’21

推薦

小論文２

（医学部医学科）

注 意 事 項

1. 試験開始の合図があるまで、この問題冊子を開いてはいけません。
2. 問題冊子は１冊（10 頁）、解答用紙は3枚、下書用紙は３枚です。落丁、乱丁、印刷不鮮明などの箇所がある場合には申し出てください。
3. 氏名と受験番号は解答用紙の所定の欄に記入してください。
4. 解答は指定の解答用紙に記入してください。
   (1) 文字はわかりやすく、横書きで、はっきりと記入してください。
   (2) 解答の字数に制限がある場合は、それを守ってください。
   (3) ローマ字、または数字を使用するときは、マス目にとらわれなくてもかまいません。
5. 解答用紙は持ち帰ってはいけません。
6. 問題冊子と下書用紙は持ち帰ってください。

以下の文章を読んで、問 1～問 8 に答えなさい。 *の付いた語には末尾に訳注があります。

When TV became ubiquitous* across the globe it was supposed to become the mainstay of education for the masses and bring literacy as well as knowledge even to the most remote places on Earth. It failed miserably! The same happened with E-learning (do you still remember the craze?) when computers became commonplace in most households. It turned out not to work and was therefore replaced by "blended learning", i.e., the teachers got "blended" back in.

With global sales of the smartphone, (A) the Swiss-army knife* of the digital age, reaching 5.5 Billion units we now witness the next big fad* in pedagogy*: M-learning – i.e., *mobile* learning. To some education "specialists", the fact that almost everyone owns a smartphone, is enough to proclaim that mobile learning is going to finally liberate mass education from the shackles* of "cumbersome* textbooks", boring lessons, and – in the long run – schools: if you can learn while waiting at the bus-stop, why go to school?

Of course, so the argument by the proponents* runs, there are yet some obstacles that have to be overcome, such as small screens, bad programming, and slow connections. But these are merely "technical glitches*" that are eventually going to be ironed out*, given the amount of resources spent on this by the richest companies on Earth. Even according to this new "learning industry", the content to be learned cannot be just transferred to a new medium, let's say, from the textbook to the smartphone. It rather has to be broken down into small snippets* – the industry and its proponents call them "nuggets*" – of information in order to be digestible for the learner "on the move". Of course, M-learning suffers from distractions such as traffic, other media and, yes, people. So "context" somehow is an issue. And of course, as complex content needs time and attention, M-learning is best geared towards the memorization of rote* facts and foreign vocabulary. M-calculus*, m-philosophy? – Forget it!

Let me state up front, this "revolution" won't happen! In order to show you why, let me give an example: When you drive a car, you push and pull the stirring wheel, press down pedals, and you counteract acceleration and centrifugal* forces on your torso* with its muscles when accelerating, braking and taking turns. But if somebody came along to sell you a car as your next and most wonderful physical fitness training device ("it even doubles as a locomotion implement!"), you'd be skeptical. – Why? You know that cars prevent you from auto-locomoting yourself by walking, running, swimming or cycling, thereby taking physical fitness training away from you and thereby effectively reducing your physical fitness. In fact, even small physical affordances* have been removed from cars by inventions such as power stirring, power brakes, power locks, and power windows. The more powers your car provides, the less your muscles have to work. However, working your muscles gives you physical fitness. Everyone knows this – your car decreases your physical fitness!

Digital information technology (IT), of which smartphones are the most recent

implementation, takes mental effort away from us. This is why we use IT in offices to get mental work done around the world: computers and the internet can do a lot of tricks much faster and more efficiently than workers with paper, a phone, and a typewriter could do 30 years ago. By this very function of digital IT – i.e. outsourcing mental effort into a machine to get office work more efficiently done – this technology is, by definition, detrimental* to mental activity in your brain and therefore to learning. If there is one thing that neuroscience has demonstrated over and over again during the past 30 years, then it is the fact that the brain is very much like a muscle: it grows, and is maintained, by its use. Hence, outsourcing mental activity leads to reduced learning, that is, reduced growth and maintenance of your brain. Using a calculator instead of doing mental arithmetic will decrease your ability to handle numbers in your mind. Using a sat nav* to find your way instead of navigating using a map and your mind decreases your ability to find your way. Copying and pasting text instead of reading and writing it, or taking pictures of museum artifacts instead of looking at them, causes reduced learning and retention of knowledge.

In addition, smartphones come with a large number of costs – risks and side effects –, which appear to be completely ignored by their proponents in educational settings. They have been shown to cause addiction, attention deficits, sleep deficits, empathy deficits, impaired learning and hence decreased educational achievement, hypertension, obesity, anxiety, depression, personality disorders, increased aggression, dissatisfaction with life, and loneliness (cf. Table 1). In addition, smartphones increase risky behavior, from texting while driving to unprotected sexual intercourse, facilitated by geosocial networking phone apps. In most papers on the educational benefits of smartphones (the final "revolution" in education!), these very real risks and side effects are not mentioned at all. Those who deny this just do not know or do not want to know the facts! Add them all up and it becomes clear that smartphones represent a massive threat to education and health – for almost every individual and for society as a whole.

According to a recent German study on 500 children and adolescents (age range: 8–14 years) who own and use a smartphone, 48% feel distracted by it when they do their homework, 24% feel stressed by it, 20% report school problems due to it and 8% are on the verge of addiction or outright* addicted.

In addition to the studies on the risks and side-effects their effects on educational achievement have also been studied, either by giving out smartphones to students who do not own one already, or by banning them in schools, and looking carefully what happens.

Table 1 Risks and side effects of smartphones.

Country/population studied	*N*	Results: smartphone-use found to be related to…
Norway/students	423	Neuroticism, sleeplessness, addiction
Spain/students	365	loneliness, depression, anxiety, sleeplessness
USA/adults	1508	Sleep deficit, disturbed circadian rhythm, reduced morning alertness
USA/students	163	Anxiety
USA/students	40	Stress
New Zealand/students	200	Neuroticism, reduced agreeableness
Norway/Population based study	9846	Disrupted sleep
USA/students	312	Reduced agreeableness
Switzerland/12–17 years of age	362	Sleep deficit, depression
USA/students	536	Anxiety
USA/adults	183	Anxiety
Japan/adolescents	95680	Disturbed sleep
USA/students	83	Sleep disorders, stress, depression
Japan/ adolescents	17920	Reduced sleep, poor mental health, suicidal feelings, self-injury
Australia/adults	112	Reduced agreeableness
USA/adults	1143	Depression
Spain/13–20 years of age	1328	Alcohol- and tobacco use, depression, school drop out
Japan/students	487	Loneliness
Sweden/general population	4156	Stress, sleep disorders, depression
USA/students		Sleep disorders
Taiwan/students	10191	Depression
China/adolescents	7102	Attention deficit disorder

When smartphones were given out to 24 undergraduates (mean age: 19.2 years) for free, with the instruction to freely use them for one year, they responded quite enthusiastically, immediately used them a lot, anticipating gains in doing their homework, learning, and their grades. This was found by asking them at the beginning of the study. When asked again after one year, their opinion had dramatically changed. They no longer believed that their smartphone was helpful as regards their academic performance, and instead, they now saw it mainly as a distraction (see Fig. 1). Their grades actually worsened during the year.

The authors concluded: "[…] according to students, smartphones did not facilitate enhanced learning to improve performance in the classroom. Before they regularly used a smartphone, students expected that the technology would help them complete their homework, achieve high marks on academic tests and learn outside of the classroom. Instead, after they used their smartphones, students perceived their smartphones as competitive to achievement in the classroom and learning. At the broadest level, students mostly agreed before the study that their iPhones would help them get better grades and would not be a distraction. By the end of the study, their devices were viewed as a distraction that deterred* them from classroom goals".

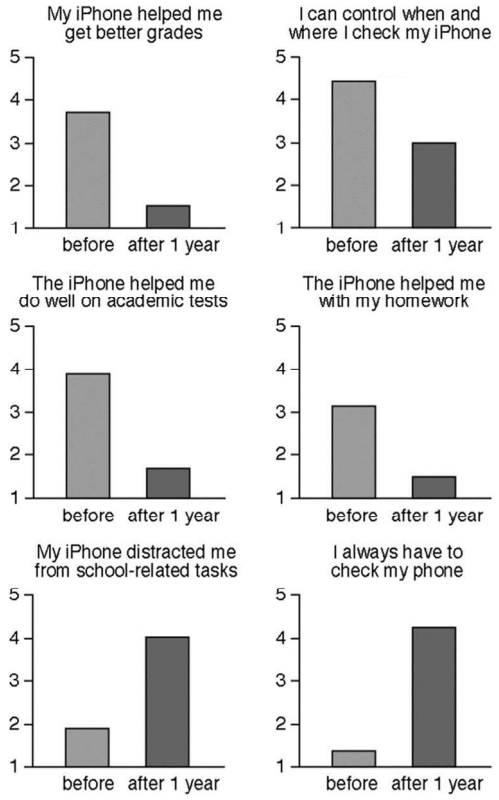

Fig. 1 Students' ratings – on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*) – of what was going to happen (expectations) and what actually happened during the year during which they were handed out a smartphone.

Harvard economist Robert Fryer gave out prepaid mobile phones to almost 1500 pupils in grades 6 and 7 at 22 schools in Oklahoma City, (B) with help from a large phone company. To make the long story of a rather complex design of this naturalistic study short, his conclusion was that "there was no measurable increase in educational attainment or achievement".

What happens if you do just the opposite of giving out smartphones, i.e., ban them in schools? In order to find out, scientists from *the London School of Economics and Political Science* took advantage of the fact that in 2013 a study on the use on mobile phone use was carried out in 91 High-schools and 130,482 pupils in four locations (Birmingham, London, Leicester, and Manchester). They combined these data with administrative data on the pupils' academic performance and data on cell-phone bans in 90 schools, which were introduced in the years 2002–2012 (Table 2). Pupils were followed during their entire time in High-school, i.e., from 11 to 16 years. As more than 90% of pupils owned and used a mobile phone, any ban on mobile phone use in school affected almost all students directly and all students indirectly. "Even if a student does not own a phone oneself its presence in the classroom may cause distraction", the authors note.

Table 2 Cumulative number of schools in which a ban on mobile phones was introduced within the observational period.

Year	Number of schools with mobile phone bans
2000	0
2001	0
2002	3
2003	6
2004	9
2005	19
2006	29
2007	43
2008	58
2009	71
2010	85
2011	88
2012	90

With all the data compiled it was even possible to relate mobile phone bans to academic performance at the end of elementary school (at age 11 years) with academic performance after 3 years (at age 14) and academic performance at the end of high-school (at age 16).

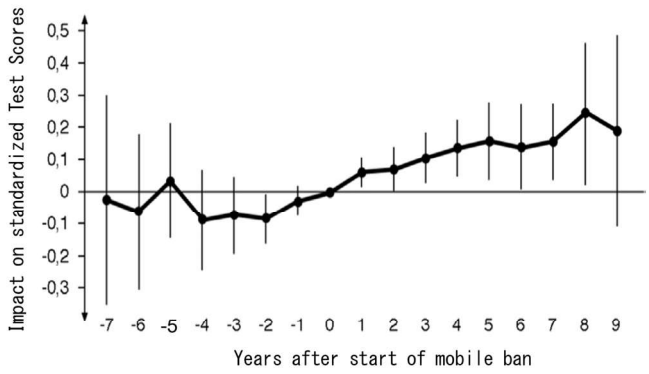

Fig. 2 Impact of mobile phone ban on standardized test scores at age 16 over the years after the ban started (after statistical removal of the effects of school year, age 11 test scores and certain pupil variables such as special needs and eligibility to receive free school meals).

Data were analyzed such that all schools were normalized to day 0 of the mobile ban, and

academic grades of all pupils were averaged before and after the ban (cf. Fig. 2). It turned out that grades increased significantly (compared to the reference year prior to the introduction of the ban) already in the first year after the ban. Numerically, this increase became larger over the years and remained significant up to 8 years after the ban.

Of particular interest is a further analysis focusing on the relationship of the impact of mobile phone bans to prior achievement. When students were grouped into five quintiles* based on their achievement level at age 11 (quintile 1 with the lowest and quintile 5 with the highest level of achievement), it was found that those students with the lowest academic achievement before the ban benefited the most after the ban was introduced (Fig. 3).

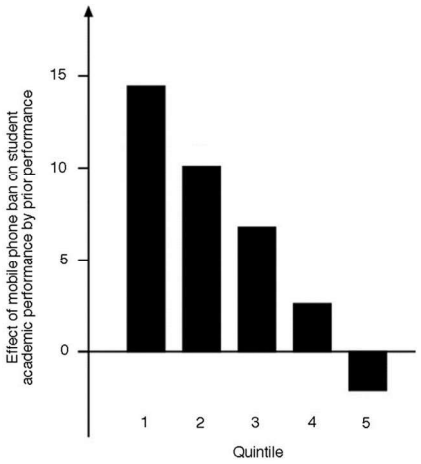

Fig. 3 Effect of mobile phone ban on academic student performance (standardized test score in student GCSE* exams) on the condition of prior performance. Student characteristics (such as sex, minority, special needs, and free meals recipient) were controlled for in this analysis.

In the light of these data, it is hard to understand that the mayor of New York abolished the banning of smartphones in the city's schools in March 2015, just as the City of Toronto did so in 2011.

So why are there so many advocates of M-Learning, who tell us that smartphones have to be integrated into classroom activities just as books, paper and pencils are? A closer look at the Handbook of Mobile Learning does not reveal an answer, as no data are provided on empirical* evaluations of the effects of smartphones on academic performance. Instead, this rather thick volume provides merely anecdotes* and stories. In my view, a huge lobby backed by the world's richest companies (Apple, Google, Microsoft, Facebook, Amazon; with a combined market capitalization of over 2.5 thousand Billion US$) heavily influences us with daily accounts of the inevitability and utmost necessity of digital media use in schools, even though the evidence of its benefits is completely lacking. For example, the latest is a report by the Organisation for

Economic Co-operation and Development (OECD) stated that education systems investing most in information technology found “no appreciable* improvement” in the PISA (Program for International Student Assessment) test results which compare student academic performance internationally.

To add insult to injury*, smartphones are highly addictive. In Germany, the most recent data speak of 8% risk of smartphone addiction in children and adolescents in a survey of 500 eight to fourteen year olds. Globally, the range of addiction in young people is between about 2 and 11 percent. South Korea, the country with the most widespread use of smartphones (5.4 h/day in 11–12 year old children), suffered from a rate of 25.5% smartphone addiction in 2013, and 29.2% in 2014. Therefore, this country has introduced drastic measures to counter this trend in May 2015. People under the age of 19 who buy a smartphone, by law, must have special software installed that prevents them from accessing certain sites (such as pornography), monitors the use of their smartphone, and sends results to the parents. Even though the software was found to be technically flawed*, the endeavor clearly demonstrates the problematic risks and side effects of smartphones, as assessed by the country which globally has the most use of them by people of young age.

To sum up: smartphones are disruptive* to attention and learning, and they cause addiction. We cannot ignore these risks and side effects and have to weigh them against yet unproven promises of benefits to learning in schools. We must not let (C) market forces ruin the education of our children!

〔出典〕 Manfred Spitzer : M-Learning? When it comes to learning, smartphones are a liability, not an asset (editorial). *Trends in Neuroscience and Education* 4 (2015) 87-91
〔一部改変〕

【訳注】

ubiquitous	どこにでもある
Swiss-army knife	多機能ナイフ（短期間の野外生活などのアウトドア活動に使う様々な機能、小道具をまとめたコンパクトなフォールディングナイフ）
fad	一時的な流行
pedagogy	教育学
shackle	束縛
cumbersome	重く大きくてやっかいな
proponent	支持者
glitch	小さな問題
iron out	解決する
snippet	断片
nugget	小さな塊
rote	機械的な
calculus	微積分学
centrifugal	遠心の
torso	胴体
affordance	環境からの刺激
detrimental	有害な
sat nav	satellite navigation system のこと
outright	全く
deter	妨げる
quintile	五分位点
GCSE	イギリスの国家試験 General Certificate of Secondary Education
empirical	経験的な
anecdote	逸話
appreciable	目に見えるほどの
add insult to injury	踏んだり蹴ったりのめにあわせる
be flawed	欠陥がある
disruptive	妨害する

問 1　この文章において著者が「脳と筋肉は類似している」としている内容を 50 文字以内で説明しなさい。

問 2　下線(A)の「the Swiss-army knife of the digital age」は、スマートフォンのどのような特徴をたとえたものであるかを 25 文字以内で説明しなさい。

問 3　下線(B)の「with help from a large phone company」は文章の流れのためには不必要な句だが、敢えて記載した著者の意図を推測し 60～100 文字で説明しなさい。

問 4　Fig. 2 のグラフは、何を表したもので、どのような結果が示されているかを 60～100 文字で説明しなさい。

問 5　Fig. 3 のグラフは、何を表したもので、どのような結果が示されているかを 80～120 文字で説明しなさい。

問 6　Fig. 3 のグラフのような結果が得られた理由を推測して 120～180 文字で説明しなさい。

問 7　下線(C) の「market forces ruin the education」という著者の主張の内容とその背景を 80～120 文字で説明しなさい。

問 8　この文章の著者の主張に対して、「学習方法が新しい時代のものに変わったにも関わらず、成績を従来の方法や基準で評価した結果にもとづいた議論なので、説得力がない。」という批判がある。この批判についてのあなたの賛否とその理由を 100～200 文字で述べなさい。賛否の意見そのものは評価の対象ではなく、その理由の説明が論理的なものであるかどうかを評価する。