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Dental Students' Digital Competence Evaluation: Preliminary Results of a Cohort Study †

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Abstract: Digital competence, a crucial aspect of online education, was studied among dental students at the Egas Moniz School of Health & Science. This study, in line with the Horizon Europe Strategic Plan 2021–2024, aimed to understand students' digital skills and competences in the context of higher education. A questionnaire was administered to 503 participants, covering various topics such as socio-demographic characteristics, digital learning participation and the impact of the COVID-19 pandemic. The results highlight the importance of digital learning and its future role in clinical practice. While students perceived their digital competence level as high/intermediate, an assessment test indicated a lower level of competence. These findings highlight the need to address challenges and improve digital competence in education for social and economic advancement.

Keywords: digital competence; dental students; higher education; online learning

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1. Introduction

Digital competence, which encompasses essential information and communication technology (ICT) skills, plays a vital role in the success of online educational activities [1]. As the world becomes increasingly interconnected and technology-driven, it is imperative for educational institutions to equip students with the necessary digital skills to navigate the digital landscape effectively. This is particularly true in the field of dentistry, where technological advances and digital transformation have revolutionized the ways in which oral health professionals practice and engage with patients [2].

The present study focuses on characterizing and profiling the digital competence of dental students at the Egas Moniz School of Health & Science (EMSHS), within the broader context of the Horizon Europe Strategic Plan 2021–2024 [3]. In line with Cluster 6 ('Digital, Industry and Space'), the research aims to contribute to the advancement of digital technologies, particularly in the fields of education and healthcare.

In recent years, the integration of technology in higher education has become increasingly widespread, and the COVID-19 pandemic has further accelerated the adoption of digital learning platforms and tools [4]. The transition to online education has highlighted the importance of digital competence among students, as they need to navigate virtual classrooms, engage with online resources and use technology for effective learning [5].

The specific aims of this study are to assess the digital skills and competencies of dental students, identify the challenges they face in the digital learning process, and explore their perceptions of the future role of digital health in clinical practice. By investigating these factors, the study aims to contribute to the development of strategies and interventions to enhance the digital competence of dental students, ultimately improving their online

learning experience and preparing them for the digital transformations taking place in the field of dentistry.

This article presents the preliminary results of a cohort study involving 503 dental students at EMSHS. A comprehensive questionnaire was used, covering various dimensions.

In the following sections of this article, we will describe the methodology used, present the results of this study and discuss the implications for educational institutions and the wider field of dentistry. By examining the current state of digital competence among dental students, we can take steps to foster their digital competence and maximize the potential of technology to advance universal health coverage.

2. Methods

2.1. Study Design

This research used a cohort study design to assess the digital competence of dental students at EMSHS. This study aimed to understand students' digital competence, as well as to identify the challenges they faced in the learning process.

2.2. Participants

A total of 503 dental students participated in this study. Participants were selected using convenience sampling to ensure representation from different academic years and programs within the curricular plan.

2.3. Data Collection

Data were collected using an anonymous structured questionnaire consisting of 44 items, administered electronically to ensure efficient and standardized data collection. The questionnaire covered various aspects, including socio-demographic characteristics, residential context, family background, digital characteristics, involvement in digital learning, and the impact of the COVID-19 pandemic. Additionally, digital competence was evaluated using DigComp to assess their proficiency in utilizing digital technologies and skills.

2.4. Measures

The questionnaire included items designed to assess participants' digital competence, such as their ability to use technology in an integrated way for work and study, their critical evaluation of the technologies they use, and their active engagement in digital culture. Participants were also asked to self-assess their digital competence.

2.5. Data Analysis

Descriptive statistical analyses were conducted in order to summarize the demographic characteristics of the participants, as well as their digital learning preferences and self-perceived digital competence. The data collected on digital competence were compared with the participants' self-assessments to identify any gaps or discrepancies.

2.6. Ethical Considerations

Ethical approval from the Egas Moniz Ethics Committee was obtained prior to conducting the study. Participants were provided with information about the study's purpose and procedures, emphasizing their voluntary participation. Strict confidentiality and anonymity were maintained during data collection and analysis.

3. Results

Regarding the importance of digital learning, the findings indicate a high level of recognition among dental students. A significant majority (78.5%) of participants acknowledged the pivotal role digital health will play in their future clinical practice. This finding emphasizes their awareness of the increasing integration of technology in the field and the necessity to acquire digital skills for professional success.

The study found that over half (51.3%) of dental students use digital skills daily in their learning environment. They particularly prefer class transcripts and video-based support for digital learning, indicating that they appreciate the convenience and accessibility of digital resources, which enhance their learning experience.

Interestingly, despite most students having high or medium self-perceived digital competence (94.0%), the objective assessment test showed lower competence levels. Only 26.6% rated themselves highly skilled after the assessment. This highlights the limitations of self-assessment in accurately measuring digital competence and stresses the need for objective assessments and targeted training to address identified gaps effectively.

The results also shed light on the challenges faced by dental students during the shift to online education due to the COVID-19 pandemic. The rapid adoption of digital learning platforms has required quick adjustments in educational practices. Understanding the specific challenges in this digital learning environment is crucial for institutions to develop effective strategies and interventions. Further research focused on exploring the unique challenges that dental students encounter in digital learning could inform the design of tailored support mechanisms.

4. Discussion

This study explores the digital competence of dental students and its implications for online education and future practice. The findings shed light on various aspects of dental students' digital competence, including skills, preferences, and self-perceived competencies, thus having significant implications for educational institutions and in this field.

The findings can guide targeted interventions to address skill gaps, enhance online learning, and prepare students for technology-driven healthcare practice. This study aligns with broader goals of digital transformation in education and healthcare, contributing to societal and economic progress through effective use of technology [6].

The implications of this research extend beyond dental education. This study aligns with the broader goals of digital transformation in education and healthcare, promoting the effective use of digital technologies for social and economic progress. By identifying the digital competence levels of dental students, educational institutions can develop targeted interventions to improve digital competence. This, in turn, will enhance the overall online learning experience and prepare students for the evolving digital landscape in the field of dentistry.

Future research could use more diverse sampling methods and incorporate objective measures to provide a comprehensive understanding of digital competence among dental students.

Limitations

There are several limitations to this study. Firstly, the convenience sampling method may introduce selection bias towards a potential overrepresentation of certain groups or characteristics within the sample, limiting the generalizability of the findings to the wider population of dental students. Secondly, the self-reported nature of the data may be subject to response bias and overestimation of digital competence. Finally, the preliminary results do not allow for causal inference or the assessment of changes in digital competence over time.

5. Conclusions

This study offers valuable insights into the landscape of digital competence among dental students, underscoring the significance of digital skills and competences within the realm of online education and future dental practice.

The results reveal a noteworthy discrepancy between the participants' self-perceived digital competences and their actual performance as evaluated by the digital competence assessment test. This suggests a tendency for participants to overestimate their digital com-

petence, highlighting the importance of objective assessments for an accurate understanding of individuals' digital competence, as well as promoting self-awareness and training.

The findings also underscore the imperative for educational institutions to develop strategies aimed at bridging gaps in digital competences and enhancing the overall learning experience. By fostering digital competence among dental students, institutions can ensure that future oral health professionals are well-equipped to effectively utilize technology for improved healthcare practices and contribute to the advancement of digital transformation within the field.

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Data Availability Statement: The data used to support the findings of this study are available from the corresponding author (L.P.) upon request.

Conflicts of Interest: The authors declare no conflict of interest.

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