majority and minority students indicates that the climate in the university environment is equally supportive for both groups of students. This is in line with the study of Berger and Milem (1999) but in contrast with the studies of Beekhoven et al. (2002) and Eimers and Pike (1997). In these studies, majority students showed either a higher or lower levels of interaction. The finding of similar levels of the sense of belonging of all students differs from several other studies where the sense of belonging was proved to be more important for minority students (Just, 1999; Swail et al., 2003; Zea et al., 1997).

The findings revealed a positive relation between students’ peer and teacher interaction and their sense of belonging. The biggest contributor to students’ feel of belonging was their informal interaction with peers, followed by their formal contacts with teachers. From the perspective of academic and social integration, social integration (peer interaction) showed a stronger positive correlation with students’ sense of belonging.
belonging than academic integration (teacher interaction). This finding confirms the crucial role of peer engagement emphasized in Tinto’s theoretical framework (Tinto, 1993, 1997, 1998). Furthermore, our study reaffirms the belief that positive formal and informal interactions of students with faculty and peers have a positive relationship with their sense of belonging (Hoffman et al., 2002; Johnson et al., 2007). The findings of similar relations between majority and minority students’ interaction and sense of belonging are at odds with Meeuwisse et al. (2010) who found that the relation between interactions and sense of belonging was different for majority and minority students. The difference in findings could be caused by the fact that my sample concerned students who already persisted in college and is therefore in this sense self-selective. This could result in a group of majority and minority students that share more common characteristics.

The findings on technology use for interaction revealed relatively low levels of technology use for all types of interaction except for the formal peer interaction. The low levels of technology use reveal that generally students interact face to face and use technology mainly for study related interaction with peers. The students who more often use technology to collaborate in their study also show a higher sense of belonging. In these collaborations, they prefer to use the laptop and file sharing applications. This finding confirms the idea that students share study related information when collaborating in learning (Gikas & Grant, 2013; Kirkwood & Price, 2005; Margaryan et al., 2011).

Although students predominantly interact face to face, the findings clearly show that students who use technology more often for informal interactions with peers also have more interactions with teachers and show higher levels of belonging. The positive correlation with the teacher interaction might be explained by their higher levels of sense of belonging because through the online engagement students can further expand their bonds with peers and feel at home in the university environment. In this way, students gain more confidence to engage in conversations with the faculty. These findings are in line with the studies by Ito et al. (2008), Dabbagh and Kitsantas (2012), and Kim et al. (2016) that shows that social media use mediates relationships with friends and a broader group of peers. Furthermore, it supports the findings by Qin et al. (2011) and Hwang (2011) that through social media networks people can feel that they are involved in some groups or can bond with other people. The main device that students use for informal interactions with peers is the smartphone. Through the smartphone they most often interact by texting, using social media network sites or making phone calls. The preference for the smartphone can probably be explained by its multifunctionality and its portability so students can stay connected in a way they choose (Helles & Media, 2013; Kato & Kato, 2015). A clear preference of students for texting is also seen in a study by Kim et al. (2016).

Technology use for teacher interaction showed only a positive link for informal interactions, while the other relations were not significant. In these informal teacher interactions student preferred to use a laptop.

The significance of technology use seems to depend on students’ type of interaction with teachers or peers. As students’ interactions shift from formal teacher interaction to informal peer interaction, the variety and significance of technology use seem to increase. This development could be a result of an increase of students’ control of technology use in a way that meets their needs in interaction.
No significant difference occurred in the use of technology between majority and minority students. This means that students from different backgrounds who managed to persist the first year of college use technology in the same way when interacting with peers and teachers. The findings show that their online interaction on study related matters as well as their personal engagement with peers benefits their sense of belonging and further advances their interaction with teachers. The portable and multi-functional smartphone makes it easy to connect with peers on a personal level, while the laptop and file sharing tools support their collaboration with peers in learning.

6.2. Limitations of the study

The present study had the limitation that the ethnic minority subgroups were relatively small. This limits the generalization of the findings for different ethnic groups in the study. Great variety may occur between students from different ethnic groups, due to the time they have been living in The Netherlands and their access to academic and social support in their academic careers.

6.3. Suggestions for future research

The exploratory nature of this study gives several opportunities for future research. Future research could focus on differences in the use of technology during the first year of college between minority and majority students. It is, for example, imaginable that students have to find their way in effectively interacting with peers and teachers by using ICT. Differences in ICT use for formal and informal interaction could be discovered between students who dropped out of studies and students who manage to persist in the first year of college. This, in turn, might help to understand and influence study progress of all students.

7. Conclusions

The different findings have shown that second-year college students from different backgrounds show similarities in the levels of interaction, sense of belonging and technology use. Students peer interactions supported by technology use and their face-to-face interactions with teachers play a key role in their sense of belonging. Students’ technology use for peer interactions proved to be beneficial, it, therefore, leaves room to further maximize its beneficial effect on a larger scale for all students. Presented findings could be utilized to support the students entering the first year of college in their struggle to adapt to the academic and social environment of the university. Institutional support could encourage these new students to enhance and further routinize interaction habits they are already familiar with. Minority students whose level of integration and sense of belonging is crucial for persistence in college could especially benefit from technology use, as it provides the opportunity to connect with like-minded and supportive peers within and beyond the classroom.
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Disclosure statement

No potential conflict of interest was reported by the author.

Notes on contributor

Nasser Mohamedhoesein’s 17 years of experience in Dutch Higher Education, involves student development which he approaches by including the diversity of talent discovered among students from all backgrounds into the learning environment. For this approach, he received the Dutch ‘Challenging Diversity Award’ for Higher Education in 2011. Currently, he works on a PhD study in the area of Student Well-Being and Student Success at the VU University Amsterdam.

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