

Neurocine: From Art to Science

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Abstract

Allying the concept of “liberating education” purposed by the Brazilian educator and philosopher Paulo Freire to the concept that integrating different senses on the teaching process – imagination, intuition, films and photography – the effectiveness of learning it is optimized the project “Neurocine: from art to science” was developed. The project consisted in three arms – the major were four weekly sessions of movies and lectures about four neurological themes (Alzheimer’s disease, Parkinsonism, stroke and Gilles de la Tourette Syndrome) where questionnaires were answered anonymously by the participants before and after the lectures; another one were a discussion group in a social network; and the third one were classes plus articles discussions with academic graduate on Rehab Sciences about the same themes of the weekly movie sessions. This article aims to, using this project, discuss about the validity of using non-traditional methods to acquire knowledge.

1. Introduction

In the twentieth century, a new concept of education it was grounded by the Brazilian educator and philosopher Paulo Freire. The idea was called “liberating education” and its provision to insert the citizen at his environment, rejecting the paternalistic model of teaching, where the student is only an earpiece of knowledge; the goal of the liberating education it is to make the teacher-student relationship a horizontal relationship. For this, is purposed a teaching with three phases: 1) evaluation of the linguistic conditions of the students, accepting each one’s language; 2) selection of certain words, according to its phonetic importance, the level of difficulty and its socio-cultural and political role for the group in question; and 3) preparation of typical experiential contexts addressed to the community, for that the students learn to critically analyze the raised issues in the context where they live.

Although the steps suggested by Paulo Freire where primarily designed as a guide for literacy, it is possible adequate them to any learning process. So fact it is that, grounded on these concepts, raise modern methods of teaching-learning which consider the needing of active acquisition of knowledge and, specially at high school, the training citizens with productive skills, who knows to apply the knowledge and think of innovating ways. In addition, for several years has proven that by integrating different senses – imagination, intuition and other esthetical forms, like movies and photography -, the effectiveness of the teaching-learning process it is optimized.

Having in mind these elements and the idea of liberating education that has been thought the project “Neurocine: from art to science”, which used alternative ways of teaching, provided space for discussion and evaluated the efficacy of the method. This article aims to report the development of the project and describe the forms of assessment, generating discussions about the validity of using non-traditional methods to acquire knowledge.

2. Methods

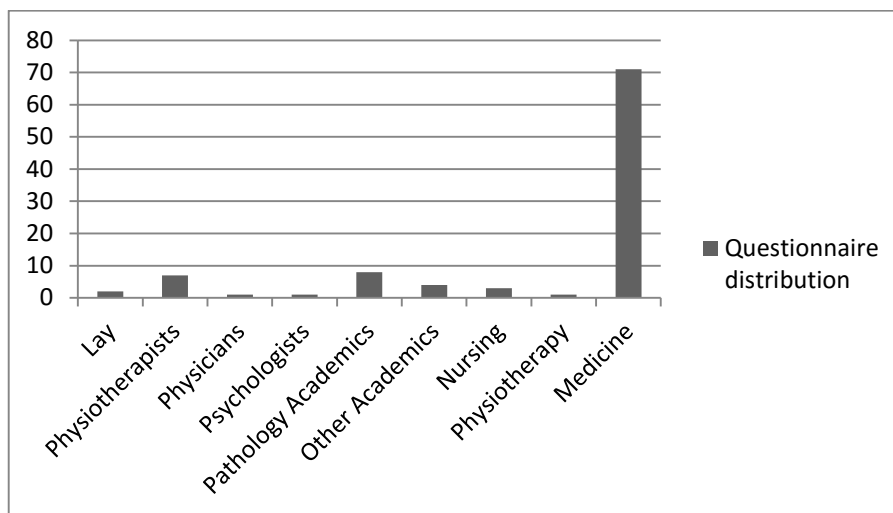
The project was organized in four weekly sessions at Universidade Federal de Ciências da Saúde de Porto Alegre which the participants had access through online application. Each session had a neurologic disease or syndrome as theme and was composed of a movie, followed by a lecture given by a neurologist which analyzed the pathology under several aspects – epidemiology, pathophysiology, diagnosis, treatment, preventive aspects and multidisciplinary approach. The films used were “El hijo de la novia” (Argentina, 2001), which addresses Alzheimer’s Dementia, “Awakenings” (United States, 1990), talking about Parkinsonism, “Amour” (Austria/France/Germany, 2012), which discusses about stroke and its sequels. “Front of the Class” (United States, 2001), which has the theme Gilles de la Tourette syndrome.

The method efficacy was assessed by questionnaires distributed at the beginning of each session and the participants were instructed to answer, anonymously and voluntarily, one time before and one time after the lecture (Appendix). The only identification requested was the classification in “Health care professional”, “Health care student” and “Lay”. The questionnaires consisted of four questions each, in the model “true or false” and elaborated by the speakers themselves.

The sample had 106 answered questionnaires – three by lay participants, twelve by academic graduate, twelve by health care professional and seventy-nine by health care students. Eight between the 106 were excluded from the analysis because they do not had complete answers – one at the lay group, three at the professional health care group (one physiotherapist, one physician and one psychologist) and four at the health care students group (everyone from the medicine school). (Table 1 and Graph 1).

Table 1 Distribution of questionnaires to agreement with classification proposal

Sample		Amount
<i>Lay</i>		2
<i>Health care professionals</i>	Physiotherapists	7
	Physicians	1
	Psychologists	1
<i>Graduation academics</i>	Pathology	8
	Others	4
<i>Health care students</i>	Nursing	3
	Physiotherapy	1
	Medicine	71



Graph 1 Distribution of questionnaires to agreement with classification proposal

Another project arm had a group on a social network, which included participants of movie and lecture sessions, to provide an extra space for discussions, regardless of training or the group where the individual had been classified. The sample on this group was 44 members.

A third extension of the project included the academic graduate on Rehab Sciences and consisted in specific classes about the movies’ themes on the day after the sessions. The first class was given by specialized speech therapist and psychologist, and talked about Cognitive Therapy on Alzheimer’s Dementia. The second lesson, after Awakenings, was about physiotherapy in parkinsonian patients and was approached by a specialized physiotherapist. About the film Amour and stroke, the academics attended a class taught by a speech therapist on speech therapy for dysphagia. Lastly, a psychologist specialized on the theme treated about Cognitive Therapy on Gilles de la Tourette syndrome after the movie Front of the Class. In addition to classes, three articles about each topic were made available to academics, sending written discussions about two of them.

The responses were evaluated in the following ways: overall percentage of correct answers before the lectures, overall percentage of correct answers after the lectures, percentage of correct answers for each of the four questionnaires before and after each lecture, further the percentage of correct answers according to the group in which the participant was.

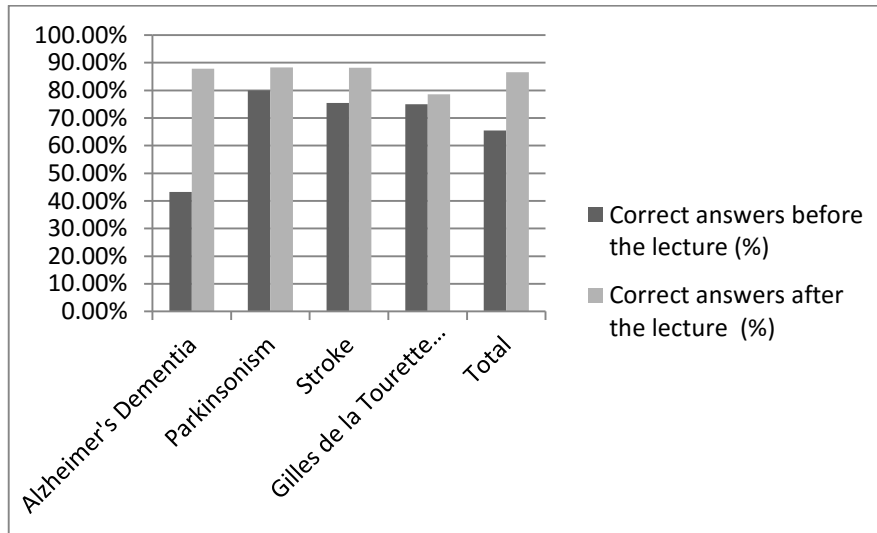
3. Results

Analyzing all questionnaires, the percentage of correct answers before the lectures were 65,49%. After the lectures, the percentage of correct answers grown for 86,62%. When the analysis is done looking at each questionnaire in particular, the first questionnaire applied, about Alzheimer’s Dementia, had 43,24% of correct answers before the lecture and, after, 87,84%. At the second questionnaire, about Parkinsonism, before the lecture were 80% of correct answers and, after, 88,33%. When the topic of the questionnaire was stroke, the percentages of correct answers before and after the lecture were 75,49% and 88,24% respectively. At the questionnaire about Gilles de La Tourette Syndrome the hit rates before and after the lecture were, respectively, 75% and 78,57%. These data are shown in Table 2 and Graph 2.

Table 2 Percentage of correct answers before and after the lecture according the disease theme and a total percentage

	Alzheimer’s Dementia	Parkinsonism	Stroke	Gilles de La Tourette Syndrome	Total

Correct answers before the lecture (%)	43,24	80	75,49	75	65,49
Correct answers after the lecture (%)	87,84	88,33	88,24	78,57	86,62



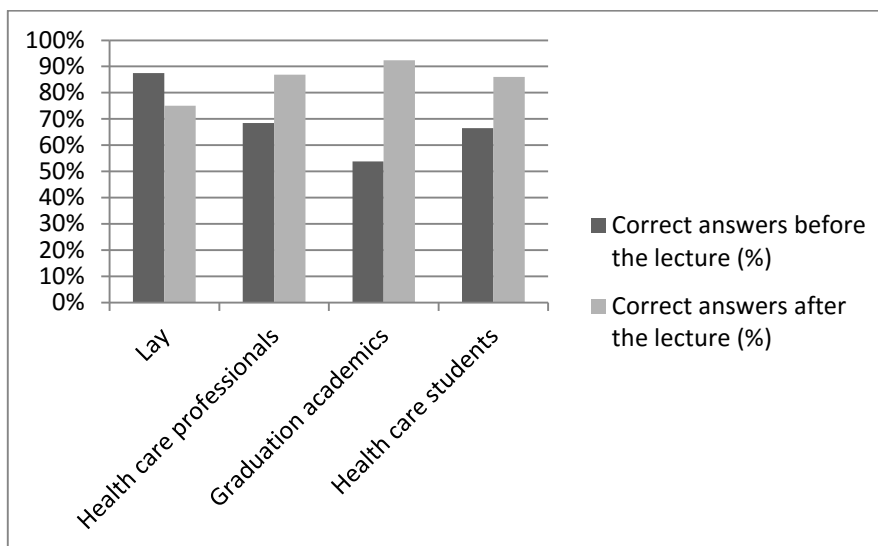
Graph 2 Percentage of correct answers before and after the lecture according the disease theme and a total percentage

The hit ratios, analyzing separately each sample category were represented as follows: on the group lay, the percentage of pre-lectures correct answers was 87,5%; post-lecture was 75%. On the health care professionals group, the percentage of right answers before the lectures was 68,42% and after the lectures, 86,84%. The graduation academics had correct answers ratio pre and post-lectures of 53,84% and 92,31%, respectively. The health care students reached 66,46% of correct answers on the questionnaires before the lectures and 85,98% on the questionnaires after lectures. The results are shown at Table 3 and Graph 3.

It is worth to note that none of the results consider the incomplete questionnaires.

Table 3 Percentage of correct answers before and after the lecture according the classification proposal

	Lay	Health care professionals	Graduation academics	Health care students
Correct answers before the lectures (%)	87,5	68,42	53,84	66,46
Correct answers after the lectures (%)	75	86,84	92,31	85,98



Graph 3 Percentage of correct answers before and after the lecture according the classification proposal

The production of material arising of the discussion group, organized on a social network, generated seven publications by three different participants, with an average of 14,8 views each publication. The average of likes and comments were six and one, respectively. The most frequent addressed theme talked about socio-anthropologic analysis of the movies by a law professional.

4. Discussion

The book “Neurocinema – when film meets neurology” discusses about the neurologic disorders and the neurologists’ role in films. It is said that, although the general view of physicians is that the portrayal in film of neurologic disorders is inaccurate, even absurd, the analysis made by the author showed that this portrayal of major syndromes and clinical signs can approach reality quite closely. In this reference, they rate the movies in “one to four reflex hammers” according how well-represented are the diseases.

Two of the four books used in our project are discussed. *Awakenings* had three reflex hammers (“parts can be used for teaching”) and it is described with a good representation of Parkinsonism, including the later dystonic movements. *Amour* is also represented in the book. It had four reflex hammers (“mandatory viewing”), and, despite there is a little to allow a detailed neurologic assessment of the character, it is really well-represented the necessary care after a stroke with sequelae by family and health assistants and the problems with the home care of a neurologically disabled patient. With this analysis we see that films can be a good picture of neurological diseases and used as teaching material. *El hijo de la novia* and *Front of the class* were not cited in this book.

About the questionnaires, the percentual analysis of the correct answers applied before and after the lectures shows, almost at all, a substantial improvement in the right answers post-lectures comparing to the pre-lectures. This observation is possible both when analyzing the questionnaires divided according to the theme as when the exposure data is made according to the category which participant belongs.

The only worsening that can be observed on the number of correct answers after in relation to before the lecture is when analyzes all questionnaires answered by the lay group, in which, before the lecture, the percentage of correct answers was 87,5% and, after, 75%. An explanation to this impaired can be the fact that the sample of this group was really small (two questionnaires).

Another way for to evaluate the efficacy of the learning can consist on analysis of discussions of articles realized with the graduation academics, like a mediator review, which valorizes the dialogue and produces knowledge through horizontal discussions, where all participants opine and exchange information equally. This evaluation

had not been realized by the project here described and can be topic of future works about alternative ways of learn and teaching.

5. Conclusions

The efficacy of the alternative teaching method which ally films to lectures taught by specialists in the theme can be represented by the improvement seen in the scores of the questionnaires after the lectures comparing to the questionnaires responded before the lecture, independently the previous level of knowledge about the theme. Meanwhile, should be considered the small sample of this analysis, as well as the important difference on the number of participants in each group. Thus, it is necessary to continue the apply of the method and its testing by questionnaires to, with a larger number of data and with the match of analyzed groups, the assessment turns more reliable about to be effective or not this learning method.

6. References

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7. Appendix

Questionnaire: Alzheimer's Disease

- 1) It is occurring a tendency to diminution of Alzheimer's disease, probably related to the instauration of prevention measures of cardiovascular diseases at the adult population.
() True () False
- 2) The recent memory it is always compromised on Alzheimer's disease.
() True () False
- 3) Alzheimer's disease usually starts two years before de clinical manifestations.
() True () False
- 4) For the histopathological diagnosis it is essential the presence of beta-amyloid and phosphorylated tau protein deposits.
() True () False

Questionnaire: Stroke

Say true (T) or false (F) to the following questions.

- 1) In young patients (<45 years old) with ischemic stroke frame, the following etiologies should be thought:
Arterial dissection () True () False
Atherosclerosis () True () False

Vasculitis () True () False

- 2) The thrombolytic treatment with r-TPA should be administrated until 4.5 hours from the ictus' start.
() True () False
- 3) The blood pressure control was not effective in the long-term secondary prevention for stroke.
() True () False
- 4) The using of statins associated to an anti-platelet aggregation drug is part of the treatment to secondary prevention to ischemic stroke.
() True () False

Questionnaire: Gilles de La Tourette Syndrome

- 1) The Gilles de la Tourette syndrome is a syndrome which starts on childhood and is characterized by the presence of ticks, hyperactivity, attention deficit and obsessive-compulsive signals.
() True () False
- 2) Gilles de la Tourette syndrome is characterized by a dopaminergic hyperfunction.
() True () False
- 3) Gilles de la Tourette syndrome is an immunological syndrome post-infection by beta-hemolytic *Streptococcus*.
() True () False
- 4) Coprolalia is a patognomonic finding of Gilles de la Tourette syndrome.
() True () False

Questionnaire: Parkinson's disease

- 1) The most frequent initial symptom on Parkinson's disease is the tremor, but not all the patients present this symptom at the start.
() True () False
- 2) The biochemical alteration on the patients' brain with Parkinson's disease is the lack of dopamine, without alteration of the other neurotransmitters.
() True () False
- 3) Parkinson's disease starts always after 40 years old, usually after 60 years old.
() True () False
- 4) The Parkinson's disease symptoms are always asymmetric (one side of the body worst than the other).
() True () False