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Analysis of an i-Pad Initiative: Are Students Using the Technology?

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Abstract

This study follows the implementation of an iPad Initiative program at a university in the mid-south region of the United States. Freshmen students enrolled in a First Year Experience (FYE) course within the College of Nursing and Health Professions (CNHP) were surveyed regarding iPad use and curriculum implementation. Research questions included which apps are most popular for personal and school related use, which courses most commonly use the iPad, and whether students are satisfied with the current level of iPad integration within the curriculum.

Keywords: iPad integration, iPad initiative, m-learning, technology, apps

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Starting in the fall of 2013, Arkansas State University (A-State) embarked upon a technological adventure described as an iPad Initiative. This Initiative, still in practice today, requires incoming freshmen to obtain an iPad for use in the First Year Experience (FYE) "Making Connections" course, a mandatory course used to help transition freshmen from high school to higher education (Arkansas, 2014; Bostic, 2013). Campus faculty are encouraged to integrate the iPad into additional courses throughout the campus, including all general education courses typically taken during the freshmen and sophomore years (Bostic, 2013). The efforts of administration and faculty to implement this iPad Initiative have not gone unnoticed, asA-State's FYE course was selected as an Apple Distinguished Program for the 2014-2016 cycle (Arkansas, 2014).

While there is much published enthusiasm regarding the iPad Initiative and other similar programs, researchers wanted to know if this enthusiasm is shared by freshmen students. Research questions included which apps are most popular for personal and school related use,

which courses most commonly use the iPad, and whether students are satisfied with the current level of iPad integration within the curriculum.

Literature Review

Since its inception in 2010, the adoption of iPad technology in higher education has been on the rise (Mango, 2015). Reasons for this accelerated adoption include: fast information dissemination, current student preference for "m-learning", the emergence of technological advances, and positive faculty perceptions regarding iPad integration (Divall & Zgarrick, 2014; Dorman, 2007; Nguyen, Barton, & Nguyen, 2015). For this paper, "m-learning" is defined as mobile learning in which the learner is not at a fixed or pre-determined location and has access to class content material (Gong & Wallace, 2012). The iPad and other mobile devices are necessary for m-learning to occur.

Information Dissemination

DiVall and Zgarrick (2014) noted that the portability of the iPad makes it a convenient tool for quick workflow in the classroom. Kinash, Brand, Mathew, and Kordyban (2011) reported that students of today's constantly changing digital world are more comfortable with learning via iPad use. Studies show that some students believe the iPad is a good "m-learning" classroom tool for collaboration, peer interactions and facilitating the sharing of group work (Alyahya & Gall, 2012; Hahn & Bussell, 2012; Kinash, Brand, & Mathew, 2012). Other factors reportedly contributing to student support for iPad usage in the classroom are screen size, battery life, and weight (Pappas, Miller, Meier, & Moorfield-Lang, 2012).

Student Preference

Previous studies support an overall positive student attitude regarding iPad use in the classroom (Kinash, Brand, & Mathew, 2012; Kinash et al, 2011; Rossing, Miller, Cecil & Stamper, 2012; Wakefield & Smith, 2011). A research study completed in 2010-2011, comprising of 135 undergraduate students, indicated that 42% of students agreed the iPad had a positive influence on their learning (Kinash, Brand, & Mathew, 2012). A case study by Lahmers et al (2015) examined students' satisfaction with iPad usage. In this study, a sample set of 34 first year graduate students completed self-reported pre and post surveys from fall 2013 to spring of 2015 (Lahmers et al, 2015). Students reported on their level of comfort and familiarity with iPad technology in both the pre and post surveys. Results indicated that 82% of students who took the pre survey and 94% of students who completed the post survey indicated they were comfortable using the iPad for classroom assignments.

Another published survey explored students' view of the pros and cons of the iPad and other mobile learning (m-learning) technologies in the classroom (Gong & Wallace, 2012). Using a snowball sample method, an electronic survey was sent to 76 faculty and students in a private university in the southwestern part of the United States. Results indicated that students perceived laptops to be the most prevalent mobile classroom technology of choice, with iPads following second (Gong & Wallace, 2012).

In addition to establishing student preference for iPads in the classroom, research studies also indicate that incorporation of this technology leads to positive learning outcomes (Clark & Luckin, 2013; Diemer, Fernandez, & Streepey, 2012; Mango, 2014). Mango (2014) surveyed 35 students enrolled in two classes of first year Arabic. Students used iPads for activities pre-designed by the instructor on an average of once per week for 30-45 minutes during the duration of the semester. At the end of the course, students were provided a questionnaire to explore their perception of the impact iPads made on their learning of Arabic, as well as their perceived engagement with learning during classroom activities when using the iPad. With an overall average of 4.2 on a 5.0 Likert scale, the results strongly indicated that students found the iPad to be an effective tool to help them learn (Mango, 2015).

Technological Advances

Since its introduction in 2010, the iPad has undergone improvements in design, hardware, and software. Initially, the iPad was simply "an appliance, a device that consumes content, and one that provides limited data entry" (Drew, 2011). As one of its primary functions, it enabled users to read and modify Microsoft Office documents (Drew, 2011).

A year later, the iPad 2 was introduced with added features that included front and rear cameras, boosting recognition of the iPad 2 as a preferred camera option (Kastrenakes, 2015). In less than a two year span, the iPad 2 was quickly upstaged by the 3rd generation iPad, the iPad mini, and 4th generation iPads (Kastrenakes, 2015). Each successive generation provided better image resolution, faster charging capabilities, and sleek designs (Kastrenakes, 2015). Third and fourth generations of the iPad provided a wide variety of differences, from storage space to data rate to GPS options (Nations, 2016a).

The fifth and sixth generations of iPads were labeled the iPad Air 1 and 2, respectively. These generations of iPads provided consumers with different features and allowed consumers more options according to their personal preferences (Nations, 2016a). The iPad Air 2, for example, offers an additional color, is thinner in size and offers better quality using the rear camera (Nations, 2016a). The iPad Air 2 also offers both slow mode and burst mode for different picture taking options (Nations, 2016a). While many features of the different iPad versions improved, several features of all versions remained the same (Nations, 2016b).

During the six-year evolution of the iPad, one of the most notable (and useful) iPad advances has been the development of educational apps. Students and educators alike found using iPads and tablets to be much more convenient than the now obsolete chalkboard (Jian & Tseng, 2012). Ironically, various apps now supplement the use of the Smartboard, the traditional chalkboard's technological replacement, resulting in iPads using AirPlay for activities such as video streaming and other Apple applications (Nations, 2016b).

iPad usage is described as a new constant in higher education classrooms. Students and faculty continue to embrace the iPad and similar m-learning devices (Kinash, Brand, & Mathew, 2012). However, more research on students' and faculty's perceptions of this device is needed.

Faculty Perceptions

With the increasing popularity of the iPad and other m-learning devices, some researchers are focused on faculty use and perceptions of iPads in the classroom (DiVall & Zgarrick, 2014). A 2011 web-based needs assessment survey, with a 2013 follow-up, found that faculty use and perceptions of the iPad are varied (DiVall & Zgarrick, 2014). For this study, respondents were most likely to use the iPad for e-mail access and management, file access, connectivity, paper/project annotation, teaching in laboratories/seminars, and student assessment. Faculty whose responsibilities were primarily off-campus were more likely to use the iPad, corresponding to the definition and popularity of devices used for m-learning.

Methods

This study was designed to assess student use of the iPad, in an attempt to establish a baseline of institutional iPad use and to determine how students feel about iPads in the classroom. During each fall semester from 2013-2016, a survey instrument was distributed to freshmen students enrolled in the First Year Experience courses offered within the College of Nursing and Health Professions (CNHP). The purpose of the FYE course is to group similar students together, with the goal of fostering relationships and increasing student retention. It should be noted that a homogenous group in FYE courses, while desired, is not always achieved, as freshmen students tend to change majors or take whichever class most fits their schedules. Despite these limitations, the FYE course was determined to be the course most likely to consist of first semester healthcare-centered freshmen participating in the iPad initiative.

The survey consisted of quantitative and qualitative data. Open response questions asked students to identify:

- their top five favorite apps,
- the top five apps most frequently used for personal use,
- the top five apps most frequently used for school related use,
- the class(es) for which they would *most* likely use the iPad
- the types of activities performed using the iPad for the listed classes,
- the class(es) for which they would *least* likely use the iPad
- and what factors they believed contributed towards any lack of iPad use.

For these open response questions, students were asked not to include YouTube. Previous research studies indicated that YouTube is an overwhelming favorite for faculty and students, and researchers were interested in maximizing available responses (DuBose, 2013).

For this study, Arkansas State University's Internal Review Board approval was sought and obtained prior to survey distribution. FYE faculty were approached for permission to address students and request voluntary participation for the study. Between 2013 and 2016, data from 449 freshmen students were gathered and entered into SPSS for analysis. In 2013 and 2014, paper based surveys were distributed to each participating classroom, while electronic survey distribution via Qualtrics software was used during the 2015 and 2016 fall semesters. Paper survey responses were entered manually into either Qualtrics or SPSS, and both paper and electronic survey responses were analyzed with SPSS version 23 statistical software. Accuracy of manual survey input was verified through random selection of completed surveys by the third

author. Coding results, tabulated by the first author, were also reviewed and verified for accuracy.

Results

Demographics

Survey samples varied by year, with 2016 showing decidedly fewer students participating in the survey (Table 1). Of the 449 students, 85 (18.9%) were male and 354 (78.8%) were female, with 10 missing responses. Students were split among various degree plans offered within the CNHP (Table 2). An "other" category was available for those students who either started the course with another declared major (because of scheduling issues) or had changed their major since enrolling in the course. Student ages ranged from 16 to 30 years of age, with 18 and 19 year olds the predominant participants (70% and 21%, respectively). Participation numbers varied from year to year depending upon student enrollment numbers and First Year Experience (Making Connections) faculty encouragement of voluntary student participation.

Table 1: Frequency of Survey responses by Year

Year	Frequency (n)	Percent of total n
2013	109	24.3%
2014	123	27.4%
2015	135	30.1%
2016	82	18.3%
Total	449	100 %

Table 2: *Participant Demographics by Major within College of Nursing and Health Professions*

Major offered by CNHP	Frequency (n)	Percent of total n
Clinical Laboratory sciences	8	1.8%
Communication Disorders	37	8.2%
Diet and Nutrition	8	1.8%
Nursing	212	47.2%
Physical Therapy	50	11.1%
Radiologic Sciences	73	16.3%
Social Work	11	2.4%
Other	45	10.0%
Missing	5	1.1%
Total	449	100%

Most Commonly Used Apps

Students were asked to list their top five favorite apps (Table 3), as well as their top five apps for personal (Table 4) and school related use (Table 5). Researchers expected to find the same apps listed for both "Top Five Favorite Apps" and "Top Five Apps for Personal Use." This hypothesis holds true for at least 4 out of 5 apps, with Snapchat, Instagram, Twitter, and Facebook remaining in the top five each year for both categories. Interestingly, Pinterest was a staple within the "Favorite Apps" category until 2016, when it was replaced by GroupMe.

Table 3: Top 5 Reported Apps

2013 n=109	% of sampled n	2014 n=123	% of sampled n	2015 n=135	% of sampled n	2016 n=82	% of sampled n
Instagram	69%	Instagram	80%	Instagram	72%	Snapchat	66%
Twitter	60%	Facebook	61%	Snapchat	62%	Instagram	65%
Facebook	53%	Twitter	54%	Twitter	51%	Facebook	45%
Pinterest	32%	Snapchat	41%	Facebook	47%	Twitter	37%
Snapchat	27%	Pinterest	30%	Pinterest	24%	GroupMe	17%

Table 4: *Top 5 Apps per Year for Personal Use*

2013 n=109	% of sampled n	2014 n=123	% of sampled n	2015 n=135	% of sampled n	2016 n=82	% of sampled n
Instagram	64.2%	Instagram	80.5%	Instagram	69.6%	Snapchat	78.1%
Twitter	59.6%	Facebook	59.3%	Snapchat	61.5%	Instagram	75.3%
Facebook	56.0%	Twitter	51.2%	Facebook	51.9%	Facebook	58.9%
Pinterest	27.5%	Snapchat	43.9%	Twitter	46.7%	Twitter	46.6%
Pandora	22.9%	Pinterest	28.5%	Pinterest	20.7%	Pinterest	20.5%

Unlike the favorite apps and personal apps categories, the apps for school related use are more fluid (Table 5). Popular apps in the fall of 2013 appear centered on items required to complete class assignments (e.g. Keynote, Pages, Blackboard, iBooks, and iMovie), while a transition to the fall of 2016 demonstrates a combination of class-related function (Socrative, Safari, and Blackboard) with more informative and social/group outlets (Smart Campus and GroupMe).

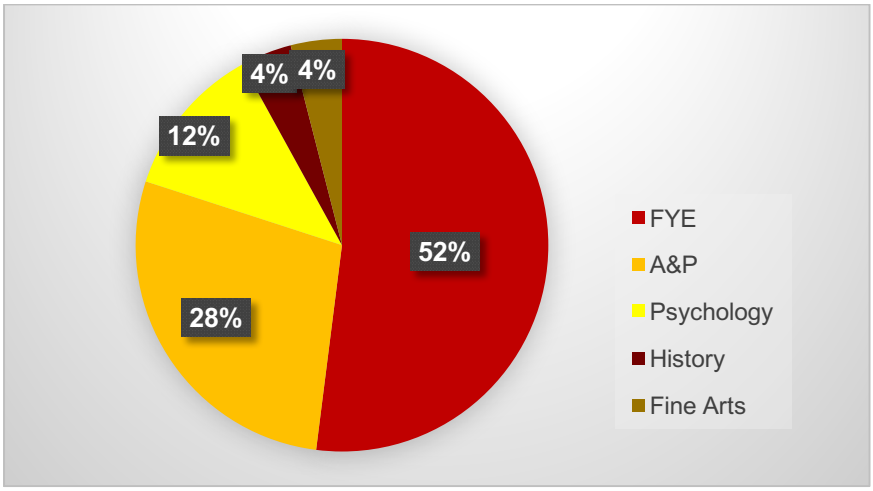
Table 5: *Top 5 Apps per Year for School Related Use*

2013 n=109	% of sampled n	2014 n=123	% of sampled n	2015 n=135	% of sampled n	2016 n=82	% of sampled n
Keynote	50.4%	Blackboard	42.3%	SmartCampus	44.4%	SmartCampus	39.7%
Pages	40.3%	Notability	42.3%	Socrative	33.3%	Blackboard	32.9%
Blackboard	29.3%	SmartCampus	39.0%	Blackboard	31.9%	Socrative	31.5%
iBooks	25.6%	iBooks	23.6%	Safari	20.7%	GroupMe	20.5%
iMovie	17.4%	Safari	16.3%	Notability	20.0%	Safari	17.9%

iPad Integration in the Classroom

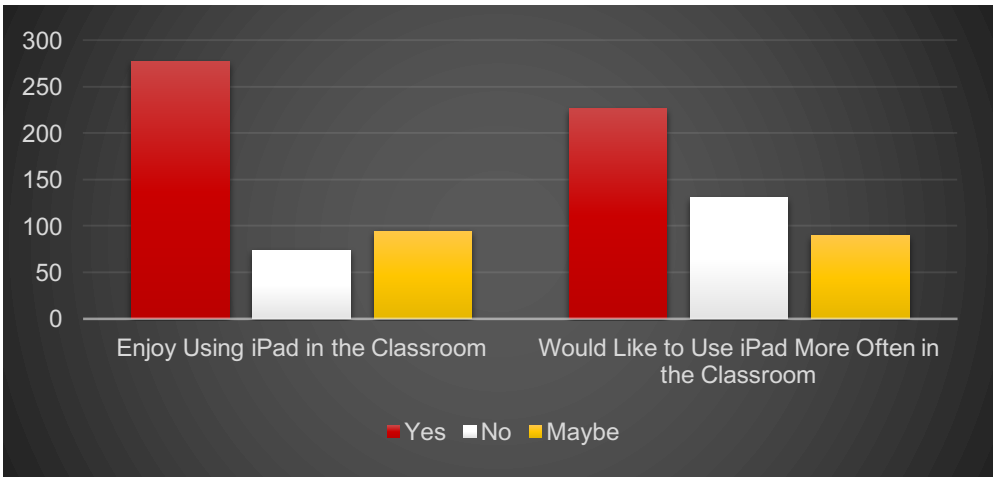
Researchers wanted to know if students were using iPads in the classroom, and if not, then why not? Data analysis revealed that over half of students reported using the iPad in the FYE Making Connections course, followed distantly by Anatomy and Physiology, Introduction to Psychology, History/Government and Fine Arts/Music/Theatre (Figure 1). Most common activities listed for iPad use included note taking, accessing Blackboard and/or PowerPoint slides, and completion of quizzes via Socrative, Blackboard, or other app software.

Figure 1: Most Common General Education Courses for iPad Use



Courses in which the iPad was reportedly *least* often used included: College Algebra/Math, English Composition I/World Literature, Introduction to Psychology, and History/Government. The list of courses least likely to use iPad technology expanded in 2015 and 2016 to include a higher percentage of Anatomy and Physiology (A&P) answers, with A&P matching History/Government (20%) as the least likely of all subjects to use iPad technology

Figure 2: Student Perceptions Regarding iPad Use in the Classroom



Students provided researchers for a wide variety of reasons they believed the iPad was not used for particular subjects or classrooms (Table 6). Responses were coded into the following most prevalent responses: distracting, lack of faculty training, perceived subject incompatibility, software compatibility issue, student untrained on potential, and unwilling professor.

Table 6: *Reasons Students Believe the iPad is NOT Used in the Classroom*

• Students untrained on iPad potential • Unwilling professor • Perceived subject incompatibility • Software compatibility issue • Lack of faculty training • Faculty view as a distraction

"Distracting," "lack of faculty training," and "unwilling professor" were considered self-explanatory categories. "Perceived subject incompatibility" was used for responses such as, "I think history is fine without it," or "What good is an iPad for college algebra?" "Student untrained on potential" was a similar category and the argument could be made to combine the two categories. Student responses for this category included, "It's easier to take hand-written notes," or "It would be hard to work out math on a tablet." Researchers chose the category based on knowledge of popular apps used for taking notes, working math problems, or practicing anatomy. Finally, "software compatibility issues" was used for those comments detailing the inability of the iPad to download course specific software. The most common reference was the software required for College Algebra.

At the end of the survey, students were asked if they enjoyed using iPad technology in the classroom. Approximately 62% answered in the affirmative, while 17% responded they did not enjoy it, and 21% were not sure. When asked if they would like to see iPad technology used more often for classroom-related activities, only 50% said yes (Figure2). Surprisingly, approximately 29% responded they did NOT want to see more iPad related activities, while 20% answered they were not sure.

Discussion

Popular iPad Apps

An analysis of the data shows that social media apps remain an overwhelming favorite, for both overall favorite apps and apps for personal use. For each year of this study, Facebook, Instagram (owned by Facebook), Twitter, and Snapchat remained in the top five. While Instagram and Snapchat were not surprising entries, rumors indicated that Facebook was decreasing in popularity (Wagner, 2016). However, this study demonstrates that Facebook is alive and well for the current generation of students. Pinterest, another social media site in which participants can share and "pin" quips, recipes, and other information (Pinterest, 2017), was replaced in the 2016 dataset by the newly popular GroupMe app. GroupMe (purchased by Skype in 2011) is a free social media app that allows users to chat with anyone, due to its high compatibility with almost all phone technologies and carriers (GroupMe, 2017).

Researchers were also interested to see the absence of Yik Yak, a once popular social media app that allowed users to remain anonymous (Straumsheim, 2016). The social media app was controversial due to the anonymous harassment and threats prevalent on its site. While Yik Yak made the 2014 list of top ten apps for personal use (17%), its popularity with participants in

this study dropped to 5% by 2015. This drop is most likely due to 2015 policy changes by Yik Yak, in which user name and location required mandatory posting and participant anonymity was lost (Straumsheim, 2016).

Apps that allow for easy access to class or campus material appear favorites for school related use, with the social media app, GroupMe, again making an appearance in the most recent year. Students are using GroupMe for collaboration with course projects and to remind each other of upcoming due dates for tests and assignments. An evolution in iPad use is seen from 2013 to 2016, with the earlier years indicating use of the iPad for tasks normally relegated to a computer (i.e. Keynote, Pages, iBooks, iMovie), and later years transitioning to a focus on quick information access and retrieval (SmartCampus, Socrative, Safari, GroupMe). Blackboard, the Learning Management System used for this university, was listed in the top five school related apps for all four years, with its popularity consistently between 30-40% of participants. SmartCampus, an app designed for A-State student use, also topped the list for 2014-2016. SmartCampus allows students quick access to personal records, campus maps, and various campus policies.

iPad Integration

Analysis of iPad integration into general education courses demonstrated a disappointing lack of campus wide involvement in the iPad initiative. Faculty for the FYE Making Connections courses appear most likely to incorporate iPad technology into the classroom. This is possibly due to the availability of university owned iPads, as well as extensive training sessions, that are provided to FYE faculty. Also, the textbook for the FYE course is only available in iBooks, and faculty is provided with PowerPoints to match the text in both Keynote and Microsoft Office PowerPoint formats. While iPad training and digital books are available to all campus faculty, it is unclear how many non-FYE faculty take advantage of this training or technology.

Researchers noticed a decline in iPad use for the Anatomy and Physiology courses between 2013 and 2016. These courses are required for the majority of FYE students listed as nursing or allied health majors. It is unknown whether or not a change in faculty has occurred, or if there was another reason for this decreased iPad use.

When asked why iPad technology was not integrated into various general education courses, some students responded in a predictably humorous fashion. “Technologically challenged,” “he isn’t a big tech guy; he likes to keep it old school,” and “he may not know how; he always writes everything on the whiteboard,” were a few of the responses. Less humorous were those answers that completely negate the point of the iPad initiative: “Instructor does not want technology use to take away from learning,” “instructor asking us not to use cell phones, computers, and iPads,” and “the instructors teach us; no iPads allowed,” were some of the more disappointing, but not altogether unsurprising, comments. These results show that all faculty are not fully invested in the iPad initiative, despite four years of implementation and use.

Limitations

The first two years of survey data were collected via paper and pencil. Data were entered manually into Qualtrics survey software or SPSS software by researchers and undergraduate assistants. It is possible that mistakes were made upon entry. Attempts to minimize mistakes were made through random selection and review of keyed data. It is also possible that some paper surveys were not entered into the system. Coded data and available statistics were reviewed to ensure accurate reporting of survey results.

Responses to this survey were self-reported. It is possible that some students shared false information through survey apathy or in an effort to provide answers they believed the researchers wanted to hear. It was observed that some paper-based students changed answers as they proceeded through the survey. There is some question as to whether or not those completing the electronic survey did the same, which could affect overall survey accuracy.

Future Research

While research has been published regarding faculty use of technology, future research should include a survey provided to students and faculty within the same institution regarding iPad (m-learning) use. It would be interesting to see if faculty perception and use matches student perception and use. If faculty are not using the iPad in the classroom, are they willing to try? Do they believe adequate training on how to use and implement this new technology is available to them? Are time constraints a factor for lack of use? Answering these questions and addressing the resultant responses can help faculty comfortably progress towards the incorporation of m-learning technology.

Conclusion

Research questions included which iPad apps are most commonly used, how students are using the iPad, and whether students are satisfied with the current level of iPad integration within the curriculum. Researchers were not surprised to see that the top five favorite apps and the top five apps for personal use were mostly the same. It was also unsurprising to see a marked difference listed for top five favorite apps and top five apps for school related use, but it was interesting to note the change from coursework or class-related function to more of a tool for quick information access or social networking.

The study data suggest that iPad usage is not widespread across the campus, with only a small percentage of courses identified as incorporating this mobile technology. Potential reasons for lack of integration included: technology is a distraction, students are untrained on the iPad's potential, lack of faculty training, unwilling professors, perceived subject incompatibility, and software compatibility issues. Overall results indicate that while the majority of students enjoy using iPads in the classroom and would like to see more iPad incorporation, a startling 38% responded they are unsure or do not enjoy using the iPad, and 49% are unsure or do not want to see more iPad related activities.

Educators interested in the successful incorporation of iPad or other m-learning technologies should consider how students prefer to use these devices. Uploading course information to an accessible platform (e.g. Blackboard), encouraging classroom use through

quizzes or games (e.g. Socrative, Kahoot!), and providing collaboration activities (e.g. GroupMe) will allow students to effectively, and enjoyably, utilize mobile technology.

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