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# **UNREASONABLE USE OF MOBILE PHONES AND LEARNING EFFICIENCY IN CHILDREN. PROPOSAL OF A PROPRIETARY DESIGN SOLUTION USING THE OFF DESK AS AN EXAMPLE**

**Art research paper**

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## Abstract

The article presents a description of the negative implications of using mobile phones as well as the process and description of the original project which is a response to the problem of unwise use of smartphones in terms of the effectiveness of childrens' learning and work. The article is a synthesis of the author's observations and conclusions from her own observations and analyzes as well as the cited studies and reports. In line with socially responsible design, it answers a number of questions that arise. Does the problem of unreasonable use of mobile devices really exist and does it pose a threat? Who is most at risk of it? Do mobile devices affect the effectiveness of learning and work? Which step in tackling the problem is appropriate - ban or rationalization? What solutions and design scenarios can be used here?

## Keywords

socially responsible design, school desk, smartphone, digitization, efficiency, rationalization, Faraday cage, digital children, "always on" generation, phonoholism, FOMO syndrome, cyber society, interaction, new technologies

## Introduction

Smartphones, which are almost constantly at hand, play an important role in shaping human attitudes and behaviors. In the modern world we cannot imagine life without them. We reach for them almost every day, unwittingly using their functions. There is no denying that they improve our living comfort and are a source of knowledge and entertainment. Despite the multitude of benefits they bring, they generate risks to many aspects of life. Delving into the subject, reviewing Polish and international reports and studies, and making my own observations and analyses, I noticed that digitization entails serious problems requiring rationalization. The topicality, prevalence and seriousness of the problem of the negative impact of the smartphone on man motivated me to take on the challenge and face this problem in my thesis project. I highlighted the aspect of reduced learning and work efficiency due to unreasonable use of mobile phones. As an interior architecture student passionate about innovative design that is socially responsible and uses new technologies, I paid special attention to children who start to live in the digital world. Given their openness and mental absorption, they are a target group that can be properly oriented to prevent problems related to unreasonable use of smartphones in their adult lives. I have designed an interactive school desk for them to rationalize the use of mobile phones. I present the detailed context and processes accompanying the implementation of the design in my thesis titled “The role of design in the education and rationalization of the use of mobile phones by children”. This article is a kind of synthesis of my observations and conclusions resulting from my basic research. In the article I will try to answer a number of questions that came up during the work on the thesis project. Does the problem of unreasonable use of mobile devices really exist and does it pose a threat? Who is most vulnerable to it? Do mobile devices affect learning and work efficiency? Is the ban or, instead, rationalization the right measure to combat the problem? What solutions or design scenarios can apply here?

## Socially responsible design

Social design is nothing else than designing things that are not only nice but, above all, needed. It is based on empathy and higher goals to offer benefits and solve existing problems. The responsibility of the designer lies in using design as a tool to improve the world, paying attention to the real needs of people, especially groups excluded and overlooked in commercial design<sup>1</sup>. Socially responsible design is equally necessary, especially in the today’s world, where technological progress and the environment are generating problems we have never seen before. I believe that the role of the designer should be, first of all, to take action to help directly or indirectly, by paying attention to a problem or trying to shape the right habits that build awareness in the audience, which have a positive impact on their life.

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1 <https://www.designbiznes.pl/2020/07/social-design-czyli-design-odpowiedzialny-spoecznie/>.



## Digital childhood – the “always on” generation

Children born in the 21st century do not know life without the Internet. There is a reason why we call them “digital kids” or the “always on” generation: they are constantly online. It is not surprising, therefore, that they are the group most vulnerable to the dangers of using mobile devices. The smartphone and the tablet moved their childhood from social life in the backyard to a virtual world closed behind the “black mirror”<sup>3</sup>.



Figure 2. The backyard generation / the „always on” generation (source: <https://www.flaticon.com>, authors: <https://www.flaticon.com/authors/freepik>), author’s modification

This world, despite its great potential, is, unfortunately, explored by children unproductively, often even destructively. Children follow one another on social networks, share touched up photos and misleading posts, while commonly doing the cyber bullying. It turns out that smartphones, although attractive to them, cause a decrease in their life satisfaction, as evidenced by studies showing an increase in depression and suicides among teenagers since 2012. Research conclusions point to mobile technology as a source of relationship crises, sexualization, depersonalization of people, adulthood impairment, depression, obesity, and even an increase in ADHD instances among children<sup>4</sup>. The importance of the problem is depicted by the following illustration which shows results of nationwide surveys conducted among people aged 12-19 years<sup>5</sup>.

3 “Black mirror”: smartphone screen; a borrowing from the „Black Mirror” TV series

4 <https://magazynpismo.pl/cykle-pisma/jak-naprawic-internet/zombie-fonoholizm-dzieci-smartfon/#>.

5 M. Dębski, M. Bigaj, *Ogólnopolskie badanie „Młodzi Cyfrowi”*, Fundacja Dbam o Mój Z@sięg, Uniwersytet Gdański, 2019, p. 11

# „Młodzi Cyfrowi”

## – podsumowanie wyników/

The “Digital Young People” – a summary of the results



Figure 3. The “Digital Young People” study (source: <https://dbamomojzasieg.com/mlodzi-cyfrowi/>)

The seriousness of the problem is also demonstrated by the introduction into the dictionary of the concept of **phonoholism**, that is, dependence on a mobile phone<sup>6</sup> consisting in an inability to function normally without a smartphone, in particular because of the lack of access to the Internet. The addiction manifests itself in the need to be online at all costs due to the fear of being overlooked<sup>7</sup>, the so-called “fear of missing out” (FOMO) syndrome, characterized by constant activity and by tracking other Internet users and by frequent sharing of content on social media for the purpose of boasting and feeling excited about likes and positive comments<sup>8</sup>. About 14% of the Polish youth suffer from it<sup>9</sup>.

It cannot be denied that the problem of irrational use of smartphones by children and young people actually exists. There is no doubt that it is worth talking about and trying to overcome its negative implications.

6 M. Dębski, *Nalagowe korzystanie z telefonów komórkowych. Szczegółowa charakterystyka zjawiska fonoholizmu w Polsce. Raport z badań*, Fundacja Dbam o Mój Z@sięg, Instytut Filozofii, Socjologii i Dziennikarstwa, Uniwersytet Gdański, Gdynia, 2016, p.19

7 M. Dębski, *Uzależnienie od smartfona – najważniejsze symptomy*, <https://siu.praesterno.pl/arttykul/562>, Instytut Filozofii, Socjologii i Dziennikarstwa Uniwersytetu Gdańskiego, 2017.

8 M. Dębski, *Nalagowe korzystanie z telefonów komórkowych...*, op. cit., p. 19.

9 M. Dębski, M. Bigaj, *Ogólnopolskie badanie „Młodzi Cyfrowi”*, op. cit., p. 13.

## The child's first steps into the world of mobile devices in the context of family and school

In the age of digital childhood it seems important to look at the moment of entering the digitized world. Children start exploring it very early. The school plays an important role here while the first contact of a child with new technologies is usually decided by parents by making their own smartphones available to the child.



Figure 4. Smartphone as an „education” method

(source: <https://www.flaticon.com>, authors: <https://www.flaticon.com/authors/freepik>), author's modification

A study conducted in Poland by the No Man's Children Foundation in 2015 found that 64% of children aged from 0.5 to 6.5 years used mobile devices. 30% among one-year-olds, over 50% among two- and three-year-olds and 84% among others. The results for the youngest children raise concern. Of the daily users, the most, as much as 35%, are two-year-olds. The motivations of parents sharing smartphones with their children are of particular concern. These include addressing one's own affairs, not having an idea of taking time out for children, rewarding them for good behavior, manipulating them to force the child to eat a meal, or make it easier to fall asleep<sup>10</sup>. The commonly used system of punishment and reward is often disproportionate and recklessly used by parents. It leads to a lack of comfort and emotional instability in children who, in fact, achieve higher scores on the scale of phonoholism. Moreover, it turns out that this is determined by the fact that parents motivate their decision to equip their child with a mobile phone by the need for control. This leads to the child's development of a sense of duty to reach for the smartphone frequently. About 40% of families do not set rules for the use of mobile devices and in many cases the rules are not set with children but imposed by parents. More than half of parents do not talk to their children about the harm and dangers of irrational use of the smartphone. They usually think that this is the role of the school. The research also shows that quality of family relationships has an impact on this problem, especially the lack of a parent's presence in the child's life, as well as high expectations regarding the child's performance at school<sup>11</sup>.

The issue of unreasonable use of smartphones is also evident in the school environment. Children at early school age are forced to submit to new rules and discipline while establishing new social relationships. At the same time, they enter the digital world the immeasurable potential of which can reasonably be used to benefit them but, otherwise, can cause many problems and have a negative impact

10 M. Kowaluk-Romanek, *Cyfrowe dzieciństwo. Nowe technologie a rozwój dziecka*, „Edukacja – Technika – Informatyka”, 2019, nr 1/27.

11 M. Dębski, M. Bigaj, *Ogólnopolskie badanie „Młodzi Cyfrowi”*, op. cit., p. 33–34.

on their lives. The school is where they spend most of the day. At this point, parents who have so far hidden the Internet and mobile devices from their children, realizing the dangers, are almost forced to introduce the children to the digital world. The reasons for this are different, more or less reasonable, such as that the child does not feel inferior to others.



Figure 5. Smartphone in the context of the school

(source: <https://www.flaticon.com>, authors: <https://www.flaticon.com/authors/freepik>), author's modification

Unfortunately, education and support for general development are not the top motives for buying a smartphone, especially that the Internet is used in school education usually only for communication between teachers and students or parents through social groups and parental control applications. Mobile devices are used in the teaching process sporadically while the vast majority of children use smartphones on breaks, thus communicating with one another without establishing face-to-face relationships. Students also use their phones during lessons, unfortunately not only for learning purposes. Children's self-confinement in the digital world is detrimental to their social skills which are so important during this period of their lives. Teachers, aware of the problem, feel incompetent about this topic. The lack of regulation and school prevention programs in this area make them helpless<sup>12</sup>.



Figure 6. Traditional lesson / Lesson using E-learning

(source: <https://www.flaticon.com>, authors: <https://www.flaticon.com/authors/freepik>), author's modification

The conclusion is that home and school environments do not exploit the educational and development potential of mobile devices. The lack of parental control, their unawareness of their own educational mistakes perpetuating bad habits in children and the unpreparedness of schools to combat phonoholism show the need for taking an action to address this problem.

### Prohibition or rationalization?

The use of mobile phones in schools remains an unresolved and controversial issue that divides the society into two groups: supporters and opponents of the ban. The proponents of the ban motivate their attitude by the distraction of children during classes, the deterioration of their learning outcomes,

12 Ibid, p. 35–36.



difficulties faced by teachers or the breaks spent by students in isolation with their eyes fixed on phone screens. For example, the ban was introduced in France in 2018. Children are not allowed to use Web-enabled devices, especially smartphones, on school premises. The steps taken are intended to combat phonoholism among children and young people. The proponents of the ban cite the research carried out by the London School of Economics, which shows that limited use of smartphones increases concentration in students, resulting in higher exam scores. The restriction also contributes to reducing educational inequalities and the phone theft in schools. The law enforcement relies on the teachers' right to confiscate smartphones. In practice, however, it appears that it is impossible to enforce the ban on children's activities at school throughout the day<sup>13</sup>.



Figure 7. Prohibition or rationalization

(source: <https://www.flaticon.com>, authors: <https://www.flaticon.com/authors/freepik>), author's modification

In Polish schools there are no top-down rules governing the use of the Internet and mobile devices. Sometimes these issues are determined by school statutes. The views of Polish teachers on the introduction of the ban are divided: 17.5% positively against the ban, 17.4% “rather” against, 56% in favor and 9.1% undecided. Interestingly, 23.7% of teachers admit that they happen to use their smartphones for private purposes while teaching<sup>14</sup>. Opponents of the ban believe that it is the school's duty to harness the potential of mobile devices in the education and development of students and, at the same time, to teach students how to use such devices appropriately. This view is shared, among others, by Achim Berg, the head of BITKOM, who stresses the role of schools and parents in introducing children to the digitized world<sup>15</sup>.

These diverse opinions made me reflect. Is the ban an appropriate educational method? Undoubtedly, it brings immediate results but they satisfy only the person who is its initiator, and this satisfaction often results from a sense of comfort and control over another person. Therefore, the ban seems to be a half-measure giving an illusive sense of proper upbringing. It causes frustration, rebellion and aggression in the child, plus an undoubtedly justified sense of being kept under surveillance. It should be noted that the problem of unreasonable use of mobile phones affects not only children but also their parents and teachers. The observations suggest that children should not be patronized but should be treated as equals and the practice of rationalizing the use of smartphones should be implemented

13 <https://www.forbes.com/sites/alexledsom/2019/08/30/the-mobile-phone-ban-in-french-schools-one-year-on-would-it-work-elsewhere/#131c1e575e70>.

14 M. Dębski, *Nalogowe korzystanie z telefonów komórkowych...*, op. cit., p. 116

15 <https://www.dw.com/pl/ankieta-smartfony-s%C4%85-dla-dzieci-oczywisto%C5%9Bci%C4%85/a-48937970>.

in collaboration. In addition, problems with obtaining parental consent to a total ban on the use of mobile devices on school premises, and legal complexities associated with this issue, tip the scales at the rationalization side. The above-mentioned studies justify the claim that such measures will have beneficial effects on children in their future lives, such as reasonable and responsible use of new technologies, and will help children develop mental maturity by activating cognitive processes teaching independent thinking and responsibility.

Undoubtedly, the unreasonable use of smartphones has an impact on children themselves: their effectiveness and psycho-social needs. I believe that, at this stage of technological development, we cannot remove smartphones from children's lives. Given their large potential, rationalizing their use seems to be a good step.

### Personal conclusions and insights

The methodology of socially responsible design and the foregoing facts support my argument that unreasonable use of mobile phones reduces the efficiency of learning and work. The exploration of the topic motivated me to take on the design challenge and pushed the idea of developing a new school desk function for children in grades 1-3, rationalizing the use of the smartphone.

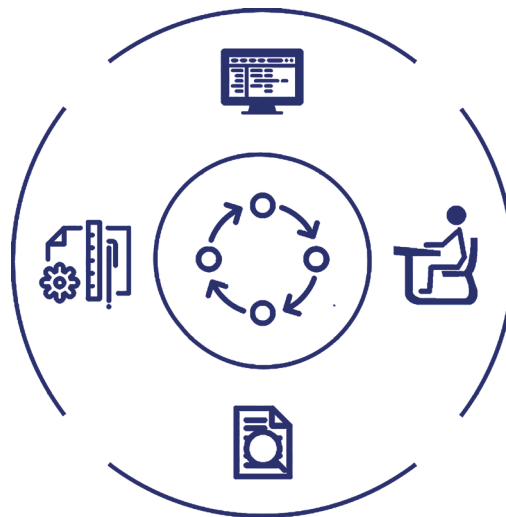


Figure 8. Methodology of author's design process, author's design with the use of pictograms  
sources: <https://www.flaticon.com>, authors: <https://www.flaticon.com/authors/freepik>

The methodology of the desk design process consisted of a basic research, technical design, electronic and programming design and prototyping. The basic research (based on user-centered design)

user-centered design)<sup>16</sup> consisted of experimental verification of hypotheses resulting from the defined idea.

My visit to a primary school resulted in unrecorded informal interviews with teachers, which confirmed that mobile telephony has an adverse negative impact on efficiency and behaviors of students. According to the interviews, the problem was manifested by the use of mobile phones by students during classes, contributing to both individual and collective mind-wandering caused by sounds coming out of active devices. In addition, students often used smartphones to cheat in tests. What is more, the teachers noted that students also spent time on their smartphones during breaks, mostly playing games, destructive to their development, or becoming active on social media, which negatively affected their direct interpersonal relationships and often fueled cyber bullying. Citing long-term observations of school teachers and educators reporting the problem, I can conclude that the use of smartphones by students requires rationalization.

I conducted an experiment with seven-year-old Dominica during which I observed the girl's behavior and measured time she needed to complete a task requiring concentration in two settings: without the smartphone in sight and with the smartphone lying on her desk. In the first case, Dominica, focused on the task at hand, completed it in 16 minutes. In the second case, the smartphone clearly distracted the girl from the task. She finished it within 22 minutes. The experiment requires more children to follow certain procedures to provide reliable data, while informal conversations with parents of early school age children have strengthened my belief that the mobile phone in sight undoubtedly causes distraction.



Figure 9. Dominica focused on the task,  
photo by Magdalena Konior



Figure 10. Dominica distracted by the smartphone,  
photo by Magdalena Konior

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*Projektowanie zorientowane na użytkownika*, [https://pl.wikipedia.org/wiki/Projektowanie\\_zorientowane\\_na\\_u%C5%BCytkownika](https://pl.wikipedia.org/wiki/Projektowanie_zorientowane_na_u%C5%BCytkownika).

Conversations with parents show that using mobile devices is more attractive for children than the performance of any other task. Smartphones in sight of children doing homework cause distraction, especially when someone nearby is using them.

The next step of the design process was the technical design of a school desk based on ideological assumptions, anatomy of children aged 6-9 years and basic guidelines for ergonomic design of desks, taking into account the principles of selection of the student's workplace depending the user's height, according to the applicable Polish Standard. Following the idea, the basic details of the project consisted of a mobile phone pocket located in a place out of sight of the child working at the desk and an attractive element of persuasion urging the child to put away the smartphone. I provided for four desktop height settings fitting the ages and anatomies of the target group and I designed a functionality for convenient work and storage of school supplies.

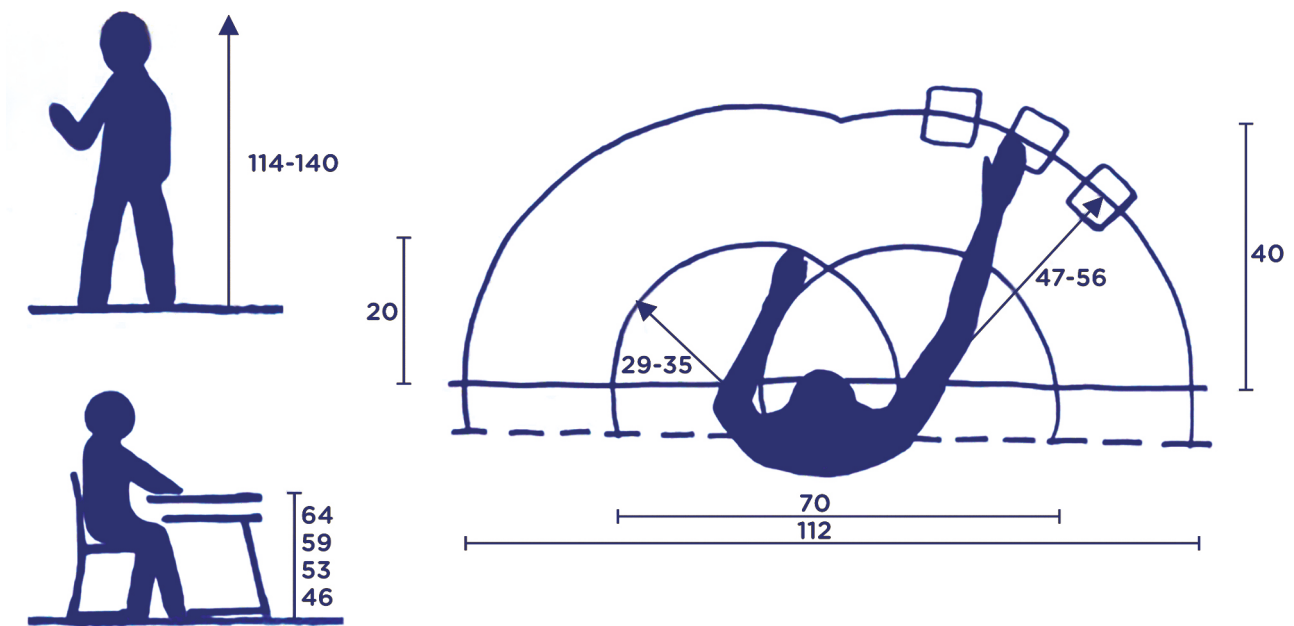


Figure 11. Analysis of the anatomy of 6-9-year-olds in the context of a desk, (design by the author)



Figure 12. Exploration and analysis (photo by the author)

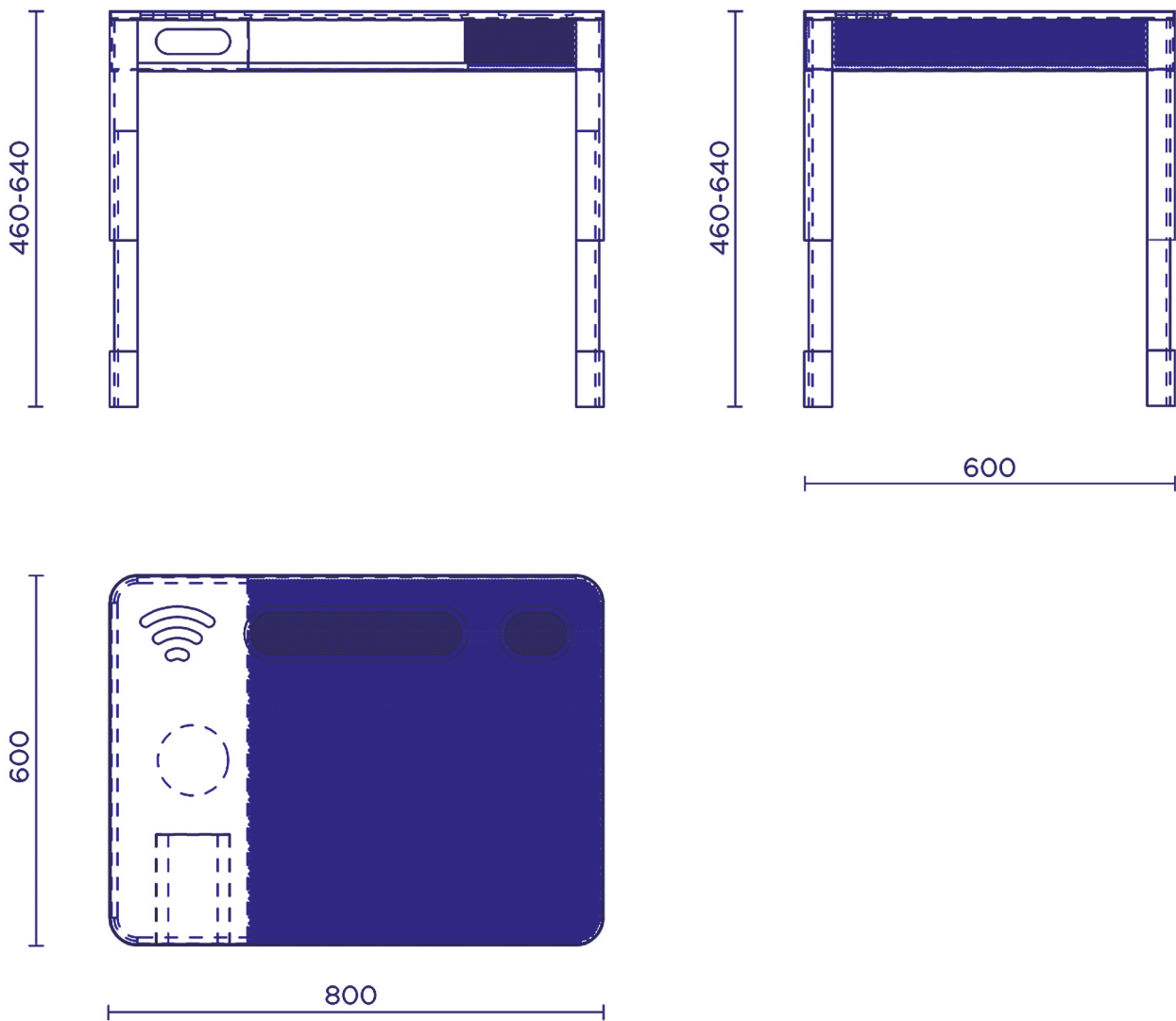


Figure 13. Overall desk dimensions (photo by the author)

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Równoległe rozwijanym etapem było projektowanie elektroniczne i programistyczne zakładające interaktywność jako atrakcyjny zabieg tworzący więź między użytkownikiem a produktem oraz wzmocnienie przekazu idei, którą niesie ze sobą projekt.



Figure 14. The electronic and programming side of the project – experiments and tests (photo by the author)

The final phase of the design process was the execution of a prototype: a tangible result of the above-mentioned steps.



Figure 15. The prototyping process (photo by the author)

## A desk for the youngest to rationalize the use of the mobile phone

I named the completed prototype the “OFF DESK”. It is an interactive school desk for the youngest students intended to help them rationalize the use of their mobile phones. The desk is equipped with a **Faraday cage**<sup>17</sup> designed to store a smartphone during classes and stimulate the child visually and aurally to learn and work.



Figure 16. The OFF DESK in use (photo by Magdalena Konior)

The name of the desk refers to the switching from online to offline activity and, thus, taking a break from the digital life in favor of experiencing what is here and now, focusing on the learning and work.



Figure 17. The “OFF DESK” logo (design by the author)

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The Faraday cage is an electrostatic shield made in the form of a closed metal vessel or a dense metal mesh, mainly used to protect electrical equipment from interfering external electrical fields (...). Inside the cage the intensity of these fields is zero (...). Applied for the first time by M. Faraday (source: <https://encyklopedia.pwn.pl/haslo/klatka-Faradaya;3922729.html>).



Although the problem of irrational use of mobile phones affects all age groups, the project is dedicated to the younger group: children 6-9 years old (students of grades 1-3) who start their education and who are receptive and prone to agitation. Making them aware of this problem, forming rational habits and teaching right behaviors is an attempt to prevent the formation of the so-called “cyber society”<sup>18</sup>.



Figure 18. Illustration of benefits of using the desk (design by the author)



Figure 19. OFF DESK – details (photo by Magdalena Konior)

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Figure 20. OFF DESK – technology details (photo by Magdalena Konior)

## The functionality and materials

The OFF DESK is designed for use by one person because it assumes the awareness of putting away the smartphone, the efficiency of the performance of tasks and the concentration in the assimilation of knowledge. It has the four-step height adjustment provided in the legs made from steel tubes, allowing the student to adjust the desk to his or her height. The desktop, made of PVC, is designed to fit the user's anatomy, takes into account the whole range of both precise and more relaxed work and has a comfortable milled space at the back of the tabletop designed for desk organizers, writing utensils and a tablet, the latter supposed to facilitate mobile learning during classes. The organizers are mobile, which facilitates cleaning and makes their functionality future-proof. They are made using the 3D printing technology and the new MJF technology<sup>19</sup>. In the line of the organizers on the left side there is a place for a light point in the form of the Wi-Fi symbol milled in the tabletop, obscured by milky Plexiglas. Under the table top there is a shelf designed for storing school supplies, such as books, made of perforated steel plate. On the left, at the height of the shelf, there is space for electronics using the entire depth of the desk. In addition, in the front there is a magnetically lockable aluminum pocket for the smartphone, acting as the Faraday cage. The powder-coated structure and the desktop are white. This combination provides a neutral background for the performance of school duties. The motive of this design decision is the symbolism of whiteness which calms emotions, relieves stress, does not burden the mind and allows for focus<sup>20</sup>. The mobile and functionally and conceptually important components of the design (the organizers, smartphone space and lower legs) are grey, which is an accent that enriches the significance and appearance of the desk, making it easier for children to use the piece of furniture. The form of the desk, referring to the shape of the smartphone, encourages use and makes the desk safe and user-friendly.

## The electronic and programming side of the project

The electronic and programming part contributes much value to the design. The space for electronics includes a scale made from a strain gauge beam (which is also the space for the smartphone), two Arduino Uno microcontrollers, a LED matrix, an MP3 module, an amplifier, a speaker and power supplies and connecting wires for the individual components. The whole thing is powered by a cable coming out from the back leg of the desk.

19 <https://www.materialise.com/pl/manufacturing/technologie-i-materialy/multi-jet-fusion>.

20 *What colors are conducive to learning and motivating employees?*, <https://www.edukey.pl/blog/psychologia-kolorow/>.

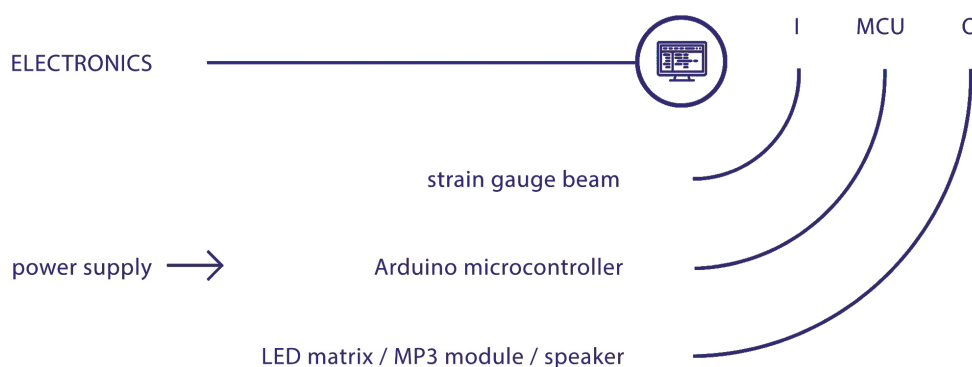


Figure 21. Simplified electronic design (design by the author)

## Interaction

The OFF DESK is designed for use in the classroom during classes. The student, taking up the seat at the desk at the start of the classes is mobilized with a visual stimulus provided by the red Wi-Fi symbol located on the tabletop to put the smartphone away to the side pocket. The Wi-Fi symbol indicates online activity and highlights its key importance in the context of the problem of unreasonable use of the smartphone. The red color of the light sends an intuitive message to the user: “put your phone away”. It is based on the symbolism and importance of using the red color accent in the design, which draws attention, stimulates, motivates, signals and warns<sup>21</sup>.

The user’s first response to the red light is to place the smartphone in the magnetically lockable Faraday cage which attenuates electromagnetic signals from GSM and Wi-Fi networks and from satellite navigation systems. As a result, the smartphone is “dead”. In addition to eliminating the possibility of disruption of work by incoming notifications, messages or calls, this procedure has an additional symbolic meaning of the operation of putting away the smartphone: the getting disconnected from the digital world.

Based on programmed appropriate weight thresholds of standard mobile phones, the OFF DESK responds to the placement of the smartphone in the Faraday cage and generates a discretionary sound from the speaker hidden under the tabletop and changes the lighting color of the Wi-Fi symbol from red to blue. This color calms, stimulates the work of the brain and increases concentration<sup>22</sup>. Therefore, it then sends a message to the user: “now you can focus your mind on absorbing knowledge and performing tasks”.

21 <http://blog.michalgosk.com/psychologia-kolorow-kolor-czerwony/>.

22 <http://blog.michalgosk.com/psychologia-kolorow-kolor-niebieski/>.

When the phone is taken out from the Faraday cage, the Wi-Fi symbol lights up again in red and the speaker generates another, now unpleasant, sound which acts as a warning to the child and informs the teacher that the student has taken the phone out from the dedicated place.

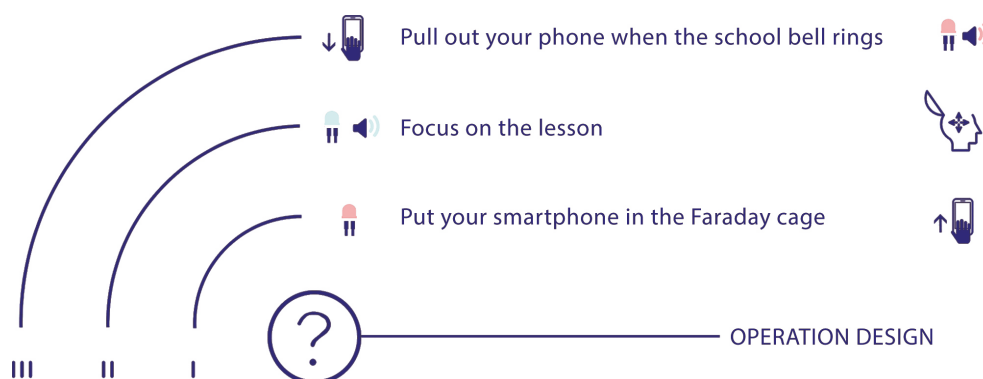


Figure 22. Desk operation design (design by the author)

The idea of using sound effects in the design is based on *sound studies*<sup>23</sup>. This science emphasizes importance of so-called sound landscapes operating in scientific disciplines as mental landscapes in which sound stimuli alongside visual ones play a very important role<sup>24</sup>. An important element of the sound landscape are sound events which can perform certain functions, emphasize context, arouse associations or emphasize symbolism. They can also be a sound signal that attracts special attention<sup>25</sup>. Since sound is one of the most intense stimuli and causes associations with visual memory, its reception is an essential component of emotional sensations and creates the atmosphere of a given place<sup>26</sup>. The sound effects used in the prototype are therefore intended to make children put their phones away while they are studying and working. The amassing of sounds from a dozen or so desks will not produce cacophony because the sounds are inspired by nature<sup>27</sup>. Taking into account the age of the users, they desks add a fun element to the interaction, arousing in children engagement and good and bad associations based on, for example, the chirping of “friendly” birds or the croaking of crows or ravens (as currently used in the prototype). The software aspect of the desk provides flexibility in the selection of sounds that can be changed depending on the season or the type of the class.

In addition, the prototype hardware allows easy introduction of various technical solutions. The OFF DESK can also be considered as a universal desk for use at home, in the after-school club or in other educational environments.

23 *Sound studies* – is a broad interdisciplinary field of sound science, which emerged in the early 21st century, based on Theodore Adorn’s thesis on “listening regression” and on evaluations of R. Murray Schafer’s changing acoustic environment (or sound landscape) (source: <https://www.oxfordmusiconline.com/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-1002258177>).

24 S. Bernat, *Kierunki kształtowania krajobrazów dźwiękowych*, [w:] *Dźwięk w krajobrazie jako przedmiot badań interdyscyplinarnych*, „Prace Komisji Krajobrazu Kulturowego”, t. 11, Lublin 2008, p.100, 102.

25 *Ibid.*, p. 104.

26 *Ibid.*, p. 102.

27 Cacophony is an unpleasant-sounding mix of sounds (source: <https://sjp.pwn.pl/sjp/kakofonia;2562525.html>).

## Conclusion

The content cited demonstrates that the problem of unreasonable use of mobile devices actually exists and poses a threat, especially to children who are exposed to the dangers of the digital world from an early age. A common negative implication of the smartphone use is the reduced learning and work efficiency, which affects all age groups. Given the high impact of the issue, children should be the target group for an action to combat the problem, which can be shaped to prevent problems in their later lives. To do this efficiently, rationalization is an appropriate step that raises awareness and develops responsible behaviors. This provides a spacious creative room for designers who, according to the idea of socially responsible design, have the opportunity to drive human attitudes and behaviors. The OFF DESK aims to combat the problem of the reduced efficiency caused by unreasonable use of mobile devices. By shaping children's good habits of putting down the smartphone for the duration of school and work, it builds awareness in them, which is a big step towards rationalizing the use of mobile phones. I trust the implementation of a school desk in this form would have long-term positive impact by alleviating the bad effects of the smartphone on people and by addressing the use of mobile devices in schools.

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Peer-reviewed article

Publisher: **The Academy of Fine Arts in Kraków,  
The Faculty of Interior Design**

Editors: **prof. dr hab. Beata Gibała-Kapecka, Joanna Łapińska, PhD**

Translation PL-EN: Ireneusz Sojka, MA

Graphic design: Joanna Łapińska

Title page photograph: Aleksandra Sitek

The „inAW Journal – Multidisciplinary Academic Magazine” was established owing to the financing from the project titled „Projektowanie przyszłości – program rozwoju Akademii im. Jana Matejki w Krakowie na lata 2008–2022”



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