The Use of the Computer as Supplementary Tool and Teaching Media for Students with Disabilities

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Abstract: *In recent years, a pedagogic-teaching change and a transformation in the education of students with disabilities has been noticed, which has computer technology at its core. In this way, it is recognized that the computer significantly affects the teaching style of the students of this group and at the same time, it enhances their academic performance as it provides more learning opportunities and teaching practices during the educational process. The careful critical-interpretative consideration and review of the various domestic and international numerous works related to the specific scientific theme was used as the main method of writing and rendering this work. Finally, it appears that the introduction and utilization of the computer as an auxiliary and complementary tool in the teaching and learning processes of the students of this particular group, contributes to the development of their critical thinking, turns learning into an active one and forms authentic working conditions and conditions regarding the their multiform and multimodal improvement and promotion.*

Keywords: computer, students with disabilities, developing critical thinking, improving academic performance, supplemental media

1. Introduction

The computer in the form of an educator-teacher has the ability to present to -potential learners- and depending on the level of their knowledge and skills, the scientific-educational content in another form, which I mentioned in passing will be adapted to the profile and their interests (Otto et al., 2010). The various educational software installed on the computer and used by all students, especially those with disabilities, on the other hand, highlight the usability and contribution of the (computer) to the teaching process as an additional auxiliary tool and medium (Richardson & Placier, 2001) that every teacher has in his/her methodological quiver for the accomplishment and realization of his/her daily pedagogic-educational work, action and action (Petersen & Bunting, 2012).

In this way, it appears that especially the people/students who fall into this special group, based on their learning profile, their interests and the way they learn and assimilate knowledge, can access the various information and data, to facilitate their access, analysis and utilization and also to use them in a constructive and beneficial way and form for their individual development, evolution, improvement and promotion (Kron & Sofos, 2007). Computing technology, therefore, provides these students with a new and different form and use of audio-visual assistance and facilitation in their pedagogical-learning ventures and activities. It also helps teachers in a groundbreaking and effective way during the teaching and learning processes (Johnstone, 2003).

Henceforth, it can be seen that the computer is a reliable and versatile electronic tool and machine in the methodological palette of every teacher, through which he can shape and adapt the various already existing teaching techniques, strategies and practices to the new and optimal pedagogical-scientific trends and imperatives, but above all, especially in the needs, peculiarities and abilities of students with disabilities (Area & Sanabria, 2014). The students of this group, therefore, can use the computer as a tool that facilitates them in recovering their practical skills to the fullest and provides solutions to most of their cognitive problems and obstacles that arise in the processes of the

learning process and practice (Bawden, 2001). In this sense, it becomes noticeable and understandable to anyone involved and related to the field of Special Education and Education, that the planned, guided and controlled introduction and use of the computer by teachers in the teaching of students with disabilities, can only offer positive benefits and multiple alternative scientifically meaningful solutions and practices to improve either their academic weaknesses and difficulties or their behavioral deviations from the norm (Arici & Barab, 2013).

Even today, the computer is an evolving educational tool and medium for the teaching and learning of individuals of this group, since it enhances their enthusiasm and curiosity for heuristic search of information and knowledge (Cheng & Tsai, 2013). With computing technology, among other things, physical learning environments are created, which are enhanced by the addition of digital information and data (Tomi & Rambli, 2013). The student user with a disability, in other words, interacts in real time with a computing environment rich in stimuli and relevant information, thereby blending the virtual with the real as human senses and perspectives are enriched in various ways (McMahon, 2014). Among other things, it is observed that the computer activates the interest and curiosity of students with disabilities in particular, as it combines the digital with the physical world where the engagement of users/students with the intake of information and knowledge is encouraged, while simultaneously developing creativity and their imagination (Abas & Badioze Zaman, 2010).

The computer as a complementary tool in the teaching and training of students with disabilities
Computer technology, now, as a means of information, communication, information and knowledge, completely changes all areas of scientific reality and, especially, the area of Special Education and Training (Burraston & Bebell, 2013). In this sense, it is noted that students with disabilities are impressed by the controlled and under educational conditions and guaranteed use of the computer to carry out some of their activities and tasks during the educational process. It is noteworthy, however, that while the attention of students with disabilities when dealing with tasks in the

traditional/classical way and format is superficial and the results of their actions are limited, with the use of the computer, on the contrary, it is found that there is a participation without interruption and at the same time to increase their substantial and effective performance regarding the completion of their tasks (Carr, 2012).

Certainly, the use of this digital computing tool, in short, facilitates students with disabilities as it provides them with more opportunities for cognitive development and development of all their skills, since it functions as a system of multiple teaching methods, from where it is drawn from the respective teacher and depending on the occasion, the best and most effective teaching methodology and technique for the students of this group. Consequently, the computer is considered to be a modern technological tool that contributes during the teaching of these students to the improvement of their reasoning abilities, as they have the possibility to acquire knowledge through a learning environment that is rich in stimuli, multisensory and potential (Mabry & Snow, 2006). In any case, the pedagogical-teaching contribution of the computer to the development and progress of the students of this particular group is highlighted, since their education requires, in addition to new and modern scientific teaching practices, flexible and differentiated learning environments that will be adapted as best as possible manner and form to their individual and evolutionary needs and weaknesses (Bebell & Kay, 2010).

The best possible and scientifically controlled use and exploitation of the computer in the teaching and learning of these individuals, therefore, is a very big bet since it significantly and catalytically determines the acquisition of new skills on their part both diversely and multimodally (Zucker & Hug, 2008). As a transformative tool for teaching and learning, the computer, among other things, enhances the way of acquiring knowledge, attention and critical thinking processes, acts as a permanent alternative source of information and data for these students and also guides them safely towards the educational process and practice. With the computer, among other things, the information is transferred differentiated and adapted -depending on the mental level of each student with a disability- as acquired knowledge of the real world. The computer as a complementary co-assistance tool of the instructors/teachers of students with disabilities, in general, is used for the seamless and unrestricted discovery of knowledge and information finding, so that their options for solving their problems are more and their decisions for pedagogic-didactic issues to be governed by diverse alternative proposals and options (Apostolou et al., 2011a; Wright & Dawson, 2013).

However, it must be pointed out and strongly emphasized that the design, integration, utilization and application of computer technology in the processes of education and teaching of students with disabilities is a difficult undertaking even today (Vekiri & Chronaki, 2008). Nevertheless, it is considered that the introduction of the computer in their education on a daily and logical basis is likely to be particularly useful and effective for the full understanding and experience of limitations, phenomena and issues of social becoming and scientific reality. Taking into account the various researches and studies regarding the contribution of the computer to the education and learning process of these individuals, it appears that its use and utilization is a creative, imaginative, happy and interactive experience and practice of their daily work (Warschauer et al., 2010).

This implies that computing technology enables the participants-students with disabilities to understand and above all to be able to remember various aspects of the received information and knowledge during the delivery of teaching materials and tasks of learning objects (Spektor-Levy & Granot-Gilat, 2012). In this light, the propulsive power of integrating computer technology into the teaching of these students is highlighted, which through the balanced and harmonious mixing of images, effects, sound and music together, give more substantial interest and deeper meaning and dimension to the content of the lessons being taught cognitive objects (Pamuk et al., 2013). In this way, the students who fall into this group are gathered during the delivery of the lessons and remain active for more time during the teaching period. In addition, it is observed that their reactions, feelings and behavior change regarding the actual teaching process and practice. The playful character (puzzles, cards, digital games, etc.) of the computer, in other words, peaks their mental concentration and ability to fully enjoy their activities and at the same time eagerly await the performance of the new ones (Stager, 2012).

The essential and effective introduction and utilization of the computer in the education of students with disabilities
In recent years in particular, there has been a rapid trend of spreading the use of the computer in the teaching of students attending the standard school, which is beginning to spread as a philosophy and practice now also in the field and context of Special Education and Education (Ertmer & Ottenbreit-Leftwich, 2010). The use of computing technology, however, in the teaching and learning of people with disabilities by teachers/teachers -whether through curricula or as an auxiliary tool to facilitate their teaching work- involves many methodological and technical risks, which in turn they may bring about completely the opposite results in relation to the expected ones. Certainly, the properly designed and methodologically correct use of the computer in the education of these students can activate their learning motivation, as they have the opportunity to use the image, to produce text in a different format compared to the classic/traditional one and in general, to they entertain themselves pleasantly without resenting both their tradition and their deeds (Inan & Lowther, 2010).

In any case, it is demonstrated by the various findings of research and studies that have seen the light of day in recent years regarding the specific topic, that the use of the computer in the teaching of students with disabilities activates their cooperative skills, reduces their extracurricular mental burden to carry out their tasks, it is proven to improve their analytical skills, while at the same time they learn to search for information and data in a targeted and effective way (Bosco 2015). On the contrary, however, the various pedagogical issues faced by teachers during the use of the computer in teaching these students

must be mentioned. In particular, they face problems of maintaining discipline, finding time to explain all the stages of the digital presentation of the thematic unit under delivery, searching for the most optimal -in manner and form- technique for their substantial involvement in the specific project and also creating a suitable environment for experimentation them with the new didactic approach and assimilation of various cognitive subjects (Chevallier et al., 2015).

The successful realization of the above, of course, depends on two main and fundamental variables and parameters, which are, on the one hand, the ability of teachers to use computing technology in the most optimal pedagogical-scientific way (Mautone et al., 2005) in teaching of students with disabilities and, on the other hand, the ability of these students to handle the specific digital tool and medium in a didactic-educational way in order to obtain as many substantial benefits as possible from its use (Pennington, 2010). Also, it can be seen that students with disabilities when dealing with solving their problems through the computer, are most often led to the correct and/or incorrect answer/solution using the trial and error method. Moreover, it can be seen that these students are motivated and simultaneously influenced during the educational process when they are encouraged and positively reinforced by the teachers, rather than by the digital technology itself and the options it provides to these students (Cayton-Hodges et al., 2015).

Especially the mobilization, motivation, encouragement and activation of people/students with disabilities and/or special educational needs, is usually carried out and achieved in the teaching practice when there is appropriate adoption and utilization of the computer as a complementary tool in order to achieve the expected positive results. Nevertheless, the method and way of using the computer should not be overlooked to achieve the desired behavior of these students during teaching and learning (Nowacka & Nowacki, 2014). The issue that arises at this point is the extent to which the specific technological tool can fully enhance the willingness of the students of this particular group to participate actively and not mechanistically in the educational process (Moore & Kearsley, 2012). However, the mobilization of these students in the educational practice is not achieved solely through the introduction and use of this tool in learning conditions, but is a combination of multiple and varied factors such as the role and position of the teacher in the entire process as well as the effect of positive reinforcement and support of their desired behaviors (OECD, 2016).

Obstacles to the integration and utilization of the computer in the teaching of students with disabilities
In essence, obstacles refer to situations and problems that in a sense make it difficult and/or cancel even the attempt to partially achieve the specific project (Holland & Muilenburg, 2011). As for the obstacles created during the teaching and learning of students with disabilities, they are usually due to the inherent weaknesses presented by the group of these individuals in handling and managing the specific digital tool effectively, so as to obtain optimal results for their development and progress (Ertmer & Newby, 2013). In addition to this, however, there are and

can be seen difficulties and obstacles concerning the level of teachers regarding their digital training, knowledge and skills and the level of the digital infrastructure they have, mainly the special structures in the Greek territory. Unfortunately, the inability of the Greek education system to prepare informatics teachers who will not only teach the content of the various subjects of the curriculum of the Special Education and Training Schools but will have the skills and capabilities to optimally deal with and ultimately the psycho-emotional and behavioral weaknesses and deficits of these students (Harridge-March et al., 2010).

The success, however, of the substantial integration and use of the computer in education, especially of students who study in SMEAE and have/present pervasive neurodevelopmental disorders, depends on the educational factor, which constitutes a point of reference regarding the best possible application of the aforementioned venture. However, it must be emphasized that there are obstacles regarding the process of integrating and utilizing computer technology in the teaching and learning of these students, which are not due to and are directly and/or in any other way related to the teachers (Sofos et al., 2010). In the first stage, there are obstacles such as the minimal computing equipment of the primary schools, the inability to train teachers, the insufficient time for students to effectively learn how to operate the computer, the inability to access computers most of the time for both teachers and students and the absence continuous technological support, maintenance and upgrading of the specific teaching tool and medium. In a second stage, on the other hand, there are obstacles that are due exclusively to the teachers and concern their reluctance to change and adapt to new technological trends and practices and to their established perceptions, attitudes and opinions regarding the way and form of doing the teaching educational process (EAITY, 2011; Lin et al., 2012).

Taking into account the above data, it is recognized that prioritizing and at the same time eliminating the various obstacles to the introduction and use of the computer in the teaching and learning of people with disabilities is an intractable puzzle and/or a dystopian event, because there is a dynamic and inescapable overlap, interaction and multi-level complementarity of all these obstacles, regarding the essential and complete application of the (computer) in the teaching practice (Karga & Satratzemi, 2014). As much will and passion there is on the part of the teachers for the daily inclusion of the computer in the teaching of these students, therefore, it is almost impossible to achieve from the moment it will appear and definitely appear during the implementation of the aforementioned project and action, some or/and many combinations of these obstacles. The only constant to eliminate some of these obstacles is certainly the individual teacher, since as the absolute master of the class (Olson, 2000) he significantly determines the successful and/or not outcome of the teaching through the integration and utilization of computer technology in the educational processes of students in this particular group (ITYE, 2013).

2. Conclusions-Suggestions

Obviously, the successful, correct and substantial adoption and utilization of computing technology by teachers -at all stages and phases- of teaching and learning, particularly of students with disabilities who attend SMEAE (School Units of Special Education and Training) is considered and is an important catalytic issue and event. It is certainly necessary at the level of teachers to have experience and willingness in this field, while at the level of student's, at least the minimum knowledge and digital skills regarding the simple use of the object/tool/medium must exist, so that they can respond even to the minimum in their teaching duties. Consequently, in order to make the learning and education of these individuals more qualitative, optimal and effective, the appropriate conditions must be created so that the specific project that offers so much -whether in psychosocial or academic- development does not fail and promotion of students with disabilities. Unfortunately, the findings of various researches that see the light of day from time to time, demonstrate that even today, the computer is used in the education of these students, as a means and environment for their employment, entertainment and relaxation during the various psycho-emotional processes taking place and their behavioral outbursts.

However, it must be urgently emphasized on the other hand, that the state, through the agencies that plan and implement the specific project in the field of Special Education, must throw its weight into the preparation and training of teachers. Of course, not in the field of digital training, but on the contrary, in changing their teaching culture so that they have the ability and ability to deal with the psycho-emotional inadequacies and deviant behaviors -from the lows- of these students in the best possible way and method performance of the educational process and act. Also, special schools should be provided with more computers and digital technology in general, because the interactivity and multimedia provided by computer technology, works as a soothing and balanced force to concentrate their attention so that they can continuously follow the learning processes. Finally, the existence of a digital library, from the archives of which teachers will draw ready-made digital lesson plans, where they will have the possibility to reuse them and/or modify their content, in order to use them as they wish, is considered an absolute and imperative necessity and they think In this way, they will overcome their lack of specialized digital knowledge, limited teaching time and lack of technical support.

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