Diversity in the Information Technology Program at the University of Belize

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Abstract

A diversity of perspectives produces solutions that benefit a broad range of people. In computing, this is crucial since the field is ubiquitous, with applications in a broad spectrum of areas that include science, humanities, and foundational work to develop computing itself. This need for diversity in computing is important for the employees provided to the technology sector by institutions like the University of Belize. This research examines diversity in the University of Belize Bachelor of Information Technology program from 2011 to 2020. An overview of the demographics of the program includes the variables of gender, ethnicity, geography and more. Gender is essential; the results show that males are the majority in program enrollment. Both females and males have similar views that the program can benefit from more diversity, but females do not think it is as diverse as males, and they feel less successful at the university.

Keywords: Computer science education, social impacts of computing, gender, stereotypes, diversity

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Introduction

Over the past decade, the computing industry has grappled with the challenge of enhancing diversity and inclusion, a subject widely acknowledged as slow to progress (Fry et al., 2021) and fraught with difficulties (Lewis et al., 2019). In recent years, this critical issue has gained increased attention and support from a variety of sources. Alliances, coalitions, blogs, and surveys have played pivotal roles in raising awareness and advocating for diversity in computing. Prominent contributors to this effort include organisations like the Computing Research Association's Committee on Widening Participation in Computing Research (CRA-WP), the Center for Minorities and People with Disabilities in Information Technology (CMD-IT), the Gender Diversity in Computer Architecture blog (Enright Jerger & Hazelwood, 2017), the MICRO Diversity Survey (ACM SIGARCH, 2018), and the Taulbee Survey (Computing Research Organization, 2021).

These concerted initiatives have led to numerous activities designed to mobilise the computing community to take purposeful action. Notable examples of these efforts include an open letter and a call to action addressed to the computing community on June 8, 2020 (https://blackincomputing.org/), a Heartfelt Concern Call to Action letter sent to the Association for Computing Machinery (ACM) (ACM Interactions, 2020), and the establishment of the ACM Standing Committee on Systemic Change (https://www.acm.org/diversity-inclusion/committee-on-systemic-change).

It's also worth noting that universities, in general, have recognised the significance of collecting demographic data on students across various disciplines. One of the largest efforts in this regard is the CIRP Freshman Survey (Higher Education Research Institute, 2022). This data includes information on gender, ethnicity, and academic preferences, all of which play a pivotal role in shaping the marketing and recruitment strategies of post-secondary institutions. Additionally, in the context of computing, several studies (Blaney, 2020; George et al., 2022; Babeş-Vroman et al., 2022) and reports from organisations like computerscience.org (Simmons, 2022) have been instrumental in providing updated insights into diversity within Computer Science programs.

Entering the computing industry can take various paths, but each pathway demands the acquisition of skills, knowledge, and attitudes relevant to one's desired role (Quaglia, 2021; Lara et al., 2019). The degree programs offered by post-secondary institutions serve as gateways to attaining these skills and, ultimately, a career in the computing industry. Recently, these programs have witnessed surges in demand, resulting in a significant enrollment increase (Lehman et al., 2021). Recognising that these programs serve as pipelines into the computing industry and acknowledging the ongoing challenge of diversity, it becomes essential to analyse student demographics and their attitudes regarding diversity.

Our research is focused on the Information Technology (IT) students at the University of Belize (UB). Given the limited availability of similar studies at UB, we anticipate that our research will initiate systematic investigations into undergraduate student demographics and perspectives on diversity at UB. Furthermore, our analysis and findings regarding the demographics and diversity of UB's IT students will inspire other programs at UB to undertake similar research. In this paper, we outline the research methodology, present the data, scrutinise the results, and engage in a comprehensive discussion of our findings and their implications for the field of computing at the University.

Background

Research into the demographics of undergraduate computing students demonstrates an evolving landscape in the field of diversity. Despite progress, there remains a concerning lack of representation for females, minorities, persons with disabilities, and members of the LGBTQ+ community (Simmons, 2022).

The Integrated Postsecondary Education System (IPEDS) conducts annual surveys under the purview of the U.S. Department of Education. The Completions survey (National Center for Education Statistics, n.d.), as detailed by the National Center for Education Statistics, compiles demographic data for graduates of participating institutions, which is then aggregated into demographic data sheets by the National Center for Science and Engineering Statistics (NCSES). Notably, the 2021 NCSES Women, Minorities, and Persons with Disabilities in Science and Engineering Data (National Science Foundation, 2021) highlighted a

deficiency in diversity. In this dataset, gender disparities were evident, with a notable increase in female representation, albeit slight, from 17.69% in 2008 to 19.93% in 2018. Additionally, ethnic diversity among respondents in 2018 revealed considerable imbalances, with 54.71% identifying as white, 16.19% as Asian, 11.39% as Hispanic or Latino, 8.93% as Black or African American, and 8.78% as other. Respondents reporting disabilities lasting for six months or more were classified as having a disability. A majority of respondents in 2016 (76.91%) indicated that they were without a disability, while 23.05% reported having a disability.

The issue of gender disparity in computing has persisted over time, prompting calls for proactive strategies to recruit and retain females in the field (Zhang et al., 2021). A large-scale analysis of Computer Science literature (Wang et al., 2021) has revealed that achieving gender parity in computing, based on observed trends over the last fifty years, may not be achievable within this century. This gender imbalance contrasts significantly with other fields where gender parity has either been attained or is projected within 20 to 30 years. Despite females outnumbering males in colleges, female representation in technology has faced significant challenges, with levels plummeting below 20% in recent years (Zhang et al., 2021). Studies suggest that attitudes towards IT develop from an early age, with males gravitating towards technology-related toys more than females. This early divergence has led to lower female confidence in technology and a perception of IT as a male-dominated domain, perpetuating the gender gap (Meyer et al., 2015; Chang & Milkman, 2020).

While extensive research has been conducted on gender disparities, demographic practices in computing have often excluded data collection on queer-spectrum individuals. This exclusion poses a challenge to the publication of relevant demographic data. Initiatives are now underway to broaden gender inclusivity in computing through research and discussions (Menier et al., 2021), a critical step in addressing the needs of transgender and non-binary learners. This heightened awareness aims to counter the discrimination and lack of support faced by queer-spectrum individuals in computing environments. Recent studies (Casper et al., 2022) of undergraduate engineering and computer science students have incorporated queer-inclusive surveys, revealing a spectrum of gender affiliations. These surveys indicate the urgent need for more comprehensive data and support.

Studies have examined various motivating factors for students pursuing computing, but fewer have delved into gender differences in computing major selection. Some studies have unearthed the reasons why females avoid computing majors (Vilner & Zur, 2006), including a higher dropout rate for females compared to males. Research has long focused on improving female representation in computing, with various studies suggesting different strategies. For example, one study (J. Wang et al., 2015) identified social encouragement as a potent influencer in choosing IT or tech fields of study, particularly for females. The lack of technology exposure further impacts the major students choose, with females sometimes rejecting computing majors due to misconceptions or a lack of understanding of the field (Zhang et al., 2021).

The diversity of the computing industry and academia encompasses multiple dimensions, including age, ethnicity, gender, and disabilities. Research has consistently shown that women and minorities are underrepresented in computing and often feel that they do not fit in or measure up. Cultural barriers and a lack of exposure further impact the perspectives of individuals in the field, affecting their sense of belonging, self-confidence, and scientific identity, both in the classroom and the workplace (Metcalf et al., 2018). Effective teamwork in both educational and professional settings necessitates diversity, as 85% of high-value IT work is derived from diverse collaboration (Woszczynski et al., 2006). The significance of diversity in computing lies in its ability to offer varied perspectives and foster innovation. The absence of females in technology may lead to a narrow focus on fast development rather than alternative solutions or viewpoints. Additionally, the inclusion of individuals with disabilities in computing teams offers insight into accessible technology, enriching the industry. Age diversity is also crucial as it preserves valuable knowledge held by older computing experts. Lastly, ethnic diversity contributes a cultural perspective vital for global inclusion in the computing landscape.

Methodology

No research has been conducted concerning diversity in UB's Information Technology program, and therefore no data from previous studies exist. As a result, this study used raw data from two data sources. The first is an unpublished transactional dataset of UB IT student records from 2011 to 2020. The second is a dataset created from the UB IT Diversity Survey conducted in April 2022. The diversity survey is vital to this research because it provides additional data not available from the transactional dataset. Specifically, it includes data on student perception of diversity at the UB and in the Information Technology program of the UB.

The transactional dataset contained all transactional records for courses taken by students from 2011 to 2020. Specific columns selected from a filtered graduate aggregate provided the necessary demographic data. The columns were student id, program, enrolled semester, year, course code, graduation date, gender, ethnicity, and district. Descriptive statistics focused on gender, ethnicity, and geographical distribution generated from the data. From this data, baseline demographic statistics provided a benchmark for assessing the UB IT Diversity Survey demographic data.

The UB IT Diversity Survey design drew from various diversity surveys for computing (J. Wang & Hejazi Moghadam, 2017; Sloughter et al., 2019; Babeş-Vroman et al., 2022). The questionnaire was designed to keep the number of questions to a minimum and employed multiple choice, multiple answers, and forced Likert scale questions. The survey's twenty questions comprised three demographic questions; three questions about religious affiliation; political preference, and sexual orientation; a question about disability; six questions on diversity; three questions about the UB academic program; two questions on computing identity; and two questions on favourite high school subject and career interest. An online survey instrument was created and deployed using the survey administration software Google Forms to collect the data.

The survey sample comprised Associate and Bachelor's students that graduated from the IT degree program at UB from 2011 to 2020 or are currently enrolled. Students currently enrolled were included to capture current student perceptions of diversity. A component of the survey deployment was sending three emails. The first email was an invitation for the student to participate in the online survey. The subsequent two emails were an initial and a final reminder for participation in the survey. The survey was entirely voluntary, and if students chose to participate, they could skip any question they were uncomfortable answering and exit the survey at any time. Also, their participation and responses were confidential and not part of any academic record, and no individually identifiable information was collected or reported. The survey was available to these students from 4 April 2022 to 14 April 2022.

SPSS Statistics was used to analyse the transactional dataset and survey data. Frequencies expressed as counts and percentages described the characteristics of the responses from the demographic questions for both datasets and the non-diversity questions for the survey dataset. One-sample z-tests determined whether the proportions of the transactional dataset (the hypothesised population) differed significantly from those of the survey dataset (the observed sample). The significant differences between the gender and ethnic populations were determined using t-tests, and Cronbach's Alpha test measured the internal reliability of the questions about diversity.

Results

The transactional dataset of student records had 15,344 records that represented a student aggregate of 247 graduates. Of the 394 students (graduates and currently enrolled) invited to participate in the diversity survey, 214 entered the survey, and 212 completed the survey. This number represents a completion rate of 99.0% and a response rate of 53.8%. We first discuss the student demographics using these datasets, including general demographics of gender, ethnicity and geography, religious and political affiliations, sexual orientation, disabilities, and interests. We then discuss student perceptions of diversity at the UB and the UB IT program; and differences in response to the gender and ethnic questions, specifically for male versus female and Mestizo versus non-Mestizo participants.

Demographic Data

The transactional dataset and the diversity survey indicate that the Information Technology program is male-dominated. The Transactional dataset reports 80.2% male and 19.8% female. Of the 212 responses, the diversity survey reports that 75.0% were male, 24.1% female, 0.05% Other, and 0.05% preferred not to respond. Of the 211 responses, most students in both datasets were of Mestizo ethnicity - 42.5% in the transactional dataset and 45.5% in the diversity survey - as shown in Table 1. Of the 211 responses, most students in both datasets were from the Cayo District - 52.2% in the transactional dataset and 55.9% in the diversity survey - as shown in Table 2.

	Transactional Data		Diversity Survey	
Ethnicity	**Count**	**%**	**Count**	**%**
Mestizo	105	42.5	96	45.5
Creole	57	23.1	51	24.2
Garifuna	16	6.5	17	8.1
Mayan	16	6.5	12	5.7
East Indian	5	2.0	5	2.4
Ketchi			3	1.4
Caucasian			3	1.4
Oriental	9	3.6	1	0.1
Other	14	5.7	18	8.5
Unknown	25	10.1	5	2.4

Table 1. Ethnicity

	Transactional Data		Diversity Survey	
District	**Count**	**%**	**Count**	**%**
Cayo	129	52.2	118	55.9
Belize	77	31.2	47	22.3
Stann Creek	20	8.1	19	9.0
Orange Walk	10	4.0	16	7.6
Toledo	7	2.8	6	2.8
Corozal	3	1.6	5	2.4

Table 2. District

Verifying that the survey data proportions were consistent with the transactional data proportions determined the claim that the data was reliable. Examples of z-tests conducted using the demographic data are Ethnicity and District, where Mestizo: $n=211$, $\hat{p}=0.46$, $p_0=0.43$) and Cayo: $n=211$, $\hat{p}=0.56$, $p_0=0.52$, respectively. The claim satisfied normality with $np = 96 \geq 5$ and $nq = 115 \geq 5$; and $np = 118 \geq 5$ and $nq = 93 \geq 5$ respectively. For H_0: $p = 0.43$ and $\alpha = 0.05$, these tests yielded z values of 0.88 and 1.07, respectively, which are not in the critical region of -1.96 and +1.96 and do not reject the claim. The majority of the other tests yielded z-values that did not reject the claim; therefore, the conclusion is that the survey data proportions are consistent with the transactional data proportions. Thus, the survey data are considered reliable.

Religious and Political Affiliation

212 responses to the religious affiliation or denomination survey question (shown in Table 3), 6.1% of the participants preferred not to respond. A majority, 31.6%, identified as Roman Catholic, 16.5% did not have a religious preference, and 12.7% identified as Other.

Diversity Survey: Affiliation/ Denomination	**Count**	**%**
Roman Catholic	67	31.6
None	35	16.5
Pentacostal	17	8.0
Methodist	11	5.2

Baptist	10	4.7
Nazarene	9	4.2
Seventh Day Adventist	8	3.8
Anglican	5	2.4
Jehovah's Witness	3	1.4
Mormon	2	0.9
Bahai Faith	1	0.5
Buddhism	1	0.5
Hinduism	1	0.5
Islam (Muslim)	1	0.5
Rastafarian	1	0.5
Mennonite	0	0.0
Salvation Army	0	0.0
Other	27	12.7
I prefer not to respond	13	6.1

Table 3. Religious affiliation/ denomination

For the survey question on political preference, of the 209 participants who responded, 19.1% preferred not to respond, and a majority of 37.3% identified as not caring about politics. Of the remaining participants, 14.4% identified as Middle of the road, 13.4% as Liberal, 10.5% as Conservative, and 5.3% as Other. Table 4 shows the political preferences of the respondents.

Diversity Survey: Preference	**Count**	**%**
Don't care	78	37.3
Middle of the road	30	14.4
Liberal	28	13.4
Conservative	22	10.5
Other	11	5.3
I prefer not to respond	40	19.1

Table 4. Political preference

Sexual Orientation

Of the 212 responses to the survey question about sexual orientation (see Table 5), 4.2% preferred not to respond. The majority (86.8%) identified as heterosexual, 3.3% as bisexual, and 2.4% as gay or lesbian. The remaining participants (3.3%) identified as other.

Diversity Survey: Orientation	**Count**	**%**
Heterosexual	184	86.8
Bisexual	7	3.3
Gay/ Lesbian	5	2.4
Other	7	3.3
I prefer not to respond	9	4.2

Table 5. Sexual orientation

Disabilities

Concerning disabilities, the survey question asked participants with one or more disabilities to select all the disabilities that applied to them. The majority of participants (71.2%) did not choose any disability. Only 61 (28.2%) participants indicated they had one or more disabilities. The majority of these participants responded that they had a disability with remembering and concentrating, representing 14.6% of the survey population. The second and third largest reported disabilities were Communication and speaking (12.3%) and Seeing (even with glasses), representing 11.3% of the survey population. Table 6 provides information on reported disabilities.

Diversity Survey: Preference	Count	%
Remembering and concentrating	31	14.6
Communicating and speaking	26	12.3
Seeing (even with glasses)	24	11.3
Self-care	13	6.1
Learning	9	4.2
Walking and climbing stairs	4	1.9
Behavioral disorders	4	1.9
Hearing (even using hearing aid)	3	1.4

Table 6. Disabilities

Academic and Career Interests

All 212 participants responded to the survey question that asked to identify their favourite high school subject (see Table 7). Not surprisingly, the majority of participants selected Technology (50.9%), followed by Mathematics (18.9%) and Science (6.6%). These three subjects collectively represent 76.4% of the choices made.

Diversity Survey: Subject	Count	%
Technology	108	50.9
Mathematics	40	18.9
Science	14	6.6
Social Studies	10	4.7
Art	9	4.2
English	9	4.2
Physics	9	4.2
Music	8	3.8
Foreign language	1	0.5
Other	4	1.9

Table 7. Favourite high school subject

Of the 211 participants that responded to the career interest survey question (see Table 8), the largest group representing 28.4% of the respondents, selected software as their career interest. Web (17.5%) was the next largest, followed by Network (13.7%) and Hardware (11.8%). Security, Data Science, and Systems all garnered around 8%, and Database as a career interest was the least selected, representing only 3.8% of the choices made.

Diversity Survey: Interest	Count	%
Software	60	28.4
Web	37	17.5
Network	29	13.7
Hardware	25	11.8
Security	19	9.0
Data Science	17	8.1
Systems	16	7.6
Database	8	3.8

Table 8. Career interest

Student Perceptions

Included also were questions on perceptions of diversity at the University of Belize and its Information Technology program and about diversity in the computing industry. These questions utilised a forced Likert scale. This four-point scale does not provide a safe or "neutral" option but requires participants to consider the questions and form opinions. The scale used 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 =

Strongly Agree. Cronbach's alpha was used to measure the internal reliability of the diversity-related questions and produced a reliability coefficient of α = 0.72. This value falls between 0.7 and 0.8, indicating acceptable reliability.

Table 9 shows that concerning diversity, the participants agreed that workforce diversity is essential to the future success of the IT industry (93.4%), that a diverse workforce has a direct impact on the information technology produced (92.0%), and that the IT industry is diverse (79.6%). While the students agreed that the university values excellent teaching (82.4%), they agreed less strongly that the IT program is diverse (65.5%) and that diversity was discussed in one or more of their courses (67.3%). From those perceptions, it is not unexpected that 88.1% of the students agreed that the IT program would benefit from more diverse students. Concerning success and sense of identity, the students did not agree as much that they felt successful at the university (73.5%) and agreed less strongly that they considered themselves typical IT persons (67.0%). Regarding the mentoring question, 54.5% agreed they met with their advisors because it was required and not for mentoring.

Statement	N	M	SD
Q1. Workforce diversity is important to the future success of the IT industry.	212	3.24	0.677
Q2. A diverse workforce has a direct impact on the information technology produced.	212	3.10	0.541
Q3. The IT industry is diverse.	212	3.01	0.860
Q4. UB's IT program would benefit from more diverse students.	212	3.04	0.610
Q5. The IT program at UB values excellent teaching.	212	2.95	0.610
Q6. The IT program at UB is diverse.	212	2.68	0.703
Q7. In one or more of my courses at UB we discussed diversity.	212	2.67	0.731
Q8. I feel successful at UB.	212	2.83	0.741
Q9. I consider myself a typical IT person.	212	2.71	0.791
Q10. I met with my advisor because it was required and not for mentoring.	212	2.53	0.884

Table 9. Student perceptions

On the topic of student perception of teaching, the survey included a question about missing lectures and the previously mentioned question on excellent teaching. Participant responses identified one or more motivations for being absent from a lecture. Table 10 shows that of the 209 answers, the majority (72.7%) stated that they only missed lectures if unwell, 19,6% said that they did not like the teaching style, 19.1% stated they did not have time to attend the lectures, 9.6% preferred to watch lecture videos, and 9.1% felt that the lectures did not help them learn.

Motivation	Count	%
I only miss lectures if I am unwell.	152	72.7
I do not like the teaching style of the lecturers.	41	19.6
I do not have time to attend all the lectures	40	19.1
I prefer to watch lecture videos	20	9.6
I do not feel that lectures help me learn	19	9.1
Other	27	12.9

Table 10. Motivation to be absent from class

Table 11 and Table 12 show independent-sample t-tests on the diversity questions conducted for gender and ethnicity to identify significant differences between these two independent groups.

For gender, both females and males had similar responses to most questions. However, while both females and males agreed that the IT program would benefit from more diverse students (Q4), females do not think it is as diverse (Q6) as males. The question asking whether they felt successful at the University of Belize (Q8) elicited significantly different responses, with females agreeing less than their male counterparts about feeling successful.

	Female			Male				
	N	M	SD	N	M	SD	p	t
Q1	51	2.65	.72	159	2.69	.73	0.97	0.33

Q2	51	3.25	.82	159	3.24	.63	0.09.	-0.15
Q3	51	2.53	.73	159	2.76	.80	0.81	1.84
Q4	51	3.08	.66	159	3.03	.60	0.48	-0.48
Q5	51	2.51	.70	159	2.73	.70	0.37	1.95
Q6	51	2.80	.98	159	3.08	.82	0.06	1.97
Q7	51	2.96	.56	159	2.95	.62	0.67	-0.11
Q8	51	2.61	.85	159	2.91	.69	0.01	2.52
Q9	51	3.18	.52	159	3.08	.55	0.90	-1.08
Q10	51	2.51	.88	159	2.53	.89	0.82	0.13

Table 11. Student perceptions by gender

The independent-sample t-test for ethnicity compared the responses of the majority ethnic group, Mestizos (45.5%) and other ethnic groups. There were significant differences between the groups for several questions. Mestizos agreed more that workforce diversity is essential to the future success of the IT industry (Q1). However, they agreed less that: the IT program would benefit more from diverse students (Q4), that the IT program values excellent teaching (Q5), that felt successful at UB and considered themselves typical IT persons.

	Meztizo			**Other**				
	N	**M**	**SD**	**N**	**M**	**SD**	**p**	**t**
Q1	96	2.74	.64	116	2.61	.80	0.00	1.27
Q2	96	3.16	.69	116	3.31	.66	0.09	-1.66
Q3	96	2.61	.81	116	2.78	.77	0.20	-1.56
Q4	96	2.99	.55	116	3.09	.65	0.00	-1.15
Q5	96	2.71	.63	116	2.66	.76	0.02	0.55
Q6	96	3.03	.81	116	2.99	.90	0.41	0.34
Q7	96	2.91	.52	116	2.98	.67	0.20	-0.91
Q8	96	2.81	.64	116	2.84	.82	0.03	-0.32
Q9	96	3.07	.49	116	3.13	.58	0.02	-0.75
Q10	96	2.55	.88	116	2.51	.89	0.87	0.36

Table 12. Student perceptions by ethnicity

Discussion

The results derived from this research, when analysed in conjunction with relevant studies (Sloughter et al., 2019; Babeş-Vroman et al., 2022), reveal consistent demographic trends. These findings align with earlier research (Wang et al., 2021; Zhang et al., 2021), demonstrating a predominantly male student population and a high percentage identifying as heterosexual. Notably, the remaining categories include approximately 3% for bisexual, gay/lesbian, and "Other," with 4.2% choosing not to respond. Comparisons to broader studies such as those conducted by the National Science Foundation (2021) reveal significant variations in the ethnic composition of the student body. While the largest ethnic groups for the NSF study were white and Asian, the majority of students at UB identify as Mestizos (45.5%), with Creole (24.2%) as the second-largest ethnic group. This difference can be attributed to the unique cultural and geographical context of Belize, which is a Caribbean country in Latin America.

Geographically, the majority of students hail from the Cayo District (45.5%), where the university's main campus is located, followed by 22.3% from the Belize District, home to the university's secondary campuses. The distribution of students across other districts correlates with the relative distances of these districts from the primary and secondary campuses. However, the higher percentage of students from the Toledo District, compared to the Corozal District, suggests the presence of other influencing factors, other than those related to geographic proximity and accessibility.

Religious affiliation patterns are in line with the national context, with the majority of students identifying as Roman Catholics. Students without any religious affiliation or denomination constitute the next significant group. In the realm of political preferences, a substantial majority of students expressed a lack of interest in politics (37.3%). Among those specifying a political preference, the distribution was relatively balanced, with 14.4% identifying as middle of the road, 13.4% as Liberal, and 10.5% as conservative, paralleling findings in broader research (Thomas et al., 2019; Vakil, 2020).

In terms of academic interests, it's unsurprising (Burgiel et al., 2020; The Importance of Computer Science for High School Students, 2020) that Technology (50.9%) and Mathematics (18.9%) emerge as the favourite high school subjects among students. The majority of students are interested in a career in software, web development, or networking. This is consistent with articles on computing career interests (Maleki, 2022). However, it is interesting to note that cutting-edge areas of security and data science did not garner high scores. This may suggest that students are not aware of the opportunities in these fields. Similarly, Database careers, despite projected growth (Bureau of Labor Statistics, 2021), account for only 3.8% of students' career aspirations.

A critical facet of this study pertains to the prevalence of disabilities among students. The most commonly reported disabilities are related to memory and concentration, communication and speaking, and vision. These findings align with common observations in the computing industry (Tamer, 2017). The prevalence of disabilities among students in the IT program is a significant aspect of the diversity discussion, and it is essential to consider these findings in the broader context of fostering a more inclusive and accommodating educational environment. Such considerations can lead to improved opportunities and outcomes for all students, regardless of their unique needs and abilities.

One pivotal aspect of this study revolves around the views of students on the importance of diversity. The majority of students concur that a diverse IT workforce is crucial, recognising its direct impact on technology innovation and the potential benefits it can bring to the IT program. However, responses concerning the perceived diversity within the program are mixed, reflecting a degree of uncertainty. Females and males have similar views that the program can benefit from more diversity, but females agree more than males that the IT program would benefit from more diverse students and are less inclined to perceive the program as already diverse compared to their male counterparts.

From an ethnic perspective, the majority ethnic group, Mestizos, had significant differences from the other ethnic groups in their responses to questions about diversity, success, and sense of self. While Mestizos recognise the significance of diversity in the IT industry, their agreement is comparatively lower concerning the program benefiting from increased diversity, their perception of the program's emphasis on excellent teaching, personal success at the University, and self-identification as typical IT individuals. These findings emphasize the critical influence of perceptions of success and self-identity on students' experiences of belonging, membership, and inclusion (Metcalf et al., 2018).

The results related to student-advisor meetings indicate that a substantial proportion of students (54.5%) perceive these meetings as mandatory rather than mentoring opportunities. This perspective suggests that students may view these meetings primarily as bureaucratic requirements for registration, rather than valuable educational and career development interactions. This finding suggests an opportunity for the university to enhance the mentoring aspect of such interactions, which are crucial for students' education and career development.

Moreover, the vast majority of students (72.7%) reported missing lectures only due to illness, indicating a strong alignment with the perception that the IT program values excellent teaching. However, a notable 19.6% of students cited dissatisfaction with the lecturers' teaching style as a motivation for absenteeism, while another 19.1% indicated time constraints as the reason for missing lectures. These findings offer valuable insights into the students' attitudes and motivations regarding academic engagement. This also suggests that the university could improve student engagement by providing more training for lecturers and by offering more flexible learning options.

Conclusion

In the pursuit of a more diverse and inclusive IT program, this research serves as an initial exploration into the perceptions of diversity among students at the University of Belize (UB). The insights derived from this study, complemented by the broader discussion, underscore critical dimensions of diversity within the IT program and across the entire student body at UB. It is evident that these findings illuminate areas that warrant further examination, analysis, and intervention.

The gender disparity observed in the UB IT program is a reflection of a global concern (Gledhill et al., 2019). The survey results bring this issue into sharp focus, signalling the urgent need for more extensive investigations to understand and address the underlying factors contributing to this imbalance. Future studies should delve deeper into the experiences, expectations, and aspirations of female students pursuing IT education, with the aim of promoting gender diversity and equity within the field.

The diverse ethnic composition of the UB student body, with Mestizos as the majority, provides a unique context for examining the role of minorities in our society. The ethnic variations identified in this research invite further exploration into the experiences and challenges faced by students from different ethnic backgrounds within the IT program. Promoting inclusivity and representation from various ethnic groups is essential not only for the University but also for the broader societal well-being (Agarwal et al., 2017).

The influence of geographic location on students' intentions to attend the University, as suggested by previous studies (Cooper et al., 2018), is affirmed by the survey results. This observation presents an opportunity for deeper research into the factors that shape educational choices based on geographic considerations. Understanding how geographic location affects students' access to and engagement with the IT program can inform strategies for promoting equitable access and participation.

The strong affinity of participants (50.9%) for technology as their favourite high school subject emphasises the need for introducing computing as an educational track at earlier stages of students' academic journeys. This finding underscores the potential benefits of establishing two-year career education tracks in computing at the secondary level in Belize. Such an initiative can lay the foundation for fostering diversity and inclusion in the IT program by nurturing students' interest and competence in computing from an early age.

The results related to teaching, identity, and inclusion highlight the importance of improving equity and inclusion in computing education. These findings resonate with research conducted by scholars like Manches & Plowman (2015), Rich et al. (2018), and Upadhyaya et al. (2020), suggesting the need to integrate computing education into earlier stages of the academic journey. This proactive approach can foster a sense of belonging and membership, ultimately enhancing the diversity and inclusivity of the IT program.

Future research should consider whether similar studies have been carried out in neighbouring Caribbean and Latin American countries and consider the broadening of the survey to other tertiary education institutions in Belize. These considerations would provide for demographic comparative analysis to validate the findings and conclusions of this study and provide opportunities to further explore issues of diversity in computing at a national, regional, and global level.

In conclusion, this research represents the beginning of a journey to unravel the complexities of diversity in the IT program at the University of Belize. The data and insights derived from this study offer a valuable foundation for further investigation and innovation aimed at advancing equity, inclusion, and diversity within the IT field and at the University. The quest for a more diverse and inclusive IT program is a collective endeavour that requires ongoing research, strategic initiatives, and a commitment to effect positive change, benefiting not only the University but also the broader society it serves.

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