

Impact of smartphones on student motivation in the classroom

John Maurice Gayed

Introduction

Higher education has a love and hate relationship with smartphones. On the one hand, they are perceived as a distraction which decreases the students' ability to focus in the classroom and follow a lesson. On the other hand, they are seen as an opportunity to improve student engagement by using smartphones as tools for more effective instructor-student interaction. However, both of those perspectives are typically reflected in studies that focus on the objective assessment of the impact of smartphones in the classroom by the instructor. As such, existing studies are limited in that they do not take into account the students' subjective views of the extent to which using mobile phones in the classroom affects their learning experience. The present study conducted on a group of 16 university students at a private university in Japan aims to address that gap by allowing students to voice their own opinions about the use of mobile phones through a standardized survey distributed to students in April and subsequently in October 2019. The useful insights discovered as part of the study provide grounds for conducting a similar study on a much greater scale in order to allow for a more effective generalization of the results.

Literature review

There is no doubt that the common availability of smartphones and their acceptance in the classroom have changed traditional instruction styles. Schachter (2009) suggests that this shift is evidence of an emerging "anytime, anywhere" learning movement which demonstrates the untapped educational potential of today's generation of students. However instructors and their opinions about smartphone use in classroom is divided between those who see it purely as a distraction (Kuznekoff & Titsworth, 2013; Lepp et al., 2014; Kim et al., 2017) and those who attempt to use it in class to enhance students' learning experience (Lindquist, 2007; Al Hamdani, 2013; Chaisatien & Akahori, 2007; Cheung, 2010; Stowell, 2015). Several studies demonstrated that

students who do not use their smartphones during classes tend to write down more information in their notes, are able to recall more detailed information from the lecture and are likely to score higher grades on a test based on the lecture content (Kuznekoff & Titsworth, 2013; Kuznekoff & Titsworth, 2015). Moreover, increased mobile phone use among university students was shown to negatively affect student performance and their levels of anxiety (Lepp et al., 2014). As a result, Kim et al. (2017) attempted to address the problem by creating a software-based intervention service which helps students to self-regulate their mobile phone use in classrooms.

On the other hand, several studies demonstrate that the use of mobile phones during classes can, in fact, be beneficial to student learning experience under certain circumstances (Lindquist, 2007). For instance, some argue that smartphones can be used as a mediator in the process of learning and teaching (Al Hamdani, 2013). In particular, smartphones were in the past used as part of different studies to stimulate student engagement through the use of QR codes (Chaisatien & Akahori, 2007) or instead of clickers for classroom polling (Cheung, 2010; Stowell, 2015). Nevertheless, the previous studies focus mostly on the objective perception of student learning experience and/or academic performance assessed by the instructor (Dunn et al., 2012). Literature evaluating university students' subjective perception of the impact of using mobile phones during classes is scarce. Existing studies are limited to exploring students' satisfaction with the use of mobile phones as part of a structured session incorporating mobile phone-based exercises (Dunn et al., 2013). But there is little data available on the students' perception of the impact of distractive use of mobile phones (e.g. texting, chatting, browsing) in the classroom on their own experience of learning. Such information would constitute a desirable contribution to the literature in this area, as such it would enhance the understanding of the student learning experience as a whole. In order to fill that gap, this study aims to measure the subjective experiences of the impact of distractive smartphone use by students on their own learning experience.

Method

The study was conducted on a group of 16 students at a private university in Japan. The students were asked to complete a questionnaire at the beginning of the term, in April 2019, and subsequently at the end of the treatment term, in October 2019. The Likert based questionnaire was used to measure the students' understanding of the lesson, ability to follow instructions given by the lecturer and their perceptions about the use of smartphones in the classroom before and after they were asked to refrain from

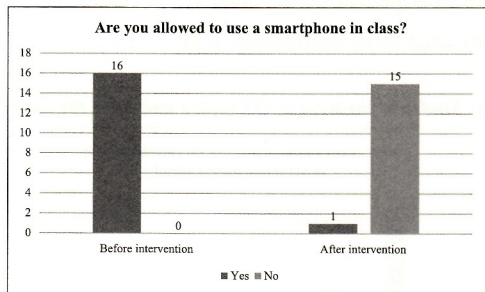
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using their phones in class. The results of the study are set out in the following section of this paper.

Results

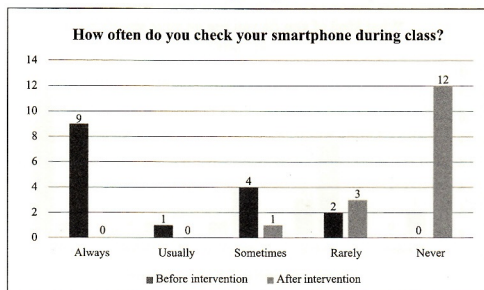
The first question in the questionnaire was a test question seeking to confirm the conditions of the study prior to the ban on the use of smartphones in the class being introduced. As illustrated by Graph 1 below, all of the students participating in the study (16 out of 16) confirmed that in April 2019 they were allowed to use smartphones in class, and a statistically significant majority (15 out of 16) confirmed that they were not allowed to use smartphones in class at the end of the intervention, in October 2019.

Graph 1: Students' answers to Q1 before and after the intervention



Next, the students were asked about the frequency with which they checked their smartphone, according to their subjective assessment. As illustrated by Graph 2 below, prior to the intervention more than half of the students (9 out of 16) selected the answer "Always", whereas one fourth (4 out of 16) responded "Sometimes". The remaining students (3 out of 16) responded either "Usually" (1 out of 16) or "Rarely" (2 out of

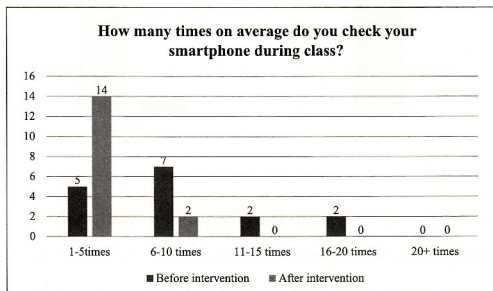
Graph 2: Students' answers to Q2 before and after the intervention



16). Following the intervention 12 out of 16 students responded “Never”, 3 out of 16 replied “Rarely” and 1 out of 16 selected the answer “Sometimes”. The responses in Graph 2 show that even with a smartphone ban in effect, some students still persisted to use their smartphones disregarding the teacher’s instruction.

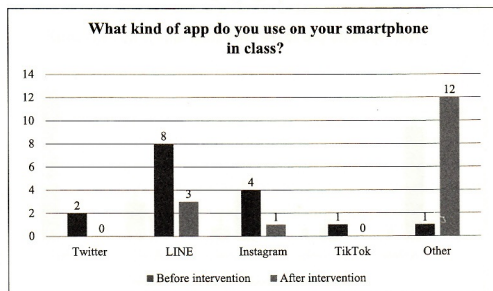
Graph 3 below represents students’ subjective estimates prior to and after the intervention of the average number of times they checked their phones during class. In April 2019, majority of the students (12 out of 16) admitted to checking their phones 1-5 times (5 out of 16) or 6-10 times (7 out of 16), whereas the remaining students (4 out of 16) admitted to checking their phones more frequently, i.e. 11-15 times (2 out of 16) or 16-20 times (2 out of 16). On the other hand, in October 2019 14 out of 16 students estimated their use of smartphones during class as “1-5 times” and the remaining 2 out of 16 stated that they used their smartphones 6-10 times.

Graph 3: Students’ answers to Q3 before and after the intervention



Subsequently, the participating students were asked about the apps which they used on their smartphones in class (Graph 4 below). Before the intervention half of them (8 out

Graph 4: Students’ answers to Q4 before and after the intervention

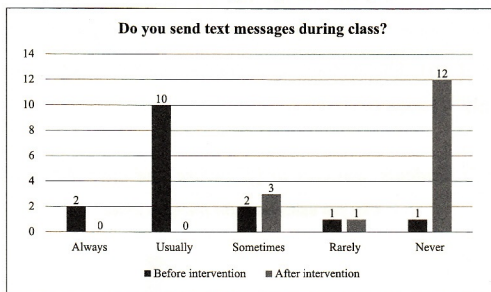


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of 16) declared that they used LINE, a quarter (4 out of 16) admitted to using Instagram and the remaining votes were spread between Twitter (2 out of 16), TikTok (1 out of 16) and “Other” (1 out of 16). After the intervention the vast majority of students (12 out of 16) selected “Other”, 3 out of 16 admitted to using LINE and 1 out of 16 confirmed that they used Instagram. The “Other” category was simply a choice students selected even when they were not engaged with their smartphones.

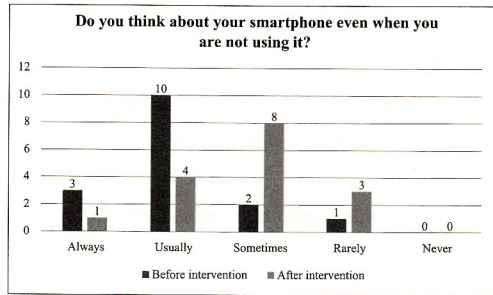
In response to Q5 – “Do you send text messages during class?”, prior to the intervention the overwhelming majority of students (10 out of 16) responded “Usually”, 2 out of 16 students responded “Always” and “Sometimes” and 1 out of 16 responded “Rarely” (see Graph 5 below). At the end of the intervention, 12 out of 16 students responded “Never”, 3 out of 16 students replied “Sometimes” and 1 out of 16 students responded “Rarely”.

Graph 5: Students’ answers to Q5 before and after the intervention



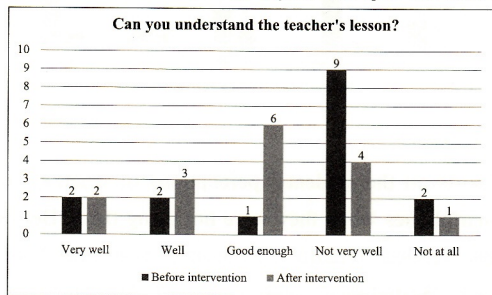
Graph 6 below reports on the students’ perceptions of whether and how often they thought of their smartphones when they were not using them. Before the intervention, 10 out of 16 students replied “Usually”, 3 out of 16 responded “Always”, 2 out of 16 selected the answer “Sometimes” and 1 out of 16 stated “Rarely”. After the intervention, 8 out of 16 students responded “Sometimes”, 4 out of 16 responded, “Usually”, 3 out of 16 students responded “Rarely” and 1 out of 16 students replied “Always”. Here we can see the latent effects of smartphone use on students’ cognition. While the treatment period effectively banned smartphones in the classroom, some students were still mentally engaged in their use.

Graph 6: Students' answers to Q6 before and after the intervention



According to Graph 7 below prior to the intervention, most students (9 out of 16) were not able to understand the lesson very well. The remaining responses ranged from “Very well” (2 out of 16) and “Well” (2 out of 16) to “Good enough” (1 out of 16) and “Not at all” (2 out of 16). Following the intervention, many students rated their understanding of the lesson as “Good enough” (6 out of 16), “Well” (3 out of 16) or “Very well” (2 out of 16). The remaining responses ranged from “Not very well” (9 out of 16) to “Not at all” (1 out of 16).

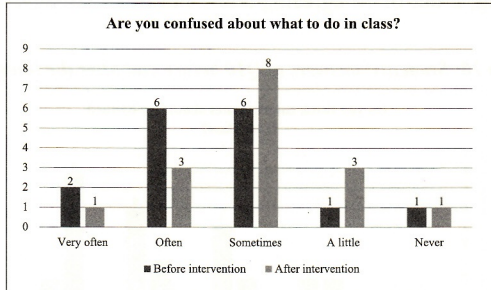
Graph 7: Students' answers to Q7 before and after the intervention



Building further on Q7, Q8 asked about the students' level of confusion about what they should do in class (see Graph 8 below). Before the intervention, 12 out of 16 students responded “Often” (6 out of 16) or “Sometimes” (6 out of 16), 2 out of 16 responded “Very often”, 1 out of 16 responded “A little” and 1 out of 16 replied “Never”. After the intervention, the data shows less confusion among the students.

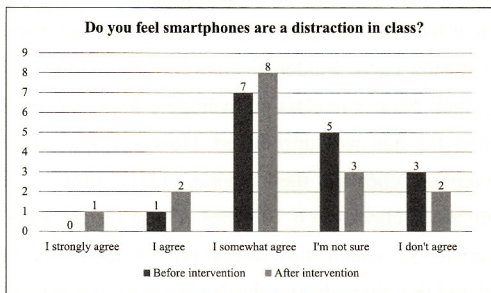
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Graph 8: Students' answers to Q8 before and after the intervention



As illustrated in Graph 9 below, prior to the intervention responses to Q9 – Do you feel smartphones are a distraction in class? ranged from “I somewhat agree” (7 out of 16) and “I’m not sure” (5 out of 16) to “I agree” (1 out of 16) and “I don’t agree” (3 out of 16). After the intervention, “I somewhat agree” continued to be the top response (8 out of 16), whereas “I am not sure” was the second most popular response (3 out of 16). The remaining answers ranged from “I strongly agree” (1 out of 16 students) and “I agree” (2 out of 16 students) to “I don’t agree” (2 out of 16 students).

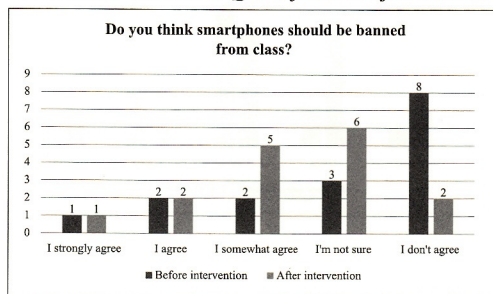
Graph 9: Students' answers to Q9 before and after the intervention



Finally, Graph 10 below illustrates student perceptions of whether smartphones should be banned from class prior to and after the intervention. Before the intervention half of the students (8 out of 16) responded that they did not agree with the ban, 3 out of 16 were not sure, 2 out of 16 somewhat agreed, further 2 out of 16 agreed and 1 out of 16 strongly agreed. Interestingly, following the intervention, only 2 out of 16 students

disagreed with the ban completely, with 6 out of 16 remaining unsure, 5 out of 16 somewhat agreeing, 2 out of 16 agreeing and 1 out of 16 strongly agreeing.

Graph 10: Students' answers to Q10 before and after the intervention



Discussion

The Likert survey distributed to the students before and after the intervention provided an interesting insight into the students' perceptions of the impact of mobile phones on their learning experience. The results of the study can be divided into four clusters, according to the type of insight which they provided. The first cluster of results (answers to Q2 and Q3) relates to the frequency with which students checked their smartphones during class prior to and after the intervention. It provides an interesting insight into the extent to which it was possible for the instructor to enforce the ban on using smartphones during class. Students' answers to Q3 showed that those students who were checking their phones in class on average 1-5 times continued doing so at the same level even after the ban was introduced. However, the remaining students who prior to the intervention checked their phones 11-15 times or even 16-20 times decreased their number of checks to 6-10 times. These results were also confirmed by the students' answers to Q2, which showed that prior to the intervention more than half of the students declared that they always checked their phone in class, whereas after the intervention the vast majority of students declared that they never did that. Therefore, the ban was effective to the extent that it allowed all students to decrease, and most students to eliminate completely, their use of smartphones in class. As such, it could be concluded that introducing a ban on the use of smartphones in class could be an easy way to enforce classroom strategy for instructors.

The second cluster of results (answers to Q4, Q5 and Q6) provides insight into the

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activities that the students engage in on their mobile phones as well as their level of dependence on their phones. In particular, students' answers to Q4 demonstrate that prior to intervention half of the students accessed LINE on their smartphones, which is a messaging app that allows them to communicate with each other or with other outsiders the classroom. The use of the app in class required students to devote a part of their attention to participating in conversations, which was likely to impact their ability to focus on the lesson. The intervention encouraged the vast majority of those students to refrain from using LINE, which was likely to help the students focus on the lesson to a greater extent. The results were further confirmed by students' answers to Q5. Here, the majority of the students admitted that prior to the intervention they would usually engage in texting during class, whereas after the intervention the vast majority of them confirmed that they did not text during class. Therefore, the ban introduced by the instructor was highly successful in enabling students to become significantly more focused on the lesson and less distracted by messaging or texting. Interestingly, this also had an impact on the level of attention that the students were devoted to thinking about their smartphones even when they were not actually using them, as illustrated by students' answers to Q6. Prior to the intervention more than half of the students admitted in response to Q6 that they usually thought about their smartphone even when they were not using it. In contrast, after the intervention, exactly half of the students declared that they were thinking about their mobile phone when not using it only sometimes. As such, the introduction of the ban enabled the students to remain more focused in class not only by preventing them from using their smartphones but also by stopping them from redirecting their thoughts towards their phone during the remaining part of the session.

The third cluster of results (answers to Q7 and Q8) shed light on the students' understanding of what was happening in class. In response to Q7 prior to the intervention over half of the students answered that they did not understand the instructor's lesson very well or at all, whereas following the intervention the same amount of students confirmed that they understood the lesson at a level "good enough", "well" or "very well". The answers to Q7, therefore, illustrate that there is a clear correlation between the students' use of mobile phones during class and their ability to understand the session. Students' answers to Q8 also showed a similar trend, with increased ability to understand instructions given in the classroom and reduced confusion in general.

Finally, the fourth cluster of results (answers to Q9 and Q10) assessed the students' views about the extent to which they perceived their smartphones as a distraction to their learning as well as their opinions on whether smartphones should be banned in class. In response to Q9 half of the students prior to the intervention replied that they did not agree that, or were not sure whether smartphones were a distraction to them during classes. Following the intervention three of the students who previously selected such answers now agreed, strongly agreed or somewhat agreed with the statement. In both cases (i.e. prior to and after the intervention) nearly half of the students somewhat agreed that smartphones constituted a distraction to them in class. This demonstrates that the intervention convinced at least some of the students who did not previously believe that smartphones can distract them during classes, that this is indeed the case. But a significant proportion of the students already recognized prior to the study that the use of smartphones did not support their learning positively. As such, the introduction of the ban offered all students an opportunity to refrain from using smartphones in class, which many of them already recognized as having a negative effect on their learning, although they did not have enough self-discipline to refrain from it. Similarly, the students' answers to Q10 which enquired about their views on whether smartphones should be banned in class changed following the intervention. At the beginning of the study majority of the students stated that they did not agree with the ban or were not sure whether it should be introduced, whereas after the intervention exactly half of the students strongly agreed, agreed or somewhat agreed with the ban. The students' answers to Q9 and Q10 illustrate that, although reluctantly, the students recognized the need to prevent smartphones from distracting them during sessions and supported the ban as an effective method of improving their learning experience.

Conclusions

Prior studies demonstrate that mobile phones can be distracting students in class, which in turn has a negative effect on their learning experience, levels of anxiety and academic performance (Kuznekoff & Titsworth, 2013; Lepp et al., 2014; Kim et al., 2017). The insights provided by this pilot study confirm that even the students themselves recognize the distractive nature of smartphones and support if reluctantly, the possibility of introducing a ban on the use of smartphones in class. Given the small sample size of participants in this pilot study, it is important to recognize the low generalisability of its findings. However, the insights discovered are a step in the right direction and will serve as a basis for a more extensive study that can be conducted in

several universities in Japan that will render more generalizable results.

Appendix

Survey Questions

- Q1 – Are you allowed to use a smartphone in class?
Yes / No
- Q2 – How often do you check your smartphone during class?
Always / Usually / Sometimes / Rarely / Never
- Q3 – How many times on average do you check your smartphone during class?
1-5times / 6-10 times / 11-15 times / 16-20 times / 20+ times
- Q4 – What kind of app do you use on your smartphone in class?
Twitter / LINE / Instagram / TikTok / Other
- Q5 – Do you send text messages during class?
Always / Usually / Sometimes / Rarely / Never
- Q6 – Do you think about your smartphone even when you are not using it?
Always / Usually / Sometimes / Rarely / Never
- Q7 – Can you understand the teacher's lesson?
Very well / Well / Good enough / Not very well / Not at all
- Q8 – Are you confused about what to do in class?
Very often / Often / Sometimes / A little / Never
- Q9 – Do you feel smartphones are a distraction in class?
I strongly agree / I agree / I somewhat agree / I'm not sure / I don't agree
- Q10 – Do you think smartphones should be banned from class?
I strongly agree / I agree / I somewhat agree / I'm not sure / I don't agree

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Abstract

There is no doubt that the common availability of smartphones and their acceptance in the classroom has changed the landscape of traditional instruction methodologies. Among educators' opinions about smartphone use in the classroom are divided between those who see it purely as a distraction and those who attempt to use it in class to enhance students' learning experience. This researcher has found little data available on students' perception of the distractive effects of using mobile phones (e.g. texting, chatting, browsing) in the classroom on their own experience of learning. In order to fill that gap, this study measured the subjective experiences of students primarily focused on the motivational impact of smartphones on their own learning experience. The insights provided by the study confirm that even the students themselves recognize the disruptive nature of smartphones and support, if reluctantly, the possibility of introducing a ban on the use of smartphones in class.

Keywords: smartphones in class, learning experience, Japanese university students, impact of mobile phones on student learning, L2 learning, student motivation