

Graphic design in special school: a new didactic proposal for students with intellectual and cognitive disabilities

Diego Bernaschina

Independent Scholar, Santiago, Chile

E-mail: diegobernaschina@gmail.com

Abstract. This paper corresponds to the educational experience on the importance of the information and communication technologies used for students, especially with the theory of structural cognitive modifiability of the Romanian psychologist Reuven Feuerstein (1921-2014) about borderline intellectual functioning incorporation. Feuerstein is the theoretical vision of special students manifests a culturally disadvantaged and socially disadvantaged life by incorporating this educational model through new technologies at different school stages. The only question suggested raising the methodological work for the graphic design subject: Is there a good tool for the graphic design for young students with intellectual and cognitive disabilities? There is no space to think and understand the use of more significant materials. Therefore, this situation arises to respond to the new socio-educational demands of users with intellectual and cognitive disabilities through the information and communication technologies used in the special school. It is possible to analyze the “new” guidance on the specialization of complementary teaching in graphic design, facilitating the recognition of students with intellectual and cognitive disabilities. The methodological proposal was designed through planning guidelines series to create new concepts of basic tools and digital content for special students. A brief analysis of the didactic resources to include the combination of strategic skills and teaching-learning processes of visualization capacity and usability tools. The main recommendations on different criteria to improve the quality of educational interaction, especially for borderline students and for the Deaf teacher/artist in the graphic design workshop.

Keywords. Graphic design, didactics, disability, teaching, special school.

1. Introduction

Life teaching is not easy to interact between Deaf teachers/artists and intellectual and cognitive young students in the virtual classroom. Since I started working as a visual arts teacher in a small special school of “Alamiro” in Santiago, Chile, this experience of the educational system there was a short period of the Digital Art workshop (from May to June 2011). This proposal was developed in the pilot process (preliminary or test stage) for the participation of young students with intellectual and cognitive disabilities based on the model of the structural cognitive modifiability theory (SCM theory) of the Romanian psychologist Reuven Feuerstein (1921-2014), by minimizing the barriers to learning and the development of values associated with the mediated learning experience theory (MLA theory).

Just as personal experience of art education through Feuerstein is SCM-MLA theory to incorporate “the complementary subject of media arts” [1-4]. For example, some authors analyze instrumental teaching to incorporate annealed strength in the learning profile of Down syndrome, just as their potential for disability and their challenging barriers to participation through the learning experience, adaptive design, and creative strategies; additionally, it is important to involve the educational experience over ICT [Information and communication technologies], and the programming learning (or computational thinking) for the students with Down syndrome, by incorporating the adapted content, and even their particular needs, and integrated into their curricular activities [5-9].

This Romanian theory implies the hypothesis of digital literacy and digital art tools for young students. Very little effort is invested in theory building, in developing strategies, and in finding ways to implement approaches to the prevention and treatment of cognitive deficiency in the deprived adolescent [10]. So, the theory of SCM occupies special education programs, especially for disadvantaged students. Just as the work of different situations for school learning and sociocultural motivation. Not all special schools allow this Feuerstein's theory, i.e., each school requires additional support associated with the school system for special education, depending on the chosen specialty of various services, resources, and assistive technology.

Feuerstein's theoretical vision of special students manifests a life of culture and socially disadvantaged life by incorporating this educational model through new technologies in the younger's stage (or primary school). It is possible to know and acquire the necessary skills for the new experiences between success and school failure through educational work in the virtual classroom for the special school. Education is important no matter which point we are in our lives [11]. Thus, the special school helps preserve the classroom climate to generate student reinforcement. The unique classroom climate of the art room often allows for students to communicate with one another while working creatively on their art [12]. This theory supports the development of young students with intellectual and cognitive disabilities, enhancing their socioemotional skills and self-esteem. The importance of ICT use for students, especially in Feuerstein's SCM-MLA theory about borderline intellectual functioning (BIF) incorporation. However, there is still reason to believe that persons with borderline intellectual functioning face substantially elevated morbidity risks and some have intellectual disabilities [13].

2. Literature review

Arts education and special education have seen challenges in several years, leaving a larger gap in resources and accessibility for marginalized students, minorities, and students in poverty, of course, in the wake of school reform, as well as arts and humanities programs; including those with disabilities that require numerous adaptations for full participation (e.g., physical, visual, severe, and multiple disabilities) for the funds would be made available for school systems to employ art therapists and art support teachers [14, 15]. It is relevant to incorporate the BIF about the adaptive limitations, and the learning disabilities of young students. Despite the skills and the development of technological learning, it is very different from the approach by students with disabilities [3]. It is necessary to emphasize the help for students to access the integration of their classmates. Nevertheless, there are certain criteria to consider developed by the different special schools to cater to individuals with BIF. Explaining by removing the barriers to improving art education through ICT use and good practices in special schools. Thus, the adaptive capacity and different capabilities in the educational context emphasize the participation of young students with the BIF.

A small example is the reference to the basic contents of the use of graphic organizers [16, 17]; and part of the inclusion of art education in the incorporation of disability studies to promise multidisciplinary and transdisciplinary; the visual arts afford preservice teachers and students a way of participation in the educational system [18-27].

The only question suggested raising the methodological work for the graphic design subject. Exist as a good graphic-design tool for young students with intellectual and cognitive disabilities? Lack of sufficient space hinders the ability to contemplate and grasp the utilization of more substantial materials. Therefore, this situation arises to respond to the new socio-educational demands of users with intellectual and cognitive disabilities through ICT use in special schools.

Consequently, within the framework of SCM-MLA theory, this combination of diverse features is introduced to incorporate specific functions and educational approaches suitable for school learning in individuals with BIF, relying on ICT use for straightforward activities. This reasoning operates for adaptation and school learning, especially for students with intellectual and cognitive disabilities, to support different forms of didactic resources and computer materials. Thus, having a disability leads to a level decrease in capability or performance in the context of borderline intelligence, resulting in the inability to exhibit a competitive attitude within a group characterized by poor learning performance.

Next, what is the step to defining the interaction of a Deaf teacher and students with intellectual and cognitive disabilities in the complementary teaching process? How does the ICT process for graphic design work? According to the different functions for complementary education, the above depends on the characteristics of the generations and the double culture (informatics and media).

The educational realm often demands significant transformations in digital literacy and accessibility. However, implementing these changes can be challenging, especially in art education and ICT in a complementary manner. Developing educational software for graphic arts and facilitating learning through digital technology can be particularly arduous for students with intellectual and cognitive disabilities. Such endeavors require stimulation at all levels of education and the creation of specialized programs that align with the educational landscape of ICT and graphic design.

Most Deaf teachers use sign language to teach intellectual and cognitive young students because it is confusing, complex, and entangled. They rarely encounter a disabled artist as role model and none of the students I interviewed had been taught by a disabled teacher before they came to the college [28]. There is a short theory on the role of the Deaf artist for the incorporation of Feuerstein's educational model in the special school for students with intellectual and cognitive disabilities. The outcome may not always be favorable, as there can be significant challenges in fostering interactions between students and teachers with both types of disability.

This situation constitutes one of the main obstacles for Deaf and hard-of-hearing people, depending on the differences between human activity and the problems derived from the teaching methodology in formal schools [1]. However, in most cases of teacher training, they feel discriminated against due to their disability, above all with the employment relations, and, of course, one of the various reasons for the incapacity of employment is professional underperformance, low salary, the lack of inclusive social approval, and few job opportunities. Likewise, it is more difficult to fulfill educational interaction through ICT use, of course, its relationship with school performance, cognitive stimulation, and motivation for learning. Thus, there is an impossibility of socializing and communicating through the sign language used by Deaf teachers in special schools for students with intellectual and cognitive disabilities.

On the other hand, for the hard-of-hearing teacher—who uses a hearing aid to hear, and depending on the degree of hearing loss—it is more difficult to understand the feedback from students. You could also say that it is almost impossible for a Deaf or hard-of-hearing teacher who teaches your computer subjects in the classroom.

3. Research goal and objectives

Integration of ICT and BIF proposes the complementary subject of art and technological education in a special school. The most important thing about the specialization, it is possible to cooperate the design pedagogy with the teaching of graphic arts within the virtual classroom of a special school.

3.1. General objective

The general objective is to guide the specialization of complementary teaching of graphic design and facilitate the recognition of students with intellectual and cognitive disabilities.

3.2. Specific objectives

The specific objectives consist of some points:

- i) To provide a personal experience of graphic design work with educational software and their learning method through the use of ICT;
- ii) To point out the planning carried out for the Digital Art Workshop and its main characteristics of the didactic resource;
- iii) To propose the new orientations of simpler didactic tools and guide the visualization capacity of border users through the use of ICT and graphic design; and
- iv) To improve some complementary teaching criteria based on the motivations and stimuli of the students about the BIF.

3.3. Special objective

It is important for special education; it has played the interpretation of the functional curriculum for students with low-incidence disabilities and remedial programs for those with mild disabilities; also, in the face of this new approach to the curriculum to address students with disabilities in the classroom; the composite of these components also reflects the needs of students with extensive support needs to acquire skills to participate in functional activities that naturally occur in across school contexts, at home, and in the community [29, 30].

Further, such an approach requires that we commit ourselves to train teachers to be enabled to act not only as a source of knowledge but also as mediators of the two necessary disciplines—the content knowledge needed to function in the world and the cognitive processes by which to make this knowledge adaptive, applicable, and functional [31]. In certain curricular programs, it is also important that special schools not only include students with BIF in the virtual classroom but also that each student is actively involved and accommodates this ICT activity.

4. Methods

The methodological proposal was designed through planning guidelines series to create new concepts of basic tools and digital content for special students. It is quite complex to carry out the ICT educational activities, depending on the orientation of the educator's forces, i.e., the special education teachers analyzed the preliminary proposal for the digital art workshop by using the recommended programs of art education without the need for previous experience for all the students. The design was implemented with the ensuring goal of its usability and accessibility in every placement, regardless of the location [32]. The new educational approach corresponds to the photography and graphic design software used to facilitate the exploration of didactic activities in different fields of technology and education. There were some strategies to facilitate learning, ICT use, and BIF, both in pedagogical practice for teachers and in educative practice for students.

However, in the process of educative methodological incorporation, the documentary review presented different sources for the manual use of some educational software programs in digital art. Furthermore, it delved into the exploration of a personalized tool with applications in graphic design and various areas of empirical studies, including educational planning. Finally, the curriculum for digital art workshops enhances complementary teaching by incorporating digital tools through Adobe Photoshop (Photoshop) to teach the fundamental skills in photographic manipulation.

5. Results

The fundamental bases for educational development consist of different activities, subjects, or contents, creating new sophisticated tools such as technological instruments and supports; therefore, this educational model for the ICT requires a technological approach that involves teachers, students, and special educators, educative technologists (or experts in digital literacy), and therapeutics to improve changes through the teaching-learning process [33, 34].

Next, the curricular about the planning made of the Digital Art Workshop (Table 1).

According to [35], the students used the computer program Photoshop to change the images and also took new photographs; however, in some cases not like the original images of people with intellectual disabilities. Occasionally, students with severe disabilities fail to respond at all on days when their health is poor, they have seizures, or some change in their environment has occurred [36]. It is difficult to analyze the didactic proposal and the methodological tools in Photoshop, and of course, the cognitive stimulation for borderline students in the ICT. However, this educational experience and its relationship with learning is quite a complex task to relate to the Deaf teacher and the feedback from students with intellectual and cognitive disabilities. To provide structure for pairs of teachers who may not have schoolwide support for collaboration and to focus teachers' efforts in planning adaptations and accommodations for students with disabilities who are in general education classes, [...] [37]. This implies adapting the use of basic and simple tools in Photoshop, depending on the techniques of manipulation and photo retouching by the special students.

The art teacher is responsible for planning for these key components to lead to a more valuable level of paraprofessional support in the art classroom [12]. It is also important to consider the acceptability of the methodology for the main benefits for young students with the BIF. This influences the intervention of different skills in technological

resources and different compositions of images for digital content, without discrimination of personalized work.

Table 1. Sample proposal of Digital Art Workshop (planning made)

Title	Digital Art Workshop
Duration / Number of sessions	2 hours / 4 sessions
General objectives	<ul style="list-style-type: none"> - To know the handling of the basic tools of the Photoshop program. - To understand the processes of execution and construction of works. - To apply knowledge of imaging techniques in the program by making simple drawings, based on class observation. - To automate tasks through the use of executing certain steps in Photoshop.
Specific objectives	<ul style="list-style-type: none"> - To develop the basic tool handling through the use of layers, color tools, blend modes, drawing and painting tools, retouch tools, etc. - To propose the ability to reconstruct an image, retouch it, colorize it, or simply make use of different creative proposals by students.
Contents	<p>Contents Session #1:</p> <ul style="list-style-type: none"> - Introduction to the Adobe Photoshop's software: <ul style="list-style-type: none"> • Photoshop screen on Windows • Menu bar • Tool box • Options bar • Title bar • Status bar • Minimize, maximize (or restore) and close buttons for a window and a document • Pallet box - Menu file: <ul style="list-style-type: none"> • Open and create a new document • Save as and close (or exit) a new document • Selection tools, rectangular frame, move, brush, paint bucket, rectangle, ellipse, polygon, hand, zoom, etc. - Layer palettes, color (application), history, browser, etc. - Create a new folder - Exercise n°1: Composition of a color <hr/> <p>Session #2:</p> <ul style="list-style-type: none"> - Menu file: <ul style="list-style-type: none"> • Copy and paste JPEG files - Edit Menu: <ul style="list-style-type: none"> • Free transform • Rotate • Scale • Flip Horizontal / Vertical - Image Menu: <ul style="list-style-type: none"> • Adjust a color • Hue / saturation - Selection tools, basic text, layer (and create a new layer) - Exercise n°2: Composition and modification of an image and color adjustment <p>Session #3:</p> <ul style="list-style-type: none"> - Menu file: <ul style="list-style-type: none"> • Modification of a file from JPEG to PSD (Photoshop file) - Magic wand tools, deselect, text to color (change the color of a text) - Exercise n°3: Choose a figure to use the lasso or pen tools <p>Session #4:</p> <ul style="list-style-type: none"> - Preparation of the final work: <ul style="list-style-type: none"> • Create your own group work, freely, expressing your own knowledge in the use of Photoshop.
Methodologies	Middle-level students —equivalent to high school— are able to identify users in different areas, who manage to develop their personalized autonomy, responsibilities, flexible learning and teamwork as fundamental tools to promote comprehensive and multidimensional learning, respecting diversity, through of a methodology based on artistic mediation (traditional duo) that promotes creation, reflection, and dialogue in digital art.
Evaluation	Not apply with the expected results.

Source: self-made

6. Discussion

These discussions were canalized by the questions pertaining to the images, and the usability of graphic design. Participants cited differential expectations of teachers, lack of accommodations or supports, and physical isolation of students among the challenges to inclusion of special education students [...] [38]. All young students with the BIF will

be reinforced with different affective (or emotional) skills, both positive and satisfactory in the virtual school.

In this sense, it is important to establish the different areas of students' lives towards the role of the characteristics of social nature [and] of technological literacy [4]. For example, according to the quote from [31], point out that the passage of failure or frustration is affected by the relevance of the tasks, the experience of changes in functioning, and a sense of the transcendence of the learning process. It is also, as [39], that the arts education of disabled young encompasses inclusive experiences in schools as well as segregated provision, with many moving between these provisions. Those decisions sometimes involve great difficulty for students in special schools.

Next, we present a brief analysis of teaching resources that contemplate the combination of strategic skills and teaching-learning processes for the complementary subject, both art education and technological education in the special school.

6.1. Brief analysis of teaching resources

Commencing with two concepts, we will conduct a brief analysis of teaching resources from diverse educational and technological standpoints, all in the context of addressing this complementary teaching approach: Capacity of visualizing and Usability tools.

The capacity of visualizing consists of a preliminary work curriculum or the previous demonstration with the use of usability tools to socialize the group work of two or more people. Some educational software tools to create digital image processing, depending on the characteristics of the educative work, and Photoshop use. So, this consideration of educational planning in ICT to develop the new task with Photoshop.

There is a wide variety of tools, both for users and students, which allow us to use and learn about digital image processing in Photoshop. This connection of creative activities fosters, both curiosity and socialization, contributing to the advancement of graphic design. By examining the straightforward and practical manipulation of digital images, it becomes essential for young students to capitalize on their collaborative efforts, integrating personalized work through the use of usability tools. Socializing with classmates within such a workshop activity proved quite challenging, with some students lacking motivation or reinforcement.

6.2. Technique concept

This definition of the concept of technique is associated with the digital image processing use in Photoshop, such as usability tools to incorporate group work or the community of students with disabilities. In this context, the development of school users through the integration of ICT and BIF represents a highly significant task. Therefore, it implies the existence of free access to digital literacy for students.

Effectively, contextualized ICT is about complementary teaching and new learning. So, it is to acquire within the digital image treatment. In essence, the ability to choose various instruments for graphic design empowers creativity, effectiveness, and autonomy. It is overcoming the barriers that hinder the capacity of visualizing and usability tools in Photoshop. Some challenges emerge when considering the accessibility of ICT in special schools, specifically regarding cultural and functional diversity among individuals with different types of disabilities. These challenges are important to promote inclusion within the school environment.

7. Conclusion

Despite the obvious, everyday problems that people with BIF face, the issue seems to be almost invisible in the field of research [40]. Therefore, there are three conclusions on different criteria to improve the quality of educational interaction, especially for borderline students and Deaf teachers/artists in the graphic design workshop.

7.1. Analysis of borderline students in ICT and educational software

The lack of ICT resources and educational software for complementary teaching to create a new method of graphic arts. One of the main causes of demotivation and poor school performance of borderline students, such as the failure of creativity for the future of labor insertion, especially for job orientation for young people with intellectual and cognitive disabilities.

Another aspect to consider is digital literacy for special students using Photoshop. By acquiring essential digital technology skills and employing strategic learning approaches in the graphic arts subject, these students can achieve improved and favorable results in their ICT use. It is necessary to respond to good pedagogical practices through teaching resources and collaborative work for teacher/artist and differential education, as well as the possibility of interdisciplinary methodology for art education and technological education in the special school, avoiding the cases of abandonment of students in various situations of school failure, poor school performance, and slow learning difficulties.

7.2. Analysis of socio-educational interaction in the classroom

Most students with BIF encounter significant challenges in interacting with their environment, i.e., the opposite environment of competition and academic performance for graphic design. Motivation and creativity pose intricate challenges at various levels of visualizing and utilizing usability tools, considering the feasibility of working with ICT

and educational software. Socialization issues impact not only other students but also the teachers within the classroom.

Several key aspects are proposed for contemplation regarding the use of educational technology and supplementary tools, particularly for students in diverse educational contexts. These aspects encompass teaching strategies involving ICT, virtual education, and other relevant tools. By dynamizing this social and educational context in the special school, the didactic resource in the face of the complexity of digital content. So, the lack of stimulation for young students with intellectual and cognitive disabilities and low school performance.

On the other hand, although most of the teaching of graphic design is very difficult to include Deaf teacher interaction and borderline students, the only way to obtain it is with differential education collaboration.

Accompaniment or «traditional duo» to guarantee and improve the quality of shared teaching of ICT in the world's graphic arts. According to [2], this means of accompanying collaborative work (or the traditional duo) for the complementary subject, depending on the methodological knowledge to develop strategic learning (or the didactic resource) for students at different levels of the school system. Each student has the creation of their digital image treatment freedom to provide motivation, educational stimulation, and reinforcement of learning without the need for evaluation in the workshop.

7.3. Special considerations

The impossibility of working with Feuerstein's theory since our educational specialty or procedural learning disorder doesn't apply, except for a special education specialist to include the traditional duo for Deaf teachers/artists within the virtual activity. Some recommendations for students with intellectual and cognitive disabilities according to this Romanian pedagogical model:

- To check the basic cognitive functions: innate abilities, history of school learning, strategic attitudes for learning digital content, ICT, and digital literacy, such as the different functions depending on the reinforcement of the stimulation of borderline students.
- To socialize and adapt to the classroom climate for students with intellectual and cognitive disabilities in school functioning, depending on the cognitive development and mediated learning experience.
- To collaborate with the special program of graphic design instruments or tools, which allows incorporating the conceptualization, or accompanying, of specialists who dedicate themselves to this Feuerstein's theory on the mediated learning experience.

These points are allowed to reduce the digital gap through ICT and access to literacy, i.e., support in special education to avoid discrimination on the BIF. Finally, we conclude the three conclusions on different criteria for graphic design, especially for students with intellectual and cognitive disabilities through ICT use. Facilitating the strategic changes and techniques in Photoshop, and of course, Feuerstein's theory of associating classroom climate and motivation of graphic arts for activity education.

Conflict of Interest Statement

There is no conflict of interest.

References

- [1] D. Bernaschina, "Art in the Silence: New Experience Towards the Role of the Bilingual Hypoacus Teacher," (in Spanish), *Educación Artística Revista de Investigación*, no. 9, pp. 45-55, 2018, <https://doi.org/10.7203/eari.9.12582>.
- [2] D. Bernaschina, "ICTs and Media Arts: The new digital age in the inclusive school," *Alteridad*, vol. 14, no. 1, pp. 39-50, 2019, <https://doi.org/10.17163/alt.v14n1.2019.03>.
- [3] D. Bernaschina, "Incorporation of Media Arts for Chilean Young Students With Special Learning Needs," *Journal of International Education and Practice*, vol. 5, no. 2, pp. 23-28, 2022, <https://ojs.bilpubgroup.com/index.php/jiep/article/view/5038>.
- [4] D. Bernaschina, "Pedagogical interaction in ICT: inclusive mediation in the virtual classroom," (in Spanish), *Etic@net: Revista científica electrónica de Educación y Comunicación en la Sociedad del Conocimiento*, vol. 21, no. 1, pp. 171-192, 2020, <http://doi.org/10.30827/eticanet.v21i1.15978>.
- [5] K. M. Whitbread, S. L. Knapp and M. Bengtson, "Teaching Foundational Reading Skills to Students With Intellectual Disabilities," *Teaching exceptional children*, vol. 53, no. 6, pp. 424-432, 2021, <https://doi.org/10.1177/0040059920976674>.
- [6] C. González-Ferreras, D. Escudero-Mancebo, M. Corrales-Astorgano, L. Aguilar-Cuevas and V. Flores-Lucas, "Engaging Adolescents with Down Syndrome in an Educational Video Game," *International Journal of Human-Computer Interaction*, vol. 33, no. 9, pp. 693-712, 2017, <https://doi.org/10.1080/10447318.2017.1278895>.
- [7] C. González-González, E. H. González, L. M. Ruiz, A. Infante-Moro and M. D. Guzmán-Franco, "Teaching computational thinking to Down syndrome students," in *TEEM'18: Proceedings of the Sixth International Conference on Technological Ecosystems for Enhancing Multiculturality*, Salamanca, Spain, Oct. 24, 2014, pp. 18-24, <https://doi.org/10.1145/3284179.3284191>.
- [8] B. Pickard, "A Framework for Mediating Medical and Social Models of Disability in Instrumental Teaching for Children with Down Syndrome," *Research Studies in Music Education*, vol. 43, no. 2, pp. 1-19, 2019, <https://doi.org/10.1177/1321103x19855416>.

- [9] J. Villasante, S. Poma, J. Gutierrez-Cardenas and N. Rodriguez-Rodriguez, "Information and Communication Technologies Based Teaching Methodologies for Peruvian Children with Down Syndrome," in *Proceedings of the 2019 11th International Conference on Education Technology and Computers. ICETC 2019: 2019 11th International Conference on Education Technology and Computers*, Amsterdam, Netherlands, October 28-31, 2019, pp. 12-17, <https://doi.org/10.1145/3369255.3369270>.
- [10] R. Feuerstein and D. Krasilowsky, "Interventional strategies for the significant modification of cognitive functioning in the disadvantaged adolescent," *Journal of the American Academy of Child Psychiatry*, vol. 11, no. 3, 1972, pp. 572-582, [https://doi.org/10.1016/S0002-7138\(09\)61209-7](https://doi.org/10.1016/S0002-7138(09)61209-7).
- [11] P. Plengdisakul, S. Phothisane and N. Soodsang, "Graphic Design for Children with Learning Disabilities Based on the Isaan Mural Painting," *Academic Journal of Interdisciplinary Studies*, vol. 10, no. 2, 2021, pp. 149-162, <https://doi.org/10.36941/ajis-2021-0046>.
- [12] C. Burdick and J. Causton-Theoharis, "Creating Effective Paraprofessional Support in the Inclusive Art Classroom," *Art Education*, vol. 65, no. 6, 2012, pp. 33-37, <https://doi.org/10.1080/00043125.2012.11519198>.
- [13] M. Ferrari, "Borderline Intellectual Functioning and the Intellectual Disability Construct," *Intellectual and Developmental Disabilities*, vol. 47, no. 5, 2009, pp. 386-389, <https://doi.org/10.1352/1934-9556-47.5.386>.
- [14] W. Zilz and Y. Pang, "Application of assistive technology in inclusive classrooms," *Disability and Rehabilitation: Assistive Technology*, vol. 16, no. 7, pp. 684-686, 2021, <https://doi.org/10.1080/17483107.2019.1695963>.
- [15] R. M. Hourigan, R. M. "Intersections Between School Reform, the Arts, and Special Education: The Children Left Behind," *Arts Education Policy Review*, vol. 115, no. 2, pp. 35-38, 2014, <https://doi.org/10.1080/10632913.2014.883892>.
- [16] D. D. Dexter and C. A. Hughes, C. A. (2011). "Graphic Organizers and Students with Learning Disabilities: A Meta-Analysis," *Learning Disability Quarterly*, vol. 34, no. 1, pp. 51-72, 2011, <https://doi.org/10.1177/073194871103400104>.
- [17] S. Darcy, H. Maxwell, S. Grabowski and J. Onyx, "Artistic impact: From casual and serious leisure to professional career development in disability arts," *Leisure Sciences*, vol. 44, no. 4, pp. 514-533, 2022, <https://doi.org/10.1080/01490400.2019.1613461>.
- [18] A. Allen, "Intersecting Arts Based Research and Disability Studies: Suggestions for Art Education Curriculum Centered on Disability Identity Development," *Journal of Curriculum Theorizing*, vol. 34, no. 1, pp. 72-82, 2019, <https://journal.jctonline.org/index.php/jct/article/view/767>.
- [19] C. Creed, R. Beale and P. Dower, P. "Digital tools for physically impaired visual artists," in *ASSETS '14: Proceedings of the 16th international ACM SIGACCESS conference on Computers & accessibility*, Rochester, New York, USA, October, 2014, pp. 253-254, <https://doi.org/10.1145/2661334.2661386>.
- [20] J. Derby, "Disability Studies and Art Education," *Studies in Art Education*, vol. 52, no. 2, pp. 94-111, 2011, <https://doi.org/10.1080/00393541.2011.11518827>.
- [21] J. Derby, "Art Education and Disability Studies," *Disability Studies Quarterly*, 2012, Online, <https://doi.org/10.18061/dsq.v32i1.3027>.
- [22] J. Derby, Derby, "Confronting Ableism: Disability Studies Pedagogy in Preservice Art Education," *Studies in Art Education*, vol. 57, no. 2, pp. 102-119, 2016, <https://doi.org/10.1080/00393541.2016.1133191>.
- [23] K. Keifer-Boyd, F. Bastos, J. Richardson and A. Wexler, "Disability Justice: Rethinking "Inclusion" in Arts Education Research," *Studies in Art Education*, vol. 59, no. 3, pp. 267-271, 2018, <https://doi.org/10.1080/00393541.2018.1476954>.
- [24] C. Penketh, "Putting Disability Studies to Work in Art Education," *International Journal of Art & Design Education*, vol. 33, no. 3, pp. 291-300, 2014, <https://doi.org/10.1111/jade.12052>.
- [25] C. O. Seidler, "Fighting Disability Stereotypes with Comics: "I Cannot See You, but I Know You Are Staring at Me."," *Art Education*, vol. 64, no. 6, pp. 20-24, 2011, <https://doi.org/10.1080/00043125.2011.11519148>.
- [26] A. Wexler, "Re-imagining Inclusion/Exclusion: Unpacking Assumptions and Contradictions in Arts and Special Education from a Critical Disability Studies Perspective," *Journal of Social Theory in Art Education*, vol. 36, pp. 32-42, 2016, <https://scholarscompass.vcu.edu/jstae/vol36/iss1/5/>.
- [27] A. J. Wexler and J. Derby, "Art in institutions: the emergence of (disabled) outsiders," *Studies in Art Education*, vol. 56, pp. 127-141, 2015, <https://doi.org/10.1080/00393541.2015.11518956>.
- [28] M. Taylor, "Self-identity and the arts education of disabled young people," *Disability & Society*, vol. 20, no. 7, pp. 763-778, 2005, <https://doi.org/10.1080/09687590500335782>.
- [29] M. C. Pugach and C. L. Warger, "Curriculum Matters: Raising Expectations for Students with Disabilities," *Remedial and Special Education*, vol. 22, no. 4, pp. 194-213, 2001, <http://doi.org/10.1177/074193250102200401>.
- [30] D. L. Ryndak, M. A. Moore, A. M. Orlando and M. Delano, "Access to the General Curriculum: The Mandate and Role of Context in Research-based Practice for Students with Extensive Support Needs," *Research and Practice for Persons with Severe Disabilities*, vol. 33, no. 4, pp. 199-213, 2008, <https://doi.org/10.2511%2Frpsd.33.4.199>.
- [31] R. Feuerstein and L. H. Falik, "Learning to Think, Thinking to Learn: A Comparative Analysis of Three Approaches to Instruction," *Journal of Cognitive Education and Psychology*, vol. 9, no. 1, pp. 4-20, 2010, <https://doi.org/10.1891/1945-8959.9.1.4>.
- [32] C. Spina, "Accessible and engaging graphic design," *Public Services Quarterly*, vol. 16, no. 3, pp. 194-199, 2020, <https://doi.org/10.1080/15228959.2020.1772168>.
- [33] J. Hartley, "Teaching, learning and new technology: a review for teachers," *British Journal of Educational Technology*, vol. 38, no. 1, 2007, pp. 42-62, <https://doi.org/10.1111/j.1467-8535.2006.00634.x>.
- [34] M. Pilamunga-Poveda, J. L. Santamaría Aguirre, D. Jordán and C. Nájera Galeas, "Didactic strategies based on ICT and their link in the educational process," in *ICERI2018 Proceedings. 11th Annual International Conference of Education, Research and Innovation*. Seville, Spain, November 12-14, 2018, Online, <https://doi.org/10.21125/iceri.2018.1847>.
- [35] A. Fudge Schormans, "'Weightless?': disrupting relations of power in/through photographic imagery of persons with intellectual disabilities," *Disability & Society*, vol. 29, no. 5, pp. 699-713, 2014, <https://doi.org/10.1080/09687599.2013.844100>.
- [36] D. M. Carey and P. Sale, "Practical considerations in the use of technology to facilitate the inclusion of students with severe disabilities," *Technology and Disability*, vol. 3, no. 2, pp. 77-86, 1994, <https://www.doi.org/10.3233/TAD-1994-3203>.

- [37] N. Carter, M. A. Prater, A. Jackson and M. Marchant, "Educators' Perceptions of Collaborative Planning Processes for Students With Disabilities," *Preventing School Failure: Alternative Education for Children and Youth*, vol. 54, no. 1, pp. 60-70, 2009, <http://doi.org/10.3200/PSFL.54.1.60-70>.
- [38] S. R. Copeland, C. Hughes, E. W. Carter, C. Guth, J. A. Presley, C. R. Williams and S. E. Fowler, "Increasing Access to General Education: Perspectives of Participants in a High School Peer Support Program," *Remedial and Special Education*, vol. 25, no. 6, pp. 342-352, 2004, <https://doi.org/10.1177/07419325040250060201>.
- [39] M. Taylor, "Access and support in the development of a visual language: arts education and disabled students," *International Journal of Art & Design Education*, vol. 24, no. 325-333, 2005, <http://doi.org/10.1111/j.1476-8070.2005.00456.x>.
- [40] M. Peltopuro, T. Ahonen, J. Kaartinen, H. Seppälä and V. Närhi, "Borderline Intellectual Functioning: A Systematic Literature Review," *Intellectual and Developmental Disabilities*, vol 52, no. 6, pp. 419-443, 2014, <https://doi.org/10.1352/1934-9556-52.6.419>.