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Preferring print: The planned behavior and preferences of first-generation college students in the academic library

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ABSTRACT

Background: Academic libraries have been adapting and changing their collections with technology. Often this technology has accompanied a transition from physical collections, such as print books, to electronic collections and electronic books. Understanding how this shift away from print formats might affect certain campus populations is essential as electronic collections continue to grow and expand in various academic institutions.
Methods: This mixed methods case study aimed to understand how first-generation college students at a public research university use print books versus electronic books. Data was collected in two phases, with the first phase consisting of a Likert scale survey distributed to 4419 potential participants. The second phase was a qualitative semi-structured interview with 19 self-identified participants from the survey.
Results: The survey did not indicate a strong preference for print books over electronic books. However, the qualitative interviews did indicate that first-generation students preferred using print to facilitate their reading styles.
Conclusion: The study showed that students prefer to use print books over electronic formats daily at their academic institutions for various factors, including the ability to focus and review information. However, the primary reason first-generation college students prefer print books is that it helps them retain information for classes better than electronic books.

Introduction

Today's academic library is a vital partner in the various structures, policies, and practices that encompass the research status of an institution. As an institution expands, for example, with new graduate programming, the academic library often also benefits from this growth. However, it has long been an issue for academic libraries that the buildings housing the collections often do not see the same growth rate as the rest of the university (Atkins, 1991; Budd, 2018). Additionally, increasing publishing costs accompany the growth of new programs while federal funding for higher education has subsided, leading to less funding for many academic libraries (Atkins, 1991; Budd, 2018). For many years, this funding imbalance has led to an accelerated transfer to electronic content, which can increase available space in buildings by removing rows of similar print content and creating collaborative study areas for students. At the same time, providing electronic books through the library can benefit undergraduate students through lower out-of-pocket costs than print books (Johnston & Salaz, 2019).

As more resources are reallocated to electronic access, students' use of the academic library, particularly undergraduate students, has remained the same (Deng, 2022; Salubi et al., 2018). Nevertheless, despite the sustained use of the physical library, the university administration recently launched an electronic-preferred policy only to reverse it due to student and faculty protests (Darling, 2023; Jesse, 2023). Such a pro-electronic policy would seem appropriate considering that many expect undergraduate students to be digitally savvy, assuming considerable exposure to technology (e.g., digital natives). In addition, the Covid-19 pandemic hastened collection shifts from print to electronic in

many libraries (Kavanaugh, 2020). Nevertheless, many digital inequalities still exist among college-age students that may prevent them from fully embracing digital resources (Hall, 2021; Janschitz & Penker, 2022; Prensky, 2001a,b; Prensky, 2001a).

First-generation college students (FGCS), generally recognized as the first in their families to attend college, are an increasing percentage of today's college enrollment, which can reach over 50 % at some institutions (Nguyen & Nguyen, 2018). These same students are also often unaware of how the campus environment works, frequently struggling to understand the roles and procedures of the modern university since they do not have a social network to turn to for assistance (Brinkman & Smith, 2021; Couture et al., 2021; Davis, 2010). First-generation college students may not be as versed in the latest technological trends despite being born in a technological age (Hodge, 2022; Prensky, 2001a,b). The lack of familiarity with current technology can be detrimental for any student, but for FGCS it tends to accompany inequality (Banerjee, 2022). In the library, these inequalities may manifest as difficulties in analyzing, evaluating, and using information sources (Brinkman & Smith, 2021; Deng, 2022; Graves et al., 2021), or even how to use library resources generally (Chen et al., 2014; Couture et al., 2021; Singer & Alexander, 2016; Soria & Stebleton, 2012; Weisberg, 2011). Improving academic library awareness of FGCS skills upon their arrival on campus will, in turn, increase FGCS success in their academic pursuits as they become more familiar with their library surroundings (Couture et al., 2021; Ilett, 2019; LeMire et al., 2021; Markle & Stelzriede, 2020).

This mixed methods case study sought to understand the intentions behind the usage of print books and electronic books at a public research university with a high number of FGCS located in the Northeastern United States, Marathon University, a pseudonym. Using Ajzen's Theory of Planned Behavior, the study sought to understand better the behaviors and preferences of FGCS at the university. It is incumbent on any university to consider how any specific policy affects individual students and, in this case, a specific group such as FGCS. Understanding if in fact, FGCS prefer using print books for an in-depth comprehension of their coursework and long-term retention of the material is essential to balancing funding and supporting the FGCS population.

Background of the study

Academic libraries have typically developed around creating a repository of print books in every discipline (Atkins, 1991; Budd, 2018), yet academic libraries have been shifting to electronic formats for decades. With this shift in reading formats, librarians have been studying whether undergraduates and graduates prefer print over electronic resources and why.

Print books versus electronic books

A significant effort undertaken by research librarians to understand student resource needs was the Academic Reading Questionnaire (Mizrachi, 2015a), which examined the reading preferences of undergraduate students at the University of California, Los Angeles. This project evolved into The Academic Reading Format International Study (ARFIS), a multi-year study conducted by Mizrachi et al. (2021) and one of the largest international studies to examine undergraduate and graduate print book and electronic book usage preferences in 33 countries with over 21,000 university students. As with the original study, the ARFIS study and the three subsequent reports it generated stated that students prefer print books 71 % of the time (Mizrachi et al., 2018; Mizrachi et al., 2021). Users further indicated that they preferred print books because they helped them focus, were easier to revisit for further study, were easier for notetaking, and did not cause health issues such as eye strain or ergonomic issues (Mizrachi et al., 2018; Mizrachi & Salaz, 2020).

Student preference for print books tends to be tied to the particular subject matter (Baron et al., 2017; Chohda & Kumar, 2023; Dilevko &

Gottlieb, 2002; Liu, 2006; Ross et al., 2017; Weisberg, 2011; Yuan et al., 2018), to the length of text (Baek & Monaghan, 2013; Ross et al., 2017), to their notetaking needs (Baron et al., 2017; Dilevko & Gottlieb, 2002), and to the lack of availability electronically (Rojeski, 2012). Yet, students also indicate that they sometimes choose electronic book formats because of ease of access (Baron et al., 2017; Chohda & Kumar, 2023; Dilevko & Gottlieb, 2002; Liu, 2006) and ease of searching (Yuan et al., 2018). These preferences ultimately are influenced by a particular preference for a specific reading style.

Reading styles

It is also interesting to note that print books and electronic books both facilitate different reading styles. Print books have been linked to deeper reading and concentration, sustained focus and attention, and a better ability to memorize content and integrate knowledge into concepts (Carr, 2010; Durant & Horava, 2015; Rowe, 2013; Wolf & Barzillai, 2009). On the other hand, electronic books lead to a more nonlinear approach which leads some individuals to rapid pattern recognition and quick decision-making while also leading to readers desiring instant gratification and impatience when they cannot immediately find what they need (Carr, 2010; Durant & Horava, 2015; Rowe, 2013; Wolf & Barzillai, 2009). Reading experiences also become a more shared experience through electronic books and social media (Durant & Horava, 2015). Academic libraries recognize this and continue to advocate for hybrid collections containing both print and electronic (Chavali & Gundala, 2022; Chohda & Kumar, 2023; Durant & Horava, 2015). However, despite findings that suggest undergraduates desire print books, institutions are purchasing electronic books much more frequently (Chavali & Gundala, 2022; Chohda & Kumar, 2023). As academic library collections continue to move towards more electronic collections, it is possible that specific populations, such as first-generation college students, are put at a disadvantage by such a transition.

First-generation college students

While FGCS are the first in their family to attend college, there is a tendency to oversimplify and present these students as monolithic rather than a group of individuals with diverse needs affecting their college experience (Hodge, 2022; Sly & Coren, 2022). Research suggests that FGCS have strong familial and social connections, typically live and work close to school, and often have additional responsibilities while in school (Chen & Carroll, 2005; Choy, 2001; Davis, 2010; Hodge, 2022; Nuñez & Cuccaro-Alamin, 1998; Sly & Coren, 2022; Ward et al., 2012). Thus, FGCS relate differently to higher education institutions than their continuing-generation college student (CGCS) peers and may be unfamiliar with the culture of college, the colloquialisms of college students, and what it means to be a college student due to their status as first to attend college (Davis, 2010; Ward et al., 2012).

First-generation student interactions with academic libraries have had mixed success. Libraries recognize that this student population often encounters hidden barriers, such as navigating systems or organizational language. Therefore, libraries frequently create programming to explain these barriers to foster more successful encounters with FGCS (Couture et al., 2021; Deng, 2022; Graves et al., 2021; Ilett, 2019). Academic libraries have sought to determine how to best serve FGCS by examining aspects of previous library knowledge upon arrival at the institution (Hands, 2009; Ilett, 2019; LeMaistre et al., 2018; LeMire et al., 2021; Sly & Coren, 2022). The resultant literature suggests that by focusing on the integral knowledge of FGCS from their K-12 experience, libraries can better understand how to make the college experience more relevant, including incorporating multilingual aspects and addressing gaps in skills and learning, such as searching for resources, finding information generally, and properly citing sources (Hands, 2009; Ilett, 2019; LeMaistre et al., 2018; LeMire et al., 2021; Sly & Coren, 2022). Through

close engagement, the library may more easily gauge information literacy, including search methods and the use of library research tools. Thus, more effective library services can be established (Brinkman & Smith, 2021; Deng, 2022; Graves et al., 2021; Pickard et al., 2013).

FGCS are also often hesitant to approach librarians for assistance (Couture et al., 2021; Ilett, 2019; Pickard et al., 2013). This hesitation makes it difficult for library staff to determine if they are providing the appropriate resources, programs, and services (Brinkman & Smith, 2021; Couture et al., 2021; Ilett, 2019; Pickard et al., 2013). The often-false assumption is that the contemporary student is a "digital native" (Prensky, 2001b; Prensky, 2001a; Singer & Alexander, 2016; Weisberg, 2011). The "digital native" approaches learning much differently and multi-tasks constantly, requiring a different approach to capture their attention and to aid their absorption of the lessons and materials provided (Prensky, 2001a; Prensky, 2001b; Singer & Alexander, 2016; Weisberg, 2011). With the digital native label, many assumptions are made that students can "naturally" manage everything electronic (Chen et al., 2014; Couture et al., 2021; Singer & Alexander, 2016; Soria & Stebleton, 2012; Weisberg, 2011). These expectations may obscure the difficulties that FGCS experience with accessing or using library resources (Chen et al., 2014; Couture et al., 2021; Singer & Alexander, 2016; Soria & Stebleton, 2012; Weisberg, 2011).

Theory of planned behavior

The Theory of Planned Behavior, developed by Icek Ajzen (1988), is a theory meant to explain human behavior through specific contexts (p. 181). The pivotal factor behind the theory is intention, which is to surmise the motivation behind an individual's behavior (Ajzen, 1988). Intentions can indicate motivation by illustrating, for example, an individual's desire to learn a skill or to try a new concept, and the stronger the inclination is to engage in a particular behavior, the more likely that behavior will occur in practice (Ajzen, 1988). An individual's control over behavioral intention is also linked to their free will to perform or not perform said behavior. If behavior is involuntary the intention would be inapplicable to Ajzen's TPB (1988).

Working alongside intention in TPB is the concept of perceived behavior control (PBC). According to Ajzen (1988), an individual's ability to perform a particular behavior is directly tied to their confidence in performing the behavior. If the PBC is credible, it can be used to predict future behavior as long as intention is constant (Ajzen, 1988). Ajzen's model maintains that certain aspects are required of intention for prediction to be constant. These aspects include corresponding measures of intention and PBC to the behavior the researcher wants to predict and keeping intention and PBC stable throughout the study (Ajzen, 1988).

To determine a participant's intention, three factors moderate this theory component. These factors are attitude, subjective norm, and perceived behavioral control, which are also influenced by salient beliefs and must be solicited from the participants. These salient beliefs are the "prevailing determinants of a person's intentions and actions" (Ajzen, 1988, p. 189). The first factor, attitude, must be displayed by the individual for the behavior in question. Ajzen (2002, 2020) refers to this as behavioral beliefs. Behavioral beliefs influence a participant's attitude towards a belief, such as positive outcomes originate from positive attitudes, whereas adverse outcomes result from negative attitudes (Ajzen, 1988; Ajzen, 2020). Subjective norms, the second factor, are normative beliefs that derive from perceived social norms regarding whether an individual should or should not engage in a behavior (Ajzen, 1988; Ajzen, 2020). Beliefs for this factor can stem from an individual's social network, peers, co-workers, and spouses (Ajzen, 1988; Ajzen, 2020). The influence of this social network can determine whether or not an individual undertakes a particular behavior in that their approval of the behavior may be a driving factor behind a participant's decision-making (Ajzen, 1988; Ajzen, 2020). Finally, the third factor, PBC, is considered to be control beliefs "based on the ease with which an individual can perform a particular behavior (Ajzen, 1988; Ajzen, 2020). These control

beliefs can be related to previous experience with a particular behavior, the influence of social members regarding how well they performed a past behavior, or even associated obstacles or impediments towards completing a particular behavior (Ajzen, 1988; Ajzen, 2002). PBC is also believed to temper the other two factors, as the greater its influence over attitude and subjective norms, the more likely the individual will perform a particular behavior (Ajzen, 1988; Ajzen, 2020).

This study uses the Theory of Planned Behavior (TPB) (Ajzen, 1988) to examine the behavior behind the preferred reading preferences of first-generation undergraduate students at Marathon University. The Theory of Planned Behavior's use in studies that focus on student behaviors also has a wide application. Some examinations of internet utilization and online gaming have focused on undergraduate students (Alzahrani et al., 2017; Zamani-Miandashti et al., 2013). Other examinations have focused on particular behaviors on campus, such as tobacco compliance, walking behaviors, and advice-seeking (Ng et al., 2020; Record, 2017; Sun et al., 2015). In comparison, why students enroll in business ethics courses or adopt e-textbooks have also been examined (Cheng & Chu, 2014; Hsiao & Tang, 2014).

Libraries have also incorporated the TPB into various studies to determine the reasons behind student behavior. For example, to decide how to help students use services better, Harati et al. (2019) used the TPB to uncover unplanned behaviors in the library by examining when behaviors changed unexpectedly during patron's library usage. Library service was also a factor in other studies that sought to understand how individuals seek information, conduct self-service, or use social media (Chang et al., 2009; Chang & Chang, 2009; Joo et al., 2019). User behavior, specifically within the library context towards print and electronic books, was examined through the TPB in a study by Mustafa et al. (2021) and compared against two other behavioral models to determine that a congruence of models may be necessary for determining intention. Through further examination of attitudes, subjective norms, and perceived behavioral control, libraries may better understand patron behaviors of library services.

Context

Marathon University, a four-year public research institution, is in the Northeastern United States. It has a rapidly growing undergraduate student population, of which over one-third identify as an underrepresented group on campus, and 5711 were self-identified first-generation students. As with many research institutions, it boasts a multi-library system that includes a medical library, which caters mainly to graduate students, and a main library that focuses primarily on the undergraduate student population.

Materials and methods

This mixed methods study was designed as a convergent case selection variant model, where the data was collected in two parallel phases to converge the results and findings (Creswell & Plano Clark, 2018). Using an intrinsic case study design thus allowed for the focus on undergraduate FGCS at Marathon University (Stake, 1995). The purpose of this study was to understand better the behaviors and preferences of FGCS surrounding their usage of print books or electronic books at the Marathon University Libraries. To prevent unjustified or unwarranted assumptions, both CGCS and FGCS were included in this study, and CGCS were used for the purposes of comparison. Ultimately, this study elucidated how FGCS best used the library collections and how their use could inform policy, practice, and research.

The quantitative phase of the study was based on the Academic Reading Questionnaire (Mizrachi, 2015). It used Likert item-type values, including 1) "strongly disagree," 2) "somewhat disagree," 3) "neither agree nor disagree," 4) "somewhat agree," and 5) "strongly agree." A survey based on Likert items was also chosen since these were specifically designed to measure an individual's attitude towards a particular

issue (Fishbein, 1967; Likert, 1967), which works well with the Theory of Planned Behavior. The qualitative phase of the study used Stake's (1995) categorical aggregation technique and applied Ajzen's TPB (1988; 2002) to the analysis. Data were collected during the 2021–2022 academic year.

Quantitative phase

Participants for the study were invited in two phases. For the quantitative phase, participants had to be undergraduate students at Marathon University and were asked to respond to a survey about preferences for print books versus electronic books. Participants were asked 19 questions about their specific usage and preferences for print and electronic books to answer the research question, "What percentage difference is there between first-generation and continuing-generation college students using print books and electronic books in Marathon University Libraries?" Participants answered questions based on Likert-item type values, including 1) "strongly disagree," 2) "disagree," 3) neither agree nor disagree," 4) "agree," and 5) "strongly agree." The instrument used for the survey is the Academic Research Questionnaire developed by Mizrachi (2015) and adapted by this researcher (see Appendix A). This was specifically developed to measure undergraduate reading preferences, habits, and behaviors towards print and electronic book usage by Mizrachi (2015) and was eventually developed into the Academic Reading Format International Study (ARFIS). The ARFIS study reports two Cronbach's coefficient alpha scores. For Dimension I, which includes the questions concerning format preferences, the Cronbach's coefficient alpha is 0.882. Dimension 2 includes the questions concerning learning engagement (highlighting, annotating, printing, reviewing notes, etc.) and has a Cronbach's coefficient alpha of 0.894 (Mizrachi et al., 2018; Mizrachi and Salaz, 2020).

After seeking IRB approval, the Analytics, System, & Applications (ASA) group provided the list of possible students to which the stratified random sampling method was applied. The list included 12,635 students, of whom 4419 participants were surveyed using the sampling method. The survey was sent out twice to recruit participants and anonymity was assured to increase participation, early in Fall 2022 and late in Fall 2022. The survey was hosted via Marathon University's instance of Qualtrics, and data was collected in SPSS and analyzed using contingency tables. There were 318 respondents (N = 318) to the survey, of which 149 (47 %) self-identified as FGCS, 141 (44 %) self-identified as continuing-generation college students (CGCS), and 28 (9 %) did not identify at all. An incentive of 20 gift cards worth $25 each was raffled off to those who participated in the survey. As a delimitation, the survey was sent out to both FGCS and CGCS to narrow the focus to the habits and behaviors exhibited only by FGCS participants towards print books and electronic books (Table 1).

Qualitative phase

The qualitative phase was focused on FGCS experiences with the library and their book preferences. Participants were derived from the survey respondents, and everyone was assigned a pseudonym to protect their identity. Of the 318 survey respondents, 80 participants expressed interest, and ultimately 19 (6 %) FGCS volunteered to participate in an interview focused on their preferences surrounding print books versus electronic books at Marathon University. Of these participants, eight (42 %) were male students, and 11 (58 %) were female. Thirteen interview participants were majoring in Science, Technology, Engineering, and Math (STEM), and the remaining six were majoring in Humanities and Social Sciences. CGCS were excluded from participation in the interviews so that the focus of the study could be narrowed to the behaviors of FGCS. Thus, using Stake's (1995) analysis method, themes were collected via categorical aggregation to clarify further how FGCS used print books and electronic books in the Marathon University Libraries. According to Stake (1995), categorical aggregation is when one seeks to collect themes through a data review to interpret the case under study (Table 2).

Results

Results were analyzed using contingency tables to understand how both FGCS and CGCS behaviors are reflected in their usage of print books and electronic books. These results are meant to answer the research question, "What are the factors that lead to a preference for print books or electronic books for first-generation and continuing-generation students in Marathon University Libraries?" To answer this question, a chi-squared test of independence was run with $\alpha = 0.05$ (Table 3).

The first chi-square test of independence was performed to examine the relationship between FGCS/CGCS and their preference for either print books or electronic books. Neither question indicated a significant association between FGCS/CGCS and a preference for either electronic books, χ^2 (4, N = 318) = 0.251, p = .993, or print books, χ^2 (4, N = 318) = 5.398, p = .249. Therefore, students are likely to select either a print book or an electronic book when both are available. When closely examining survey question four, 83 FGCS and 79 CGCS (51 %) agreed that they preferred the course materials in print, while 54 FGCS and 58 CGCS (35 %) disagreed. Alternatively, survey question 12 asked participants if they preferred electronic books over print books, and the results were more evenly split, with 65 FGCS and 63 CGCS (41 %) agreeing and 64 FGCS and 68 CGCS (40 %) disagreeing (Table 4).

The next set of chi-square tests of independence performed provided some insight into why FGCS/CGCS preferred print books over electronic books. Each of these tests showed a significant association between FGCS/CGCS and the variable. The first test compared FGCS/CGCS and whether print helped students focus better, χ^2 (4, N = 318) = 5.810, p =

Table 1
FGCS/CGCS survey participant age.

| | | First-gen/continuing-gen | | | | | |
| | | First-gen | | Continuing-gen | | Total | |
		N	%	N	%	N	%
Age	18–22	122	74.4 %	132	89.8 %	254	81.7 %
	23–27	18	11.0 %	10	6.8 %	28	9.0 %
	28–32	9	5.5 %	0	0.0 %	9	2.9 %
	33–37	6	3.7 %	2	1.4 %	8	2.6 %
	38–42	5	3.0 %	2	1.4 %	7	2.3 %
	43+	4	2.4 %	1	0.7 %	5	1.6 %
Total		164	100.0 %	147	100.0 %	311	100.0 %

Table 2
Qualitative interview participant demographics.

Pseudonym	Gender	Major	Year	Age
Brighton	M	Education	Freshman	20
Calista	F	Management	Sophomore	18
Cassandra	F	Nursing	Sophomore	40
Colin	M	Chemistry	Sophomore	19
Dave	M	Mechanical Engineering	Junior	33
Felicity	F	Sports Communication	Sophomore	20
Henry	M	Civil Engineering	Freshman	19
Isabella	F	Sociology	Freshman	18
Jayna	F	English	Junior	38
Julia	F	Biological Sciences	Junior	20
Kyrah	F	Biomedical Engineering	Freshman	18
Lexa	F	History	Freshman	18
Louis	M	Computer Science	Senior	20
Nathaniel	M	Computer Science	Senior	22
Nazir	M	Sociology	Junior	52
Raquelle	F	Theatre	Freshman	18
Sabrina	F	Inclusive Education	Junior	20
Teagen	M	History	Senior	42
Xavia	F	Psychology	Sophomore	18

Table 3

FGCS/CGCS print preference versus electronic preference.

	Strongly disagree		Somewhat disagree		Neither agree nor disagree		Somewhat agree		Strongly agree		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Q4												
FGCS	17	47.2	37	48.7	21	47.7	44	61.1	39	43.3	158	49.7
CGCS	19	52.8	39	51.3	23	52.3	28	38.9	51	56.7	160	50.3
Total	36	100.0	76	100.0	44	100.0	72	100.0	90	100.0	318	100.0
Q12												
FGCS	31	47.7	32	48.5	30	50.8	22	50.0	43	51.2	158	49.7
CGCS	34	52.3	34	51.5	29	49.2	22	50.0	41	48.8	160	50.3
Total	65	100.0	66	100.0	59	100.0	44	100.0	84	100.0	318	100.0

Note. Abbreviations refer to survey question number (see Appendix A).

Table 4

FGCS/CGCS print preferences.

	Strongly disagree		Somewhat disagree		Neither agree nor disagree		Somewhat agree		Strongly agree		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Q14												
FGCS	11	42.3	10	41.7	36	54.5	35	50.0	35	41.7	158	49.7
CGCS	15	57.7	14	58.3	30	45.5	49	58.3	52	44.1	160	50.3
Total	26	100.0	24	100.0	66	100.0	84	100.0	118	100.0	318	100.0
Q8												
FGCS	15	37.5	13	46.4	17	50.0	45	47.4	68	56.2	158	49.7
CGCS	25	62.5	15	53.6	17	50.0	50	52.6	53	43.8	160	50.3
Total	40	100.0	28	100.0	34	100.0	95	100.0	121	100.0	318	100.0
Q10												
FGCS	20	51.3	18	42.9	27	44.3	40	49.4	53	55.8	158	49.7
CGCS	19	49.7	24	57.1	34	55.7	41	50.6	42	44.2	160	50.3
Total	39	100.0	42	100.0	61	100.0	81	100.0	95	100.0	318	100.0

Note. Abbreviations refer to survey questions (see Appendix A).

.214, and the relationship between the variables was not significant. Thus, students did not agree that print does not facilitate focus. However, a closer examination shows that 70 FGCS and 101 CGCS (64 %) agreed with this statement, whereas 21 FGCS and 29 CGCS (16 %) disagreed. The second test compared FGCS/CGCS and whether they highlight or annotate their print books. χ^2 (4, N = 318) = 4.753, p = .315. This test also did not indicate a significant association between student preference for highlighting and annotating their print books. However, when viewed descriptively, 113 FGCS and 103 CGCS participants (68 %) indicated that they prefer highlighting and annotating print books, with only 28 FGCS and 40 CGCS (21 %) disagreeing. Finally, a test was run comparing FGCS/CGCS and whether they are more likely to review their print books for classroom assignments. χ^2 (4, N = 318) = 2.960, p = .565. As with the other tests, this did not demonstrate a significant association for students preferring to review their assignments using print books for classroom assignments. Over 55 % (93 FGCS and 83 CGCS) indicated they were more likely to review course materials after reading them at least once when they were available in print. However, 38 FGCS and 43 CGCS (25 %) disagreed with this statement (Table 5).

The final chi-square test of independence examined the relationship between FGCS/CGCS and their ability to retain information better using print books rather than electronic books. χ^2 (4, N = 318) = 0.341, p = .988. Regarding retaining information, 95 FGCS and 96 CGCS (60 %)

agreed that print materials helped more than electronic materials, and 28 FGCS and 29 CGCS (18 %) disagreed. While there was no significant association between the student population and the use of print books to retain information, the qualitative data indicated that for first-generation students, print books are a determining factor in their ability to retain information for their classwork.

In conjunction with the surveys, first-generation participants also took part in semi-structured interviews that clarified their responses regarding their choice of reading format. Findings centered around the participants' stated attitudes, e.g., behavioral beliefs (Ajzen, 2002, 2020), and perceived behavioral controls, e.g., ease of use factors, which participants believed facilitated their reading styles. As mentioned previously, attitudes/behavioral beliefs and perceived behavioral controls lead to intention (Ajzen, 2002, 2020). Throughout the interviews, participants indicated their intention through explicit statements illustrating their attitudes/behavioral beliefs and perceived behavioral controls. These statements were then organized into categories and subsequently three themes: kinesthetic needs, convenient features, and retaining information.

Findings

During the semi-structured interviews, participants' responses to

Table 5

FGCS/CGCS ability to remember.

	Strongly disagree		Somewhat disagree		Neither agree nor disagree		Somewhat agree		Strongly agree		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Q2												
FGCS	14	51.9	14	45.2	35	50.7	44	49.4	51	50.0	158	49.7
CGCS	13	48.1	17	54.8	34	49.3	45	50.6	51	50.0	160	50.3
Total	27	100.0	31	100.0	69	100.0	89	100.0	102	100.0	318	100.0

Note. Abbreviations refer to survey questions (see Appendix A).

targeted questions resulted in them discussing the particulars surrounding their usage of print books and electronic books in Marathon University Libraries, with most interviewees stating a preference for print books over electronic books. Specific attitudes and behavioral beliefs surrounding the usage of print books versus electronic books emerged, focusing on how either format facilitated reading styles. Most participants were quite adamant in their preference for print books for class preparation compared to electronic books, even frequently equating materials from the bookstore and the library in their enthusiasm. As "textbooks" for the classroom often are not standardized works but any monograph a faculty member deems essential to study, it is understandable how students can confuse the two entities. Regardless, they strongly professed their need to use the medium that best facilitated their individual reading style for greater success in the classroom. These styles emerged regarding participants' kinesthetic needs, convenience, and information retention.

Kinesthetic needs

One of the primary concerns indicated throughout the interviews with participants was the desire to touch print books, e.g., a kinesthetic need to hold a book rather than read a book on the computer screen. Participants' attitudes towards print books were reinforced when associated with touch. As Raquelle stated,

The very tactile, it's in front of me, this is the thing I am supposed to focus on, rather than having it on my phone or my computer where I have, oh, 'distraction, distraction, distraction,' … It's that kind of thing where it's meant for this thing. This is the only thing that this thing is meant for.

First-generation college student Calista added, "but having that actual, physical presence in your hands, being able to, you know, touch it and feel it, move it around, manipulate it, I think there's probably maybe even a kinesthetic aspect there too." Finally, Nazir acknowledged both that he prefers the physical presence of print while comparing it to electronic, which lends to confidence in the subject matter:

If there's a book, or I have a printout, or if it's a book I'm reading, I'm going to grasp whatever I need…I don't feel that way with digital. I think with a book, I will absorb [the subject matter] because I think I enjoy it. To me, a book in print facilitates my learning much better.

Nazir's experience illustrated the experience of several other participants who expressed that print books were generally more straightforward to use for their studies than electronic books. Ease of use strongly determined participants' overall positive attitudes towards the intention to use print books for their studies whenever possible. Participants would even go out of their way to obtain print copies for their studies, including making photocopies or traveling to other regional libraries to obtain a print version.

Students' overwhelming desire to touch resources for class and study provides both a way to center their focus and offers a path towards more security with the information needed for classroom assignments.

Convenient features

Participants had much to say about the convenient features of electronic and print books. However, even when some favored the electronic tools available, the participant would still prefer the print version for deeper study. Teagen, one of the few that compared both formats, stated,

The print books better facilitate [study] because I have more options immediately. I can highlight, I can bracket, I can make column notes because it's mine, and I can do my typical style of writing. So, I have four options right there, boom, boom, boom. Now I know that the same process can be done digitally, and it would take more work for

me to navigate the system. I guess maybe some of it is me being comfortable in the pen-and-paper style versus the digital. But I am noticing that as these programs evolve and become more of a priority over print, they're getting better with ease of access…. the connectivity is great, but the physical acts... of me noting it, [is] something that helps me lock it in my mind.

For Teagen, the ease of use factors (PBC) for print books outweighed the convenience of electronic books and accommodated his writing style. His attitude/behavioral belief was also that these factors lead to better retention and success in the classroom. It did not matter that he could replicate these techniques digitally; he felt less successful.

Most participants had relatively strong feelings about one format or another, with only a handful mentioning a positive electronic books experience. For these participants, there was more interest in the instant gratification and satisfaction of fulfilling an immediate need, i.e., ease of access to the text. These solid feelings and interests influenced their positive attitudes towards a particular format. For instance, Nathaniel mentioned in his interview that:

I find using the [electronic book] easier because I can just use [control-F] if it's a PDF to find exactly what I am looking for…I can use the highlighting option…[Electronic books] are just way more convenient than print textbooks.

While Louis also felt that electronic books were more convenient than print books. In his interview, he mentioned,

If I am reading something printed, I notice I'm supposed to make one choice for instance. If I am doing something electronic, I can have conflicting things, I can look stuff up on a website…I can expand more on what I read, and I try to get it from more perspectives.

Nathaniel, like Teagen, made his choice about preference based on ease of use factors (PBC), which in this case stem from electronic books. His attitude/behavioral beliefs were that this format was much better for his purposes. Louis' attitudes/behavioral beliefs were adamantly against print books and their limitations. He much preferred electronic books and the accommodation of further research that electronic books offer for his major in computer science.

Throughout the interviews, participants were vocal in their expressions of preferences about ease of use factors and their attitudes/behavioral beliefs towards print books or electronic books. In each instance, the preference centered around factors that supported their reading styles and study habits for their majors.

Information retention

For some participants, using print books coincides with convenient factors such as the ease of flipping through the pages, locating content in a chapter, and skimming the table of contents or references. Many indicated that these factors affected how well they could maintain information for their classes. For example, Dave discussed his experience with finding information and retaining it choosing a print book to accommodate his reading style, stating that,

Generally, I do prefer a print book versus an electronic book, especially for textbooks. It's just having it in front of me and being able to flip the pages a lot [it's] easier to go back and forth once I have the book. And it... I kind of feel I retain the information a little better that way than reading it electronically.

Xavia agreed, stating, "I feel like I can easily miss stuff in the ebook, but not if I have a printed book." Finally, Nazir also commented about retaining information digitally versus print to facilitate his reading style,

I'll go through it quicker because I'm thinking in my head. As I move into it, then I'm not going to absorb it as easy because I got to get right to the point. I think when I get to the point that allows me to start swiping and going past what I need, to get certain little gems out

that I think I need and to me, that will make me do the work as me like, 'Okay, I got it. That's it.' I'm not looking into it.

These students' attitudes/behavioral beliefs indicate a preference for the print book versus the electronic book when the purpose is to retain information for classroom assignments. Like other participants, they believe that electronic books hinder their reading style in some fashion and, therefore opt for print books for better success in the classroom.

Discussion

This study asked, "What attitudes and perceptions emerge from comparing the relationship of print books versus electronic book preferences for first-generation students?" Additionally, it sought to understand the intentions behind the usage of either print books versus electronic books by FGCS in the Marathon University Libraries. Much like the studies conducted by Mizrachi et al. (2021) using the ARFIS, participants had a statistically significant preference for print books. This coincides with earlier studies on format preference without a focus on first-generation students (Baron et al., 2017; Dilevko & Gottlieb, 2002; Liu, 2006; Ross et al., 2017; Weisberg, 2011; Yuan et al., 2018). Participants in this study also indicated that one of the reasons they prefer to use print books is that it helps them to focus, review material, and do tasks such as highlighting. This preference reflects other work that indicated students' preference for print books for these same reasons (Baron et al., 2017; Dilevko & Gottlieb, 2002; Mizrachi et al., 2018; Mizrachi et al., 2021). However, few of these studies indicate whether participants prefer print books to retain information other than the ARFIS studies (Mizrachi et al., 2018; Mizrachi et al., 2021).

The data were analyzed in tandem with Ajzen's Theory of Planned Behavior, which incorporates attitudes, social norms, and PBC (perceived behavioral controls) to determine the intention behind the behavior (Ajzen, 1988; Ajzen, 2005). These aspects were best viewed in the qualitative interviews, which focused on FGCS usage of print and electronic books in Marathon University Libraries. Attitudes, or the favorable or unfavorable evaluation of a particular behavior (Ajzen, 1988), which in this case is the preference for reading material, as indicated by participants' explanation of reading styles, particularly how print books better facilitate their reading styles, such as decreasing distraction and deeper study.

As with the quantitative data, the qualitative interviews displayed participants' preference for print books. Through the three themes of kinesthetic needs, convenient features, and information retention, the participants demonstrated that while they may use a particular format for ease of use, their preferred format coincides with their reading style. This finding corresponds to Mustafa et al.'s (2021) research that suggested users prefer formats based on reading style. Findings also indicate that through participants' positive attitudes and ease of use factors, students intend to choose print materials. According to Ajzen (1988; 2005), such an intention leads to a behavior, which in this case is a preference for print books both now and in the future.

As Ajzen indicates in his model, a study of these aspects moderates intention, and intention leads to behavior (1988; 2006). For first-generation college students at Marathon University, there is a need to continue to have access to print books to facilitate their reading styles and to make studying and preparing for coursework less burdensome. Both the qualitative and quantitative data indicated that there is a strong preference for print books by the FGCS population at Marathon University.

Academic libraries have conducted many of these surveys over the years and will probably continue to do so as more institutions gravitate towards e-preferred policies. However, as these policies are written, effort should be made to consider the effects on various student populations. As the results of this mixed method study demonstrated, FGCS at Marathon University certainly indicated that they preferred to use print books as it facilitates their retention of information for classwork.

One of the challenges, particularly for entities like Marathon University Libraries, is that electronic first policies can often be implemented at the university level without input from the library or student populations affected by the implementation. Institutions similar to Marathon University with student bodies that are over one-third underrepresented minorities, and many of those individuals self-identifying as first-generation students, may also require dispensation as regards their reading styles. Therefore, it is important for these institutions to maintain policies and practices that do not undermine specific learning needs for these groups, as one size does not fit all student populations. Marathon University Libraries' library administration can develop policies and work with university administration that highlight the needs of these underrepresented groups to ensure they succeed in their academic pursuits. Continuous advocacy on campus using studies such as this provides hard data to the university administration to illustrate that undergraduate students still need desired formats, such as print books to obtain such success.

Academic libraries can also work with other entities on campus to determine how their services can enhance and improve populations, such as FGCS. Some studies have already been conducted in this area surrounding library space and services, but not on how FGCS study and further clarification on how this population uses specific library materials (Brinkman & Smith, 2021; Couture et al., 2021; Graves et al., 2021). Further study on such areas can clarify how these populations truly use these materials and supplement the conversations that may have already begun around ensuring that FGCS and other underrepresented student populations persist to graduation.

Limitations and future research

This mixed methods study was limited to focusing on first-generation undergraduate college students. Continuing-generation undergraduates were only included in the quantitative phase, and as graduate students are inherently different, these students were not included. The survey was also a reflection of a student population at an electronic primary institution; therefore, results may differ for those at print primary institutions. Finally, students self-reported information and data could be biased based on overreporting of activity participants felt would resonate with me (Brenner & DeLamater, 2016). According to Brenner and DeLamater, this is normal, internalized human behavior reflecting societal, community, and group norms and function as a way to present and individuals ideal self. That said, it can cause unintended biases that should be acknowledged.

Academic libraries are only beginning to study FGCS as a population rather than design studies that treat them as a monolith or do not even designate them specifically as a population of interest. Expanding to a longitudinal study that follows a group of FGCS throughout their undergraduate experience may provide a complete picture of their academic library use and the effect certain policies may have. Additionally, expanding the study to include the entire undergraduate student body and conducting focus groups with FGCS and CGCS to understand participants' preferences may provide further understanding at an e-preferred institution.

Conclusions

First-generation college students at Marathon University work and study in two mediums, print books and electronic books. While some are comfortable in both formats, others certainly have defined needs for why they use their preferred medium. As long as academic institutions continue to move towards a more e-preferred policy or an e-preferred collection, first-generation college students may walk a fine line between what is convenient and what works best for them academically.

Academic libraries must consider what is expedient for the patrons on campus and what is good for the patron using the material. For some institutions, this is less of a battle than others. Each institution has its

own set of policies and priorities. More research is necessary on first-generation college students and electronic books to determine the impact on this specific student population. As this study has demonstrated, first-generation students prefer print books. However, more studies need to be conducted in this area to truly understand how the growing shift away from print books might affect this population. Future studies should be conducted in a way that not only focus on this group but also on how the academic library can strategize solutions without further marginalizing this or other student populations.

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Jennifer K. Matthews: Conceptualization, Data curation, Formal analysis, Investigation, Writing – original draft, Methodology. **Ane Turner Johnson:** Supervision, Validation, Writing – review & editing.

Declaration of competing interest

None.

Data availability

The data that has been used is confidential.

Appendix A. Quantitative survey interview questions

1. I have recently used print books and electronic books in Marathon University Libraries.
2. I remember information from my course readings best when I read them from printed pages.
3. It is more convenient to read my assigned readings electronically than to read them in print.
4. I prefer to have all my course materials in print format (e.g., book, course reader, handouts, etc.).
5. If an assigned reading is more than five pages long, I prefer to read it in print.
6. I prefer to print out my course readings rather than read than electronically.
7. It is more convenient to read my assigned readings electronically.
8. I usually highlight and annotate my print course readings.
9. If an assigned reading is less than five pages long, I prefer to read it electronically.
10. I am more likely to review my course readings (after I've read them at least once) when they are in print.
11. If an assigned reading is longer than 10 pages, I prefer to read it in print.
12. I prefer electronic textbooks over print textbooks.
13. I usually highlight and annotate my electronic readings.
14. I can focus on the material better when I read it in print.
15. I prefer to read my course readings electronically.

16. I prefer electronic textbooks over print books because of the COVID pandemic.
17. I prefer print textbooks over electronic books because of the COVID pandemic.
18. I am more likely to have difficulty in my courses because I can only access electronic books due to the pandemic.
19. I am more likely to have difficulty in my courses because I could not access print books due to the pandemic.
20. English is my strongest language.
21. I read my electronic course readings on a __ (please check all that apply): _Desktop computer _Laptop computer _iPad/tablet _Dedicated E-reader (e.g., Kindle).
22. I am _First-generation student _Continuing-generation student
23. I am _years old
24. My cumulative grade point average (GPA) is: _3.5-4.0 _3.0-3.49 _2.5-2.99 _2.0-2.49 _1.5-1.99 _1.0-1.49 _Below 1.5 _Other
25. I am in my _year of undergraduate study. _1st _2nd _3rd _4th _Other
26. I am majoring, or planning on majoring in:
27. Do you have any visual or other limitation that influences your preference for electronic or print format? _No _Yes (if yes, please specify:)
28. What else would you like us to know about your academic reading format preferences?

Appendix B. Interview protocol

1. What was the first book you remember reading, and why did it stand out to you?
2. Why were you interested in participating in this study?
3. Describe how you use the Marathon University Libraries collections.
   a. When you use the collections, do you prefer to visit the library in-person or virtually and why?
4. In what ways do you use print books and electronic books for your academic courses?
5. Describe your preference for print books or electronic books for your course readings.
   a. How do assignments affect your usage of either print books or electronic books?
   b. Can you describe a time when Marathon University Library had a resource in a book format that was not to your convenience or preference? What did you do?
6. Describe how the use of either print books or electronic books better facilitates your learning.
7. Describe how the availability of a particular book format in the Marathon University Libraries may facilitate or inhibit your study habits.
8. In what ways have your reading preferences or habits changed since starting college?
   a. How has the presence of print books or electronic books in your area of study affected your approach to reading assignments and classwork generally?
   b. How has the presence of print books or electronic books in your specific area of study changed your approach to reading assignments and classwork for your major?

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