Should Gender Differences be Considered When Assessing Student Satisfaction in the Online Learning Environment for Millennials?

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Abstract

The majority of today’s students in online higher education are millennials and have grown up using technology. Therefore, there is a need to determine if their expectations from online learning are different from previous contextual studies and whether or not these vary across gender. This study used a mixed method approach, using focus groups, followed by online surveys of 834 undergraduate students from the University of Mauritius enrolled in an online course. Using factor analysis and structural equation modelling, the study found no significant differences based on gender for millennials, but identified three significant antecedents of student satisfaction for both males and females: university reputation; physical facilities; and instructor empathy.

Background

Is higher education addressing the current needs of the millennial generation in the age of online learning? Millennials are those who were born between 1982 and 2000, and as a result have grown up using technology and ‘have characteristics unique to the digital age’ (Northern Illinois University, 2013). Millennials have different perceptions and experiences (Renes and Strange, 2011), and they tend to demand more interactive and collaborative learning environments, be it in the classroom or online (Cutler, 2014). Furthermore, what works for one gender may not

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work for the other (Maceli et al., 2011), since historically, gender differences have influenced how students learn and develop in the classroom.

However, the difference as it relates to gender in online learning has often been contradictory (Helgesen and Nesset, 2007; O’Driscoll, 2012; Sultan and Wong, 2012). Some authors argue that gender-specific behavior patterns might discriminate and prevent women from using e-learning (e.g. Cuadrado-García et al., 2010), while others contend that e-learning, through its flexible and interactive approach, supports women (e.g. Bruestle et al., 2009). Therefore, trying to ascertain a clearer picture of whether or how gender affects students’ expectations or use of online learning is essential.

Meanwhile, there is a growing student demand for online learning in higher education (Cole et al., 2014), and many university presidents view online education as a core component of their higher education programmes (Parker et al., 2011) with women composing the majority of the students enrolled in numerous countries (Findlow, 2013). While market forces in tertiary education have placed growing pressure on universities to adopt a customer-oriented business model where students expect that they can ‘work, learn, and study whenever and wherever they want’ (Johnson et al., 2011, p. 3). Therefore, the objective of this study was to investigate whether or not academic-related experiences online were perceived differently by millennial men and women, and how these differences could potentially impact their student satisfaction.

**Gender bias, culture and education**

Cross-cultural gender bias starts at childhood and is just one factor that impacts the educational setting, in what Olesen (2007) coined as embodied culture, where emotional and cognitive processes are interlinked or woven together and lead to different societal conditions. Moreover, in the educational setting, children are ‘continuously bombarded with deeply embedded expectations about what constitutes suitable gender-specific behavior and must learn to manage according to the dominant normative conceptions of femininity and masculinity’ (Barone, 2011, p. 159). In much of the world there is still the view that women are inferior to men concerning knowledge and capabilities, which permeates within paternalistic societies (Reda and Hamdan, 2015). These roles play out globally. In Latin America, girls receive the message to fulfil traditional gender expectations by marrying and having children (Englander et al., 2012), while for cultural traditions many universities in Saudi Arabia segregate male and female learners on different campuses (Parahoo et al., 2017).
2013), and in Sudan, families of girls would not allow them to travel and stay away from their homes (Muneer, 2011). Thus, patriarchal societies create and reinforce a gender disparity that may affect educational opportunities for women.

**Gender and technology**

Hence, are there behavioural differences exhibited by the two genders in the online learning environment? Are they truly attributable to gender differences, or are cultural differences masked by gender roles and societal expectations? Hofstede (1991), in his early research, identified several key constructs that offer insight into these cultural components including masculine and feminine values. Srite and Karahanna (2006) applied the masculine and feminine constructs with students from 30 different countries to see if gender behaviours influenced the use of technology. Their data showed that the masculinity/femininity values did not moderate their use of technology. But more recently, Thowfeek and Jaafar (2012) suggested that the male/female dimension is one of the key factors that should be explored before adopting an e-learning system, leaving the question still unresolved as to whether or not gender differences (that are culturally embedded) affect students in online learning. Therefore, it became important to conduct this study in a multicultural environment, to allow the diffusion of different cultures to offset potential cultural gender biases built into studies done in more homogeneous cultural contexts.

Numerous studies have examined gender interactions and educational differences (Barone, 2011; Rossing et al., 2012; Tucker, 2014), showing that boys and girls develop different attitudes towards school and their working habits (Legewie and DiPrete, 2012). With regards to technology, men are more likely to use computers and new media and to make more contributions to online discussions with greater levels of social exchange (Tucker, 2014), while women tend to view computers as social media (Cuadrado-García et al., 2010). Females may be further disadvantaged, since young men are more likely to have reported using virtual worlds, with higher frequencies (Lin et al., 2012), influencing their performance as well as their perception of helpfulness from an online environment. Findings also revealed that instructional design and comfort with technology were pertinent (Rossing et al., 2012) and should reflect these differences and accommodate both genders.

**Student satisfaction in higher education**

Despite potential differences, perceptions on the integration of emerging technologies into classroom instruction have been positive (Rossing
et al., 2012). This is important because online education is predicted by some to become the dominant mode of delivery of tertiary education (Spanier, 2010). The Pew Research Center, in association with the Chronicle of Higher Education, reported that 15 per cent of those taking online courses have earned their degree via an online programme (Parker et al., 2011), and in Australia there is an increasing emphasis directed towards programmes adopting cloud learning (Cinque and Brown, 2015). Continuous technological advances, previously constructed definitions and conceptual frameworks are constantly being reframed and redesigned, as online learning continues its rapid growth phase, while deregulation, globalisation and increased competition have shifted the strategic emphasis of higher education institutions from a teaching-oriented model to a service model (e.g. Kuo et al., 2013; Parahoo et al., 2013). These changes have resulted in universities creating new benchmarks and ways to evaluate student experiences to reduce frustration when their expectations are not met (Rossing et al., 2012).

However, the impact of gender on determinants of student satisfaction has shown mixed results as to online learning (e.g. Yukselturk and Bulut, 2009; Albert and Johnson, 2011; O’Driscoll, 2012; Young-Jones et al., 2013). Satisfaction has been defined as, ‘a judgment that a product or service feature, or the product or service itself, provides a pleasurable level of consumption-related fulfilment’ (Oliver, 1999, p. 34), while Sinclaire (2011) showed that student satisfaction in online learning was a combination of student success and having an enjoyable experience. Makarem et al. (2009) found that service interactions influence customer perceptions of quality and satisfaction, and within such technology-enabled contexts university administrators need to be aware that these activities or processes (Grönroos, 1990) must be effectively managed to achieve student satisfaction.

Ahmed and Dar (2015) identified five business characteristics that were positively correlated with university satisfaction: consumer attributes; provider attributes; marketing activities; product attributes (such as quality of education); and symbolic attributes including institutional identity and reputation (Mourad et al., 2011). Reputation refers to the collective judgements of an organisation based on assessments of the financial, social and environmental impacts attributed to the organisation, making it a key intangible asset (Vidaver-Cohen, 2007). While university reputation traditionally was not identified as a major determinant of student satisfaction (Gibson, 2010), recent empirical research supports the importance of reputation to universities (Helgesen and Nesset, 2007; Parahoo et al., 2013; Ahmed and Dar, 2015).
In addition, research demonstrates that the academic experience of students extends beyond human interactions to other aspects that affect student life, such as physical characteristics of university facilities (Helgesen and Nesset, 2007; Gibson, 2010; Parahoo et al., 2013). In traditional settings, this is hardly surprising. Lastly, university-wide initiatives are promising a fundamental drive towards a new paradigm in relation to how universities engage with their students (Van der Velden, 2012), requiring them to ascertain and manage determinants of student satisfaction to achieve sustainability (Parahoo et al., 2015).

**Development of conceptual model and hypothesis**

As discussed in the preceding section, various studies (Helgesen and Nesset, 2007; O’Driscoll, 2012; Parahoo et al., 2013; Ahmed and Dar, 2015) have identified that the quality of student interactions; service quality considerations; and university reputation affect student satisfaction. The qualitative phase of the present study supported similar findings, therefore, a conceptual model based on six independent factors affecting student satisfaction was adopted: Student satisfaction = f(IT/admin staff interactions; Instructor empathy; Reputation of university; Student interactions; Physical facilities & Instructor feedback).

It was hypothesised that the factors affecting satisfaction would differ for millennials by gender, due to differences in online learning styles and learned behaviours (e.g. Srite and Karahanna, 2006; McCoy et al., 2007; Cuadrado-García et al., 2010; Barone, 2011; Lin et al., 2012; Thowfeek and Jaafar, 2012; Tucker, 2014).

**Methodology**

**Study setting**

While the bulk of satisfaction studies have been undertaken in Western contexts, those done in other cultural contexts have usually focused on overall satisfaction and not considered gender differences, thereby making the findings difficult to generalise due to cultural differences (Parahoo et al., 2015). Therefore, Mauritius was chosen to conduct this study based on the gender profile in the education system and its multi-ethnic population. Mauritius has four public universities and over 50,000 students enrolled in some form of tertiary education between the ages of 20 and 24 making up 49.2 per cent of the population for that range (Educational Statistics, 2015). Starting with primary school, boys and girls are almost equal (girls 50.2%) in numbers, which could reduce the impact of primary gender bias. Moreover, at all three levels of performance testing
the girls outperform the boys, by 10 per cent or more at each level (Educational Statistics, 2015), and by the time students matriculate, females outnumber males almost three to one, even in the sciences (University of Mauritius, 2014).

Mauritius has 1.3 million residents of Indian, African, Chinese and French ethnic groups (Mauritius in Figures, 2015). These diverse geographical origins of the different ethnic groups would be expected to lead them to display different cultural traits regarding gender roles. Therefore, any potential cultural biases or confounds relating to gender expectations deriving from the cultural traits associated with a specific ethnic group would through aggregation in data analysis be reduced or mitigated, allowing expectations to be attributed to gender differences and not to other embedded cultural influences.

**Sampling and collection of data**

A mixed method design was implemented with a qualitative approach at the first stage, to support the development of the conceptual model and the constructs. Two focus groups (eight students per group, representative of the population) were held with undergraduate students enrolled at the university. Participants described their perceptions of factors that influenced their satisfaction and openly shared their common feelings and thoughts with other participants. The discussions were recorded and then analysed independently for reliability and to minimise researcher bias. A meeting was then held to resolve divergences with consensus regarding seven emerging themes:

- interactions with and feedback from instructor;
- effective and meaningful interactions with other students;
- IT staff support;
- support from administrative staff;
- instructor’s classroom engagement and competence in using technological tools;
- quality of physical infrastructure of the university;
- university reputation.

Survey constructs were sourced and fine-tuned to the context of the present study from empirical studies in the literature: e.g. measures for different types of interactions were derived from the performance-based measure of service quality (SERVPERF) (Cronin and Taylor, 1992) and higher education performance (HEdPERF) (Firdaus, 2006); university reputation items were from Sultan and Wong (2012) and Parahoo et al.
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(2013); while satisfaction items were from Butcher et al. (2001) and Sivadas and Baker-Prewitt (2000). The pilot instrument consisted of 29 items representing the seven identified constructs. This pilot study resulted in minor item refinement and the final study questionnaire.

The survey was then given to students enrolled in the ‘General Education Module in Educational Technology’, an online course, because students campus-wide take the class, and it had an enrolment of 927 students. The survey was administered online at the conclusion of the course for purposes of convenience and anonymity, resulting in 834 usable responses (a 90% response rate). The data were then analysed in a multi-stage process.

An exploratory factor analysis (EFA) was undertaken to categorise the distinct factors involved (Hair et al., 2010). The resulting factor structure was then validated and purified by confirmatory factor analysis (CFA). Composite reliability (CR) was assessed to determine the internal consistency of the various study scales (Hair et al., 2010). Face, convergent and discriminant validity were also assessed. At the end of the scale construction stage, the study hypotheses were tested by structural equation modelling (SEM) using linear structural relations (LISREL).

A demographic profile of the respondents was conducted showing that the undergraduate students were relatively young with 72.5 per cent being below 20 years and 99 per cent below 25 years. Most of the students were female (62.4%) as compared to male (37.6%), priming the students, as millennials, to be fully immersed in the e-learning experience.

Measurement models, latent factors, reliability and validity of scales

The assumptions underlying EFA were confirmed through the Kaiser–Meyer–Olkin measure of sampling adequacy (λ = 0.930) and Bartlett’s test of sphericity (p < 0.001). Principal component analysis was used as an extraction method, followed by varimax rotation to clarify the results. Using eigenvalues greater than 1.0, seven factors were extracted, which cumulatively accounted for 59.1 per cent of the variance of total variance. The names attributed to the seven factors; the eigenvalue for each factor (in parentheses); and the description of the constituent items of each factor were:

• student satisfaction (10.5): students are very satisfied with university; which met their needs; expectations; and aspirations;
• IT/admin staff interactions (2.1): IT staff are accessible; provide good technical support and training; while admin staff provide dependable information;
• instructor empathy (1.8): instructor responds promptly to students’ requests for assistance; are interested to solve students’ problems; are caring; and display a positive attitude towards students;
• reputation of university (1.6): university has a good reputation in market; instructor uses technology effectively; and uses electronic communication tools;
• student interactions (1.2): good collaboration and communications among students during group assignments; and during the course;
• physical facilities (1.1): university facilities are visually appealing; physical environment is comfortable; and layout is attractive;
• instructor feedback (1.1): instructor provides timely and detailed feedback and is available for consultation.

The uni-dimensionality of each of the measurement scales was determined through CFA (Hair et al., 2010). In line with the study’s objective, the measurement models were separately tested for the two independent groups, male and female students. While the overall fit of each model was satisfactory, an analysis of the measurement models for both genders showed that six specific items had poor loadings (<0.5). The authors consulted with colleagues and students and it was determined that deleting these six items (out of a total of 29 items) would not affect the domain of the respective constructs. The fit indices pertaining to the revised models (normed chi-squared; root mean square error of approximation (RMSEA); standardised root mean square residual (SRMR); and incremental fit index (IFI)) with the six items omitted suggested a good fit of data to the measurement models of both male and female students, as per established criteria (Hair et al., 2010), as illustrated in Table 1.

The CRs of each of the seven scales for both genders were separately assessed and were found to be well above the minimum

<table>
<thead>
<tr>
<th>Group</th>
<th>Normed chi-squared</th>
<th>RMSEA</th>
<th>SRMR</th>
<th>IFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female students</td>
<td>381/209 = 1.82</td>
<td>0.040</td>
<td>0.036</td>
<td>0.99</td>
</tr>
<tr>
<td>Male students</td>
<td>422/209 = 2.02</td>
<td>0.057</td>
<td>0.051</td>
<td>0.98</td>
</tr>
</tbody>
</table>

RMSEA, root mean square error of approximation; SRMR, standardised root mean square residual; IFI, incremental fit index.
threshold \(>0.70\) (as recommended by Hair et al., 2010) (see Tables 2 and 3). Face validity was established by using validated measures from the literature, and convergent validity was established by examining the path loadings, which were all high. Further, the average variance extracted (AVE) exceeded 0.5 for all constructs for both genders, with the exception of instructor empathy which had a borderline value of 0.49 for female students (see Tables 2 and 3). Discriminant validities between a pair of latent variables was established by comparing the two respective AVE values to the squared correlation estimates between the same two variables, resulting in AVE values exceeding the correlation estimates as required (see Tables 2 and 3).

**TABLE 2**
Summary statistics for scale items for female students (AVE values on diagonal, squared correlation estimates below diagonal)

<table>
<thead>
<tr>
<th>Item description</th>
<th>#Items</th>
<th>CR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Student satisfaction</td>
<td>4</td>
<td>0.919</td>
<td>0.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Student interactions</td>
<td>3</td>
<td>0.865</td>
<td>0.15</td>
<td>0.68</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 IT/admin interactions</td>
<td>4</td>
<td>0.806</td>
<td>0.20</td>
<td>0.14</td>
<td>0.51</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Instructor empathy</td>
<td>4</td>
<td>0.790</td>
<td>0.30</td>
<td>0.11</td>
<td>0.35</td>
<td>0.49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Reputation of university</td>
<td>3</td>
<td>0.782</td>
<td>0.50</td>
<td>0.14</td>
<td>0.19</td>
<td>0.24</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Physical facilities</td>
<td>3</td>
<td>0.815</td>
<td>0.41</td>
<td>0.10</td>
<td>0.16</td>
<td>0.21</td>
<td>0.38</td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>7 Instructor feedback</td>
<td>2</td>
<td>0.746</td>
<td>0.12</td>
<td>0.04</td>
<td>0.17</td>
<td>0.31</td>
<td>0.10</td>
<td>0.05</td>
<td>0.63</td>
</tr>
</tbody>
</table>

AVE, average variance extracted; CR, composite reliability.

**TABLE 3**
Summary statistics for scale items for male students (AVE values on diagonal, squared correlation estimates below diagonal)

<table>
<thead>
<tr>
<th>Item description</th>
<th>#Items</th>
<th>CR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Student satisfaction</td>
<td>4</td>
<td>0.917</td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Student interactions</td>
<td>3</td>
<td>0.810</td>
<td>0.16</td>
<td>0.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 IT/admin interactions</td>
<td>4</td>
<td>0.863</td>
<td>0.27</td>
<td>0.08</td>
<td>0.63</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Instructor empathy</td>
<td>4</td>
<td>0.815</td>
<td>0.37</td>
<td>0.17</td>
<td>0.24</td>
<td>0.533</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Reputation of university</td>
<td>3</td>
<td>0.799</td>
<td>0.56</td>
<td>0.17</td>
<td>0.31</td>
<td>0.36</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Physical facilities</td>
<td>3</td>
<td>0.738</td>
<td>0.49</td>
<td>0.08</td>
<td>0.27</td>
<td>0.23</td>
<td>0.40</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>7 Instructor feedback</td>
<td>2</td>
<td>0.746</td>
<td>0.25</td>
<td>0.03</td>
<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
<td>0.25</td>
<td>0.59</td>
</tr>
</tbody>
</table>

AVE, average variance extracted; CR, composite reliability.

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Testing the study hypothesis

An independent samples *t*-test was run across both genders for the following four variables: satisfaction; reputation; physical infrastructure; and instructor empathy. It was observed that the mean scores for male and female students across each study variable were not significantly different (3.55/3.60; 3.64/3.66; 3.42/3.39; and 3.37/3.47; \( p < 0.05 \), respectively), implying that the two genders reported similar ratings for the four study variables.

For a more formal testing of the hypotheses, the conceptual models were next tested using SEM in LISREL for the two groups (female and male students). It was observed that three paths: student–student interactions; IT–administrative staff interactions; and instructor feedback were not significant for both genders \( (p < 0.05) \). Consequently, these three paths were omitted and the model was reformulated with three independent variables: instructor empathy; university reputation; and physical infrastructure postulated to influence student satisfaction. Path coefficients in both the measurement and structural models were determined and it was observed that the model fit based on normed chi-squared; RMSEA; SRMR; and IFI, for both females and males, was good (see Table 4).

Findings

It was observed that the satisfaction for both genders was influenced by the same three factors in decreasing order of importance: reputation \( (\text{Gamma} = 0.45 \text{ and } 0.42 \text{ for female and male students, respectively}) \); physical infrastructure \( (\text{Gamma} = 0.27 \text{ and } 0.35 \text{ for female and male students, respectively}) \); and instructor empathy \( (\text{Gamma} = 0.21 \text{ and } 0.19 \text{ for female and male students, respectively}) \). In addition, the respective path coefficients for the three independent variables were found to be quite similar for both genders (see Figures 1 and 2). This implied that

\[ \text{TABLE 4} \]

Fit indices for the structural models for males and females

<table>
<thead>
<tr>
<th>Group</th>
<th>Normed chi-squared</th>
<th>RMSEA</th>
<th>SRMR</th>
<th>CFI</th>
<th>IFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female students</td>
<td>165.6/71 = 2.3</td>
<td>0.051</td>
<td>0.035</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>Male students</td>
<td>182.9/71 = 2.6</td>
<td>0.071</td>
<td>0.047</td>
<td>0.98</td>
<td>0.98</td>
</tr>
</tbody>
</table>

RMSEA, root mean square error of approximation; SRMR, standardised root mean square residual; CFI, comparative fit index; IFI, incremental fit index.

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the male and female students tended to demonstrate homogeneous behaviour as consumers of education services. Therefore, the hypothesis proposing that the factors impacting online student satisfaction for millennials differ between male and female university students was rejected.

**Theoretical implications**

The findings from the SEM models indicate that satisfaction was driven by university reputation, instructor empathy and physical infrastructure for both males and females with the relative weighting of each factor being quite similar, implying that the two genders collectively comprised...
a homogeneous group. University administration could then develop similar marketing strategies for both genders, and devote their efforts and resources to strengthening the three identified factors, in multicultural ethic settings.

This finding is in sharp contrast to a study that determined student satisfaction in a technology-enabled environment in Saudi Arabia, was different based on gender (Parahoo et al., 2013). Male satisfaction was determined by: reputation and instructor academic competence, and they expected their instructor to possess not only good academic credentials but to display a customer-oriented and an empathetic attitude towards them, while females only valued reputation. But this difference

Figure 2 Standardised path loadings for male students. *All paths in structural and measurement models were significant at $p < 0.01$
may be linked to the cultural context, more so than gender differences (Srite and Karahanna, 2006), with paternalistic societies reflecting masculine roles, protectiveness towards the women and acceptance of cultural ways (Englander et al., 2012). Hence the differences exhibited by the two genders in learning environments may be attributable to cultural differences masked by gender roles and societal expectations, not actual gender differences.

Furthermore, the findings in Mauritius tend to be similar to recent ones in the United States and Western European countries indicating that gender differences as to antecedents of online satisfaction are not significant (Chitkushev et al., 2014; Cole et al., 2014) in multi-ethnic settings where male and female gender roles are not as culturally embedded, or are diverse enough to mask cultural confounds.

However, there appears to be a need to better understand and measure culturally embedded gender differences and how these impact student satisfaction, especially in patriarchal societies. For when selectively comparing patriarchal societies, they display greater differences in regards to higher power distance, being more hierarchical in nature, they function as more collective as opposed to individualistic societies, have higher uncertainty avoidance, tend to have lower long-term orientation/normative scores and are typically classified as cultures of restraint, indicating the importance of tradition to their societies (Hofstede Centre, 2016).

Another interesting finding was that in Mauritius, the academic credentials of the instructor did not emerge as a factor affecting students’ satisfaction. This is contrary to findings by Howell and Buck (2012) who found that instructor subject matter competency was one of the four main criteria impacting student satisfaction. This may be due to a combination of reasons: students took for granted that instructors appointed by the university would be qualified; the difference between traditional older students and those of millennials; or that the students relied more on course materials to learn autonomously.

It is also important to consider that these students are among the first generation of virtual learners. Because of this both the males and females are accustomed to seeking and building knowledge in a technology-enhanced environment and it is part of their identity (Renes and Strange, 2011), so student expectations and their heuristic viewpoint may be different from previous studies. And the differences previously observed were probably reflective of gender differences in use, which may be being mitigated by the more homogeneous behaviour of millennials with regard to technology usage.
Managerial implications

University administrators in culturally diverse settings should recognise that the two genders behave similarly with regards to their satisfaction, enabling them to design a universal marketing strategy for satisfaction, with the major factor being reputation. Hence, it would make sense to devote resources to improving programme quality and developing corporate branding. Then, the managers should focus on ensuring that the physical facilities on campus are well-maintained and aesthetically pleasing. This is because students pay particular attention to aesthetics and comfortable consideration in design and layout of facilities. This finding is in contrast to those of Speece (2012), who concluded that those taking online courses primarily do it for convenience, and implied little or no association to the physical facilities. However, this discrepancy may be reflective of the fact that the University of Mauritius is a traditional university that provides both classroom-based and online courses. Many universities worldwide now follow this trend, so these findings could be of interest to them as well.

Finally, both male and female students expect that the instructor displays empathy towards them (be caring, display a prompt response to student queries and a desire to address student issues efficiently). This need for having instructor commitment to students falls in line with findings from Ma and Yuen (2011), who showed a strong need for perceived online attachment motivation between both male and female students and instructor, and that millennial online learners were more dependent on their relationship with their online instructors (Maceli et al., 2011). As a result, the university departments need to recognise that student expectations for their instructors are different in online learning. The instructors assigned to such courses must possess the personality traits and psychological pre-dispositions to display empathy towards the students and willingness to go the extra mile to support them. University administration should therefore understand that an instructor rated high by students in a traditional setting may not score similarly in an online learning scenario due to differing student expectations.

Limitations and further research

The limitation of the present study was that it was conducted in a specific empirical context: a university in a multi-ethnic country so the influence of culturally embedded gender influences would be mitigated. As a result, the findings may not be readily extended to culturally divided or more paternalistic societies. However, the study has unearthed some
important findings regarding the absence of gender differences on student satisfaction in online learning among millennials. This finding should be further explored in other cultural contexts to see if the latter display similar attributes.

Conclusion
While various studies have resulted in conflicting results, the findings from this study indicate that gender differences, in regards to students’ satisfaction in the online class environment are not present among millennials when looking at ethnically diverse groups and an environment where female enrolments in the various majors match those of males. Furthermore, for millennials, reputation and physical infrastructure are the primary drivers determining student satisfaction followed by instructor empathy and interactions. However, the findings also indicate that more attention should be given to culturally embedded gender roles and other cultural contexts in patriarchal societies and those with higher cultural restraint, as the drivers of student satisfaction may differ from those that are multicultural and ethnically diverse.

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