Proceedings of the 8th World Conference on Media and Mass Communication, Vol. 7, Issue. 1, 2023, pp. 20-38

ISSN 2424-6778 online
DOI: https://doi.org/10.17501/24246778.2023.7102

DEVELOPING CUSTOMISED COMPUTER SCIENCE COURSES FOR NON-MAJOR STUDENTS IN INFORMATICS, COMPUTER SCIENCE, OR MEDIA: A CASE STUDY ON HEALTH PSYCHOLOGISTS

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Abstract: Learning how to effectively communicate in our media-centered digital world is crucial for all professionals. However, it holds even greater importance for health professionals, given their primary objective of improving people's health. Therefore, it is imperative to dedicate significant effort to designing Computer Science (CS) courses that cater to the specific needs of these professionals, equipping them with the skills and capabilities of modern digital communication. Developing CS courses specifically tailored for non-CS majors is particularly significant, as it reduces the likelihood of failure. In this study, I aim to outline the process of identifying relevant directions and tools, and designing a comprehensive course plan that enables professionals to acquire the necessary CS skills. By pinpointing topics that are directly applicable to their future professions, the course will teach professionals how to effectively utilize and design digital systems. To conduct this research, the doctoral degree course "Informatics for the Psychology of Health" at the University of Cagliari has been selected as a case study. Using qualitative methods, I assessed the satisfaction levels and perceived usefulness of the course among students. Through this investigation, numerous valuable directions were identified, along with a concise collection of free and open-source tools that will provide students with the knowledge they require to independently create and design digital interactive media. By adopting this approach, courses tailored to professionals can be designed, effectively reducing high dropout and failure rates.

Keywords: Psychology of Health, Digital Authoring Tools, Computer Science Education, Computer Science in Context

Introduction

In today's digital world, communication is evolving rapidly, with various platforms and media being used for transmitting information. The field of Computer Science (CS) has seen significant advancements in recent decades, making it crucial for professionals to acquire the necessary skills to navigate this rapidly evolving landscape (OECD, 2016, European Commission, 2019, Kee *et al.* 2023). However, generic CS courses may not adequately address the specific needs of professionals (Gudzial

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and Forte, 2005, Kurkovsky, 2007). Therefore, it is imperative to dedicate significant effort to design CS courses tailored to their specific requirements, empowering them with the skills and capabilities of modern-era scribes.

In this study we investigated on the needs of the students of the Psychology of Health doctoral course at the University of Cagliari. The majority of these students are professionals already working in the field of Health Psychology. While they have a clear understanding of their objectives, they lack expertise in CS and are unsure which digital tools they should learn to fulfill their needs.

Effective communication plays a critical role in the healthcare sector, where even a slight miscommunication can have significant consequences (Campbell *et al*. 2018, Tiwary *et al*. 2019). The digital revolution has transformed the way we communicate, and health professionals must adapt to these changes to provide better care to their patients. They need to effectively utilize various platforms, including social media, email, messaging applications, and telemedicine. Furthermore, thanks to the availability of user-friendly tools over the past few years, Health Psychologists are enabled to learn how to create their own websites, interactive media, and mobile apps, which can enhance patient care, improve the patient experience, and increase patient engagement.

These new tools empower health professionals to create simple apps or platforms tailored to their patients' needs. For instance, mobile apps for electronic health records (EHRs) have become indispensable in healthcare, facilitating the storage and access of patient data. Health professionals can develop simple mobile apps for EHRs to enhance patient care, ensure accurate documentation of patient records, and easily manage patient data.

In this context, computer science courses can play a significant role in equipping health professionals with the necessary skills to effectively communicate and leverage digital tools. These courses must be tailored to their specific needs, focusing on the digital tools and platforms most relevant to their field. Topics covered in such courses could include creating multimedia interactive content to educate on health-related issues, developing websites to share information and keep interested individuals updated, and building mobile apps to enable patients to collect and share health-related data.

To be effective, these courses must be accessible and engaging for health professionals who may not have a background in computer science. They should be interactive, practical, and provide relevant examples applicable to their daily work. Additionally, the courses should be offered in a flexible format to accommodate their busy schedules.

This research aims to address the following research questions:

> *Q1: Can tailoring the content of a CS course for professionals, who are not computer science majors, increase the satisfaction level among course participants?*
>
> *Q2: Is tailoring the content of a CS course for professionals, who are not computer science majors, an effective strategy to enhance the perceived usefulness of the course topics for the participants?*

The hypothesis is that involving students in customizing their course topics will likely result in a higher appreciation of the course content and greater engagement.

For this study we devised a three-phase investigation based on the following moment:

- *Pre-course discussion*: a forum on the course's online platform was utilized to facilitate a pre-course discussion among all interested students. The focus was on identifying the professional needs of health psychologists
- *Pre-final lesson survey*: after four out of the five planned lectures, a survey was conducted to gather students' opinions and provide them with more detailed information about the tools and topics they found most interesting
- *Post-course survey*: a final investigation was conducted through a post-course survey to assess the outcomes of the course and address research questions Q1 and Q2 regarding satisfaction and perceived usefulness. As the course did not include a final exam, the results relied on qualitative analysis.

The conclusions drawn from this research will be applicable in designing customized CS courses for professionals across various fields, aiming to increase student satisfaction and perceived usefulness of the course content.

Theoretical framework

Historically, computer science courses have been perceived as challenging by students, and efforts to make the subject more attractive have been underway for at least two decades. Researchers have noted a significant decline in computer science enrollments, reaching a staggering 70% decrease by 2007 (Lenox *et al.* 2008, Ali and Shubra, 2010). Extensive research has been conducted to investigate general principles for designing courses that meet students' needs (Athanases, 1993, Halewijn *et al.* 2007,

Hekmatshoar-Tabari and Rahimy, 2021, Zarrouk *et al*. 2022, Brouwer *et al*. 2022). While there have been studies on designing and redesigning computer science courses to appeal to students pursuing CS degrees (Ali and Shubra, 2010, McGee, 2017) or non-CS majors (Guzdial and Forte, 2005, Kurkovsky, 2007, Dawson *et al*. 2018, Mitchell *et al*. 2020), as well as students in specific majors such as Mathematics (Friend *et al*. 2023), limited research has focused on making computer science accessible to professionals and tailoring courses to their specific needs.

Considering computer science as the metaphorical "pencil" of the 21st century (Papert, 1980, Burke, 2012), computational thinking and computer science courses are crucial at all levels and in all fields of education (Wing, 2006, Van Laar *et al*. 2017, Koyuncu and Koyuncu, 2019). Since computer science serves as a tool for many students, course designers must adapt the content to those who need to learn "how to write." Continuing with the metaphor, students may be interested in "grammar" (IT courses), "creative writing" (video games), or "scientific writing" (educational and informational products). Thus, considering computer science not only as a scientific discipline but also as a vital instrument, when catering to university students in specific majors, researchers in specific fields, or professionals from diverse backgrounds, it is essential to put a strong emphasis on tailoring course topics to align closely with the students' genuine interests.

Computer Science courses tailored to the needs of professionals

As technology continues to advance, digital literacy has become increasingly important for professionals, even those who are not majoring in Computer Science or working in the ICT field (Cordella *et al*. 2022). However, when offering computer science courses to non-CS majoring students, the focus should not be on learning specific programming languages like MatLab or Python[1] or delving into the inner workings of computers. Instead, the emphasis should be on providing a quick and easy way for students to learn how to use and design digital systems within a relevant context, integrating them into an ecosystem that supports their future professions (Guzdial, 2005, Gudzial, 2013). The duration of the course also plays a significant role in determining its scope. Typically, non-majoring CS courses span approximately 40 hours (Dawson, 2018), which is about one-third of a regular university course. In the case of the "Computer Science for Health" course in the Doctoral degree in Psychology of Health at the University of Cagliari, the available time was even shorter.

The underlying logic of these new CS courses should be to learn the fundamental principles that make digital tools function, irrespective of the specific programming language or software used. It is essential then to grasp the logic behind computer programming in order to create interactive media that can assist

[1]https://engineering.tufts.edu/cs/current-students/courses-and-registration/computer-science-courses-non-majors

professionals in achieving their goals. By understanding the logic of programming, professionals can develop digital systems that are tailored to their needs, enhancing efficiency and effectiveness in their respective fields.

The CS course is designed to engage students through a quick and easy approach, incorporating practical examples that are relevant to their future profession. It is an interactive and hands-on course that provides the opportunity to create user-friendly, visually appealing, and easily navigable digital systems aligned with their professional goals. Additionally, the course is designed to be accessible and engaging for students regardless of their background or previous experience with computer programming.

By understanding the design principles underlying digital systems, students can create interactive media that not only serve their intended functions but are also aesthetically pleasing and engaging for their target audience.

The initial step in designing such a course is to engage with professionals who are interested, understand their needs, and then plan the course program accordingly.

What is Computer Science, and what is not

Prior to initiating the discussion with the students, it is essential to clarify that the objective of the degree program designers was to provide students with knowledge about the fundamental principles of computer science, namely computation and computational thinking, rather than specialized knowledge about a specific set of digital tools. This distinction is significant because it distinguishes between the need to learn how to use a particular set of tools and the ability to create one's own set of tools (Rouvrais and Kanellos, 2011).

Analyzing the needs of professionals

The course for which this customized Computer Science course was developed was a 15-hour course within the Doctoral degree program in Psychology of Health. The course consisted of five lectures, each lasting three hours.

It was delivered in the second year, providing an opportunity for initial interaction with the 20 professionals in the field of Health Psychology who were enrolled in the course. During this interaction, their professional needs, background knowledge in Computer Science, digital skills, and desired outcomes were assessed. As the Computer Science for Health course did not include a final exam, it was crucial to gather feedback from the students throughout the course to evaluate its effectiveness in meeting their professional needs. If necessary, the course could be updated or refocused based on this

feedback. A survey was scheduled to be conducted before the fifth and final lecture. A compelling aspect of the course was that despite the limited number of hours available, the final examination for the Doctoral degree in Psychology of Health required the creation and discussion of a multimedia product. Consequently, all the students expressed a genuine interest in learning new approaches to creating engaging and useful multimedia products.

Pre-Course discussion

Considering the importance of creating a multimedia product for their final exam as Health Psychologists and recognizing the significance of animation in digital media (Heo and Sundar, 2000, Sundar and Kalyanaraman, 2004), the students focused their discussion on five main topics. These topics included:

- Creation of educational apps
- Creation of apps for portable devices
- Creation of web sites / blogs
- Creation of educational videogames
- Creation and editing of videos

However, after further deliberation, the topic of creating and editing videos was eliminated as it was decided that each course topic should provide students with foundational knowledge of computational concepts in computer science (McClelland and Grata, 2018, Currant *et al*. 2019), rather than focusing solely on specific digital authoring tools (Rouvrais and Kanellos, 2011).

The remaining four topics were tailored to the interests and goals of a Health Psychologist, whose primary objective is to promote healthy behaviors at both the individual and population levels while preventing health problems (Bayazi and Delshad Noghabi, 2017). These topics were further developed as follows:

- *Communicating about health*: This encompassed the creation of educational apps, websites, educational videogames, and mobile apps that effectively communicate information related to health.
- *Events about health*: This involved the development of websites and News apps that could engage individuals and generate interest in events aimed at improving health
- *Collecting data about health*: This focused on the creation of mobile apps that would enable Health Psychologists to collect relevant data regarding their patients' health.

Considering the varying computational skills of the participants, with some having no prior knowledge of computer programming, the decision was made to utilize the simplest available free tools to achieve

the aforementioned goals. However, additional in-depth information was provided to those students who already possessed a strong technical background.

Although a significant portion of the class participated in the pre-course discussion, not all students expressed their opinions or interests during this phase. By the end of the discussion, it was noted that approximately 15% of the students had not taken part in this initial stage.

Selecting easy-to-use tools to make Health Psychologists able to communicate in the digital world

Given the need to make even students that had no previous knowledge of computer programming able to create digital apps, mobile apps, and websites, several tools were selected that either didn't require any programming knowledge or that -even being based on computer programming- were studied for people that had no previous knowledge of computer programming. The selected tools are as follows:

- *Scratch* (http://scratch.mit.edu): Scratch is a simple and free online programming tool that utilizes a visual "building blocks" metaphor for creating interactive media. It provides an intuitive interface where users can drag and snap together colored blocks to build their projects. Scratch also offers a vast library of over a hundred million freely downloadable or remixable projects, allowing users to learn from and be inspired by their peers (https://scratch.mit.edu/statistics/)

- *App Inventor* (http://appinventor.mit.edu): App Inventor is a more advanced free online programming tool that also adopts the building blocks metaphor. It enables users to create mobile apps without requiring prior programming knowledge. App Inventor offers a range of features and functionalities that can be easily combined to design and develop mobile applications.

- *Wordpress* (http://wordpress.com): Wordpress is a simple and free online platform that allows users to create websites and blogs without the need for web programming knowledge. It provides a user-friendly interface with pre-designed templates and customizable options, making it accessible for individuals to create their own websites and publish content.

- These selected tools aim to empower individuals, including Health Psychologists, to create digital media and applications without the barrier of complex programming languages or technical skills. The emphasis is on providing intuitive interfaces and resources that facilitate the learning process and encourage creativity and innovation in the digital realm.

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emphasis is on providing intuitive interfaces and resources that facilitate the learning process and encourage creativity and innovation in the digital realm.

Scratch has a very simple interface (Figure 1), with no hidden elements, allowing even very young students to create interactive media by dragging and snapping together colored blocks. In order to learn from "peers", Scratch makes available to its users more than a hundred million projects freely downloadable or remixable (https://scratch.mit.edu/statistics/).

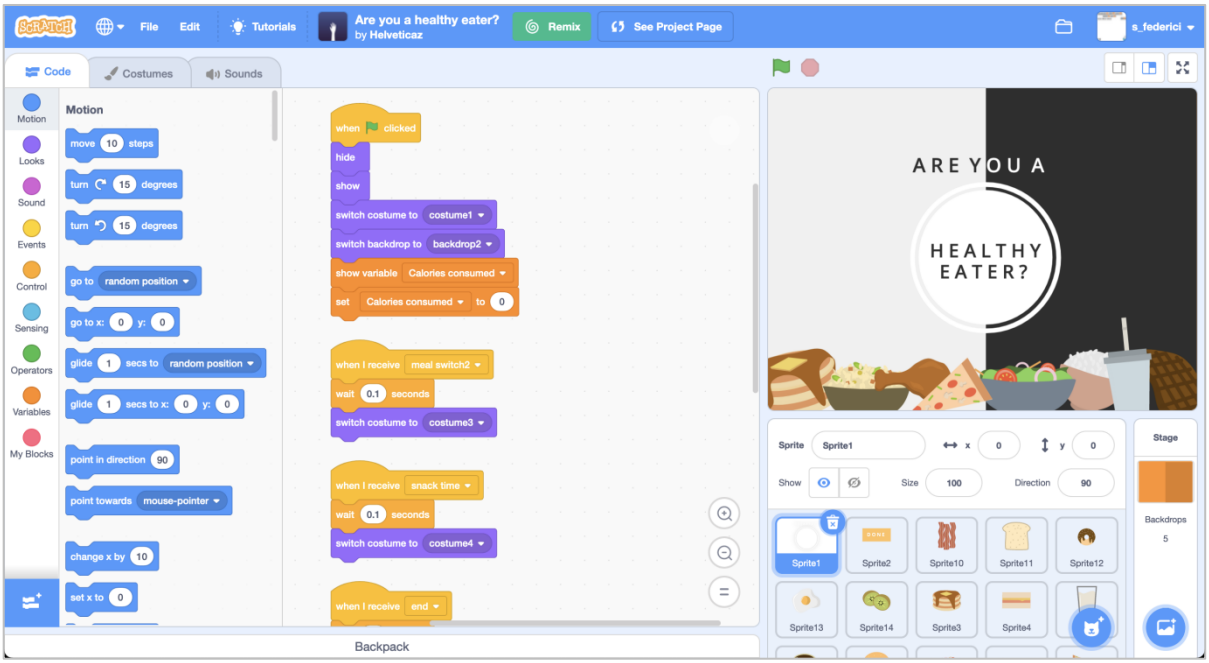


Figure 1: Scratch 3.0 interface. All elements are clearly visible. Users drag colored "blocks" (that is, programming instructions) from the left column and assemble them in the central area to create "scripts" (that is, algorithms). In the right column, users design their apps' look by organizing on the "Stage" area (top part) graphical elements called "sprites". All sprites are clearly listed in the area below the Stage.

App Inventor utilizes the same mechanisms as Scratch but separates the design area (Figure 2) from the script area (Figure 3), where programming blocks are assembled. This separation is due to the increased complexity of App Inventor compared to Scratch. Notably, App Inventor has the capability to store and share data collected by users, which is an interesting feature for the course students.

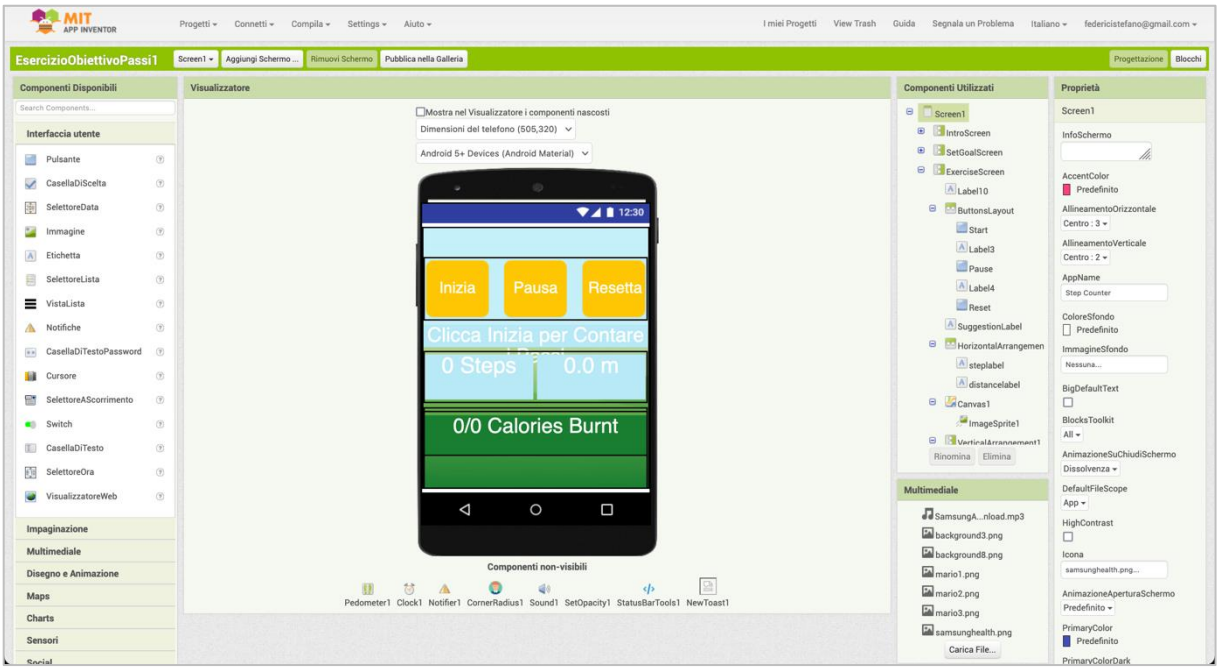


Figure 2: App Inventor 2, design interface. All elements are clearly visible. Users can select various components such as buttons, labels, lists, images, videos, and more from the left column. They can then assemble these components into the central area by creating one or more screens. In the right column, users have the ability to refine the appearance of their app by customizing the properties of the components. All the components are listed clearly in the right column for easy access and management.

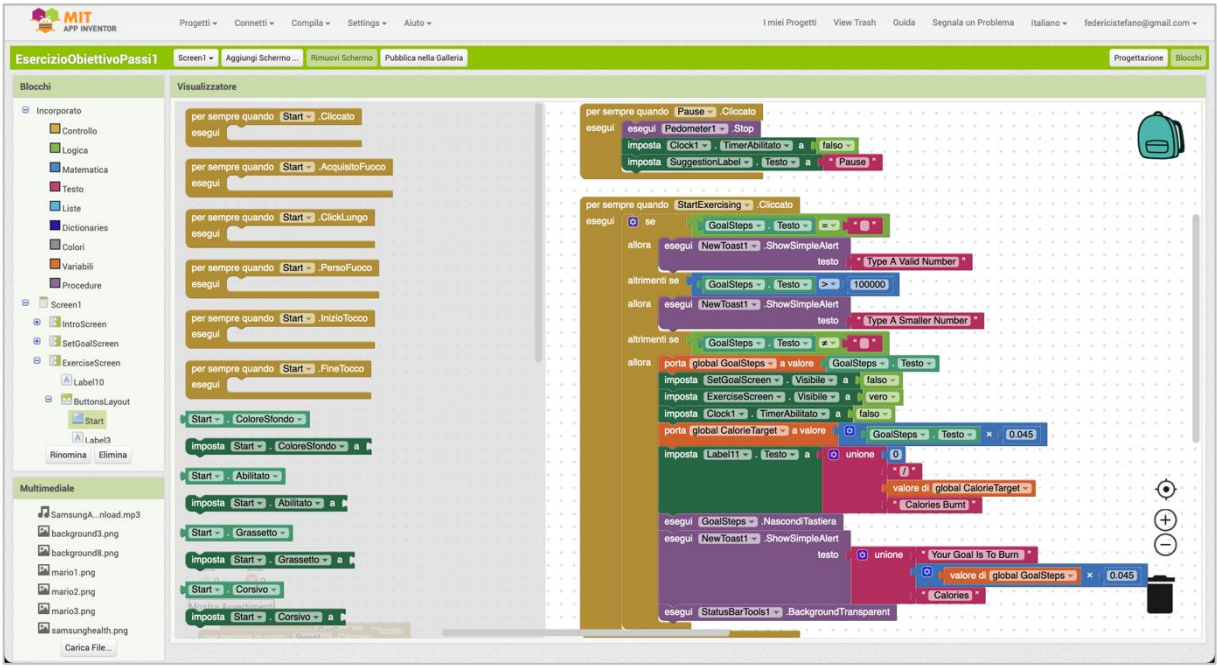


Figure 3: App Inventor 2, programming interface. Specific blocks corresponding to each component are listed in the right column of the interface. These blocks can be assembled by simply dragging and dropping them into the appropriate area to create the desired functionality for the app. This intuitive process allows users to easily combine different blocks and customize the behavior of their app without the need for complex programming knowledge.

Finally, Wordpress (Figure 3) is a user-friendly platform that offers powerful features and can be easily expanded by adding plugins (https://wordpress.org/plugins/). While Wordpress provides basic but robust functionalities, it also allows users to enhance their websites by incorporating additional

modules. This flexibility enables students to learn essential concepts such as front-end development (what the website users see) and back-end management (the content administration of the website), which are fundamental in any Content Management System (CMS) tool, including Wordpress.

Figure 3: A simple Wordpress website with a main image, a title, a menu, and several news

A new curriculum to learn how to create interactive media and how to make them available online

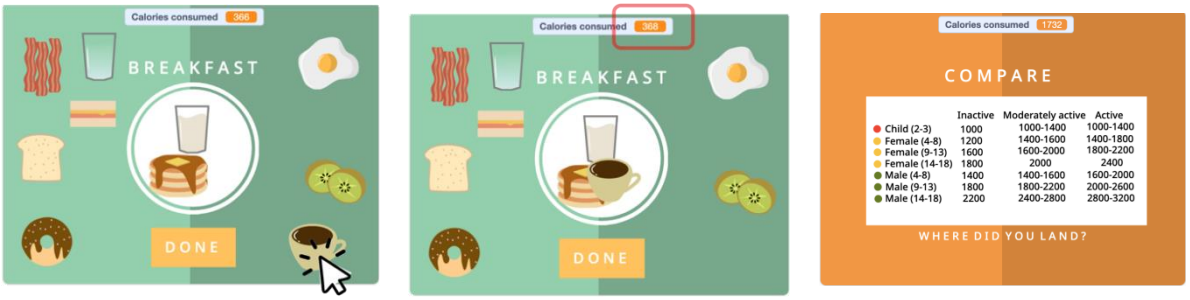
Even though the course had a limited number of hours, the approach adopted was practical to ensure that even participants with minimal technical knowledge could follow along. Step-by-step explanations allowed them to build various multimedia components and gain relevant, reusable parts for their final exam projects. We explored health-related apps on platforms like Scratch and App Inventor and drew inspiration from the website of the Italian "National Council of the Board of Psychologists" (https://www.psy.it/) for the development of a website.

For the first topic, which focused on creating multimedia interactive apps using Scratch, we provided more detailed explanations. This allowed students to gain a comprehensive understanding of computational thinking (McClelland and Grata, 2018, Currant *et a*l. 2019). However, for the second and third topics, creating mobile apps using App Inventor and designing websites using Wordpress, we provided only the essential explanations and background concepts.

The first 4 lessons of the 15-hours Computer Science for Health course were then planned as follows:

- First lesson:
    - short introduction to Scratch, App Inventor and Wordpress

- example gallery of Scratch and App Inventor apps (both informational apps and educational videogames) and Wordpress websites for health
- in-depth introduction to Scratch
- creation of the first part of a simplified version of the "Are you a healthy eater?" interactive multimedia app (https://scratch.mit.edu/projects/113414644/) that explains how many calories we ingest every day in our meals and how they compare to the correct average of calories (Figure 4). By creating this app, the students learned the relevant instruction blocks of Scratch



(a) *(b)* *(c)*

Figure 4: In the interactive app, users have the ability to select and click on each item they consume during their meals (a). As they do so, the chosen food items are added to a central dish, and the calories of the selected items are accumulated in a calories counter displayed at the top (b). This allows users to keep track of their calorie intake throughout the day. Once the last meal is completed, the accumulated calories can be compared to the recommended average values to assess the user's consumption in relation to healthy eating guidelines

- Second lesson:
  - completion of the "Are you a healthy eater?" Scratch's app, by learning further relevant instruction blocks
  - registration of a free Wordpress.com website
  - customization of a responsive website using Wordpress. The focus was on designing a website that is not only optimized for desktop computers but also functions correctly on tablets and smartphones. To achieve this, students were guided through the process of customizing their websites based on the structure and appearance of the https://www.psy.it/ website
- Third lesson:
  - adding multimedia content to their Wordpress website, such as images, video, audio
  - introduction to App Inventor
  - creation of components for a simplified version of the "Health Observation" app using App Inventor. The app served as a simple electronic health records (EHRs) system, enabling users to record and share their health data with healthcare professionals. The functionality and design of the app were inspired by the demonstration provided in the video https://www.youtube.com/watch?v=U619Gq_LmlA. Students were guided

through the process of creating and integrating the necessary components to develop their own version of the app, as depicted in Figure 5.

(a) *(b)* *(c)*

Figure 5: Values entered by the user (a) are recorded with a corresponding time stamp to keep track of when the data was captured (b). Users can share their health data with their healthcare professional (c). This feature facilitates communication and enable healthcare professionals to access the recorded health information.

- Fourth lesson:
    - completion of the simplified version of the "Health Observation" app. This involves adding scripts and familiarizing with the relevant instruction blocks in App Inventor. By exploring and understanding these blocks, the students gain hands-on experience in creating functional and interactive elements within the app.
    - addition of the sharing feature to the “Health Observation” app
    - introduction to the organization of topics by means of taxonomies
    - organization of the articles of their Wordpress website by means of a taxonomy of categories

By learning how to build the "Are you a healthy eater?" Scratch app, students will gain the skills to create engaging online interactive tools that educate people about healthy behaviors. This app will serve as a valuable resource to promote and encourage healthier eating habits among users.

On the other hand, acquiring the knowledge to build the "Health Observation" App Inventor app will enable students to develop mobile applications that their patients can use to securely share their health data. This app will facilitate seamless communication between healthcare professionals and their patients, allowing for efficient monitoring and management of health information.

Additionally, the proficiency in using Wordpress will empower students to create informative and dynamic websites dedicated to health-related topics. These websites will serve as platforms to share valuable information, news, and resources related to health. The websites will be designed to be accessible and responsive, ensuring that patients can access them easily through both personal computers and mobile devices.

Overall, the curriculum encompasses the development of interactive media, mobile apps, and websites, providing students with a comprehensive skill set to effectively communicate and engage with their audience in the field of health promotion and patient care.

Pre-Final lesson survey

After the completion of the fourth lesson, but prior to the fifth and final lesson, an online survey was conducted to gather feedback from the students. The purpose of this survey was to give students the opportunity to express their preferences for potential extensions and in-depth explanations on the topics covered in the previous four lessons. The following topics were presented as options for further exploration:

- *Hashtags*: How to create and assign hashtags to the articles of a Wordpress website. This would enable users to find similar articles by selecting the hashtags assigned to a specific article.
- enhancing a Wordpress (WP) website by:
    - *Scratch content*: Adding multimedia interactive content created in Scratch
    - *Forms*: Adding forms
    - *User Content*: Making readers able to autonomously write and propose articles
- *Quizzes*: Creating online quizzes
- *News apps*: Creating a mobile app that displays news specifically related to health

Even for the second survey, not all students expressed their opinion. Approximately 30% of the students chose not to participate in the survey. Among the topics presented, the ones that received the most votes were *WP hashtags*, *WP forms*, *WP user content*, and *News apps*.

Table 1: Results of the pre-final lesson survey

Topic	Interested	Not interested
WP hashtags	75%	25%
WP enhancement:	80%	20%
Scratch content	0%	
Forms	30%	
User content	50%	

Quizzes	27%	63%
News apps	63%	27%

For the *News apps* topic, we opted for a simplified approach by embedding a news website into a mobile app. This approach allows for a streamlined process in creating the app. The students' feedback on this simplified approach was highly positive. The final session was then planned as follows:

- Fifth lesson:
    - learning about Wordpress hashtags by understanding how to categorize articles on a WordPress website using hashtags.
    - brief introduction to markup languages, such as HTML
    - learning how to add plugins to a Wordpress website and how to use Wordpress shortcodes (https://codex.wordpress.org/Shortcode). Adding plugins enables the integration of additional functionalities and features to enhance the website's capabilities. Shortcodes, which are simplified versions of HTML code, allow the seamless integration of interactive and dynamic content into website pages
    - adding the *Contact Form 7* and the *User Submitted Posts* free plugins to their Wordpress website. Contact Form 7 (available at https://wordpress.org/plugins/contact-form-7/) allows the website manager to create and embed forms using shortcodes. These forms can then be customized using simple HTML code snippets to suit their specific needs. Similarly, the User Submitted Posts plugin (available at https://wordpress.org/plugins/user-submitted-posts/) empowers readers and users to propose new articles for the website
    - creating news blogs via the free Blogger website, http://blogger.com
    - using the App Inventor's WebViewer component to embed a Blogger's blog inside a mobile app.

Post-Course survey

At the end of the course, it was important to assess the students' overall satisfaction and feedback regarding the content and delivery of the course. A final post-course survey was conducted to gauge the students' appreciation of the agreed-upon course contents and the teaching methods employed throughout the five lessons. However, not all students participated in the final survey, with approximately 15% of the students choosing not to provide their feedback.

The final survey consisted of 14 questions, including 11 multiple-choice questions, 2 open-ended questions, and 1 yes/no question. The multiple-choice questions allowed students to indicate their level of satisfaction by choosing from the options: "not at all", "not much", "enough", or "yes". The questions were the following ones:

- *Previous*: was your initial knowledge sufficient to understand the topics of the course?
- *Lack*: (if previous answer was "not at all" or "not much") what kind of knowledge were you missing?
- *Request*: did you ask for specific topics in the initial discussion?
- *Availability*: (if previous answer was "yes") was the teacher available to add to the course topics the topics you asked for?
- *Motivation*: (if previous answer was "not at all" or "not much") did the teacher give you satisfying motivations for not including your topics in the course?
- *Scratch (T1)*: was the "creating multimedia apps with Scratch" topic in line with your expectations?
- *App Inventor (T2)*: was the "creating mobile apps with App Inventor" topic in line with your expectations?
- *Wordpress (T3)*: was the "creating websites with Wordpress" topic in line with your expectations?
- *Clarity*: did the teacher present all topics clearly?
- *Interest*: did the teacher spark the interest on the topics?
- *Questions*: was the teacher available to answer your questions/doubts during the course?
- *Online*: were online lessons -where you had to follow the teacher step by step- easy to follow?
- *Usefulness*: do you think the topics of the course could be useful for your present/future job?
- *Satisfaction*: are you globally satisfied with the course?

Results of the study

Given the relatively small number of students in the course, it is important to acknowledge that the results may not be statistically significant. However, these results can still provide some insights into the overall reception of the course and determine if it could be considered a valuable preliminary study for future experimentation.

Table 2 presents the average responses for two groups of students: those who actively participated in the initial discussion to define the course topics (85% of the sample), and those who did not provide their opinion and did not participate in the discussion (15% of the sample). To assign a numerical score for analysis, the responses from the yes/no and multiple-choice questions were converted into a 4-point Likert scale, with each point representing a specific percentage on a 0-100 scale. The scale was designed to avoid neutral choices and assign numerical values as follows: "no/not at all" (0%), "not much" (33%), "enough" (66%), and "yes" (100%).

It is important to note that scores should be interpreted with caution due to the small sample size and the limitations of the Likert scale. The scores can provide a general indication of the students' perceptions and satisfaction levels, but further analysis and consideration of qualitative feedback may be necessary to gain a comprehensive understanding of the course's success and areas for improvement.

Table 2: Results of the final post-course survey

Question	Actively participated in initial discussion	Did not actively participate in initial discussion
Previous	66%	100%
Lack	Practice	-
Availability	92%	-
Scratch (T1)	74%	66%
App Inventor (T2)	81%	66%
Wordpress (T3)	89%	100%
Average (T1-3)	81%	77%
Clarity	96%	100%
Interest	96%	100%
Questions	96%	100%
Online	78%	66%
Usefulness	77%	100%
Satisfaction	77%	66%

From the provided information, it can be observed that the average values of the students' responses were consistently 66% or above, indicating that the course was generally perceived as *clear* and *interesting.* The students who had the opportunity to influence the selection of the course topics expressed higher overall satisfaction compared to their peers who did not participate in the discussion (*satisfaction*: 77% vs. 66%). Additionally, the students who participated in the initial discussion felt that the explanation of each topic was slightly more aligned with their expectations compared to their counterparts (average t1-3: 81% vs. 77%).

Interestingly, the students who did not take part in the initial discussion believed that the course was 100% useful for their present or future profession also recognizing the value of the selected topics, whereas the students who actively participated in the selection process of course topics expressed a lower percentage of 77%. This difference in perception could be attributed to various factors, such as individual expectations and prior knowledge of the students.

Further Research

The study acknowledges its limitations, primarily due to the relatively small number of students enrolled in the course and the proportion of students who did not participate in the initial discussion and final survey. While the author believes in the effectiveness of the chosen strategy, supported by the number of scholars that already investigated related areas of research, further research with a larger number of enrolled professionals and the inclusion of multiple classes could provide a more comprehensive analysis.

In this particular study, it was not possible to establish an experimental group and a control group due to the requirements of the doctoral degree program, which necessitated all students to follow the same course. However, future studies could explore the possibility of implementing such a design to compare the effectiveness of different instructional approaches or variations in course content.

To enhance the validity and reliability of future research, it would be beneficial to address the limitations by increasing the sample size, implementing control groups, and conducting comparative analyses. This would provide a more robust understanding of the impact and outcomes of the course in question.

Conclusions

The study findings highlight the effectiveness of involving students in the customization process of a Computer Science course, even in a short introductory format. By tailoring the course content to the specific needs as future professionals, relevant concepts and skills can be successfully transmitted to the students. The level of satisfaction was higher among students who participated in the customization phases, indicating the importance of student involvement in shaping their learning experience.

Furthermore, the study indicates that perceived usefulness of the course topics was positive for both groups, with students who did not participate in the customization process also recognizing the value of the selected topics. This suggests that customization phases, both before and during the course, can enhance satisfaction, perceived usefulness, and the acquisition of course topics, particularly in Computer Science courses aimed at professionals.

For health psychologists, the availability of user-friendly tools enables the creation of websites and mobile apps containing interactive and multimedia elements. These tools facilitate communication and information sharing with present and future patients in a format that professionals can easily create and tailor to their specific needs. The course described in the study was well-received by students, with clear and easily understandable topics, even for those without prior programming knowledge. The course met students' expectations and was deemed relevant for their future as health psychology professionals.

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