

EXPLORING LEARNING OPPORTUNITIES THROUGH INNOVATIVE VISUAL AND TEXTUAL MODELS

chief assistant Dr. Teodora Pesheva

Department of Engineering Design, TU-Sofia

t.pesheva@tu-sofia.bg

Abstract: This report explores and presents innovative opportunities related to training and preparation methods. Due to the change in technology, young people are more and more visually satisfied. It is increasingly difficult to hold their attention and the learning material must be presented in an attractive and interesting way for them. The texts are increasingly demotivating for the youth and do not hold their attention for long. The learning material has to have less textual part or have components that motivate the absorption and reading of text. Infographics are a technique that is becoming increasingly popular in business, but is not yet widely used in education.

Keywords: education, methods, innovation, training, visualization

Резюме: В настоящият доклад се проучват и представят иновативни възможности свързани с методи на обучение и подготовка. Поради промяната в технологиите младите хора са все по-презадоволени визуално. Все по-трудно е да се задържи вниманието им и учебният материал, той трябва да се поднесе по атрактивен и интересен за тях начин. Текстовете са все по-демотивиращи за младежите и не задържат вниманието им за дълго. Учебният материал се налага да има по-малко текстова част или да има компоненти, които да мотивират усвояването и четенето на текст. Инфографиките са прием, които става все по-популярен в бизнеса, но все още не е широко използван в образованието.

Ключови думи: образование, методи, иновации, обучение, визуализация

Introduction

Digitalization is changing the world and the way information is perceived and synthesized. New generations encounter increasing difficulties in presenting information in analog or even textual form. Due to the dynamically developing performance and style of work when presenting information in social networks, where young people spend a huge part of their time, it leads to many changes in their way of perception, thinking and synthesis of information. This oversaturation of images, colors and movement of the image leads to different concentration times and other specifics in the psycho-somatic mental dynamics of individuals. With such a changing digital environment, it is expected that the future generations will quickly

lose total connection with the traditional (outdated) ways of teaching and generally presenting information by conventional means until the 21st century. The digital environment changes the way information is perceived and the impossibility of teaching learning material outside of a digital environment to achieve positive results. Excessive sitting in front of screens of the young generation leads to many negative effects such as obesity, problems with verbal communication, behavioral problems, problems with sleep and concentration, and brain fog. These are of course the negative aspects of new technologies, but they are also easily accessible and offer many conveniences that the educational system has been deprived of until now, such as the ability to access a vast resource of information at any time and from any place with access to internet. The purpose of the report is to present the positive opportunities for the implementation of technology in an adequate learning environment.

1 PART

What are the teaching techniques from the past and even to this day, which is characteristic of academia and beyond. We all use book media from school: textbooks, aids, notebooks and other types, let's call them, analog information carriers. In them, the information is structured and presented through text, images (illustrations, photos), drawings, diagrams, tables, etc. The assimilation of the knowledge presented in them occurs by reading the text, making sense of it, following the visual material for facilitation and illustration, and synthesis of the knowledge acquired through text and images is memorized. With the passage of time, more and more visual material is used, which helps the understanding of textual information. With the imposition of this trend, text begins to decrease due to the reason that people increasingly lose motivation to read and visualize an idea or object for themselves. The individual possibility of abstract thinking, fantasy and many other mental connections that occur when providing information in text form is also evident there. Another point is that each brain differently structures the elements of this information in terms of importance relative to the subjective characteristics of the individual. The presentation of information through text is much more labor-intensive in terms of intellectual time and other types of resources and processes. It is an approach to obtaining information that is nurtured and tested in learning through various tasks depending on the discipline and the nature of the field being studied. By providing the information through text, the imagination is also developed, something that is related to the characteristics of the personality and contacts the inner world of the individual. Accordingly, the creative potential of the individual develops and they are created prerequisites for creating new perspectives and visions of already established images and objects (fig.1)



Figure1 An example of a combination of text and book. <https://thamesandhudson.com/archaeology-9780500294246>

It can be noted as a negative aspect of the presentation of information through text that it requires more concentration, for a longer time, as well as significant differences between ideas and images that subjective associativeness can offer. Therefore, the textual presentation of information is a prerequisite for creative thinking and the cultivation of associative connections and abstract ideas. A problem with providing information through text is that when it comes to a specific object, each individual, through its description, builds their own version and idea of it. If someone reads a description of the Parthenon in Athens reading the given information, it is possible to create a close to the actual image, but given chats and details to diverge from reality. From this it is clear that according to the direction and purpose of the submitted work material, it would have a completely different manifestation and result depending on the way of submission. Then the methods by which creative expression of the individual is encouraged in the presentation of information in order to achieve maximum results in achieving a good result are different from the methodology and elements to be provided to provide and remember a given information that is related to specific object of study.

2 Part

Let's imagine that we get to the point where we start presenting information only through images, images and videos. Nowadays, among all the visual information and dynamic images coming from television, various platforms and social networks, the eye is transported by images. The trend that can be observed, for example, in social networks is that a platform such as Facebook (fig.2) is already more used by the older generation and lags behind among the young in the background of Instagram and Tok Tok. (fig3)



Figure 2 Facebook interface from computer. The sharing of text is equivalent to that of photographic material, depending on the user's desire. For this reason, it is possible to share long text posts on Facebook, which may be accompanied by a photo, but can be published independently, this feature is not built into the Instagram and Tik Tok platforms. (<https://localleader.com/marketing/building-organic-traffic-facebook-business-page/attachment/new-facebook-interface?noamp=mobile>)

What is the difference between them? Facebook is a combination of photos and text, where information is primarily supposed to be presented in the form of a text post or a combination of photos and text.

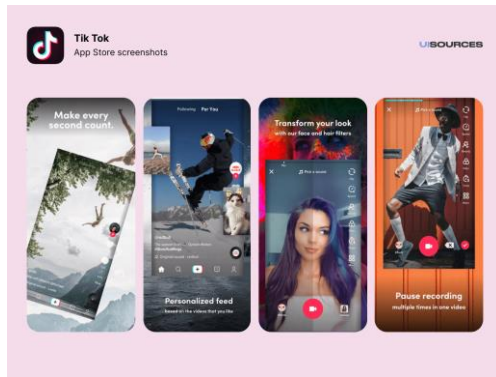


Figure 3 The Tik Tok interface is mostly for video content, there is minimal text, everything is very dynamic and overwhelming to the eye. (<https://www.uisources.com/explainer/tiktok-app-store-screenshots>)

For the generations that are still used to expressing themselves through text and are used to reading. INSTAGRAM (fig.4) is a platform where the visual "subculture" is based, manifested at first mainly through photos and whose development relies more and more on videos. Image is no longer enough, dynamism is required from it.

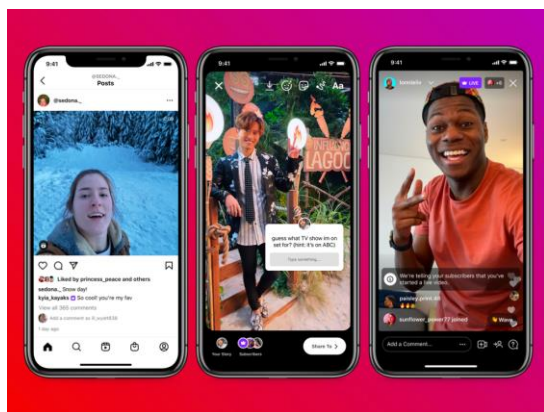


Figure.4 The Instagram interface provides the opportunity to upload photos, videos, but also to share text, which on the home page requires an additional click to read. (<https://www.shoot.be/nieuws/192340/instagram-voert-tests-uit-met-betalende-abonnementen/>)

The fast scrolling the screen allows the eye and the brain to jump from post to post, attention rarely lingers on any post for more than a few seconds. Society, in addition to being consumerist on a material level, is also becoming consumerist on a visual level, an oversaturation of visions. Tik Tok is the final phase of this metamorphosis, where everything is visual, similar to a digital reality in which one can have constant access. Naturally, each of these platforms can also be used with meaningful activity. The focus here is that learners who are of the generation of users of these digital entertainments are oversaturated and their attention is difficult to hold on a certain topic, task, object. These characteristics of being naturally also affect the intellectual potential and learning capacity of the learners. For a long time, the mass resource for students' knowledge has not been libraries, but mostly Internet search engines. For big unfortunately, finding reliable information is not the goal of education in educational institutions to date, and not oriented in the areas in which they seek information, learners often come across false or misleading information. Another problem is that due to the nature of quick searches for information and especially with images, they are often disregarded in texts for it and because the search engine presents it as a related object due to the algorithm, they assume that it is credible information and often make gross mistakes. Such an example is if we look

for examples of ancient art in the Google search engine. Then, in addition to those that are actually such, quite a few Renaissance works can also be found, simply because the publication mentions the influence and generally the connection between the two eras. Naturally, it is rare for the learner to pick up on the primary image source, and so blunders do occur. This is not about denouncing the image as a bad opportunity to provide information, on the contrary. Images are a great way to visualize an existing object, explain it and compare it. It is a conventional language such as pictograms, different types of diagrams and infographics. With them, everyone, regardless of the language they speak, receives the same information. The structuring of information and its visual representation is an action that is spared for the brain. The image carrying certain information is ready knowledge. This is probably the future of learning and the way to keep attention in the learning process. Interactive whiteboards have long been part of school classroom inventory. This also presupposes the adaptation of textbooks as content to be digitized and simplified so that this new digital generation can recognize learning as part of their world.

Conclusion

The considered ways of presenting information have their characteristic of individuals according to their era. An important point in the presentation of educational material is to use the correct elements in relation to the task that has been assigned. Each of the components and learning opportunities can be optimized for the results they deliver. The images should be used to provide specific information, to be processed and synthesized, to create prerequisites for comparison with similar objects, so that their characteristics and specifics can be remembered more easily. The construction of info graphics to present the most characteristic features of objects and their functional combination with text and creative tasks. Creativity, which manifests itself through the submission of an idea and an association, where the text is an invariable part of the provocation of this process, primarily aimed at practical tasks. (fig.5) Thus, an interaction of text and image can be observed. In training, which aims to present a specific object by focusing on a visual presentation and subsequently the learners to present the acquired knowledge in writing and the reverse process in which through a text the learner presents an idea and information that he can present through the prism of his capabilities in an image, diagram or other type of visual material.



Figure 5. Infographics are a convenient way to systematize and bring hierarchy to information to be visualized and simplified. <https://penji.co/what-is-an-infographic/>

In the future, with the development of technology, it will probably be possible to teach through sensory holograms that can be moved and learners can create their own ideas through movement. That day is probably not far off, but hopefully these generations don't lose their desire to live in the real world, the feeling of writing your thoughts with your own hands. The paradox of the ages is a discipline studied in the last century. Cursive, now everyone can choose a font to write in, but that doesn't show their individuality. Dexterity and fine motor skills are greatly threatened in this world of keyboards and touch screens, and some of the most beautiful creations of human civilization are born of imagination and mastery of dexterity, may we preserve our worth as a civilization and find the right way and measure for the sake of future generations.

BIBLIOGRAPHY

Schwab, K. (2017), *The Fourth Industrial Revolution* ISBN 978-1524758868

Schwab K., *The Global Competitiveness Report 2019*, World Economic Forum, Insight Report, ISBN-13: 978-2-940631-02-5, https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.

Sharp, Helen (2019) *Interaction Design: beyond human-computer interaction*", 5th edition. John Wiley & Sons, Inc., Indianapolis, Indiana.

Sriraman, B. (2004). The characteristics of mathematical creativity. *The International Journal on Mathematics Education [ZDM]*, 41, 13-27.

Shnurenko I, Murovana T. Kushchu I. (2020), *Artificial Intelligence, Media and Information Literacy, Human Rights and Freedom of Expression*, UNESCO IITE, TheNextMinds Publications, ISBN: 978-1-912037-64-3

SoFFel, J. (2016). What are the 21st century skills every student needs? Accessed From <https://www.weforum.org/agenda/2016/03/21st-century-skills-future-jobs-students/>

Stefanov S., Terziev V., Banabakova V., (2018) *THE UNDERTSANDING OF SECURITY IN THE POSTMODERN SOCIETY*, Proceedings of ADVED 2018- 4th International Conference on Advances in Education and Social Sciences, 15-17 October 2018- Istanbul, Turkey

Supsakova S., (2020) *Visual Literacy for the 21st Century: The Required Ability to Understand the Power of Modern Images*, ISBN: 978-989-54815-2-1

Uzpen B, Houseal A K, Slater T F and NuhPer E B, (2019) Scientific and quantitative literacy: a comparative study between STEM and non-STEM undergraduates taking physics, European Journal of Physics, Volume 40, Number 3, Eur. J. Phys. 40 035701, DOI 10.1088/1361-6404/ab07d4

IMAGES

(1 fig) <https://thamesandhudson.com/archaeology-9780500294246> visit on 23.05.2024)

(fig.2) <https://localleader.com/marketing/building-organic-traffic-facebook-business-page/attachment/new-facebook-interface?noamp=mobile> visit on 23.05.2024)

(fig.3) <https://www.uisources.com/explainer/tiktok-app-store-screenshots> visit on 23.05.2024)

(fig.4) <https://www.shoot.be/nieuws/192340/instagram-voert-tests-uit-met-betalende-abonnementen/> visit on 23.05.2024)

(fig.5) <https://penji.co/what-is-an-infographic/> visit on 23.05.2024)

Автобиография

Теодора Пектова Пешева е родена в гр. София. Завършва класическо художествено образование в НУИИ акад. Илия Петров и НХА със специалност графика, както и педагогическо образование. Завършва магистърска степен в НХА специалност Графика и в НБУ специалност Пространствен дизайн. Участва в множество изложби, пленери и конкурси, в страната и чужбина. От 2014 г е преподавател в катедра Инженерен дизайн в ТУ-София.