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ABSTRACT

The purpose of this quantitative study is to investigate the perspectives of philologists on the use of digital tools and especially using Information and Communication Technology (ICT) in order to support the improvement of written language skills for students with Learning Difficulties attending secondary education. Participants were 198 philologists who teach in secondary education schools in Northern Greece.

A quantitative research method was used and the sample completed a questionnaire. The findings reveal that teachers of philology make moderate use of ICT tools in their teaching and even less for the evaluation of the learning outcomes of students with learning difficulties in their written language practice. The school curriculum, daily tasks at school, the limited teachers' training in the pedagogical use of ICT as well as a breakdown in communication with the school administration, are serious obstacles to obtain sufficient further use of digital tools.

Keywords: Digital tools, ICT, learning difficulties, Written language skills, Secondary education, *Philologists.*

INTRODUCTION

In the second half of the 20th century, the worldwide technological development created the conditions for the transformation of human societies on the basis of a full utilization of technological achievements to improve the quality in people's lives. Digital tools as well as Information and Communication Technology (ICT) are also introduced in the educational field of all levels and changed the shape of learning and teaching environments for the benefit of the educational process. Digital tools *'are defined as a diverse set of technological tools and media used to transmit, store, create, share and exchange information'* (UNESCO, 2009).

However, the transition to the pedagogical use of digital tools was not uniform, since this process gets along to its qualitative and quantitative characteristics were a function of the degree of technological development and availability of the various societies, as well as the social disposition of educational transformation and the economic potentiality of the countries. Nowadays, ICT has proven its dynamic aspect by revealing new educational potentiality as a result of the digital tools' use to be considered as an integral part of educational life as time went by (Pelgrum, 2001).

The contribution of digital tools to overcome learning difficulties in the written language is significant and any relevant interventions date from the late 1980s (McClurg & Kasakow, 1989). A basic intervention tool is the use of a computer and word processing software. This type of software incorporates text production and text correction capabilities, which prove to

be particularly useful for improving students' writing skills. According to Huriyah (2018), the first area of improvement has to do with spelling and grammar performance (syntax), as it has been proved that the use of the spell-checking feature provided by word processors acts as a catalyst for acquiring the proper spelling of words. This happens due to the word processor indicating the misspelling to the student-user by activating their visual memory and their dynamic in memorising errors. In this context, a key factor in learning the correct spelling seems to be the indication of a 'live time' error, which leads to its awareness and subsequently to change-improvement (Drigas & Ioannidou, 2013).

An additional area where digital tools can have a positive effect and enrich the potentiality of written language production is that of organising and shaping written language also enriching vocabulary. Specific learning difficulties such as dyslexia and dysgraphia form the framework that defines these areas of students' weakness, nevertheless, defining the fields for the intervention of digital tools. According to the Welsh Government (2015), when dealing with issues relating to cases where students have issues with motor coordination, fine motor skills and/or displaying their thoughts in written language, computers and smart device technology can be used through the digital applications of dictation. These are software or applications (first appeared at the end of the 20th century) that have the ability to display the oral language produced by students and convert it into written text, which is displayed in a word processor. This activity allows the student to focus on his/her thoughts, to determine the content of their speech and finally to display it in a written text free from anxiety, difficulty or any weakness shaped by the related special learning difficulty (Azimi & Mousavipour, 2014).

The ability to organize thought is also very important for a student with special learning difficulties not only in relation to the use of dictation software. Many students can't cope with writing because they are unable to structure their thinking in such a way that it can be uttered in an understandable and comprehensible manner. However. these difficulties can be overcome by the process of concept mapping or mind mapping. The key features of digital applications that support this process are initially paying attention on a main image-idea and identifying other ideas that 'orbit' around the main idea, and in the end ordering these ideas into an overall nodal structure. The mind mapping functions effectively when its structure is enriched with graphic and visual representations (figures, tables, etc.). And finally it is an image that projects thoughts and correlations of the mind. (Liu et al, 2014).

In fact, the presence of digital tools is so important for the educational process that it has raised doubts about traditional educational systems as well as the role and teacher's importance to the learning process, especially in cases when dealing with issues relating to students with disabilities and/or special educational needs (Albirini, 2006). According to Ghavifekr et al, (2016) what needs to be redefined is the exact way in which the teacher would determine learning developments within the classroom will be to the benefit of the student.

Therefore, the teacher who educates children with special learning difficulties should be able to use the potentialities of digital tools as much as possible. In order to do so, they should be highly qualified and well-trained, in addition to the subject of their specialty, also in special education and training issues that deal with the specific learning difficulties of their students. Most of these issues have now been successfully dealt with unless a teacher is not familiar with the characteristics of dyslexia, dysgraphia or dysspelling in written language. It is important that the relevant teacher's knowledge is not static but dynamic and evolves out of the contemporary scientific developments and findings on the nature, character, symptoms and treatment of learning difficulties (Adam & Tatnall, 2017). According to Survani (2010), the teacher should develop a high level of literacy in terms of new technologies and educational software accompanied by related research.

METHOD

The purpose of this paper is to investigate the opinions of secondary school Philologists on the use of digital tools, aiming to improve written language of students with Learning Difficulties (LD). The questions to be investigated are the following:

H1: To what extent do language teachers use digital tools to support the written language of students with learning difficulties?

H2: To what extent do philologists evaluate the learning outcomes of students with learning difficulties and difficulties in written language, by using digital tools?

H3: What are the obstacles that might hinder the use of ICT for improving written language of students with learning difficulties?

Participants

Participants in the present quantitative survey were 198 secondary education philologists (Grades 1–3) teaching in Western and Central Macedonia of Greece. Table 1 shows philologists' demographic characteristics according to gender, years of service in education, their highest degree and their school type.

Table1. Description of Participants according to their Gender, Age, Years of Service in Education, Highest Degree and School Type.

Gender	Ν	%	
Male	106	53.5%	
Female	92	46.5%	
Age	Ν	%	
22-30	6	3.0%	
31-40	62	31.4%	
41-50	77	38.9%	
>51	53	26.7%	
Total	198	100%	
Years of service in education	Ν	%	
1-10	100	50.5%	
11-20	54	27.3%	
>21	44	22.2%	
Total	198	100%	
Highest Degree			
Bachelor's	120	60.7%	
Master's	75	37.8%	
Ph.D.	3	1.5%	
Total	198	100%	
School Type	Ν	%	
General School	108	54.60/	
(Grades 7 -12)	108	54.6%	
Special School	36	18.1%	
(Grades 7 -12)	50	10.1%	
Vocational Education Training (Grades 7-9)	54	27.3%	
Total	198	100%	

DATA COLLECTION

This quantitative study was conducted during March until June 2022 and the three researchers contacted the Principals of 42 schools, which were located in Central Macedonia, Greece. The researchers informed the Principals about the purpose of the study. Then, they asked for the provision of the teachers' personal email address excluding their names in order to email the questionnaires. All data were confidential and anonymous. The researchers communicated with each other after collecting the given questionnaire which was delivered to 243 philologists. However, a total of 198 returned the completed questionnaire ((81.4% of the invited sample).

Measures

A questionnaire was used for that purpose, consisting of 22 closed-ended questions and one open-ended question. Philologists were asked to complete a given questionnaire consisting of

three sections. In the first section teachers were asked to provide personal demographic information (gender, age) as well as details on their professional experience, educational qualifications and school type. The second section consists of 7 questions and aims to determine the level of knowledge and teachers' skills on issues dealing with learning and special difficulties in the written language, the consequences of special learning difficulties on students in the academic field as well as the impact of special learning difficulties in children's social life. Participants were asked about issues related to research questions on a five-point Likert-type scale with response anchors (1 = very little, 2 = a little, 3 =moderately, 4 = much, 5 = very much). The third section consists of 12 questions concerning the use of ICT on a level of pedagogical practice in relation to the management of learning difficulties. In particular they focus on the educational methods used by teachers, the degree of using digital media to support students with learning difficulties as well as the degree of effectiveness in written language. their Participants were asked in exactly the same way as they did in the second part of the questionnaire at a rate of a 5-point Likert scale (1 = not at all, 2 = a little, 3 = to some extent, 4= rather much, 5 = very much).

In addition, philologists need to delve the possible difficulties for the application of these digital media and through an open-ended question they identify their needs to achieve the optimization of teaching students with learning difficulties. The main survey was preceded by a pilot sending of the questionnaire to a sample of 15 people in order to get feedback on the clarity of the questions and their understanding.

Feedback indicated participants' ease of completing the questionnaire. The credibility and internal coherence of the questionnaire were tested by the Cronbach's Alpha criterion (Cronbach's Alpha: 0.711).

DATA ANALYSIS

Statistical analysis of the data was done using the Statistical Package for the Social Sciences SPSS v.25 (Superior Performance Software System), after they were first categorized and expressed in frequencies and percentages. Statistical tools of correlation analysis (Pearson r coefficient) and regression analysis ANOVA were used, while the x^2 criterion was also applied to research and check the independence of the variables.

Knowledge of Learning Difficulties

The analysis of the sample responses revealed that teachers are moderately aware of theoretical issues of learning difficulties (Mean= 3.22 R= 1-5, SD= 1.24). Most of the philologists 124 out of 198 (62.6%) consider that students with learning difficulties in secondary education have more difficulty in syntax, grammar and spelling, while 76,4% of teachers stated that reading and reading comprehension may present some difficulties for learners.

Learning Difficulties and Emotional Disorders

Of the 198 teachers 102 (51.5%) of them state ("not at all" + "a little" + "moderate") that students with learning difficulties can't cope with written language but they do not have reduced self-confidence or it is reduced to a small degree, while 96 (48.5%) state that these students have significantly reduced selfconfidence ("very" + "very much") (figure 1).

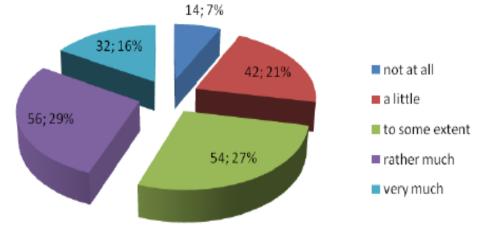


Figure1. Reduced self-confidence

In addition to the ANOVA analysis, there is statistically significant evidence that philologists who know the theoretical framework of learning difficulties are in position to identify students who may have emotional difficulties ($x^2 = 194.5$ df = 16, p<0.5).

The use of ICT

Of the 198 philologists, 44 (22,2%) declared that they haven't been trained in ICT in education, while 174 (77.8%) have received training while attending their postgraduate studies and seminars.

Furthermore, almost half of the teachers 100 (50.5%) stated the use of ICT "not at all" + "a

little, fifty-four answered (27.3%) "some extent", while 44 (22.2%) declared the use of ICT "much" + "very much". Statistical significance also emerged between the training of philologists in digital media and their use during teaching.

Of the 174 philologists (77.8%) who have received training in ICT 152 (87.3%) use them in class, while of the 44 philologists who were not trained in the use of ICT, only 8 of them (18.1%) use them in teaching ($x^2 = 16.3$, df=3, p<0.5). On average, philology teachers mostly use the internet (M=3.3) and to a lesser extent (M=2.1) smart devices (tablets, etc.) (Table 2).

Digital tools	Ν	Minimum	Maximum	Mean	SD
Smart devices	198	1,00	5,00	2,1515	1,29649
Interactive Whiteboard	198	1,00	5,00	2,6061	1,12321
Educational Software	198	1,00	5,00	2,3939	1,29219
Internet	198	1,00	5,00	3,3939	1,29219

In addition, in a correlation between the gender of philologists and the category of digital media used, statistical significance emerged only for educational software ($x^2 = 9.17$, df=1, p<0.5). 57% of philologists stated that they do use ICT more ("rather much" + "very much") to improve students' spelling and 50.5% of them to a lesser extent for syntax ("not at all" + "a little"). (Table 3)

Learning objects	not at all	a little	to some extent	rather much	very much	Total
Syntax	20 - 10.1%	80-40.4%	40-20.2%	38–19.2%	20 - 10.1%	198 - 100%
Grammar	23-11.6%	37 - 18.7%	78-39.4%	40-20.2%	20 - 10.1%	198 - 100%
Orthography	17-8.6%	23-11.6%	45-22.7%	90-45.4%	23-11.6%	198 - 100%
Vocabulary enrichment	46-23.2%	14-7.1%	78-39.4%	42-21.2%	18-9.1%	198 - 100%
Meaning of words	40-20.2%	58-29.2%	42-20.2%	46-23.2%	12-6,6%	198 - 100%

Table3. Learning objects

Evaluation with the use of ICT

Most of the half teachers in the sample (128, 64.6%) responded "not at all" + "a little" to the use of digital media to a lesser extend in order to evaluate the learning outcomes of students with learning difficulties who have problems in the written language.

Accordingly, 20 philologists (10.1%) declared "to some degree" while 50 of them (25.3%) declared "rather much" + "very much".

Furthermore, statistical significance also emerged between the variables "training in digital tools" and "evaluation with digital tools" (x^2 =34.64a, df=12, p<0.05). In particular, of the 42 philologists who have attended a training

session in ICT during their postgraduate studies, 18 (42.5%) stated "rather much" that they do evaluate the problems of their students with learning difficulties in written language using digital tools.

Also, 116 philologists who have attended seminars in learning difficulties and received training in digital tools, 38 (32.8%) stated "a little" that they evaluate the problems of their students with learning difficulties in the written language with the use of digital tools, while of the 40 philologists who have not received any training at all in digital tools, 32 (80.0%) declared "not at all" for the use of digital tools for evaluation. (Table 4)

Training in Digital Tools		Evaluation with ICT					
		not at all	a little	to some extent	rather much	very much	<u>Total</u>
Without	Count	32	8	0	0	0	40
training	%	80.0%	20.0%	0.0%	0.0%	0.0%	100.0%
Seminar	6 Count	30	38	16	16	16	116
	%	25.9%	32.8%	13.8%	13.8%	13.8%	100.0%
In the	Count	14	6	4	18	0	42
Master	%	33.3%	14.2%	9.5%	42.5%	0.0%	100.0%
Tot	al Count	84	44	20	34	16	198
	% within ICT Seminars	42.4%	22.2%	10.1%	17.2%	8.1%	100.0%

Table4. Evaluation with training in digital tools.

 $(x^2 = 34.64^a, df = 12, p < 0.05)$

Statistical significance also emerged between the variables "Type of School" and "Evaluation with digital tools" ($x^2=26.85$, df=8, p<0.05). In particular, 37.7% of philologists who work in Vocational Education Training (Grades 7-9) stated "rather much" + "very much" that they use ICT to assess written language for students with learning difficulties, respectively 20.7% of philologists working in Special Schools (Grades 7-12) answered "rather much" + "very much" that they use digital tools to assess written language to students with learning difficulties and finally, only 2.6% of philologists teaching in Special Schools (Grades 7-12) stated "rather much" + "very much" that they use digital tools to assess written language of their students with learning difficulties. (Table 5)

 Table5. School Type with Evaluation with digital tools

School type	not at all	a little	to some extent	rather much	very much	Total	
General School (Grades 7-12)	46-60.5%	16-21.1%	12-15.8%	2-2.6%	0 - 0.0%	76 - 100%	
Special School (Grades 7-12)	36 - 52.9%	6 - 8.8%	12-17.6%	6 -8.9%	8-11.8%	68 - 100%	
Vocational Education Training (Grades 7-9)	6-11.1%	22 - 40.8%	6-11.1%	12 - 22.2%	8-14.8%	54 -100%	
Total	84-42.4%	44 - 22.2%	20-10.1%	34 - 17.2%	16-8.1%	198 - 100%	

 $(x^2 = 26.85, df = 8, p < 0.05)$

Regarding their method of evaluation for students with learning difficulties in written language, only 20.20% (N=40) of the sample responses stated "Interactive individual exam with digital tools", while 29.3% (N=58) declared "Written individual exam" and finally 26.26% stated "Exam like classmates", while 24.24% (N=48) answered "Oral individual examination". (Figure 2)

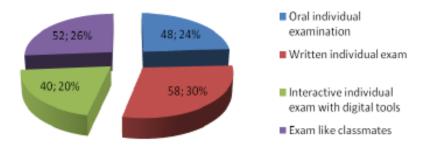


Figure 2. A method of evaluating written language problems

Barriers to the use of ICT

Most of the sample (41,3%) of philologists who took part in the survey (N=168, 84.8%) answered "very" + "very much" that the biggest obstacle to the use of ICT to support the written language of students with learning difficulties was the many tasks which were assigned to them every day at school.

The following variables are given in descending order: The lack (N=112, 56.6%) of infrastructure in the school related to ICT, the difficulty of communication (N=78, 39.4%) between teachers and the school administration, the preparation time (N =70, 35.3%) of a lesson with the use of ICT and the last barrier based on the answers of the survey sample is the limited training course (N=48, 24.2%) for the use of ICT in teaching.

The ANOVA analysis revealed statistical significance between the variables "teaching with digital media" and the "many tasks at school". In particular, most teachers use ICT to support the written language of students with learning difficulties often enough consider "much" + "very much" an obstacle to a significant degree (N=64, 62.7%) the many tasks they have to do at school, in contrast to most philologists who use little or no ICT (N=49, 53.2%) and do not consider school assignments a serious obstacle (x^2 =37.86, df=6, p<0.05).

Furthermore, statistical significance also emerged between the variables "teaching with ICT" and the "lack of infrastructure". In particular, most philologists who use digital media to a small extent (N=43, 46.7%) for supporting the written language of students with learning difficulties stated that the lack of infrastructure in their school deeply affects the decision to a large extent "much" + "very for the use of ICT, in contrast to much" philologists who often use digital media and it does not appear that they are affected (N=54, 52.9%) by the lack of infrastructure in their school ($x^2=27.58$, df=8, p<0,05).

Finally, both the majority of philologists who use ICT to a significant extent (N=75, 73.5%) and those who use digital media to a smaller extent (N=67, 69.7%) stated "much" + "very much" and they do consider that the lack of communication with the school administration is a major obstacle to the use of ICT.

DISCUSSION

The purpose of this quantitative research was to investigate the degree of utilization of the use of digital tools and especially using Information and Communication Technology (ICT) by philologists to improve the written language of students with learning difficulties in secondary education. In addition, the use of digital tools was studied for the evaluation of learning outcomes related to written language, but also the obstacles that can limit the use of ICT in teaching.

Knowledge of Learning Difficulties

According to teachers' statements it emerged that the philologists have a moderate knowledge of the theoretical issues related to the learning difficulties. The finding from the present research is consistent with international research data, where general education teachers and a lot more teachers who work in secondary education, are not sufficiently aware of issues of Learning Difficulties in general. (Bender, 2004; Fuchs, 2001; Kavale et al., 1991). In Greece, philologists have courses to a limited extent related to special education and learning difficulties in their curriculum during their undergraduate studies. Philologists acquire their knowledge about learning difficulties voluntarily through seminars or attending postgraduate studies in special education. Furthermore, from the answers given by the survey sample, it emerged that learning difficulties in secondary education affect students' written language more (syntax, grammar and spelling) and less on reading and reading comprehension.

The findings have relevance to a similar research done in Greece in secondary education, where it appears that learning difficulties primarily have affected many dimensions of written language (Treanatafellou, 2020). Moreover, the present research reveals that almost half of the students with learning difficulties and students with problems in written language have less self-confidence. Similar research data demonstrate that learning difficulties have a particularly negative effect on the self-confidence and emotional development of students in general, and are often associated with behavioral problems (Hallahan et al., 2017; Mavropalias & Andronidi, 2017). Being wellinformed about issues in learning difficulties has a positive impact not only on academic issues

but also on the emotional skills of adolescents (Lane et al., 2006).

The use of ICT

The present research reveals that the use of digital tools to support written language of students with learning difficulties is related to philologists' relevant received training. А similar finding is reported in international research (Kerzic et. al., 2021; Tsai, 2015). Most philologists who attended a training session in ICT use them in their teaching, while the majority of philologists who have no training do not use ICT. In a related study by Adam & Tatnall (2017), it is reported that teachers who have acquired the use of digital tools are willing to a significant extent to use them in teaching for students with learning difficulties, because they acknowledge the positive impact on their use especially in the improvement of written language.

Also, the present research shows that philologists, who use digital media, use the Internet and Interactive Whiteboards to a greater extent but Educational Software and Smart Devices to a lesser extent. In recent years, all schools have an internet connection in Greece, while in the last five years a significant number of classrooms have been equipped with Interactive Whiteboards and teachers have begun to be familiar with their use. Educational software for learning difficulties in secondary education is few, Smart Devices as well and most philologists are not familiar with their use.

Evaluation with the use of ICT

The present study emerged that only one out of four philologists use ICT to a significant extent to evaluate the written language of students with learning difficulties. This type of educational evaluation does not adhere to the degree of information acquisition or ready knowledge, but motivates students in the active role of knowledge scaffolding in order to be prepared for their life in the society of continuous learning. Furthermore, the evaluation of learning outcomes for students with learning difficulties is a particularly critical factor in formulating individualized and differentiated interventions (Smith, 2004).

Also the research reveals that evaluation with the use of ICT takes place more often in special education facilities (Vocational Education Training and Special schools) and to a lesser extent in general secondary education classes attended by students with learning difficulties. According to Wong, (2004), this is due to the fact that special education facilities in general are more receptive to the introduction of ICT related innovations and initiatives in contrast to general education facilities, where traditional teaching and assessment methods seem to prevail. In addition, a philologist in the general classroom will have to evaluate all the "typical" students in their class, which makes it difficult to find the appropriate time to do so with digital tools in written language of students with learning difficulties.

Barriers to the use of ICT

Research, has shown that that the biggest obstacle to the use of ICT to support the written language of students with learning difficulties was the many increased daily tasks which were assigned to students at school which do not provide teachers with the comfort and potentiality of ICT use. It becomes clear that for teachers there should be a change in their duties and responsibilities, so that they mainly focus on the educational dimension and can integrate the potentialities of ICT to improve the teaching work produced. The above condition has been corroborated by the expressed opinion of the teachers that the use of digital tools can't be effective unless they are applied individually based on the needs of each individual student (Swason et al., 2004). The increased burden of teachers' duties in the context of school life has been acknowledged by the Greek state, which in the 'Bible of Digital Transformation' (2021) refers that the goal of digitization in the field of education in general is to set free and facilitate teachers from the burden of administrative duties and obligations so that more time should be spent on their teaching and pedagogical duties.

In addition, the philologists stated that an important factor hindering the utilization of ICT was the lack of relevant laboratory and infrastructure facilities in schools. An important weakness of the Greek educational system is reflected, which is related to the fact that teaching work is not supported with the appropriate technical and laboratory means in with contemporary accordance the developments. According to Dieker, (2001) and Lane et al. (2006) teachers should be totally and ceaselessly supported by the official state so that they can dedicate themselves to their teaching

work using all potential utilization of digital tools.

Also, several philologists answered that they find it difficult to use ICT, due to difficulty in their communicating with school's administration. Mostert (2008) emphasizes that both teachers and school administration should have a problem-solving orientation showing mutual respect, exemplary communication skills and not a sharp exchange of information. The creation of a positive atmosphere, the willingness to resolve conflicts and good interpersonal relationships favor a positive environment that achieve its of better learning conditions for students, but also at a friendlier workplace for teachers. Teachers' weakness to work effectively with the school administration may be related to the absence of 'real partnerships' which are built on mutual trust, support and respect. Intuitively, it seems that effect of differences personal in the characteristics and traits, as well as in professional 'style', negatively affect the selection of common goals between teachers and administration (McCormick et al., 2021).

CONCLUSION

According to the results of the research, philologists make moderate use of ICT to improve the written language of students with learning difficulties. The most important reason for this limited use of digital tools is the many daily tasks that they have to do at school. However, from the findings it emerged that students with learning difficulties in written language seem to improve themselves with the use of digital tools in key sectors of understanding and written language production, which are mainly syntax, spelling, grammar and vocabulary acquisition. The present research also concludes that teachers use digital tools to a small extent as a means of evaluating the learning outcomes of students with learning difficulties in written language. This is primarily due to the limited training on the use of ICT, schools' limited equipment but also due to a problematic communication with the school administration.

Limitations of the research

The sample that participated in the research consists of teachers who come from Northern Greece and serve in secondary schools in Northern Greece. Therefore, the sample does not include teachers from the rest of Greece, whose opinions could perhaps differentiate the results. For example, schools in Athens, located in the capital of the country, may be equipped with better infrastructure in terms of digital tools, but also offer teachers more opportunities for training both in the use of ICT and in relation to learning disabilities. Also, no possibility was given for the implementation of qualitative research in order to shed light on the investigation of the issue in order to get the qualitative dimension in depth.

Implication in practice

Research emerged that the use of ICT significantly helps to improve written language of students with learning difficulties but the use of digital tools is not implemented by all philologists, which is the whole point. For this reason, it is suggested that philologists should be focused on the design and implementation of courses and educational interventions according to the individualized needs of students with learning difficulties to a greater extend and to a lesser extent on various tasks that school asks from them (e.g. administrative work). Thus, philologists will have the time to integrate digital tools into their teaching to deal with difficulties in the written language. Focused on training issues in learning difficulties are also proposed, with a central module being educational intervention using digital tools. Finally, a much needed enrichment to schools with the appropriate digital tools that will be accessible to all teachers.

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