

“DESKTOP ADVENTURE”: A TOOL FOR THE DEVELOPMENT OF DIGITAL COMPETENCIES IN STUDENTS WITH AUTISM SPECTRUM DISORDER

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Abstract

In this chapter the process of ideation and development of the serious game “Desktop Adventure” is presented. Desktop Adventure is a point-and-click game to develop digital competencies in youth with autism spectrum disorder (ASD). Our conceptualization of digital competencies emphasizes the development of critical thinking in “children’s digital interactions” as well the empowerment of their creative expression. Children and youth are diverse, and while this gamified app was developed for the specificities of teachers and their ASD students, Desktop Adventure aims to contribute to Educational Open resources that can be used with all children and by children themselves.

Keywords: Children; Youth and Media; Educational Game; Autism Spectrum Disorder; Digital Competencies.

Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) represents a disorder in human development with an impact on social interaction, verbal and non-verbal communication and symbolic play (Monteiro, Pimenta, Pereira, & Roesler, 2017). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (APA, 2014) describes three levels of ASD with different support needs (Level 1 – Support; Level 2 – Substantial support; Level 3 – Very substantial support) in terms of social communication and restricted and repetitive behaviours.

The General Directorate of Education and Science Statistics (DGEEC) estimates that in Portugal between the academic years 2016/2017 and 2017/2018, the number of students with ASD attending Structured Teaching Units increased 9%, mostly in basic education.

What is “Desktop Adventure”?

“Desktop Adventure” is a serious digital game app, developed under the ASDigital Project (2020-1-PT01-KA226-SCH-094961) aimed to develop “digital” competencies for verbal autism spectrum disorder (ASD) students at secondary school. While some authors use digital competencies with the same meaning as media literacy competence, the last one could be a better conceptualization for citizens since the focus is on being able to access, read, write, and critically engage with digital media environments. “Desktop adventure” was developed for PC, Windows 10.

Digital competencies as part of media literacy competence

Frau-Meigs (2014) states that core media literacy skills include operational skills (including coding and computing), editorial skills (including multimedia writing-reading-producing and mixing), and organisational skills (including navigating, sorting, filtering, evaluating) that are central to media education in a digital age. Beyond its importance as an individual skill, media literacy opens up a social and cultural dialogue that emphasises its plurality. People don’t create meanings individually but as members of “interpretive communities” (Livingstone, Wijnen, Papaioannou, Costa, & Grandio, 2013) where literacy practices evolve. Using the Internet has become part of the daily habits of a constantly growing number of people, and this process has evolved to become a bidirectional exchange of information where the audiences are able to be consumers and producers

of information. This trend started with the appearance of the first blogs, evolved with the paradigm of virtual reality, and has reached its current maturity with the generalisation of social networks. But as the opportunities for publishing, one's thoughts, pictures, videos and whereabouts grow, the need for having these pieces of information associated with our own selves creates the need for providing information about our identity, so that one can be recognized and remembered, and our contribution does not remain anonymous. This, of course, raises the issue of managing identities, and since it takes place in a digital world, we may refer to it as the issue of Digital Identity Management (Costa et al., 2017; see Figure 1).

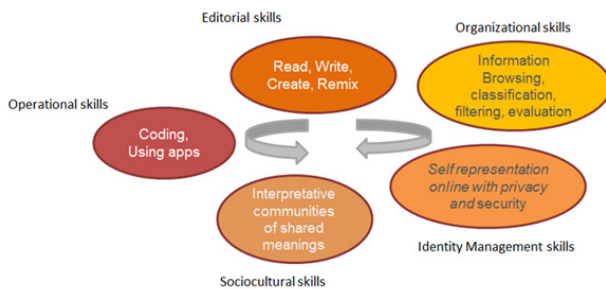


Figure 1 - Scheme of a theoretical framework for media literacy skills (Costa et al., 2017; Frau-Meigs, 2014; Livingstone, Wijnen, Papaioannou, Costa, & Grandio, 2013)

The Desktop Adventure in Practice

High Concept

Desktop Adventure is a point-and-click educational game. The game takes place in a simulated desktop environment.

The player controls a character that is careless with their digital identity and general security. There is a deadline for a school assignment. The moment the player logs into the computer he/she notices something is wrong. A friend hacked the computer and hidden his/her assignment documents, so he/she needs to unravel the puzzle.

Learning Statement

Players will feel safer, empowered, and more knowledgeable about the dangers of the bad management of their computer and digital identity. The player will learn how to create a strong password and what are the consequences of a weak one, how to use email and attach files, how to recover files from recycle bin, and how to connect to WIFI. Additionally, the

player could express/represent him-herself through drawing. Using the file explorer, changing passwords, themes, and other basic computer settings.

Learning Outcomes

- Create digital content safely.
- Identify and validate risky and unsafe situations and behaviours.
- Analyse online communications and what consequences a seemingly innocent situation can quickly go downhill.
- Apply skills to generate and manage digital content safely.
- Understand how to properly access and understand fully digital content.

Learning Content

- To send messages safely.
- To create strong passwords.
- To recognize the importance of strong passwords in security and safety
- Managing personal information.
- To recognize possible threats and know what to do in that situation.
- To creatively express oneself online.

Desktop Adventure Step by Step

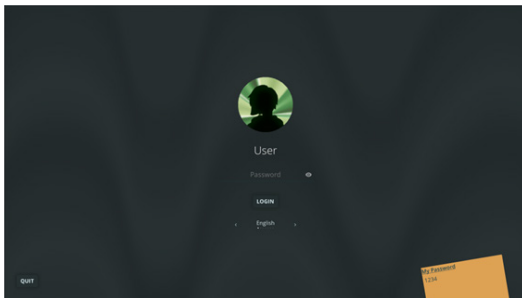


Figure 2 - User interface for “Login screen”



Figure 3 - After Login: Home of Desktop Adventure

Closing the active Window is the only possible move. A chat with “best friend” starts in order the player could change the password to a strong one, as to customise his/her avatar and background.



Figure 4 - Chat screen. The dialogue continues to introduce “homework recovery”

Step-by-step instructions are made available (see Figure 5).



Figure 5 - Chat screen. The dialogue introduces the “tasks note”

Now “settings” are available, such as in a usual app or desktop. Clicking on the file “tasks note” the player will see them on the desktop.

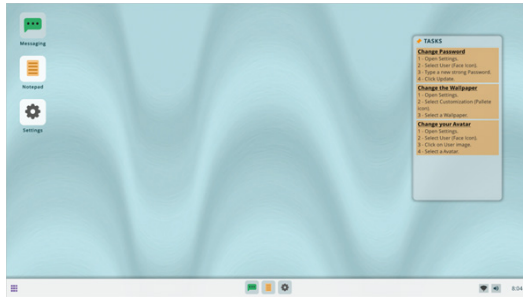


Figure 6 - Tasks to be done to customise the app and create a strong password



Figure 7 - Reset password

In “Reset password” the strength of it is indicated with red sentences that change to green every time a rule for a strong password is accomplished.

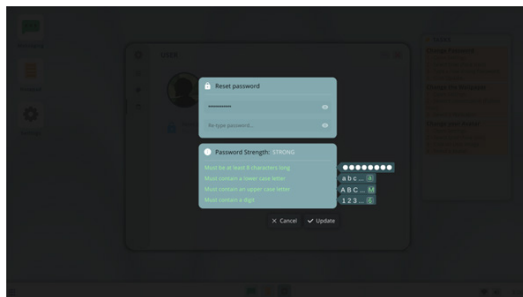


Figure 8 - Feedback for a strong password

The player needs to confirm by clicking on the “update” button. Next time the player enters the app the new password should be provided.

After the three tasks are completed, the chat appears with a positive message “nice job” and presenting a new challenge: “Internet connection is lost. Please reconnect” (Figure 9).

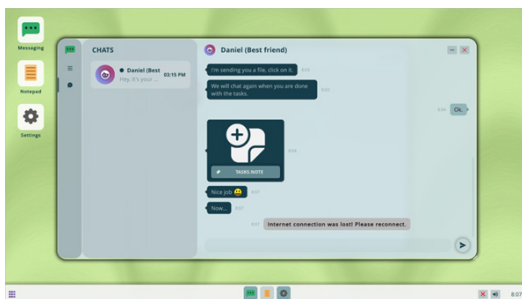


Figure 9 - The icon of Wi-Fi on the right of the bottom bar indicates the internet is off

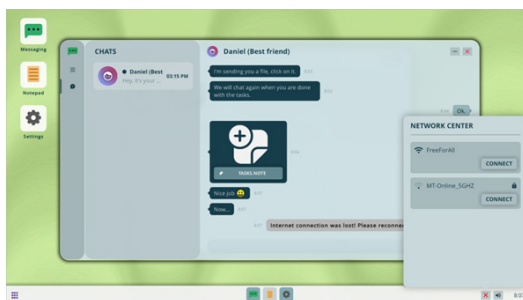


Figure 10 - Clicking on Wi-Fi button opens up two available networks

If the “MT-Online_5GHZ” is selected a password is required (and not available) therefore the only option to reconnect is to select the “FreeForAll”. The player realises he/she is online again to the next challenges since positive feedback is provided on the chat. The conversation changes to the “Art teacher’s email”, which is about a new assignment.

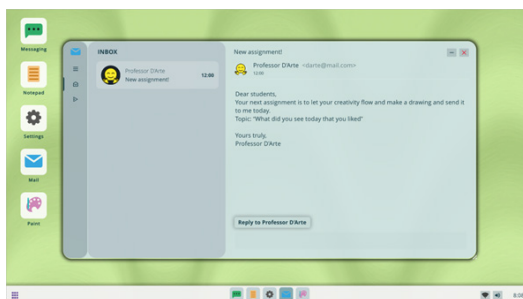


Figure 11 - Using email with an attachment

The email from the teacher is formal and it can be explored in training about “how to write an email” (see module XPTO). Selecting the button “reply to Professor D’Arte” a proper response from the student appears and the button “Make a drawing” opens the paint application where students

can freely express themselves (figure 12).



Figure 12 - Using paint

Following the player workflow there is the possibility to “attach” the draw to the email for the teacher, to save the draw, or to create a new draw.

The next challenge is to recover the homework from “trash” and when it is done the games Tetris and Pacman appear on the desktop and open on the respective websites. The respective websites were carefully chosen but advertisements could appear, and such is the real web. Therefore, there is an opportunity here for professionals to discuss with children what to do, how to avoid it, and how to ignore and close it. Moreover, the concept of “free internet” could be explained as being not so free with ads or our data as forms of payment.

Concluding remarks

Desktop Adventure can be used by children at home or at school, with or without the presence of their teachers or families. If you are a professional working with children who have ASD, kindly assist the access and use of desktop adventure by using any necessary alternate communication methods. Students from our partners in Poland and Turkey reviewed the “desktop adventure” before the current release, and the findings helped to improve it.

It is necessary to have prior experience with starting up a computer and using an app, to operate the “Desktop Adventure”.

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Software Availability Statement

“Desktop Adventure” is an open access, multi-language, digital game, available for download at: <https://cicant.itch.io/asdigital-desktop-adventure>.

References

- American Psychiatric Association (2014). Manual de Diagnóstico e Estatística das Perturbações Mentais. DSM-5™. Climepsi.
- Costa, C., Sousa, C., Rogado, J., & Henriques, S. (2017). Playing Digital Security: Youth Voices on their Digital Rights. *International Journal of Game-Based Learning*, 7(3), 11–25. <https://doi.org/10.4018/IJGBL.2017070102>
- Costa, C., Tyner, K., & Sousa, C. (2019). Evaluation of the Effectiveness of Game Creation by Youth for Media and Information Literacy. In M. Farber (Ed.), *Global Perspectives on Gameful and Playful Teaching and Learning* (pp. 193–210). IGI Global. <https://doi.org/10.4018/978-1-7998-2015-4.ch009>
- Frau-Meigs, D. (2014). *Media and Information Literacy (MIL): how can MIL harness the affordances of digital information cultures post-2015?* WSIS Action Line C9 report on Media and Information Literacy.
- Livingstone, S., Wijnen, W., Papaioannou, T., Costa, C., & Grandio, M. (2013). Situating media literacy in the changing media ecology: critical insights from European research on audiences. In: N. Carpentier, K. Shroeder, & H. Hallet (Eds.). *Audience Transformations: Shifting Audience Positions in Late Modernity*. Routledge.
- Monteiro, A. F., Pimenta, R. de A., Pereira, S. M., & Roesler, H. (2017). Considerações sobre Critérios Diagnósticos de Transtorno do Espectro Autista, e suas Implicações no Campo Científico. *DO CORPO: Ciências e Artes*, 7(1), 87–97. <http://ucs.br/etc/revistas/index.php/docorpo/article/view/5956/3198>