AUDIO DESCRIPTION AND INCLUSIVE EDUCATION: A RESEARCH IN PRIMARY SCHOOL CLASSES*

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Abstract

In recent years there has been a proliferation of initiatives designed to make accessible the audiovisual messages, through a process called audio description (AD): is a support service, composed by a set of techniques, methods and skills whose main goal is to reduce the visual deficit by making accessible any visual message with appropriate audiovisual substitute information. In recent years the pedagogical reflection considered the AD a field of study close to their research interests [1]. According to the ICF perspective [2], AD may have a facilitating role in the social and educational contexts (inclusion and social participation, learning). The paper presents a qualitative-quantitative research aims to evaluate the teaching capabilities of AD, both in terms of school inclusion and in terms of listening comprehension of narrative-filmic language. In nine primary classes, according to three different modalities of use, it has been proposed audiovisual film Kirikou and the Sorceress: animated feature for children written and directed in 1998 by Michel Ocelot and audio described by the CNTHI research group of the University of Salento in 2012 [3, 4]. The analysis of qualitative-quantitative data shows that the various methods of audiovisual enjoyment have allowed the classroom setting to live an “unusual” learning experience aimed at promoting, through the empathy and simulation, multisensory and the inclusion at school.

Keywords: Audio description, accessibility, visual impairment, inclusion, school.

1 AUDIO DESCRIPTION AS A PEDAGOGICAL TOOL

In the Information and Knowledge Society, the ICTs play a central role in the processes of knowledge construction and in the processes connected to the reorganization of societies. Technology has considerably changed the way we communicate and think introducing new languages and new categories of thought [5]. They are part of people’s educational and social process [6, 7], becoming more and more an opportunity for increasing knowledge, learning and integration. In this sense, the meaning of the term “accessibility” has been re-established, expanding its semantic value and becoming an hypernym that refers to concepts such as culture, knowledge, information, freedom, socialization and independence. In the “classical” definition, accessibility referred exclusively to physical reality and architectural barriers. After the spread of technological innovations the concept of accessibility has enriched with a broader meaning. Besides indicating the level of usability of an environment, a good or a service, the concept also refers to the virtual barriers and to the difficulties faced by different types of users in the management and use of technology. The right to accessibility of a good or service must be ensured equally to all citizens. It follows that the needs of people with difficulties must be taken into account in designing a strategy for the development of an egalitarian society, to avoid creating, even in “virtual contexts”, new forms of social exclusions. The new goods and services should be designed from the very early stages following the philosophy of the “design for all”, that is an universal design which is “sensitive” to the (different) special needs of users. In that way, the deeper concept of accessibility can be realized and consequently the direct productions of goods and services can also be accessible to users with physical, sensory, social difficulties or any other kind of difficulties. In particular, recently the attention of researchers has been devoted to audiovisual accessibility. The notion of accessibility has therefore a social connotation that means specifically, make audio-visual products, available to people who otherwise would not have access.

Audio Description (AD) for visual impairments people is a process of translating visual information into words for people who are blind or have low vision, an support service, composed by a set of techniques, methods and skills whose main goal is to reduce the visual deficit by making accessible any visual message with appropriate audiovisual substitute information in relation to the specific needs of potential users. It is a voiceover, aimed at describing aspects of audiovisual products that are not

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accessible: visual component (shares, body language, facial expressions, setting, clothes/costumes). Everything that is used to refer to the “visual world” is made accessible by a verbal description that fits between the dialogues, does not overlapping to the significant music and sound effects [8, 9]. In recent years, also in relation to “visual predominance” in teaching and learning activities [10, 11, 12], pedagogical reflection considered the AD a field of study close to their research interests [1]. In fact, according to the International Classification of Functioning, Disability and Health perspective [2], AD may have a facilitating role in the social and educational contexts (inclusion and social participation, learning), while, conversely, its absence would be a barrier for a blind person: the increase of the digital and social divide.

From a scientific point of view the pedagogical reference of theory is the ICF scientific model of reading and life situations of disadvantage by that no intervention of a technological-educational and psycho-social and medical rehabilitation be separated. What really connects the AD to ICF is the attention that this classification model was respect to the participation of the disabled people and the assessment of contextual and environmental variable. The AD is just part of this “Copernican revolution”. For the visually impaired go to the movies, seeing a documentary, following a play at the theatre means freedom, autonomy, empowerment, culture. The elimination of sensory barriers, through the AD allows the visually impaired, to appropriate the cultural and artistic heritage that characterizes the society they live in, plus the ability to enjoy the natural beauties such as (parks, landscapes marine or terrestrial) that would otherwise be denied them. The guarantee of equal participation by all individuals, both social and cultural activities within their community means to respect the democratic principles that are the basis of a civil society.

Studies about the using of AD in educational contexts have focused on the evaluation of the benefits that such support may have about numerous aspects: learning processes, mentalistic abilities and social inclusion [13, 14, 15, 16, 17]. According to Vygotskij [18] the sensory deprivation produces a functional reorganization: blind people activate vicariant processes aimed to knowledge construction. They should follow a path much longer and harder order to build the world of objects, give them a name and give them quality and actions of which he hasn’t direct experience. Language is considered the compensatory tool most functional [3] because through it blind can see what is happening. Blind people, like everyone else, build mental models to represent the world around them, abstract concepts or sequences of events and use them to give an explanation to its events to understand their experiences and cope with the new situations. Exposure to a verbal-descriptive language allows to use language as a “compensatory” tool [19], allows to start an intersemiotic process that translates the visible in speakable.

AD can generate, through few words but carefully chosen, longlasting and clear images in the mind of blind, in particular through the use of new vocabulary, comparisons and simple metaphors, thus facilitating learning and by improving their skills language [20]; can help to develop or acquire new visual knowledge especially for those who are blind from birth [21]. The user with visual impairment should be suggest physical and contextual descriptions, but also those related to the state of mind, feelings and emotions of the characters, as well as descriptions of nonverbal (proximal, paralinguistic and chinese system) figurative (jokes, irony, sarcasm, rhetorical figures, simulations) language. In this sense, any AD process involves an action on cognitive (decoding, interiorization, building of the real) and metacognitive (awareness and management of cognitive and emotional processes) functioning with particular attention to mentalistic skills (recognizing states Minds of others as emotions, beliefs, moods). Although AD studies have been initiated to address the specific needs of people with visual impairments, in recent years, the attention of researchers focused on the evaluation of the benefits that such support can have on education and learning processes [22, 23, 14, 13, 23, 1]. AD plays a facilitator role of educational settings in terms of inclusion and learning, accounting for the learning context a pedagogical tool [24] directing the didactic intervention towards meeting the needs of everyone, without exception.

2 AD4INCLUSION PROJECT: RESEARCH HYPOTHESES

According to the scientific literature and caring on the research activities started from 2012, in 2016, Center on New Technologies and Inclusion (CNTHI) of the University of Salento has launched the AD4Inclusion research project, aimed at offering an audience of primary school pupils, seeing and blind, the enjoyment of the audiovisual Kirikou and the Sorceress: children's animated feature writing and directed in 1998 by Michel Ocelot and audio described by CNTHI in 2012 [3, 4]. Audiovisual aid has been proposed in nine primary school classes in the Province of Lecce (Italy), in which pupils with visual impairment are present. Quali-quantitative study was conducted in the classes to assess the
didactic functionality: improving of inclusion and listening skills, language and comprehension and discussion activities for the film.

In this sense, we hypothesized that the presentation of the audiovisual aid:

- H1. for the class group it is not a barrier to understanding the film narrative;
- H2. for pupils with visual impairment it is an essential and functional facilitator to their learning and enjoyment needs;
- H3. for the classroom it is an inclusive practice that, through multisensory experience, promotes listening comprehension and the ability to identify.

The audiovisual aid has been divided into three phases and proposed according to three different modes of use.

- 1st Phase: all pupils, even who had a low vision, have been blindfolded and listened to the first part of the full-length movie with AD (10 min.).
- 2nd Phase, second modality. All students have been followed the second part of the audiovisual (15 min.) using an integrated modality: standard modality (video and audio) with the addition of AD;
- 3rd Phase, third modality. All students have been followed the last part of the full-length movie (20 min.) using a standard modality such as without AD.

Obviously, the duration of the narrative segments increases as a result of the development of the plot and the use of different reception modalities.

![Figure 1. Mode of enjoyment with blind fold.](image)

The choice to adopt the audiovisual has been made with the idea to work with a doubly special product. Its peculiarity is based on different reception modality and plot. Using the fairy tale language, the feature film tells the adventures of Kirikou, an African child, bumps into a witch who deprived his village of water and killed every person who defied her. Kirikou was born alone from his mother’s womb, he is tiny as a flea, but he is able to talk and run. His newborn body symbolizes man’s purity, his innocence and his peculiarity. Kirikou has been a special child since the day he was born, he fights against the prejudices of his own village and against the fetish technological tools of the witch. His deep care comes from his love for family and truth. We have been worked with a wide educational tool that has been given us the opportunity to deal with special contents in a special way: the intercultural dimension, the importance of stereotypes, prejudices and false beliefs, the struggle between Good and Bad, the wisdom of innocence, the truth research and its contextualization.

3 METHODOLOGY

At the beginning of the scholastic year 2016/2017, the research’s group has sent an attendance proposal to the schools of Lecce. A necessary condition for participating to this project was the presence of visual impairment students in the class. Nine classes belonged to eight different Institutes have been identified and engaged in this survey, for a total of 172 students. In the sample (tab. 1) there was a prevalence of female students, a range age of eight years (SD 1.52).
Eight children with visual impairment participated in the research: a pupil with a total blindness and 7 with a low vision.

3.1 Tools and procedures

A CO-TT pre-test has been implemented in regards of a verification assessment on working memory [25] has been submitted to primary school third-to-fifth grade students only, at an early stage and prior to the tracks being full-length viewed: an implementation and enhancement package on the basis of the ability to listen and text understanding. The entire class and groupings have been primarily provided with the readings of six wording lists which the students needed to remind their order and thus manage the respective types of objects by hearing those words only once.

The tool’s intention was to explore a few meta-cognitive and cognitive only items (identifying strategies and monitoring functions, auditory memory, short term memory, active listening), all told of great importance for both the hearing and the text comprehension. Upon conclusion on listening/ viewing of each benefiting stage on short-length features, the students have been provided with a survey called K4ALL: it contains 42 multiple choice items (three possible answers), each of in addition being provided by five switching stages, that aim at evaluating the film’s storytelling understanding:

- Memory: capacities of memory regarding contents and audiovisual storytelling items;
- Sequencing: the ability to reconstruct the audiovisual story based on accurate narrative aspects;
- AD References: capacities of memory and comprehension ability bound to the AD’s audio remarks;
- Comprehension of the film’s plot: comprehension of the film’s story and knowledge of the key plot elements;
- Speech: comprehension of linguistic proceedings connecting the fictional, consistent and recognizable universe to the parts which considerably are of help in shaping any symbolic meaning.

The survey’s completion lasted about 20 minutes for each stage during which the students have been assisted by experts and teachers, whilst visual-disabled students have been provided with a braille-printed survey in addition assisted by a human reader. The item related to the variable sequence have been given to primary school third-to-fifth grade students whilst those related to variable references AD have been considered only in the first and second way of reception, since in the first there wasn’t AD.

At the end of the reception experience, a group interview has been made in order to know the real ability of students to understand through listening. They were asked to reflect on practical-communicative aspects: literal, semantic-lexical of the plot related to the language of the movie they had seen. These interviews have been videotaped and then they have been transcribed and evaluated. Research’s tools, addressed to a children target, have been made easier in the language and made similar to an educational play in order to make supply more “adventurous” and “attractive”.

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### Table 1. Sample.

<table>
<thead>
<tr>
<th>Gender</th>
<th>M=79 (45.93%)</th>
<th>F=93 (54.07%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Media 8.02</td>
<td>St. dev. 1.52</td>
</tr>
<tr>
<td>Classes (n=9)</td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td>---------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Pupils (n=172)</td>
<td>36</td>
<td>34</td>
</tr>
<tr>
<td>% Pupils</td>
<td>20.93</td>
<td>19.77</td>
</tr>
</tbody>
</table>
3.2 Data analysis

It was conducted with the Excel and SPSS 20.0 packages for Windows. The results were based on Chi-square, correlation coefficient and variance analysis, while on the transcripts of group interviews it developed qualitative analysis aimed at identifying some cultural repertoires identified on the basis of recurrence/co-occurrence and significance/pregnancy of discourse. Cluster analysis was carried out according to two main themes, elaborate ex ante on the basis of questions and research hypotheses: audiovisual understanding and perception of the experience.

4 RESULTS

4.1 Pupils’ performance

From the descriptive analysis of CO-TT pre-test data [25], emerges that pupils from the third to fifth grade of primary school (n=102) have short-term memory difficulties, reporting critical performance, often below average (the score related to the list varies from 0 to 3) (tab. 2).

<table>
<thead>
<tr>
<th>List of words</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average (n/3)</td>
<td>0.99</td>
<td>0.83</td>
<td>1.40</td>
<td>1.14</td>
<td>1.60</td>
<td>1.66</td>
</tr>
<tr>
<td>%</td>
<td>33.01%</td>
<td>27.78%</td>
<td>46.73%</td>
<td>37.91%</td>
<td>53.27%</td>
<td>55.23%</td>
</tr>
</tbody>
</table>

There are slight improvements in the mnemonic performance of reading the last lists. On the contrary, pupils with visual impairment (n = 4) have excellent mnemonic performance: they remember almost all of the objects in the list, according to the order of presentation (tab. 3).

<table>
<thead>
<tr>
<th>List of words</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average (n/3)</td>
<td>2.33</td>
<td>2.66</td>
<td>2</td>
<td>2.66</td>
<td>2</td>
<td>2.66</td>
</tr>
<tr>
<td>%</td>
<td>77.78%</td>
<td>88.89%</td>
<td>66.67%</td>
<td>88.89%</td>
<td>66.67%</td>
<td>88.89%</td>
</tr>
</tbody>
</table>

This result did not surprise, as the literature notes the compensatory function that the person with visual impairment has in the use of short-term auditory memory to control contextual information. It surprises the performance difference in the group of sighted pupils, compared to the standard reference on which the instrument has been standardized. Listening, concentration and short-term memory skills are key cognitive actions at school; they are essential in understanding the text and in the strategic management of meaning and content. By shifting attention to listening comprehension/enjoyment, descriptive analyzes of the K4ALL questionnaire provide a summary of the three groups in terms of average and standard deviation of performances.

In the Factor Outputs section (tab. 3), a summary of the groups defined by the Independent variable Phase and the dependent variable performance for phase, it is confirmed that Phase III performance is the highest average (mean=0.86) and the less variable (SD=0.148).

<table>
<thead>
<tr>
<th>Performance</th>
<th>average</th>
<th>st. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1_correct</td>
<td>.597</td>
<td>.1737</td>
</tr>
<tr>
<td>F2_correct</td>
<td>.7936</td>
<td>.17962</td>
</tr>
<tr>
<td>F3_correct</td>
<td>.8643410853</td>
<td>.1480822590</td>
</tr>
</tbody>
</table>

From the descriptive analysis, percentage frequencies for item (tab. 4) and by variable (tab. 5), it can be seen that the sample performance improves in relation to the succession of phases, i.e. in phase II and phase III, there are better performances. Specifically, referring to memory variables, AD
references, and movie text comprehension, the best performances are attributable to standard fruition (III phase), while in reference to sequential and language variables, better performance is achieved in integrated use, that with Video and AD (phase II).

**Table 5.** Percentage frequencies for item.

<table>
<thead>
<tr>
<th>Phases</th>
<th>Memory</th>
<th>Sequencing</th>
<th>AD References</th>
<th>Plot comprehension</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M.1</td>
<td>S.1</td>
<td>C.1</td>
<td>C.2</td>
<td>C.3</td>
</tr>
<tr>
<td>I</td>
<td>55,23</td>
<td>55,88</td>
<td>56,28</td>
<td>54,47</td>
<td>59,30</td>
</tr>
<tr>
<td>II</td>
<td>70,93</td>
<td>75,49</td>
<td>52,44</td>
<td>76,05</td>
<td>86,05</td>
</tr>
<tr>
<td>III</td>
<td>95,35</td>
<td>77,45</td>
<td>80,23</td>
<td>86,63</td>
<td></td>
</tr>
</tbody>
</table>

**Table 6.** Sample: percentage frequencies for variables.

<table>
<thead>
<tr>
<th>Phases</th>
<th>Memory</th>
<th>Sequencing</th>
<th>AD References</th>
<th>Plot comprehension</th>
<th>Language</th>
<th>chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>49,03%</td>
<td>66,50%</td>
<td>65,50%</td>
<td>65,89%</td>
<td>66,50%</td>
<td>.000</td>
</tr>
<tr>
<td>II</td>
<td>82,36%</td>
<td>83,01%</td>
<td>74,03%</td>
<td>81,01%</td>
<td>80,23%</td>
<td>.000</td>
</tr>
<tr>
<td>III</td>
<td>94,77%</td>
<td>78,43%</td>
<td>----</td>
<td>90,70%</td>
<td>79,07%</td>
<td>.000</td>
</tr>
</tbody>
</table>

At the same time, it should be pointed out that, although the first phase score is the lowest, they do not show critical performance. Also descriptive analysis of the blind’s performance confirms the progressive improvement of the performance of enjoyment according to sequencing phases. Percentage frequencies for variable (tab. 6) show, at each stage, the best performances: above average and, almost always, overlapping with those of the general sample (fig. 5). In the phase 1 and 3 there are critical performance related to the sequential variable, i.e. performances, as in the general sample, improve in integrated use (phase 3), while, unlike the general sample, AD References and Film comprehension are most useful to visual impaired in phase 1, i.e. in the absence of visual distractor, probably because the only audio enjoyment of the film has found in this audience a greater training of listening and memorizing skills already discussed.

**Table 7.** Pupils with visual impairments: percentage frequencies for variables.

<table>
<thead>
<tr>
<th>Phases</th>
<th>Memory</th>
<th>Sequencing</th>
<th>AD References</th>
<th>Plot comprehension</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50%</td>
<td>41,67%</td>
<td>70,83%</td>
<td>83,33%</td>
<td>66,67%</td>
</tr>
<tr>
<td>2</td>
<td>83,33%</td>
<td>83,33%</td>
<td>58,33%</td>
<td>79,17%</td>
<td>70,83%</td>
</tr>
<tr>
<td>3</td>
<td>87,50%</td>
<td>37,50%</td>
<td>----</td>
<td>83,33%</td>
<td>83,33%</td>
</tr>
</tbody>
</table>

Therefore, results of the classroom context and the pupils with visual impairment show that the global performance of children, measured as% of the correct answers on the total answers provided by the subjects, depends on audiovisual use (three phases).

Inferential analysis also confirms this. The chi-square statistic test attests that the frequency values in the different phases and the five variables are significantly different from the frequencies obtained with the theoretical distribution. The significance level of the chi-square value obtained from the degrees of freedom considered ($\chi^2 =, 000$, tab. 5), it indicates a significant causality between the "phase" variable (I, II, III) and the five variables investigated (Memory, sequencing, AD references, understanding film and language). This result is also confirmed by linear correlation: correlation coefficients confirm that there are relationships between the performances obtained by subjects in the different phases (tab. 7), i.e. all correlations were statistically significant (p-value <0.05) with a direction indicating, for all variables investigated, a direct (positive) link and a moderate intensity ($\rho_{XY} > 0.3$). Comparison of the average global performance (dependent variable), obtained after phase of enjoyment (independent variable) obtained with ANOVA test for repeat measurements with Greenhouse-Geisser correction.
indicates that the performance of children are significantly different in terms of audiovisual use \[F(1,920,328,344) = 211,563; p <0.0001\].

**Table 8. Correlation coefficients scores.**

<table>
<thead>
<tr>
<th>Performance-phase correlation</th>
<th>I phase</th>
<th>II phase</th>
<th>III phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>I phase Pearson correlation</td>
<td>1</td>
<td>.416**</td>
<td>.398**</td>
</tr>
<tr>
<td>2-tailed significance</td>
<td>.000</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>II phase Pearson correlation</td>
<td>.416**</td>
<td>1</td>
<td>.540**</td>
</tr>
<tr>
<td>2-tailed significance</td>
<td>.000</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>III phase Pearson correlation</td>
<td>.398**</td>
<td>.540**</td>
<td>1</td>
</tr>
<tr>
<td>2-tailed significance</td>
<td>.000</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

The effects test within subjects, the output of ANOVA, is significant (p-value=0.000). Data confirms that at least one of the phase performance averages is significantly different from the others. Test F, in fact, confirms that "globally" there is a difference between performance averages at different phases. Consequently, inferential analysis also confirms that the succession of the phases corresponds to better performance and that the differences between the sighted audience and with visual disabilities relate to those fundamental competences in understanding the text (film and no), in the elaboration of the sequential history.

### 4.2 Pupils' perceptions

The hermeneutic-qualitative analysis of the two thematic nuclei, comprehension of the film text and the perception of the multisensory experience, shows a many contents.

Compared to the capability of the film narrative comprehension, pupils have been urged to reflect on the characters, their physical representation and the meaning they are within the film plot. Analysis of perceptions shows that the class group knows the basic elements of the film: characters, their characteristics, roles, relationships and motivation of their actions; spatial and temporal setting. In addition, pupils can identify and synthesize the elements that contribute to the definition of symbolic meanings, which transcend, that is, the literal meaning of the film narrative. At the same time, we were asked for children to identify a moral of the film story, to formulate hypotheses, to present their views on what happened (the plot) and about the narrative elements that are latent or not expressed. It was intended to explore, in the pupils, basic and inferential comprehension. Perceptions show a wide range of narrative meanings positively oriented and aimed at expressing the triumph of good on evil, love on hatred, forgiveness on envy, truth on lie, confidence on skepticism, appearance on authenticity. Pupils express the need to give/have a second chance and they invite the adults to believe in children.

In addition, the class group was asked to verbalize the perceptions and feelings arising from the experience of enjoyment: simulation of visual deficit and identification activity. During this experience, children's perceptions have highlighted moods mainly related to a feeling of fear, disorientation, numbness, inhibition, and difficulty in understanding. At the same time, after a normal adaptation phase, pupils compensated visual deprivation by focusing on attention to sound inputs and looking at desk and desk references to reconstruct the situation and find anchors Which would allow them to calm themselves and, therefore, to focus on the task.

In the second mode of use (AD with standard projection), the pupils used the two sensory registers, in an integrated and interference-free manner. They distinguished the track from the AD, showing some familiarity and interest on audio commentaries.

The latest mode of fruition, the standard one, has generated the loss of some information in pupils with visual impairment. Although most of the group of children with visual disabilities retains residual visual function, the speed of film did not always allow them to fully understand what was happening. Nonetheless, among the hesitations, fears and disadvantages, all the children have been able to understand the basic and key elements of film plot. The effort was remarkable: enjoyment activities
required concentration, silence, active listening, decentralization, a quiet but encouraging setting. More than anything, it was necessary for the pupils to simulate a sensory deficit condition, experimenting to identify themselves with the companion with visual impairments.

5 CONCLUSIONS

Data analysis about CO-TT memory pre-test shows that the school should adopt methods in the classroom to enhance the mnemonic and listening comprehension skills of Primary school students. On the other hand, the excellent performance of pupils with visual impairments confirms what is already known in the literature [26, 27, 18], i.e. experience and practice can allow blind children to use their intact senses effectively so that they seem to have greater sensitivity in hearing and memoring than sighted individuals. Sensorial compensatory abilities such as a “qualitative” heightened sense of hearing, smell and touch, as well as cognitive functions, such as memory and language.

Quali-quantitative analysis data related to the different modes of enjoyment confirms the first and second hypotheses of research: AD is not impediment or barrier to understanding the film and, for pupils with visual impairment; it is a necessary and functional facilitator to their learning and enjoyment needs. Specifically, quantitative data show that, as is often the case, the development of film narrative events and audiovisual plot is directly proportional to the increase in the time of enjoyment. In the study, this aspect is confirmed by the progression of the phases of enjoyment, i.e. the progressive change of phase corresponds to the development of familiarity and understanding of the film. Consequently, the improvement of children performing in different modes of audiovisual enjoyment indicates that the first phase (fruition with AD) and the second phase (integrated use) were preliminary and functional to experience of understanding and enjoying, which improves and increases in relation to the development of the film plot and the time of use. In addition, data analysis related to the AD experience (I and II phase/mode) shows that the sighted individuals performances does not undergo any interference during the simulation of visual deficit or during the integrated enjoyment with audio comments (AD). On the contrary, in reference to the semantic aspects of language and the ability to sequencing and rearranging the narrative events, the performance of the class group improves in the enjoyment with AD. On the other hand, visual impairments are less effective in activities related to the ability to sequencing in phase III, i.e. the one without AD. This data is also confirmed by perception analysis. In fact, qualitative analysis shows in the class group a very good basic comprehension: children have the ability to capture and recall the key ideas of the film plot (characters, settings), identifying the structure of storyline (cause-effect niches, beginning, development, and conclusion of plot). In addition, they show good inferential comprehension: they use the information to formulate narrative hypotheses. They can understand the psychological atmosphere and verbalize the emotional reaction aroused by the different mode of enjoyment.

The research experience shows that listening comprehension is a very complex process: it is a constructive and interactive activity that requires the integration of new information, contained in the text, in this case filmic plot, with internal knowledge structures owned by the user. It is a dynamic and interactive process that to impose on user to connect with the film, activating decoding and understanding skills. Understanding a film plot means to consider the relationship between words, phrases, as well as different types of language (verbal and nonverbal), building a coherent and meaningful representation of the film content.

The third hypothesis is also confirmed: data analysis shows that the different ways of enjoyment have allowed to heterogeneous users - children with or without visual impairments and teachers - to live an “unusual” experience to promote, by means of identification and simulation, multisensory and inclusion at school. In relation to the three modes of enjoyment, quantitative data confirm that pupils have used visual and auditory memory systems, using to a multi-sensory memory equipment. Specifically, the enjoyment with blind fold, produced a re-activation of an echoic memory system, a type of auditory memory based on a type of semantic processing that involves the language. In fact, the different types of enjoyment confirm that AD can represent for the class context a useful tool for enhancing various memory systems (sensory memory, short and long term memory, episodic and semantic memory, declarative and procedural memory, explicit and implicit memory); it can represent a valid pre-text to work on listening comprehension.

Several studies have shown that the level of performance in text comprehension tests is strongly correlated with good skills in listening comprehension tests [28] and how listening comprehension is a good predictor of understanding the text [29]. At the same time, the experience of multisensory enjoyment has allowed specific groups of learning, characterized by pupils with visual disabilities, to
get in touch and to imagine themselves in a real, incarnate, lived difference. It has allowed to think about inclusion as a process that involves to a radical reorganization of the learning context for everyone.

Unusual enjoyment in the dark has allowed to act on classroom management, intervening in lowering the level of competitiveness and conflict, on the sense of membership to the group, on empathy and active listening, on the promotion of prosocial and assertive skills and on common space management and elimination of sensory and physical barriers (noise, classroom disorder). Likewise, the use of AD in class has allowed teachers to be involved teacher to "learn" a series of teaching criteria that make their teaching an "audio-visual" accessible tool to everyone: choice of visual contents to describe, content essentials, understanding the meaning of reality, building messages that promote imaginative and evocative skills, managing a vocabulary that exploits the communicative force of rhetorical figures (metaphor, similarities etc.). Working in educational contexts, in close contact with disability, means finding great potential for recovery and compensation [30], means to believe in educational relationship, in school model based on inclusion. The research experience has underlined that the use of AD in learning context could be a circumstance of growth and education for everybody. Inclusion has seen as an opportunity, a way to look at it as a process that engages and advantages everybody. The AD employment is a good didactic communicative strategy that gives importance to memory, languages’ functions and meanings’ reconstruction through listening. The study has been that the employment of an inclusive didactic method through different tools and actions improves everybody’s school and pushes away the idea that integration in Italian school means low didactic quality.

REFERENCES


