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Media and Digital Skills of Visual Impaired Students

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Abstract. The developed world is being proactive in transitioning to a digital society. Thus, understanding and gathering information about the Media and Digital Skills (MDS) of visual impaired (VI) students is an important issue for evaluating this group's present and future integration into society.

With the purpose of accessing VI students' MDS, a questionnaire was administered to two samples of students, one from Portugal and the other from Greece. A multiple linear regression model was used to modulate the effect on MDS of age, sex, country, and type of vision impairment.

The model justifies a considerable amount of MDS variance, with age and vision being statistically significant factors. In the model, MDS improves with age increment, and blinds have lower MDS scores than their normal sight counterparts.

Considering that blindness impairs the MDS of this subject group, particular efforts should be made by schools and society to potentiate the improvement of MDS in this specific group.

Keywords. Blind, Digital, Inclusive Classrooms, Low Vision, Media and Digital Skills, Media, STEM, Visual Impairment.

1. Introduction

In the way toward the digital society, Media and Digital Skills (MDS) are critical for contemporary life, including daily routines, school and work [1]. In order to fully integrate into society, low vision and blind people (Visual Impaired, VI) must acquire proficiency in MDS. Therefore, this study aimed to assess the MDS of VI students from lower and upper secondary education in two European Countries.

Table 1. Information on students from different vision conditions

Country	Normal sight	Low vision	Blind
	n; mean age (years); SD	n; mean age (years); SD	n; mean age (years); SD
Portugal	25; 16.2; 1.2	7; 17.4; 2.2	4; 18.3; 1.5
Greece	26; 15.8; 1.5	13; 15.7; 2.8	8; 16.1; 2.4

n= number of students; SD=standard deviation

2. Methods

Thirty-six students, including normal sight, low vision and blind (8 males, 24 females; and 4 that preferred not to answer about their sex) from Portugal and forty-seven (24 males, 21 females and 2 that preferred not to answer about their sex) from Greece were enrolled in this study (Table 1). The Portuguese students' group, with an age (mean ± standard deviation) of 16.7±1.6 years old ranging from 14 to 19 years old and the Greek students' group, with an age of 15.8±2.1 years old ranging from 11 to 19 years old, answered a questionnaire about MDS [2] from November 2021 to March 2022. The questionnaire, as shown in Table 2, intended to assess five types of skills: Operational, Navigation, Social, Creative and Mobile. The response used truth claims ('Not at all true of me', 'Not very true of me', 'Neither true nor untrue of me', 'Mostly true of me', and 'Very true of me'), and a 'don't know' option. To these claims were attributed scores from 5 ('Very true of me') to 1 ('Not at all true of me') and 0 to 'don't know'. A mean score resulting from all five skills assessed was obtained for each subject and considered to represent the MDS of the subject, where higher numbers represent better skills.

A model to predict the MDS scores using the multilinear regression analysis was developed considering the variable age and the categorical variables sex, type of vision impairment and country.

Table 2. Questionnaire to measure Student Media and Digital Skills [2]

Skill	Item
Operational	I know how to open downloaded files I know how to download/save a photo I found online I know how to use shortcut keys (e.g. CTRL-C for copy, CTRL-S for save) I know how to open a new tab in my browser I know how to bookmark a website I know where to click to go to a different webpage I know how to complete online forms I know how to upload files I know how to adjust privacy settings I know how to connect to a WIFI network
Information Navigation	I find it hard to decide what the best keywords are to use for online searches I find it hard to find a website I visited before I get tired when looking for information online Sometimes I end up on websites without knowing how I got there I find the way in which many websites are designed confusing All the different website layouts make working with the internet difficult for me I should take a course on finding information online Sometimes I find it hard to verify information I have retrieved
Social	I know which information I should and shouldn't share online I know when I should and shouldn't share information online I am careful to make my comments and behaviours appropriate to the situation I find myself in online I know how to change who I share content with (e.g. friends, friends of friends or public) I know how to remove friends from my contact lists I feel comfortable deciding who to follow online (e.g. on services like Twitter or Tumblr)
Creative	I know how to create something new from existing online images, music or video I know how to make basic changes to the content that others have produced I know how to design a website I know which different types of licences apply to online content I would feel confident putting video content I have created online I know which apps/software are safe to download I am confident about writing a comment on a blog, website or forum I would feel confident writing and commenting online
Mobile	I know how to install apps on a mobile device I know how to download apps to my mobile device I know how to keep track of the costs of mobile app use

Table 3. multiple linear regression model parameters

Independent variables	Best model (R^2=0.26; p-value <0.0001)	
	Coefficient (95% CI)	p-value
Constant	1.08 (-0.38 to 2.54)	0.15
Age (years)	0.18 (0.09 to 0.27)	<0.001
Sex (reference: male)	Not a predictor	
Female		
Unknown		
Vision (reference: normal)		
Low Vision	-0.34 (-0.75 to 0.07)	0.10
Blind	-1.01 (-1.51 to -0.51)	<0.001
Country (ref.:Portugal)	Not a predictor	
Greece		

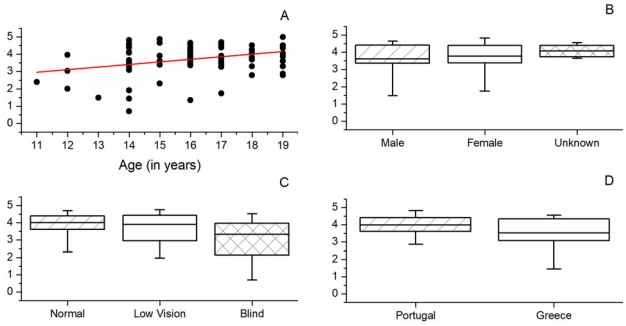

Figure 1. Media and digital skills scores for students considering: A) age; B) sex; C) vison; D) Country. The box is determined by the 25th and 75th percentiles. The whiskers are determined by the 5th and 95th percentiles. The horizontal line represents the mean values

3. Results

We found that age (P <0.001) and blindness (P <0.001) are associated, respectively, with a higher score and lower score after adjusting for sex and country. Together, these two measures explain 26% of the variance in scores performance (Table 3). Surprisingly, low vision students were not statistically significant different (p>0.05) from normal sight students.

4. Discussion/Conclusion

Considering that blindness impairs the MDS, particular efforts should be directed to these students by schools and society to mitigate this situation and capacitate them to the challenge of digital society, which is critical for their effective inclusion in the present and future.

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