The Marketing Concept and BYOD in the University Classroom:

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The Marketing Concept and BYOD in the University Classroom: Are We Practicing What We Teach?

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Abstract - For decades marketing educators have espoused the marketing concept and consumer oriented business strategies in university classrooms. In recent years, there has been a movement away from the 'sage on the stage' to experiential, active learning pedagogies. Those newer pedagogies often involve the use of mobile devices, including smart phones, laptops, and e-readers as academic tools for students. While such mobile devices are nearly ubiquitous on college and university campuses, an ongoing debate revolves on the distinction between owning mobile devices and whether or not students bring them to campus and use them as educational tools. In this study, we surveyed students in order to assess their attitudes towards and perceptions of a proposed BYOD (Bring Your Own Device) program on campus.

Keywords: BYOD, Marketing Concept, Higher Education

Introduction

"Our attention has shifted (from the company as the center of the business universe) from problems of production to problems of marketing, from the product we *can* make to the product the consumer *wants* us to make…" -- *Keith, 1960*

"We live in an Age of Mobilism, in which users want to be connected all of the time, everywhere, on devices that are affordable and globally adopted." - *Norris & Soloway, 2011*

"Despite high ownership, longitudinal data indicates that use of mobile technology in learning is not as widespread as the devices themselves." – *Chen, et. al., 2015*

The words of Robert Keith are from his seminal 1960 Journal of Marketing article in which he called on marketers to change their approach to doing business and to adopt the marketing concept. In higher education, we have embraced Keith's call and teach this concept in virtually every marketing course we offer. In their 2011 article focusing on K-12 education, Norris and Soloway wrote about the needs of individuals to be digitally connected virtually every minute of every day and in all settings and situations: "…by 2015, each and every student in America's K-12 classrooms will be using their own mobile computing device, with those devices engendering the most disruptive transformation in education in 150 years" (p.3). Chen et, al., (2015), citing the 2013 and 2014 ECAR Study of Undergraduate Students (Dahlstrom et, al., 2013, 2014) noted that while mobile device ownership by college and university students is high and continues to grow, fewer students are using those devices for academic purposes.

The writings of those researchers highlight an interesting dilemma facing colleges and universities around the world: How to balance the institution's need to design and introduce educationally effective (and cost effective) digital learning programs (such as BYOD programs) and still address the needs and preferences of students. Accordingly, the overarching question we address in this article is "Do Bring Your Own Device (BYOD) programs satisfy the needs of both university students and the organization?"

In today's university marketing classrooms educators echo Keith's call and emphasize to students that the marketing concept is a relatively long-held and straight forward business philosophy that focuses on marketing activities and strategies designed to satisfy the needs of both the organization and the customer (Drucker 1954; Keith 1960). A fundamental pillar of that philosophy is that firms and marketers must commit to the development of a customer orientation where the "customer should be seen as the fulcrum, the pivot point about which the business moves in operating the balanced interests of all concerned" (Burch 1957). [Before moving on, the authors of this manuscript would like to underscore that while we are advocating for the application of the marketing concept in academic settings, we are not suggesting that university administrators/professors view students as customers in the same way in which a merchant might view his/her customers. Rather, we are suggesting that university administrators and educators recognize that student needs are fluid and that the satisfaction of those needs must be addressed when designing and providing a rigorous and value-added academic degree.]

The college/university students of 2016 and beyond are not, and will not be, the students of the past. A quick perusal of the students gathered in the hallways and common areas outside of the classrooms and offices at our university (and probably at most other institutions of higher learning) readily reveals an important change in student communication behavior. While just a few years ago we would observe students engaged in face-to-face conversations, now we are more likely to hear them as they converse on their smart phones or see them as they tap out text messages or post information using a variety of mobile devices. Laptops, tablets, smart phones and other devices are ubiquitous as students e-mail, Snapchat, check their Facebook and/or Twitter pages, or share ideas and interests via Pintrest and Instagram. Today more than ever before we are teaching in a digitally connected world.

These changes in student behaviors and abilities have educators at colleges and universities world-wide contemplating new teaching methods and ways to add value to the educational product. With a growing emphasis on reflective and experiential learning, the traditional 'sage on the stage' model featuring a professor standing in front of a classroom and lecturing for 50 or 75 minutes is quickly falling out of favor as an effective teaching method (King 1993; Landry et. al., 2008; Saulnier et. al., 2008; Morrison 2014; Crowling and Brack 2015). The university students of 2016 were literally raised with computers, tablets, smart phones and the Internet and are more technologically savvy than students from any previous generation. In a multi-year study (2012 and 2014) study of more than 2000 university students (across the two studies), Chen and Denoyelles (2013) and Chen et. al, (2014) found that while most students owned mobile devices, fewer students were using those devices for academic/classroom purposes. Results from those studies also revealed changes in mobile device ownership. In the initial study, 91% of the participants owned a mobile phone, 37% owned a tablet, and 27% owned an e-book reader, compared to 95%, 57% and 29% respectively in 2014. Interestingly, while the 2012 study showed that only 58% of the students who owned a mobile phone used that device for academic purposes, that figure had grown to 77% by 2014. In 2012 Chen and Denoyelles reported that 82% of the students who owned a tablet and 64% of the e-book reader owners used those devices for academic work. By 2014 those figures had changed 79% of tablet owners and 59% for e-book owners. In the ECAR Study of Undergraduate Students and Information Technology (2012), Dahlstrom reported that 85% of college students rated laptops as the most important personal device in terms of their academic success and that 2012 study also showed that tablets, smart phones, and e-book readers were increasingly being used for academic purposes.

Other research suggests a different perspective regarding student use of these devices as classroom tools. Mac Cullum and Day (2014) found that while most students owned mobile devices, the majority of those students did not regularly bring those devices to class. Benham, Carvalho, and Cassens (2014) found that students didn't bring to or use their mobile devices in the classroom for a variety of

reasons, including possible theft of the devices, student-held perceptions that professors would not allow such devices in the classroom, and a lack of university provided technological infrastructure to support the use of such devices. Benham et. al's study also revealed that students were hesitant to use their mobile devices in the university classroom due to their perceptions that instructors incorporating mobile device learning activities in the classroom were unable or unwilling to effectively engage students. Those findings are consistent with the research of Chen et. al., (2013; 2015) showing that students did not want instructors to incorporate mobile devices into classroom instruction due to concerns with lack of technical support, limited funds, limited device access, and limited or no training access. In a 2009 study, Kim and Turner reported that while paper and pen might be best for note taking in the classroom, in some instances electronic devices might be advantageous. With such findings in mind, coupled with budget challenges and tech-savvy students, many colleges and universities are considering a relatively new approach to classroom teaching and learning -- an approach that takes the concept proposed by King in 1993 to a new level: the BYOD (Bring Your Own Device) classroom.

The idea behind the BYOD movement hinges on three key considerations: 1) mobile devices are ubiquitous amongst college/university students; 2) BYOD provides an effective teaching pedagogy which will enhance student learning, and 3) if implemented correctly and with strategic planning, such programs can allow institutions of higher education to reduce costs related to computer labs and technical support.

While the idea that the vast majority of college students own one or more mobile devices is readily accepted and documented in the literature the assertion that BYOD enhances student learning is somewhat open to debate. For example, Simmons (2014) stated that students were using BYOD to 'collaborate on unprecedented scales" (p. 15). In a 2013 article, de Waard wrote that 'Preliminary results indicate that opening up courses for BYOD mobile access will increase learner interactions (both social and professional) by 25%.' In a similar vein, Kurkovsky (2012) stated that 'Mobile applications are often easy for students to relate to, because mobile technology plays an increasingly important role in the lives of today's students. For many of them, their mobile phone is replacing a desktop computer as their primary computing device.' (p. 139). Works by Hamza and Noordin (2012), Nortcliffe et al. (2013) Woodcock (2012) and others concluded that BYOD programs are common for the majority of the student population and serve as an integral support system for student studies.

However, other research indicates that students are not totally enamored of BYOD and other such educational programs. In the 2013 ECAR report, with data collected from over 112,000 students at 250 institutes of higher education, Dahlstrom, Walker and Dzuiban reported that students were resistant to integrating personal mobile devices into the educational setting (p. 6). Speaking at

the EDUCAUSE Annual Conference in 2013, Kevin Koster, founder and CEO of Cloudpath, stated "No BYOD environment is more challenging than education, where security, scalability and sustainability are critical." In a 2011 study, Suki and Suki reported that student participants were more familiar with the face-to-face 'studio' learning – the sage on the stage -- environment and were not receptive to mobile learning.

In sum, while personal mobile devices are pervasive on college campuses key questions regarding student use of those devices to augment their learning experience remain unanswered. From a marketing educator's perspective, it seems unclear whether we are adhering to the marketing concept and the philosophy of meeting both the needs of our target market(s) and the organization as we move forward with the implementation of BYOD programs on our campuses. The remainder of this manuscript presents the details of a study designed to explore that concept from the perspective of the students who are being asked to use such programs.

Research Method

This study employed a paper-and-pencil questionnaire consisting of participant instructions and 16 statements designed to assess student perceptions of a proposed BYOD program and the potential contributions of such a program to their educational experience. The statements were developed via review of the relevant literatures and in consultation with IT specialists at the university where the study was conducted. All statements were written into a 5-point Likert type scale with endpoints of (1) strongly disagree and (5) strongly agree. Several demographic and electronic device usage questions were included in the survey instrument. All items, scales, and instructions were pre-tested for clarity, understanding, and ease-of-use with a sample of 88 students enrolled in a variety of courses/discipline areas at the university where the study was conducted. The finalized questionnaire, which included the following instructional/explanation cover page, was distributed to students attending a large mid-western state university where a BYOD program was being considered. These instructions were also read aloud to the students:

Dear Student:

We would like to thank you in advance for agreeing to complete this questionnaire.

The work we are doing is designed to help us learn more about your perceptions and thoughts regarding the technology available to you here at *[Insert Name of University Here]. Specifically, we are interested in your thoughts about the possibility of *[ ] transitioning to a BYOD campus.

You might be wondering: "What is a BYOD campus?" BYOD stands for 'Bring Your Own Device'. On a BYOD campus, the University takes several steps designed to provide students with leading-edge technology and to increase technological efficiencies across campus. Those steps include:

- *Each student is required to provide his/her own computer or tablet or similar electronic device;*
- *Each student is required to use their own computer/tablet in the classroom and elsewhere on campus*
- **[ ] would steadily decrease the number of computer labs on campus. This transition would be designed to prepare students for the current-day workplace and to optimize the students' experience with technology on the *[ ] campus.*
- *The University offers a limited number of computer labs and a limited number of computers in the library;*

Please keep in mind that *[ ] has <u>NOT</u> made a decision to go BYOD. We are simply interested in your thoughts about the possibility of such a transition.

Remember that there are no right or wrong answers or ratings. We want to know your own perceptions about technology on the *[ ] campus. Your responses to all statements will remain anonymous and your participation in this study is completely voluntary. Thank you for your help!

No data were collected in classroom settings. Rather, the data were collected from students relaxing or studying in the student common areas, the library, the student center, etc.

Participants

A total of 675 students attending a large state university in the Midwestern United States participated in the study.* As seen in Table 1, slightly more than 93 percent of the participants were between 18 and 25 years of age. The sample featured an almost equal gender split with 49.3% female participants and 50.7% male participants. In addition, almost 40% of the participants held freshman-sophomore class standing while nearly 57% of the participants held junior-senior level standing. Table 1 also shows that in addition to being full-time university students (12-15 credit hours per term), 61.5% of the participants held part-time jobs and 23% held full-time jobs (40 hours or more per week).

*Due to non-response to some items, the sample size reported in some tables will vary slightly

Table 1: Participant Demographics

Demographic Variable	n	% By Gender	n	% By Gender
Gender	Female		Male	
	334	49.3	337	50.7
Class Standing				
Freshmen	50	15.0	48	14.0
Sophomore	89	26.6	81	23.6
Junior	122	36.5	104	30.3
Senior	62	18.6	96	28.0
Graduate	11	3.3	12	3.5
Academic Major				
Liberal Arts	70	21.0	47	13.7
Business	126	37.7	170	49.6
Public Affairs	11	3.3	17	5.0
Science and Engineering	35	10.5	49	14.3
Education	33	9.9	19	5.5
Health and Human Services	36	10.8	12	3.5
Other	19	5.7	23	6.7
Operating System Most Often Used				
MAC/Apple	132	39.5	103	30.0
Windows	187	56.0	218	63.6
Other	6	1.8	4	1.2
Electronic Devices Used at School				
Laptop	150	44.9	137	39.9
Tablet	18	5.4	15	4.4
Smart Phone	41	12.3	58	16.9
Don't Use	26	7.8	49	14.3
Employment Status				
No job	63	18.6	94	27.4
Part-time Job (<40 hrs/week)	217	65.0	199	58.0
Full-time Job (40 hrs/week)				
	54	16.2	49	14.3

Results

Sixteen statements designed to asses student perceptions of a BYOD program and related elements of their educational experience were investigated using descriptive statistics and ANOVA procedures. Using the following instructions and the 5 point Likert scales described earlier, students responded to the following 4 groups of items (all 16 items were presented in random order to the study participants):

> *Please read each of the following statements and, using the scale beside each statement, indicate the degree to which you disagree or agree with the statement. For example, if you strongly disagree with the statement that [*] should become a BYOD campus, circle the number '1' on the scale below. If*

you strongly agree with the statement, circle the number '5' on the scale. If you disagree somewhat, circle the number '2'; if you somewhat agree with the statement, circle the number '4' on the scale.

Group 1. Student Use of Technology

1. I currently use my laptop or tablet to take notes in class.
2. My major requires me to use specialized computer software (DreamWorks, SPSS, PhotoShop, etc.).
3. I almost always bring my laptop or tablet to school with me.
4. When on campus, I use my own laptop/tablet more frequently than I use *[ ]'s computer labs.

Group 2. Provision of Institutional Technology

1. The *[ ] computer labs are very important to me.
2. Rather than have *[ ] go BYOD, I would prefer that *[ ] continue to provide computer labs.
3. Instead of going BYOD, I would prefer to pay an increased technology fee.
4. When on campus, I use the computers in the library more often than I use my own laptop/tablet.
5. When I need to print something, I most often use a printer provided by *[ ].
6. *[ ]'s current technology works well for me; I see no reason for *[ ] to become a BYOD campus.

Group 3. Perceptions of BYOD

1. BYOD would improve my overall learning experience at *[ ].
2. Going BYOD would encourage more students to enroll at *[ ].
3. BYOD would benefit me in terms of career preparation.
4. BYOD would benefit me as a student at *[ ].
5. *[ ] should become a BYOD campus.

Group 4. Potential Financial Burden

1. Buying my own laptop or tablet would be a financial burden for me.

As an introduction to a detailed discussion of the findings in this study, we offer the following overview of those findings: in general, students did not agree that a BYOD program should be implemented at the university where the study was conducted. The remainder of this section of the paper presents more detailed analyses of each of the sixteen items included in the survey instrument.

Student Responses to Group 1 Items -- Student Use of Technology

Descriptive statistics were employed to gain an initial overview of student responses to items included in each group. Those initial findings are presented in Table 2. Overall, student responses to Group 1 items revealed that students tended not to use their own devices to take notes during class (M = 2.67) and generally did not bring their laptop or tablet to school (M = 3.12). The results also showed that most students did not need specialized software for their major course work (M=2.72).

Table 2: Student Responses to Questionnaire Items

Group 1 Items	n	Min	Max	Mean
I currently use my laptop or tablet to take notes in class	665	1	5	2.67
My major requires me to use specialized computer software (DreamWorks, SPSS, PhotoShop, etc.)	674	1	5	2.72
I almost always bring my laptop or tablet to school with me	665	1	5	3.12
When on campus, I use my own laptop/tablet more frequently than I use *[ ]'s computer labs	676	1	5	3.19
Group 2 Items				
The *[ ] computer labs are very important to me	675	1	5	3.63
Rather than have *[ ] go BYOD, I would prefer that *[ ] continue to provide computer labs	671	1	5	3.94
Instead of going BYOD, I would prefer to pay an increased technology fee	669	1	5	2.51
When on campus, I use the computers in the library more often than I use my own laptop/tablet	675	1	5	3.00
When I need to print something, I most often use a printer provided by *[ ]	674	1	5	4.27
*[ ]'s current technology works well for me; I see no reason for *[ ] to become a BYOD campus	675	1	5	2.22
Group 3 Items				
BYOD would improve my overall learning experience at *[ ]	676	1	5	2.54
Going BYOD would encourage more students to enroll at *[ ]	671	1	5	2.20
BYOD would benefit me in terms of career preparation				
BYOD would benefit me as a student at *[ ]	671	1	5	2.77
*[ ] should become a BYOD campus	663	1	5	2.55
	675	1	5	2.22
Group 4 Item				
Buying my own laptop or tablet would be a financial burden for me	673	1	5	2.98

Student Responses to Group 2 Items – Provision of Institutional Technology

Initial analyses of student responses to the six questionnaire items related to the provision of technology by the university provided interesting insights to the participants' perspectives. As shown in Table 2, students indicated that computer labs provided by the university were somewhat important to them (M = 3.63) and that they would prefer that the institution continue to provide computer labs as opposed to implementing a BYOD program (M = 3.94). Interestingly, while the participants preferred those labs be provided by the university, they were not in favor of paying higher technology fees to support those labs (M = 2.51). The students also indicated that they relied on university provided printers (M = 4.27). Finally, student responses indicated that at least to some degree the technology provided by the university worked well for them (M = 3.88).

Student Responses to Group 3 Items -- Student Perceptions of BYOD

The five items in Group 3 were designed to provide information related to student perceptions of a BYOD program at their university. Table 2 shows that, in general, student perceptions of BYOD were not positive. Students did not agree that such a program would improve their learning experience (M = 2.54) nor that it would benefit them in terms of career preparation (M = 2.77). In addition, participants did not indicate that a BYOD program on campus would benefit them as students (M = 2.55). Students also indicated that they did not believe that BYOD would lead to increased enrollments at the institution (M = 2.20) nor did they agree that the university should implement a BYOD program (M = 2.22). More specifically, analyses revealed that nearly 60% of the participants did not think such a program should be implemented on campus, while 28% indicated neutrality on the item, and only 12% believed the program should be implemented.

Student Responses to Group 4 Item -- Potential Financial Burden

Students were asked to respond to a single questionnaire item related to the financial implications of buying their own laptop or tablet as designated by a potential BYOD program at the university. As shown in Table 2, student responses revealed a relatively neutral response to this item (M = 2.98), suggesting that a BYOD program was not seen as a likely financial burden for the participating students.

ANOVA Analysis

A series of ANOVA analyses were also conducted with the goal of investigating if various student groups differed in their responses to the 16 items by certain classification variables. Specifically, these examinations sought to explore if gender, major, or class standing had significant impact on student responses.

Table 3: Student Use of Technology - ANOVA Results by Gender

Dependent Measure	Gender	n	Mean	F	P=
I currently use my laptop or tablet to take notes in class	Male	331	2.74	1.823	.177
	Female	334	2.60		
My major requires me to use specialized computer software (DreamWorks, SPSS, PhotoShop, etc.)	Male	333	2.61	4.928	.027
	Female	341	2.83		
I always bring my laptop or tablet to school with me	Male	332	3.27	6.322	.012
	Female	333	2.98		
When on campus, I use my own laptop/tablet more frequently than I use *[ ]'s computer labs	Male	334	3.29	3.355	.067
	Female	342	3.09		
The *[ ] computer labs are very important to me	Male	333	3.65	.254	.615
	Female	342	3.61		
Rather than have *[ ] go BYOD, I would prefer that *[ ] continue to provide computer labs	Male	332	4.00	2.524	.113
	Female	339	3.88		
When on campus, I use the computers in the library more often than I use my own laptop/tablet	Male	333	2.88	5.361	.021
	Female	342	3.12		
Instead of going BYOD, I would prefer to pay an increased technology fee	Male	332	2.45	1.266	.261
	Female	337	2.56		
When I need to print something, I most often use a printer provided by *[ ]	Male	333	4.29	.130	.718
	Female	341	4.26		
*[ ]'s current technology works well for me; I see no reason for *[ ] to become a BYOD campus	Male	334	3.96	4.503	.034
	Female	341	3.80		
BYOD would improve my learning experience at *[ ]	Male	334	2.53	.065	.798
	Female	342	2.55		
Going BYOD would encourage more students to enroll at *[ ]	Male	330	2.21	.109	.741
	Female	341	2.18		
BYOD would benefit me in terms of career preparation	Male	330	2.77	.003	.960
	Female	341	2.77		
BYOD would benefit me as a student at *[ ]	Male	329	2.57	.127	.722
	Female	334	2.54		
*[ ] should become a BYOD campus	Male	334	2.19	.473	.492
	Female	341	2.25		
Buying my own laptop or tablet would be a financial burden for me	Male	332	2.89	3.449	.064
	Female	341	3.07		

Table 3 presents ANOVA results by gender. As this table indicates, men and women differed in their responses to 4 out of 16 statements. Post-hoc comparisons indicated that sampled male students (M = 3.26) were more likely to bring their laptops to school than were female students (M = 2.93). Further, male students (M = 3.28) reported that they used their laptops rather than computer labs to a greater extent than female students (M = 3.04). Averages also indicated that male students (M = 3.96) perceived to a greater extent than did female students (M = 3.08) the

sufficiency of currently available technology at the university. In contrast, women reported higher scores than men against the statement that referred to special software requirements in chosen majors.

Analyses conducted with the student sample to look for potential differences among student groups by their chosen/intended majors did not reveal any statistically significant differences. Tables 4a and 4b present the results of ANOVA undertaken to explore potential differences in sampled student responses by class standing. As these tables depict, there were 7 items on which sampled students differed significantly based on their class standing. The statistically significant differences between various sub-groups are discussed next.

Table 4a: Student Use of Technology - ANOVA Results by Class Standing

Dependent Measure	F	P=
I currently use my laptop or tablet to take notes in class	.710	.546
My major requires me to use specialized computer software (DreamWorks, SPSS, PhotoShop, etc.)	2.747	.042
I always bring my laptop or tablet to school with me	4.953	.002
When on campus, I use my own laptop/tablet more frequently than I use *[ ]'s computer labs	3.866	.009
The *[ ] computer labs are very important to me	2.910	.034
Rather than have *[ ] go BYOD, I would prefer that *[ ] continue to provide computer labs	3.893	.009
When on campus, I use the computers in the library more often than I use my own laptop/tablet	3.850	.009
Instead of going BYOD, I would prefer to pay an increased technology fee	1.358	.255
When I need to print something, I most often use a printer provided by *[ ]	1.954	.120
*[ ]'s current technology works well for me; I see no reason for *[ ] to become a BYOD campus	2.599	.051
BYOD would improve my learning experience at *[ ]	1.734	.159
Going BYOD would encourage more students to enroll at *[ ]	1.608	.186
BYOD would benefit me in terms of career preparation	2.830	.038
BYOD would benefit me as a student at *[ ]	1.525	.207
*[ ] should become a BYOD campus	1.291	.277
Buying my own laptop or tablet would be a financial burden for me	.706	.549

Table 4b: Significant Between Group Differences (Class Standing)

Dependent Measure	Class Standing (Response Means)	p‹
My major requires me to use specialized computer software (DreamWorks, SPSS, PhotoShop, etc.)	Freshmen (2.93) & Juniors (2.54)	.014
	Juniors (2.54) & Seniors (2.84)	.030
I almost always bring my laptop or tablet to school with me	Freshmen (3.44) and Juniors (2.94)	.005
	Freshmen (3.44) and Seniors (2.88)	.003
	Sophomores (3.31) and Juniors (2.94)	.014
	Sophomores (3.31) and Seniors (2.88)	.008
When on campus, I use my own laptop/tablet more frequently than I use *[ ]'s computer labs	Freshmen(3.40) and Seniors(2.89)	.004
	Sophomores (3.32) and Seniors(2.89)	.004
The *[ ] computer labs are very important to me	Freshmen (3.42) and Juniors (3.73)	.022
	Freshmen (3.42) and Seniors(3.75)	.025
Rather than have *[ ] go BYOD, I would prefer that *[ ] continue to provide computer labs	Sophomores (3.75) and Juniors(3.99)	.014
	Sophomores(3.75) and Seniors (4.09)	.001
When on campus, I use the computers in the library more often than I use my own laptop/tablet	Freshmen (2.73) and Seniors (3.29)	.001
	Sophomores (2.95) and Seniors (3.29)	.020

The results of post-hoc analyses (see Table 4b) revealed some interesting observations. Differences in average response scores indicated that sampled freshmen and sophomores were more likely to bring their laptops or tablets to school than were either juniors or seniors. Additionally, freshmen and sophomores reported a higher likelihood of using their laptops in the university than did more senior level students. Not surprisingly given the above results, as compared to responses by freshmen, junior and senior level students had higher average scores against the item that measured the importance of university computer labs. Although all sampled students indicated, on average, that they would prefer that the university continue to provide computer labs and not go BYOD, senior and junior level students exhibited a stronger agreement with this notion compared to sophomores. And finally, use of computers available in the university library was higher for sampled senior students compared to sampled freshmen and sophomore students.

If generalized to the student population at this university, and more broadly, to students at universities across the country, post-hoc analyses findings reported in Table 4b suggest that freshmen and sophomores are more likely to bring and use

their laptops to a university campus and use them for schoolwork to a university campus than are juniors and seniors. If this is symptomatic of a trend, in the future a higher percentage of students would be likely to bring and use their laptops to a university campus which may speak to the enhanced viability of having BYOD university campuses in the coming years. However, this conclusion is tempered by the findings reported in Table 5.

Table 5: Electronic Devices Used Most Often for School Work While on Campus

Device	Frequency	Valid Percent
Laptop	287	58.1
Tablet	33	6.7
Smart Phone	99	20.0
Don't Use Any of These	75	15.2

Note: 27% of sampled students did not respond to this question

Table 5 shows that significant percentages of all sampled respondents preferred to use their smartphones (20%) or no personal device (15%) most frequently for school work while on campus. We report these percentages for the entire sample as responses from lower classmen and upper classmen were not significantly different. Smartphones may not be ideal or even feasible for a variety of computer-related tasks students have to complete when on a university campus. Therefore, if the observations in Table 5 are generalized to the student population at a university, it follows that establishing a BYOD university campus would necessitate that about 35% of its student body change its behavior (obtain and/or bring laptops or other comparable devices to that university campus).

In summary, the sampled students did not prefer that the university change to a BYOD campus and did not have positive perceptions toward the adoption of a BYOD program by the university. However, that perception could change in the future.

Implications

BYOD programs offer a tantalizing strategic option for institutions of higher learning. On one hand, casual observation and empirical studies reveal that today's college/university students are technologically well equipped with mobile devices, including cellular phones, tablets, laptops and e-readers. These students are tech savvy and rely on such devices to search electronic sources and to gather and interpret a variety of data and information. However, at the university where this study was conducted, observation also reveals a strikingly limited use of those devices in the classroom for note taking or active learning activities.

Recognizing the potential of technology on campus and in the classroom, as well as the technological abilities of students, many universities are contemplating BYOD as a strategic educational option. Administrators and professors are exploring the implementation of such programs that are designed to meet the needs of students while at the same time maximizing the efficiency of providing related resources (i.e., classroom infrastructure, technology support services, bandwidth, support of a variety of electronic devices and platforms, and more). In short, BYOD programs are seen by many universities as a way to improve student learning while managing limited resources -- to meet the objectives of both the students and the organization.

This study examined a fundamental research question: Do university students consider BYOD programs to be a value added alternative to the more traditional technology (i.e., computers, computer labs, printers) provided by the institution? In essence, we asked whether or not the implementation of a BYOD system would be consistent with the marketing concept message we repeat in our marketing classes: Strategic business decisions should be based upon a fundamental objective – to meet the needs of the customer and the company.

Statistical analyses revealed that, for the most part, students did not view BYOD as an improvement over existing technology resources. Participants did not indicate that such a program would improve their learning experience nor better prepare them for their careers. Overall, students reported that existing university provided technology met their needs, that they did not use their electronic devices in the classroom and that the majority didn't bring their tablets or laptops to school. Perhaps one of the most revealing findings in the study was that some 60% of the sampled students did not recommend implementing a BYOD program on the campus.

With these findings in mind, interesting questions emerge: "If students don't perceive the value of a BYOD program on their campus, and if those same students don't use their mobile devices to engage in active learning in the classroom, should the university implement such a program?" "If the university does implement a BYOD program, would such a decision reflect consumer needs based marketing, the customer oriented philosophy proposed by Robert Keith nearly 60 years ago, that we profess in marketing classes around the world?" While the answers to these questions are multi-faceted and are not answered by the research reported herein, this work does provide a foundation of understanding as well as the impetus for further work in the area. For example, it would be intriguing to introduce a university wide educational program designed to explain to students the value added elements, as well as the nuances and objectives, of a BYOD program. Such an educational program, if introduced early in the students' university career, might lead to very different responses to the questions posed in this work. Indeed, if this study was replicated in two years, when the freshmen and sophomore level students in the current sample would be junior and senior level students and when

the 'new' freshmen and sophomore students in the replication would be even more tech savvy and apt to use their own technology in the classroom, as suggested by the findings in this work and by the work of Chen et. al., (2015), the research findings might be strikingly different and show a decided preference for BYOD programs. As such, if the above suggestions can be implemented, we encourage further research in this area.

A second avenue of further research might focus on the investigation of BYOD perceptions held by other stakeholders. For example, the implementation of a BYOD program would hold significant implications for the instructors in BYOD classrooms. It would be very interesting to assess faculty perceptions of a) student use of mobile devices in the classroom and b) their interest in and commitment to making the pedagogical changes incumbent to BYOD. It would also be interesting to investigate employer/recruiter perceptions of BYOD programs in terms of student learning, career preparation and recruitment.

The work by Chen et, al., (2013, 2015) revealed that students, for a variety of reasons, did not want instructors to include mobile devices as a learning tool in the classroom. Those results, when combined with the findings of this study, suggest that if institutions of higher learning are to successfully implement BYOD programs in the classroom, investment in training/educational programs for students, faculty, support staff and infrastructure will be needed.

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