

Student Satisfaction with the Information Technology Infrastructure at Saudi Universities: A Survey of Student Perceptions at Five Universities

Abdullah Alsharari

Ed.D. Student, Educational Leadership Department
Clark Atlanta University
223 James P. Brawley Dr, SW
Atlanta, GA 30314, USA

Daniel Teodorescu, Ph.D.

Professor of Educational Leadership & Higher Education
Clark Atlanta University
223 James P. Brawley Dr, SW
Atlanta, GA 30314, USA

Abstract

This study examined the satisfaction with and use of technology infrastructure by faculty across a sample of five universities in the Kingdom of Saudi Arabia. Overall, the findings indicate that faculty are relatively satisfied with the information technology (IT) infrastructure at their respective campuses, although they tend to report lower satisfaction levels than faculty or students in the United States. The analysis also uncovered disparities in the overall experience of faculty with the IT infrastructure between universities located in the capital city and universities outside the capital city.

Keywords: Saudi Faculty; Information Technology; Technology Support Services; Technology-Enabled Learning; Classroom Technologies

Introduction

As part of the Vision 2030 plan, the Tatweer educational policy initiatives in Saudi Arabia aim to create a society that can utilize technology at a higher level (Prensky, 2001). The main goals of the Vision 2030 plan for the ambitious transformation of the Saudi society will become a reality only by implementing technology that is carefully aligned with the overall objective of preparing highly qualified individuals, who are equipped with the career skills needed for the new millennium (Partnership for 21st Century Skills, 2009).

Asharq Al-Awsat (2007) noted that in order for the Kingdom of Saudi Arabia to achieve the goals of Vision 2030, the country must be willing to participate in a transformational revolution by focusing on developing high tech solutions and by improving institutional effectiveness via technology. Ghasemi and Hashemi (2011) observed that many developing nations lack an extensive background in the use of information technology at their higher education institutions. The Tatweer policy provides the Kingdom of Saudi Arabia with a unique opportunity to implement new technologies in all areas of the society, including higher education institutions.

Since today's college students come to campus well equipped with digital technology skills and expect to use technology regularly throughout their studies, it is critical that universities adapt quickly their IT infrastructure and services, provide students with access to the latest digital learning technologies, and offer training and support to faculty in learning these new technologies.

The purpose of this survey research was to describe the extent to which students enrolled at KSA universities are satisfied with the current technology infrastructure at their campus and the use of new instructional technologies by their instructors. Specifically, four research questions guided this study:

1. How satisfied are the KSA students with the university support of activities performed on mobile devices?
2. How satisfied are the KSA students with the wireless network on campus?
3. How satisfied are the KSA students with the instructors’ use of technology in the classroom?
4. How does satisfaction with the overall IT experience of KSA students vary based on gender, major, and campus location?

Methods

This research was an ex-post facto cross-sectional study, using a survey research methodology. A web-based survey was administered through Survey Monkey to assess student opinions of the IT infrastructure and use of technology by their instructors at five universities located in the Kingdom of Saudi Arabia. The study examined the research questions by incorporating the following variables (see Table 1).

Table 1. Dependent and Independent Variables Examined

Research Question	Dependent Variable (DV)	Independent Variable (IV)
RQ1	Student satisfaction with university support of activities performed on mobile devices	NA
RQ2	Student satisfaction with the wireless network on campus	NA
RQ3	Student satisfaction with instructors’ use of technology	NA
RQ4	Overall experience with University IT Infrastructure	Gender, campus location, major

Student satisfaction with the University IT Infrastructure was measured as the extent to which students (undergraduate and graduate) are satisfied with the following components of the IT infrastructure at their respective institutions:

1. Support of activities performed on mobile devices (e.g., smartphone or tablet)
2. Wireless network on campus
3. Instructor use of technology in the classroom

Three independent variables were examined in relation to student overall experience with the IT Infrastructure: gender, student’s major, and campus location. Gender was coded as dichotomous variable, taking the values 1 for Males and 2 for Females.

Major was coded as 1 for science, technology, engineering, and mathematics (STEM) fields and 2 for non-STEM majors. STEM areas include the following fields: biological/life sciences; computer and information sciences; engineering and architecture; manufacturing, construction, repair, or transportation; and physical sciences, including mathematical sciences. Non-STEM areas include the following fields: agriculture and natural resources; business, management, marketing; communications/journalism; education, including physical education; fine and performing arts; health sciences, including professional programs; humanities; liberal arts/general studies; public administration, legal, social, and protective services; and social sciences and other disciplines.

At the outset of the study, Campus Location included the following values:

1. University 1 (Public) is located in the Northern borders of the Kingdom with an estimated of 17, 000 students and 600 faculty members. The university has separate sections for male and female students.
2. University 2 (Public) has separate sections for male and female students and is located in the Eastern part of the Kingdom. The total student body is estimated to be 6,040 with 1,062 faculty members.
3. University 3 (Private) is a co-ed institution located in the Western part of the Kingdom with an estimated of 901 students and 133 faculty members.
4. University 4 (Public) is located in capital city of Riyadh with an estimated student population of 31,630 and 4,970 faculty members. The university has separate sections for male and female students.
5. University 5 (Private) is located in the capital city of Riyadh. The university is particularly geared towards female students and has a population of 60,000 students and an estimated 5,000 faculty members.

Since the majority of the survey respondents were located in Riyadh, Campus Location was recoded into a dichotomous variable: 1- Riyadh, and 2 - Outside Riyadh.

A convenience sample was used for the student survey. Participants in the student survey included 179 students at five major universities in the Kingdom of Saudi Arabia. About 80% of the respondents were undergraduates and 20% were graduate students. About half of the respondents (87) did not disclose their university affiliation. For the other half of the respondents (82) who identified their university, the large majority were located in the capital city (at University 4 and University 5). The remaining students were clustered mostly at University 1 (31 respondents) and University 2 (10 respondents). Table 2 summarizes the sample distribution by level, gender, and family income level. A large majority of the respondents were undergraduates (84%), females (69%), coming from high income families (74%).

Table 2. Characteristics of the Student Sample (N=179)

Sample Characteristic	%	N
Level		
Undergrad	83.5%	76
Graduate	23.1%	21
Gender		
Male	30.9%	30
Female	69.1%	67
Income		
Low (\$533 - \$1,333 U.S. dollars) per month	7.4%	8
Middle (\$1,334 to \$2,667 U.S. dollars) per month	18.5%	20
High (more than \$2,667 U.S. dollars) per month	74.1%	80

Note: Not all 179 student respondents answered the demographic questions.

To study the students' opinions of the IT infrastructure at their campus, the researchers used an abbreviated version of the EDUCAUSE Center for Analysis and Research (ECAR) survey of undergraduate students and information technology. For 15 years, the EDUCAUSE has conducted research on information technology (IT) and higher education's most important end users, undergraduate students. With survey responses from a broad sample of 130 U.S. and international institutions, and from more than 64,000 students, the ECAR survey is one of the higher education IT industry's largest and longest-running explorations of students' technology experiences, behaviors, and preferences. For the 2018 report, 64,536 students from 130 institutions in 9 countries and 36 states in the United States participated in the ECAR survey.

The ECAR Student Survey was translated in Arabic before it was sent to the five KSA universities. In the abbreviated survey, the researchers included the following sections from the ECAR Student Survey:

1. Mobile device access and use
2. Campus Wi-Fi experiences
3. Learning management system (LMS) use and satisfaction
4. Student learning environment preferences
5. Experiences with instructors and technology
6. Student Demographics

Findings

The main goal of this study was to examine the extent to which students are satisfied with the information technology infrastructure at their campus in the following areas: 1) mobile device access and use, 2) campus wi-fi experiences, 3) LMS use, 4) student learning environment preferences, and 5) use of technology by instructors. Table 3 captures the students' views of university support of applications for mobile devices. About 37% of the students said that they did not access library services via their mobile devices and 26% did not use mobile devices to register for classes. Approximately two-thirds of the students report that they have not used mobile devices to pay tuition or fees. Overall, more than half of the students who used their mobile devices for various functions were satisfied with the university support for mobile devices. The highest satisfaction ratings were obtained for application related to using learning management systems (72%), registering for courses (67%) and communicating with instructors (67%).

Table 3. Student Satisfaction with University Support for Mobile Devices

	Service not offered/does not function on my mobile device	Haven't used service in the past year	% Good or Excellent	N
Accessing library resources	12.4%	24.9%	57.7%	177
Checking grades	10.7%	13.0%	52.6%	177
Accessing course content (e.g., syllabus, recorded lectures, supplemental learning materials, e-texts, podcasts, blogs)	5.6%	5.6%	64.8%	179
Using the learning management system (e.g., Blackboard, Moodle, Sakai, D2L Brightspace, Canvas)	5.0%	5.6%	71.9%	179
Registering for courses	10.6%	15.6%	66.7%	179
Reviewing transcript	14.0%	25.3%	50.9%	178
Making tuition/fee payments	11.8%	53.9%	50.8%	178
Accessing information about events, student activities, and clubs/organizations	5.7%	6.2%	65.4%	177
Providing identification to access campus facilities or services	14.7%	16.4%	59.0%	177
Verifying/recording attendance for class or campus activities	10.7%	13.5%	63.0%	178
Using e-texts	6.2%	24.9%	55.7%	177
	Service not offered/does not function on my mobile device	Haven't used service in the past year	% Good or Excellent	N
Communicating with instructors about class-related matters/outside class sessions	1.7%	6.2%	67.1%	178
Taking notes in class	10.2%	10.7%	60.7%	177
Answering questions posed in class to generate/tally automatic responses	10.2%	17.1%	56.3%	176
Participating in interactive class activities (e.g., group discussion, collaborative writing)	8.4%	12.4%	65.2%	178
Producing content (e.g., documents, spreadsheets, presentations, videos)	6.7%	5.1%	68.8%	178

When asked about the satisfaction with the wireless networks on campus, only 40% reported that the reliability of access to Wi-Fi in student housing was good or excellent. In addition, only 31% were satisfied with the network performance and 28% were satisfied with the reliability of access to Wi-Fi in outdoor spaces.

Satisfaction with the reliability of access to Wi-Fi was relatively low even in indoor spaces; 51% in campus libraries, 52% in classroom spaces, and 42% in other indoor spaces (see Table 4).

Table 4. Student Satisfaction with Wireless Networks on Campus

Satisfaction with:	Good or Excellent	N/A	N
Reliability of access to Wi-Fi in student housing/dormitories	39.7%	46.6%	146
Reliability of access to Wi-Fi in campus libraries	50.8%	10.3%	145
Reliability of access to Wi-Fi in classroom/instructional spaces	51.9%	9.7%	145
Reliability of access to Wi-Fi in other indoor public spaces	42.0%	10.3%	146
Reliability of access to Wi-Fi in outdoor spaces	28.0%	9.0%	145
Ease of login to Wi-Fi network(s) provided by the institution	57.0%	11.7%	145
Network performance (e.g., high speed, no interruptions)	31.3%	7.6%	145

Note: About 47% of the respondents in the sample do not live in student housing.

About 35% of the students report that none or very few of their instructors use technology in face-to-face settings to engage them in the learning process (Table 5). Likewise, 42% say that none or very few instructors encourage students to use their own technology devices during class to deepen learning (e.g., by searching online for related concepts, examples, or demonstrations). It is also important to note that a large percentage of the students are not encouraged by their instructors to use technology in the classroom. For instance, a sizable percentage of students say that none or very few instructors have them use the tablet (44%), smartphone (46%), or laptop (37%) as learning tools in the classroom. Table 5 summarizes the students' opinions regarding their instructors' use of technology in the classroom.

Table 5. Instructors' Use of Technology in the Classroom

	N/A or don't know	None	Very few	Some	Most	Almost all	All	N
...use technology adequately for course instruction	2%	7%	18.3%	22.2%	18.3%	20.6%	8.7	126
...use technology in face-to-face settings to engage you in the learning process	2.0%	6%	24.0%	18.4%	15.2%	12.8%	8.0	125
...use technology during class to make connections to the learning material or to enhance learning with additional materials (e.g., by providing audio or video examples/ demonstrations/simulations of learning concepts)	7%	14%	18.6%	17.7%	14.5%	15.3%	8.9	124
...encourage you to use your own technology devices during class to deepen learning (e.g., by searching online for related concepts, examples, or demonstrations)	8%	12%	19.8%	22.2%	8.7%	12.7%	9.5	126
...encourage you to use online collaboration tools to communicate/ collaborate with the instructor or other students in or outside class	1%	11%	18.3%	23.0%	11.1%	12.7%	12.7	126
...encourage you to use technology for creative or critical-thinking tasks	9%	19%	17.7%	18.6%	12.1%	13.7%	12.1	124
...have you use your tablet as a learning tool in class	9%	10%	22.6%	16.1%	4.0%	11.3%	16.1	124
...have you use your smartphone as a learning tool in class	8%	10%	22.4%	16.8%	10.4%	10.4%	11.2	125
...have you use your laptop as a learning tool in class	6%	18%	16.0%	16.0%	11.2%	13.6%	16.8	125

Students were also asked to suggest resources and tools that instructors should use more in the classroom. The results summarized in Table 6 indicate that students would like their instructors to use more frequently learning management systems, e-books, and lecture capture. In addition, they would also like their instructors to allow increased use of mobile devices in the classroom.

Table 6. Resources/Tools that Students Would Like Their Instructors to Use More

	Don't	(Less)				(More)	
	know	1	2	3	4	5	N
Learning management system	12.3%	21.7%	13.2%	17.9%	11.3%	23.6%	106
Online collaboration tools to communicate/ collaborate	23.6%	19.8%	18.9%	9.4%	11.3%	17.0%	106
E-portfolios	33.7%	23.1%	12.5%	10.6%	6.7%	13.5%	104
E-books or e-textbooks	22.6%	15.1%	16.0%	16.0%	7.6%	22.6%	106
Free, web-based content to supplement course-related materials (e.g., Open Courseware, Khan Academy, iTunes U, YouTube, etc.)	23.8%	27.6%	16.2%	11.4%	5.7%	15.2%	105
Simulations or educational games	30.2%	35.9%	9.4%	9.4%	7.6%	7.6%	106
Lecture capture (i.e., recording lectures)	18.3%	31.7%	12.5%	10.6%	12.5%	14.4%	104
Student laptops as learning tools for course- related activities	23.6%	20.8%	17.0%	9.4%	9.4%	19.8%	106
Student tablets as learning tools for course- related activities	18.9%	27.4%	15.1%	10.4%	6.6%	21.7%	106
Student Smartphones as learning tools for course-related activities	16.0%	32.1%	9.4%	13.2%	13.2%	16.0%	106
Social media as a teaching and learning tool	20.8%	29.3%	17.0%	10.4%	6.6%	16.0%	106
Software to create videos or multimedia resources as a learning tool for course-related activities	25.7%	33.3%	10.5%	9.5%	10.5%	10.5%	105
Early-alert systems designed to catch potential academic trouble as soon as possible	38.1%	31.4%	9.5%	5.7%	8.6%	6.7%	105
Search tools to find references or other information online for class work	20.0%	21.0%	19.1%	9.5%	11.4%	19.1%	105
Textbook Publisher electronic resources (e.g., quizzes, assignments, tutorials, homework, practice problems)	17.9%	17.9%	23.6%	15.1%	12.3%	13.2%	106
In-class polling tools (e.g., clickers, Poll Everywhere, SMS-based tools)	28.6%	28.6%	11.4%	14.3%	7.6%	9.5%	105

Lastly, the survey asked students to rate their overall experience with technology at the current institution. Approximately 71% considered that their experience was good or excellent. Only 23% of the students rated their experience as poor or fair (see Table 7).

Table 7. Student Overall Experience with Technology at Current Institution

	%	N
Poor	6.0%	6
Fair	17.0%	17
Neutral	6.0%	6
Good	46.0%	46
Excellent	25.0%	25
Don't Know	0.0%	0

Differences by Gender. Perceptions of the IT infrastructure were assessed using a survey question that asks respondents to rate their overall experience with technology at their current institution. Responses were captured on a 5-item Likert scale with answers ranging from 1 = poor to 5 = excellent. Table 8 shows that the average satisfaction ratings were comparable between male and female students (3.60 vs. 3.77).

Table 8. Student Overall Experience with Technology by Gender

Gender	N	Mean	Std. Deviation
Male	30	3.60	1.19
Female	65	3.77	1.18

NOTE: Overall Technology Experience was measured on a 5-point Likert Scale with the following values:
1 = Poor, 2 = Fair, 3 = Neutral, 4 = Good, 5 = Excellent

To verify whether the small difference between the two groups of students was statistically significant, the researchers employed an independent samples t-test. The results of the t-test are presented in Table 9 and show that the two means did not differ significantly, $t(93) = .647$, $p = .519$. Therefore, overall satisfaction with IT services and infrastructure did not differ significantly between male and female students.

Table 9. Results of Independent Samples T-test: Student Overall Experience with Technology by Gender

	Levene's test of Equality of Variances		t test of equality of means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	.048	.827	-.647	93	.519
Equal variances not assumed			-.645	6.101	.522

Differences by Campus Location. Since there were not enough respondents from the universities located in the Northern, Western, and Eastern regions, responses from universities located in these regions were collapsed into one group—outside Riyadh institutions. Therefore, average satisfaction ratings were compared between two groups of students: students studying in Riyadh and students studying outside Riyadh. Table 10 summarizes the averages for the two groups and shows that the average rating for students in Riyadh was considerably higher than the average rating for students studying outside Riyadh (4.10 vs. 3.29).

Table 10. Differences in Student Overall Experience with Technology by University Location

Gender	N	Mean	Std. Deviation
Riyadh	51	4.10	.88
Outside Riyadh	38	3.29	1.29

Note: Overall Technology Experience was measured on a 5-point Likert Scale with the following values:
1 = Poor, 2 = Fair, 3 = Neutral, 4 = Good, 5 = Excellent

An independent samples t-test was used to evaluate whether the average ratings differed significantly between the two groups. Table 26 lists the results of the test and confirms that there was a statistically significant difference between the two averages, $t(61) = 3.33$, $p < .05$. That is, students studying at universities in the capital city were more satisfied with the IT infrastructure at their campus than the rest of the students.

Table 11. T-test Results: Student Overall Experience with Technology by University Location

	Levene's test of Equality of Variances		t test of equality of means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	16.754	.000	3.514	1	.001
Equal variances not assumed			3.327	.421	.001

Differences by Major. For the purpose of this analysis, student major was grouped into two categories: STEM and non-STEM. The average ratings for the overall experience with technology on campus for STEM and non-STEM majors are summarized in Table 12. STEM majors had a slightly better experience with information technology on campus than the rest of the students.

Table 12. Differences in Student Overall Experience with Technology by Major

Major	N	Mean	Std. Deviation
STEM	37	3.78	1.20
Non-STEM	63	3.60	1.20

Note: Overall Technology Experience was measured on a 5-point Likert Scale with the following values:
1 = Poor, 2 = Fair, 3 = Neutral, 4 = Good, 5 = Excellent

Table 13 lists the results of an independent samples t-test that examines whether the difference in the overall technology experience between STEM and non-STEM majors is statistically significant. The results reveal that there is no statistically significant difference between the two groups.

Table 13. *T-test Results: Student Overall Experience with Technology by Major*

	Levene's test of Equality of Variances		t test of equality of means			
	F	Sig.	t	df	Sig. (2-tailed)	
Equal variances assumed	.194	.660	.726	8	.470	
Equal variances not assumed			.725	5.246	.471	

Discussion of the Findings

Saudi students appear to be satisfied with their overall experience with information technology at the current institution. Approximately 71% considered that their experience was good or excellent. Only 23% of the students rated their experience as poor or fair. Yet, these findings reveal a slightly lower satisfaction than the 2017 ECAR Student Survey conducted in the United States (Galanek, Gierdowski, & Brooks, 2018), where 77% of the students surveyed reported either good or excellent overall technology experiences.

Overall, more than half of the Saudi students who used their mobile devices for various functions were satisfied with the university support for mobile devices. The highest satisfaction ratings were obtained for using learning management systems (72%), registering for courses (67%) and communicating with instructors (67%). Yet, a large percentage of students said that they did not access library services via their mobile devices (37%) or used mobile devices to register for classes (27%). Additionally, approximately two-thirds of the students report that they have not used mobile devices to pay tuition or fees.

When asked about satisfaction with the wireless networks on campus, only 40% report that the reliability of access to Wi-Fi in student housing was good or excellent. Only 31% were satisfied with the network performance and 28% were satisfied with the reliability of access to Wi-Fi in outdoor spaces. Satisfaction with the reliability of access to Wi-Fi was relatively low even in indoor spaces: 51% in campus libraries, 52% in classroom spaces, and 42% in other indoor spaces.

When compared to the results obtained in the 2017 ECAR Student Survey in the United States, the results reveal a large gap in satisfaction with the Wi-Fi infrastructure (Galanek et al., 2018). A higher percentage of the U.S. students rated the Wi-Fi connectivity as either good or excellent. Specifically, ratings of good or excellent were received from three-fourths of the U.S. respondents for Wi-Fi reliability in campus libraries and from about two-thirds for reliability in classroom and instructional spaces. Student satisfaction with Wi-Fi reliability in the dormitories as U.S. campuses was lower (about 50%), but still higher than the level reported by Saudi students (40%).

Saudi students' opinions regarding their instructors' use of technology in the classroom suggest that technology is not extensively used in the classroom. About 35% of the respondents report that none or very few of their instructors use technology in face-to-face settings to engage them in the learning process. In the survey, Saudi students reported that they would like their instructors to use more often learning management systems, e-books, and lecture capture. In contrast, the results from the ECAR study (ECAR, 2018) showed that students in the United States report a wider use of technology in the classroom by their faculty. For instance, more than half of the students agreed or strongly agreed that their instructors (a) use technology during class to enhance learning with additional materials, (b) encourage them to use online collaboration tools, (c) use technology to engage them in the learning process, and (d) encourage them to use technology for creative or critical-thinking tasks.

Likewise, it is also important to note that a large percentage of the Saudi students are not encouraged by their instructors to use technology in the classroom. For instance, many of respondents say that none or very few instructors have them use the tablet (44%), smartphone (46%), and laptop (37%) as learning tools in the classroom. In the survey, the Saudi students noted that they would like their instructors to allow more use of mobile devices in the classroom. There are similarities, however, between the Saudi and American respondents in that both populations tend to think that only few instructors let them use mobile devices in the classroom. For instance, only one fourth of the American students agree or strongly agree that their instructors let them use smartphones or tables in the classroom.

The student survey also revealed that the overall experience with the IT infrastructure did not differ by gender or major (STEM vs. non-STEM). However, the results revealed that students outside the capital (with a majority of them located in the northern part of the country) are less satisfied with the IT infrastructure at their campus than students studying in the capital city.

Implications

The findings from this multi-campus study suggest that while Saudi students are generally satisfied with the technology infrastructure on campus, they are largely dissatisfied with the reliability of the Wi-Fi connections at their institutions. Universities should invest in Wi-Fi networks to address students' needs and experiences. Students' overall experiences at their institution, not just the classroom experience, are key in ensuring student success. Therefore, in the digital age, improving network quality may be a means for universities to improve student retention and academic success.

Without reliable networks, campus-wide technology innovations may be negatively affected. For example, universities that make the switch from print textbooks to digital resources will likely need upgraded networks to meet the demands of increased student traffic to access and engage with e-books and adaptive learning platforms. Similarly, universities that are increasing online course and program offerings depend on reliable networks. In addition to accessing digital textbooks and conducting work in online courses, students spend a considerable part of their days connecting through their mobile devices—conducting business, accessing academic resources, completing tasks, communicating with family and friends, streaming content, listening to music, or gaming.

It is evident from the student survey findings that universities in the northern part of the country do not have the same level of technology resources that universities in the capital city enjoy. Therefore, much attention should be paid to reducing geographic disparities in technology infrastructure if the goals of Vision 2030 are to be materialized.

The student survey also revealed that instructor use of new technologies in the classroom is not as widespread as it is across the U.S. universities. Saudi students noted in their responses that they would like their instructors to use more often learning management systems, e-books, and lecture capture. Therefore, universities need to direct their centers for teaching and learning and/or IT offices to provide regularly faculty development related to these technologies. Evidently, there is a gap between the students' needs for digital learning and the faculty capacity to provide such learning opportunities.

Limitations

The findings of this study were based on a relatively small convenience sample of students drawn from five universities. Therefore, the results cannot be generalized to the entire higher education sector in Saudi Arabia. Future research should employ random or stratified sampling techniques that ensure generalizability to the wider Saudi population of students.

Secondly, this research utilized only surveys as the main method of gathering opinions on the adequacy and use of information technology on campus. Future research studies should consider adopting a mixed methods approach where qualitative feedback about experiences with the technology is gathered via interviews or focus groups with students and faculty. A qualitative approach involving such methods could provide an insight into some of the low ratings given by students in the survey response on reliability of the Wi-Fi networks. In addition to gathering the opinions of students, future studies should also capture the perspective of IT leaders, faculty and staff. Obtaining feedback from these stakeholders would make possible the triangulation of the results generated from the student survey.

Lastly, it is important to study in more detail the gap in satisfaction that was found between universities in the capital and universities in the northern part of the country. A more realistic assessment of the disparities in the technology infrastructure could be conducted through objective measures, such as number of classrooms equipped with smartboards, percentage of instructors using learning management systems and availability of applications for mobile devices.

Conclusions

This study examined student satisfaction with and use of the information technology infrastructure at a sample of five universities in the Kingdom of Saudi Arabia. Overall, the findings indicated that students were relatively satisfied with the IT infrastructure at their respective campuses, although they tend to report slightly lower satisfaction levels than students in the United States. The study also revealed several areas of improvement, including the need for more reliable Wi-Fi networks on campuses and for increasing the use of LMS and other digital technologies by the instructors. In addition, the study uncovered disparities in the overall experience of students with technology between universities located in the capital city and universities outside the capital city. Additional studies are needed to further investigate such disparities by assessing resources available at various universities.

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