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Nikolaus Fischer
EBS Business School, Wiesbaden, Germany, nikolaus.fischer@ebs.edu

Stefan Smolnik
EBS Business School, Wiesbaden, Germany, fuh@smolnik.net

Dennis Galletta
University of Pittsburgh, Pittsburgh, United States, galletta@katz.pitt.edu

Examining the Potential for Tablet Use in a Higher Education Context

Nikolaus Fischer[1], Stefan Smolnik[1], and Dennis Galletta[2]

[1] EBS Business School, Wiesbaden, Germany
{nikolaus.fischer,stefan.smolnik}@ebs.edu
[2] University of Pittsburgh, Pittsburgh, United States
galletta@katz.pitt.edu

Abstract. Tablet devices are rapidly being adopted by consumers and organizations, but few universities have embraced them so far, since the feasibility of tablet use in higher education is still unclear. As an exploratory study, we examined the potential for tablet use in universities regarding three use cases that cover typical scholastic tasks. The study is based on focus group interviews and a longitudinal test user group study conducted over five months at a North American university. The analysis, grounded in the task-technology fit framework for mobile information systems, shows that tablets are a useful addition to laptops for the consumption of learning materials as well as for collaborative and social activities, but need further improvements to be useful for the production of content. We will conduct a confirmatory follow-up study in the form of a pilot rollout in a German higher education institution to confirm – or rebut – our initial findings.

Keywords: E-Learning, Mobile Computing, Information Systems Adoption

1 Introduction

The remarkable commercial success of Apple's consumer-oriented iPad has prompted organizations to evaluate the usefulness of tablets for corporate use. According to Gartner, 86% of Fortune 500 companies and 47% of Global 500 companies are testing or deploying iPads in their organizations [1], [2]. However, the adoption of tablets at universities and related higher educational institutions has been slow to non-existent [3], even though a tablet provides many features that could be valuable to university students, such as portability, an extended battery life, flexible interaction and input methods, as well as applications that can facilitate typical curricular tasks. Theoretically, a tablet should give students the ability to explore digital personalized curricula, to access supplementary web content tailored to their field of study, and to read searchable, annotatable, and more cost-effective digital textbooks, which would enhance the overall learning experience.

Given these promising possible benefits, it is surprising that scholarly research has so far largely neglected the potential of tablets in higher education, which motivates our study. The paper thus seeks to answer the following research question (RQ):

(RQ1) Which typical student tasks can be effectively supported by a tablet device?
(RQ2) Can the learning process in universities profit from the adoption of tablets?

Based on empirical data gathered through focus group studies at a North American university, the paper evaluates the current potential for tablet use in higher education institutions regarding typical student activities. The empirical study has revealed three distinct use cases, namely the consumption of knowledge, the creation of knowledge, and collaborative activities, which we used to classify our results. Besides working with different use cases, it has proven useful to distinguish between different student groups, namely undergraduate, graduate, and doctoral students, as these groups perform different tasks and have different requirements regarding tablet use. We propose a confirmatory follow-up study, in which we plan to study a tablet deployment pilot project at a German higher education institution in order to verify the results of the current study and to derive further implications for the design of tablet use at educational institutions. The paper is theoretically grounded in the task-technology fit framework for mobile information systems developed by Gebauer, Shaw, and Gribbins [4], which is based on the initial conceptualization of task-technology-fit by Goodhue [5].

The paper is structured as follows: First, we provide a brief review of the current literature on mobile computing, tablet use, and the task-technology-fit framework for mobile information systems, in which the paper is rooted. Second, the methods section outlines how we gathered empirical data to explore the research question. This is followed by the results of the study and a discussion and conclusion section that includes a number of action-oriented recommendations for higher education providers and discusses the changes in individual behavior caused by tablet use.

2 Theoretical Foundations

2.1 Mobile Computing

Scholarly interest in mobile computing has picked up in recent years due to the emergence of increasingly powerful mobile devices, such as smartphones, laptops, and tablets that are potent enough to rival stationary computers [6]. Mobile computing is concerned with the notion of "increasing our capability to physically move computing services with us" [7] and is a subset of Weiser's [8] understanding of ubiquitous computing. Because of their mobility, computing devices within this field are becoming ever-present and are increasingly being taken for granted. They facilitate a broad range of activities, from inscribing and storing data to handling communication and reasoning. Through sensors and receivers that can accurately determine the device's geographical and spatial position as well as gather further data about its surroundings, modern mobile computing devices are able to construct a virtual model of their envi-

ronment and can act upon changes in said environment. These capabilities make them superior to stationary devices for tasks that can benefit from such a digitally constructed environment [7]. Although laptops and traditional personal computers (PCs) are unlikely to disappear in the near future, the rapid technological advances in mobile computing are fundamentally altering how we interact with computers [9], [10].

The focus of this paper is on tablets, which have a surprisingly long history as a class of devices. In this context, it is important to distinguish between tablet PCs and tablets: Tablet PCs are mobile PCs that employ large touchscreens as user-input devices to be operated by a stylus, pen, or finger [11]. They usually run full desktop operating systems, such as Microsoft Windows or Linux. Initial forms of tablet PCs were developed in the early 1990s. These early devices were never truly able to convince consumers or corporate users because of their bulky form factor, short battery life, and mismatched user interface [11]. In contrast, the Apple iPad has heralded in a new generation of tablet devices that carefully balance computing power and battery life, and utilize a large but easily manageable touchscreen display combined with a compact form factor and a heavily customized operating system. By clearly targeting a limited number of usage scenarios, such as communication via text and voice, Internet browsing, and media consumption, it was able to set itself apart from the previous generations of tablet PCs [12]. The attuned combination of these hardware and software features has led to a broad adoption by consumers as well as organizations [13]. The following section will introduce major technological developments in the higher education sector in order to put the use of tablets in universities in a broader context.

2.2 Technology-Mediated Learning

We apply Alavi and Leidner's [14] understanding of technology-mediated learning as "an environment in which the learner's interactions with learning materials, peers, and/or instructors are mediated through advanced information technology" (p. 2) to account for the fact that tablets may be used at home, in class, or in a team setting to support learning activities. Such learning activities are subsumed by the learning process, in which "learners individually or collaboratively perform creation and actualization of knowledge, through operating on individual or shared artifacts (i.e. data objects), assuming different roles and following specific rules and division of labor, towards fulfillment of specific pedagogical objectives" [15].

A common point of critique of the traditional lecture-based, instructor-centric learning model is that it does not engage students effectively enough [16], [17]. An intuitive thought of most education providers and students is that integrating technology in the pedagogic process will improve this learning process and skill development [18]. Despite this reasoning, few technological tools have thus far been fully integrated into university curricula and classroom-based learning [16]. Tablets could be an ideal tool to enhance the learning process, the interaction of students among themselves, and that between students and instructors.

In line with prior research on technology in education, this paper not only analyses the technology itself, but first and foremost it's potential to promote an active learning process and to be of educational value [19], [20]. Although some studies exist, that

deal with the viability of tablet PCs in education [21], [22], they predate the emergence of modern tablet devices, and academic literature on the actual use of tablets in educational institutions is consequently scarce.

2.3 Task-Technology Fit for Mobile Information Systems

The task-technology fit framework for mobile information systems [4] is an extension of Goodhue's [5] initial conceptualization of task-technology fit to account for the specificities of mobile computing tasks and technologies. Gebauer et al. [4] argue that the mobile use context, referring to issues such as high user distraction and low quality of network connections, needs to be taken into account when evaluating the fit between tasks and mobile technologies. We account for this influence by incorporating a longitudinal test user group in our research design that uses the technology in question in a variety of different contexts, thereby mitigating the impact of use context [23].

In line with the suggestions of Zigurs and Buckland [24], we conceptualize fit as profiles consisting of different characteristics for each of the student populations that participated in the study (undergraduates, MBA-level students, and doctoral students). This allows us to identify potential opportunities and problems, as the profiles are specific to the respective area of application. The following section describes the research design that we applied to gather empirical data to explore the research question.

3 Research Approach and Data Gathering

Given the lack of existing research concerned with this particular field, we opted for an explorative mode of inquiry via a number of focus groups [25] and a test user group [26], [27] as methods to conduct our study. The unit of analysis was the individual. The data collection consisted of two parts: A longitudinal test user group study with bi-weekly group feedback sessions and five focus group sessions with a different set of participants (see Table 1).

To conduct the study, five Samsung Galaxy Tab (7") devices with 3G cellular data service were acquired by the university. Important requirements to be fulfilled by the device were openness and flexibility for easy development of prototype applications, and a high degree of customizability in order to be able to adapt the tablet to the specific requirements of students, which is why we chose a device running the Android operating system. The Samsung Galaxy Tab (7") was ultimately selected because of its compact form factor, which allows use during lectures, on public transport, and at home.

Table 1. Overview of Research Approach

Study conducted in:	Business school at U.S.-based university from 12/2010 – 05/2011
Participating groups: ***(Total: 28 participants)***	Test user group consisted of one undergraduate student, two MBA students, one doctoral student, and one instructor
	Focus group #1 consisted of five undergraduate students who identified themselves as non-technology savvy
	Focus group #2 consisted of five undergraduate students who identified themselves as technology savvy
	Focus group #3 consisted of five MBA-level students who identified themselves as non-technology savvy
	Focus group #4 consisted of four MBA-level students who identified themselves as technology savvy
	Focus group #5 consisted of four doctoral students
Mode of participation:	Five 60-minute focus group sessions and test user longitudinal study over five months (with bi-weekly feedback sessions)
Technology provided:	Samsung Galaxy Tab (7") with 3G cellular data service
Data collection and analysis:	• Field notes, observation of discussions, interactive capturing of results on whiteboard • Discussion of results between two researchers immediately following each focus group

In order to gauge the usability of tablet devices in practice, the user experience was studied through a longitudinal test user group in the first part of the empirical study. Usability refers to the fit between a system and its users, while the broader notion of user experience analyses the response to the interaction with a system. It considers the impact of prior experiences, perceptions, and the users' state of mind on the success of this interaction [28]. A large array of methods to test usability and user experience exists [29]. As the usability of a device that has multiple uses in multiple geographical setting is difficult to observe in a laboratory setting, we opted for a longitudinal test user group that exposes the group to the technology and allows for an extensive trial phase. The composition of the test user group can be seen from Table 1. Participants were drafted using a volunteer sample of 200 undergraduate and 150 MBA students who attended a specific lecture, six doctoral students, and five faculty members associated with the IS department. Each participant was provided with a tablet device and cellular data service for a period of five months. This enabled participants to thoroughly evaluate the device and its features. Participants shared their experiences with the device in bi-weekly group feedback sessions. The sessions were semi-structured so that every participant could share what they discovered in terms of software, operating system features, or hardware issues during the previous two weeks of use. During the time between feedback sessions, participants were asked to solve curricular tasks, such as setting up a video conference between all test user group participants. Whether the tablet device had facilitated accomplishing the respective tasks – com-

pared to a laptop computer – was then discussed in the following feedback sessions. The longitudinal component of the study allowed the researchers to see if and how the benefits of using the tablet device changed over time and with greater experience and familiarity with the device [30], [31]. Results from previous feedback sessions were continually re-introduced to the group and discussed in subsequent sessions. The researchers observed the discussions and took field notes. In addition, participants were asked to keep a diary of their usage behavior and to record comments and opinions in the period between feedback sessions. We analyzed both the field notes and student diaries by using content analysis [32].

In a second step, we conducted five focus group sessions in order to get further qualitative feedback on the issues that were uncovered by the test user group and to collect ideas from a larger sample of students. Focus groups have historically been under-used in information systems (IS) research [33], even though they can provide valuable insights through guided and open-ended discourses. We opted to conduct focus groups, rather than – for example – participant observations, as they enable the researcher to grasp the thoughts behind participants' actions, and let participants find a consensus on issues in a group setting. This part of the study was deemed necessary and important because the results from the test user group may have been skewed by individual preferences, as only one or two representatives of each student group participated in the test user group. We synthesized results from both parts of the study using triangulation [34], [35]. The composition of the focus groups is portrayed in Table 1. The distribution across the different student groups was chosen in order to approximately reflect the overall population of students, namely the presence of few doctoral students, many undergraduate students, and many MBA-level students, and to collect data from all potentially affected users. The different self-reported orientations towards technology were queried during the selection of participants in order to see the effect of this trait on the participants' perception of tablets and tablet use in a scholastic setting, especially since each group will have different needs and requirements regarding technological devices. For the purpose of this study, we conceptualized being non-technology savvy as having little or no prior experience with tablets and similar mobile computing devices, while all participants in the technology savvy groups owned or had at least used a tablet before.

The focus groups were conducted as dual moderator focus groups to ensure that all topics were covered and that all results were collaboratively recorded on a whiteboard. The focus group participants were provided with tablet devices after the purpose of the focus group session was revealed so that they were able to acquaint themselves with the technology. They could naturally not develop the same deep understanding of the device as the longitudinal study participants, which was taken into consideration when choosing the guiding questions to ask during the session.

As guiding questions, each group was asked to describe tasks they perform during a typical day, which problems they experience when using laptop computers and smartphones to support said tasks, the likelihood that tablets would be able to overcome those shortcomings, and which essential features a tablet would need to have in order to be useful for their typical everyday tasks relating to university work. In addition, students were asked to highlight the role of the unique features of tablets with

which they set themselves apart from other mobile technologies such as laptops and smartphones. During the focus group sessions, we took field notes, interactively recorded the results on a whiteboard, and observed the discussion. Immediately following the sessions, two researchers discussed the results of each focus group session and the discussion results were recorded in writing.

4 Results

The consensus across all study segments was that participants are, to some degree, frustrated with their current laptop devices. This is due to a comparatively short battery life of most laptops, their heavy weight, interoperability issues between users of different operating systems, the dependence on wires for power supply, and frequent maintenance issues. Focus group participants agreed that most of these issues would be mitigated by tablets, as they weigh less, last for around eight hours on a single charge, are easier to carry due to their form factor, do not require a long time to start up, do not have any fragile moving parts, and use a very accessible and intuitive user interface. However, they lack a physical keyboard for text input and the simplicity of the operating system may, at the same time, restrict the breadth of possible uses.

During the discussions in early test user group feedback sessions, it quickly became apparent that there are three distinct use cases on which we should focus: The consumption of media, such as reading textbooks, studying for exams, and listening to lectures; the creation of media, such as developing essays, presentations, and answering exams; and collaboration between students, which includes organizing and conducting group meetings, collaboratively editing documents, and participating in social events and university clubs. These three cases subsume most curricular tasks that students carry out during their academic life. The potential of tablet use in higher education can thus be judged based on how well tablets support these three use cases. The results of each part of the study have been categorized with regard to these use cases. An aggregated overview of the results can be found in Table 2.

4.1 Media Consumption

Knowledge acquisition through media consumption is one of the central processes of any student population. However, the focus group results revealed some differences that are relevant for gauging the potential for tablet use with regard to this use case: Undergraduates and MBA students read textbooks and supplementary materials, such as case studies and lecture notes. The latter are usually provided in digital formats and can thus, from the perspective of the focus group participants, easily be consumed on a tablet. Regarding textbooks, the test user group reported that most textbooks are not yet available in digital form and can thus not be read on tablets. For the e-textbooks that were available, test user group participants reported that the tablet enabled them to digitally highlight and annotate textbook passages. The search feature was rated positively, particularly for exam revision. A participant noted: "*The search function is something that I always missed in regular books when studying for exams, as the*

glossary is often not complete." Another area of media consumption for undergraduate and MBA-level students is constituted by attending lectures, where test user group participants stated that they were able to follow lecture slides on their devices and take digital notes on relevant slides in a more fluent, intuitive, and seamless manner than on laptops. This is due to the fact that there is no screen in the line of sight between student and instructor, input of notes and remarks can be made in a more intuitive way through finger input, and tablets last through multiple lectures on a single battery charge, without the need for a chord and power outlet, which participants rated as helpful. In addition, tablets were viewed as an ecological alternative to paper-based notes and slide print-outs by, as participants mentioned, for example, "*I always feel bad when I need to print out hundreds of pages for a single class. With the tablet, this isn't necessary anymore and I bet this saves tons of paper a year*. "One core task of doctoral students consists of reading and reviewing academic literature, for which doctoral student focus group participants found the tablet useful. There was no difference between the technology savvy and non-technology savvy focus groups with regard to the media consumption use case. All focus groups evaluated tablets as helpful for media consumption.

4.2 Media Creation

A second important curricular task that could potentially be supported by tablets is the creation of media, such as essays, reports, academic papers, and presentation slides. During the first feedback session, test user group participants reported difficulties with text input of longer passages due to the small, non-tactile software keyboard that can be found on the provided tablet device and on most other tablets. A participant expressed this shortcoming: "*For a short mail, the keyboard is fine, but for longer texts, writing on it is a pain.*" In subsequent feedback sessions of the longitudinal study, participants reported higher levels of satisfaction with text input as their experience with the virtual keyboard increased over time. In addition, test user group participants criticized the current absence of an application to create presentations and richly formatted documents.

Focus group participants expressed similar concerns, as producing materials from scratch is currently a challenge on tablets. However, it is important to highlight that participants in both technology savvy groups (#2 and #4) conveyed that they were willing to use tablets for media creation regardless of the difficulty of text input, saying, for example, "*I think you can get used to writing on it even without a proper keyboard.*" However, participants in these groups cautioned that tablets are currently unsuitable for tasks that require a high amount of storage space or processing power, such as sophisticated spread sheet calculation software or research software packages. Specifically, doctoral students noted the lack of citation management software and statistical analytics software.

4.3 Collaboration and Social Interaction

Undergraduate and MBA-level students often work in teams to complete assignments and, consequently, have to organize group meetings, coordinate work between students, and collaboratively work on the same document or presentation. Test user group participants judged the potential of tablets to support students in conducting these tasks favorably, as tablets enable students to easily and effortlessly conduct virtual meetings via built-in cameras, share documents among each other, and use software tools to find available meeting times. This initial perspective was confirmed repeatedly over the five months of the longitudinal study, as test user group participants discovered more and more readily available virtual meeting applications and built-in features that support collaboration. Focus group participants remarked that while they did not yet use software tools to organize meetings, they would probably do so if they owned a tablet because of the increased ease of access. One participant said: "*I guess organizing meetings could get easier with a proper app for it that others are using, too.*" Since collaboration was not a focal area of importance for the doctoral students that participated in focus group #5, they did not evaluate tablet use more or less favorably based on its collaboration features.

4.4 Changes to Working Practices

Outside of the specific use cases, test user group participants noted that the use of the provided tablets changed their working practices and behaviors to some extent: Participants reported that they no longer felt bound to a desk to work and were using their device from multiple locations throughout the day. One test user group participant noted that, because of the always-on connectivity of the tablet, other participants expected him to always be available for a virtual meeting which participants were asked to arrange: "*The tablet is always online, even when the screen is off. I can always be reached for meetings, no matter where I am.*"

Since participants across all focus groups remarked that tablets are currently lacking applications that would be important for student use, and that the integrated sensors of tablets open up the possibility for new types of educational applications, participants were asked to imagine applications that would be helpful in a higher education context. The focus group participants then rated the application ideas according to their expected usefulness. Following the completion of all focus group sessions, we rated the application ideas with regard to the difficulty of implementation. Among the ideas were, for example, the automatic synchronization of lecture times and deadlines, simple drag-and-drop printing, real-time availability and reservation of study rooms, and in-class voting and exam delivery applications. The ideas that were rated as most useful were a syllabus-synchronization application, a homework assignment synchronization tool, and a dynamic campus public transport schedule application, which will be implemented as prototype mobile applications in the near future as a result of the study.

Table 2. Overview of Results

Use Case	Evidence from Focus Groups		Evidence from Test User Group		Bottom Line
Media Consumption	+	-	+	-	
	• Convenient form factor	• Some file formats cannot be opened yet	• Long battery life	• Not enough textbooks are available in digital format yet	
Media Creation	+	-	+	-	
	• Always-present, useful for quick notes	• Screen too small for some usage scenarios	• n/a	• No tactile keyboard for longer text-entry available • Not enough apps available (e.g. for data analysis)	
Collaboration and Social Interaction	+	-	+	-	
	• Increased ease of access to web services (to e.g. organize meetings)	• n/a	• Easy initiation of video meetings • Simple sharing and collaborative editing of documents	• n/a	

4.5 Changes to the Learning Process

Apart from the aforementioned changes to working practices of students, participants from the longitudinal test user group also reported that the tablet use significantly affected their overall learning process. In particular, they revealed that the learning process became more social, since the tablet facilitated social exchanges via integrated instant messaging tools, meeting apps, and social media tools that are also present on laptops, but can reportedly be accessed and used in a more fluent and natural way on tablets. In addition, participants observed that they interacted with the content of learning materials in a more immersed manner, as they were able to directly follow hyperlinks in e-books or research additional sources based on lecture materials. While a similar use of digital content would have been possible on, for example, laptops, participants noted that the use context of tablets enables a deeper engagement with the content, particularly in the absence of alternative preoccupations. Participants of the test user group were in agreement that the curricular use of the tablet led to shorter,

but more frequent exposure to the study material. This phenomenon can also be attributed to the new use contexts of tablets: Study participants engaged with them in-between lectures, during their commute to and from campus, and even in their leisure time that would normally not have been devoted to studying. Studies on learning processes have noted that learning in shorter sessions with frequent breaks is more effective for the retention of content than a single study session, which is known as the spacing effect [36–38]. As this behavior occurs naturally with the use of tablets, it may indicate that tablets effectively improve the learning process.

5 Discussion and Conclusion

In this exploratory study, we examined whether tablets are able to effectively support three main scholastic use cases, namely the creation of media, the consumption of media, and collaboration and social interaction. The analysis has shown that, especially for non-technology-oriented users, tablets are currently missing some key features that would make them useful in supporting all three use cases, namely a more substantial number of digitized textbooks, note-taking applications that are easier to use, and a fast and effortless way to input longer pieces of text. Features such as a long battery life, portability, an easily manageable screen, and digital search and annotation capabilities make a tablet ideally suited for the consumption of media. However, the use of a virtual keyboard limits the speed in which students can translate thoughts into digital text. Together with the absence of tools to create presentation slides and to adequately format text, this renders a tablet only partially useful for the creation of media. This confirms and extends the findings of Friedewald and Raabe [13], who call for new approaches to human-computer interaction techniques for mobile computing. Concerning our third use case, video conferencing and group meeting scheduling applications, as well as the possibility of easily sharing documents allow for an improved collaboration and social interaction experience that would not be as rich and seamless on laptops or stationary PCs.

Given the extensive need of students to engage in word processing, data analysis, and presentation tools, tablet devices seem at this time not ideally suited to exclusively meet all computing needs of students. Rather, they serve as an additional device to augment and expand the connectivity and lifestyle computing choices of students who desire increased connectivity and social interaction, with improved applications and interface choices not currently offered by smartphones or laptops. As a practical recommendation to higher education providers, we judge tablet use in universities as a promising approach to support the consumption of content and, thus, the process of knowledge acquisition. In addition, collaboration and social interaction between students can be enriched. Although mentioned in the focus groups, it might be premature to classify tablet devices as an environmentally responsible alternative to paper-based note-taking, since the ecological impact of producing, recharging, and eventually disposing of the tablet device has to be factored into this equation. Nevertheless, tablets leverage the technology skills of incoming students and alleviate some of the frustration current students experience with laptop devices. Tablets are thus a useful

addition to laptop computers, but exhibit too many drawbacks in the area of content creation to be made a required tool for prospective students.

A noteworthy outcome of the study is that the use of a tablet changed some of the work processes and behaviors of test user group participants: They developed an always-on mentality, as the tablet allowed them to connect to university resources and read messages instantly, everywhere. In addition, the expected availability of participants increased, as they no longer required a stationary PC to be able to attend virtual meetings. Moreover, tablet use changed the way test user group participants worked on certain tasks, as the tablet allowed them to complete these tasks in a more streamlined fashion when switching from one device to the other and from one location to the next. This result extends the findings of Bødker, Gimpel, and Hedman [39], who studied the user experience of smartphones and concluded that with continued use, mobile devices become more and more embedded in an individual's lifestyle.

This paper contributes to theory and practice in that it sheds light on tablet use in academia and examines whether tablet use is a promising pedagogic approach for higher education institutions, based on the task-technology fit framework for mobile information systems. Practical recommendations are provided to aid universities in judging the potential of tablets. In addition, it discusses the changes in processes and behavior resulting from tablet use, thereby extending the research stream initiated by Yoo [9]. A contribution to theory is the inductive development of three distinct use cases that subsume most tasks that students carry out as part of their academic life, namely the creation of content, the consumption of content, and collaboration with others. This may help researchers to better frame their findings and to make an a-priori distinction between these use cases when developing their research design.

Despite the practical implications of our study, there are limitations: The study was conducted at an early stage in the life cycle of modern tablet devices, and students might not yet have been familiar with this class of devices. Particularly the non-technology savvy focus group participants did not have prior experience with tablet devices, which may have inhibited their judgment towards the full array of features of tablets. We only examined one particular incarnation of tablets, namely one specific device, which we, however, judge as being representative of the entire device class at the point in time of our study. In addition, the voluntary mode of participation in the study might have introduced a bias inasmuch that the sampled students may have viewed tablets in a more positive light than a typical student. In order to mitigate some of these initial limitations, we propose to conduct a confirmatory follow-up study. We plan to study an actual rollout of tablet devices in a German higher education institution, which generates a larger amount of data, to which quantitative methods of analysis will then be applied.

With the growing adoption rate of tablets among consumers and a greater level of choice between hardware vendors and ecosystems, a larger number of applications that are fit for curricular use will likely emerge naturally. In addition, accessories such as portable keyboards make the input of longer text passages more feasible. Currently, tablets are a suitable addition to laptop devices for the consumption of content as well as for collaborative and social tasks. If software vendors continue to develop mobile

learning applications and textbook publishers release forthcoming editions as e-books, universities will be able to make good use of tablets to support student learning.

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