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STUDY ON THE TYPES OF ASSESSMENT IN THE LIGHT OF THE THEORY OF LEARNING STYLES

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Abstract: This article aimed to verify whether students actually achieve the best performance in the evaluation methodology that matches their learning style. Therefore, this style of each one was identified after condensing the information obtained through the interview and the test with the students of the 3rd year of high school at Colégio Estadual Edivaldo Boaventura, located in Brejões-BA, 276 km away from Salvador. Thus, this work proposed to discuss about evaluation and learning styles, punctuating and relating the interferences of one area in the other. This investigation brings both the conception and suggestions of several evaluative methodologies, such as Online test, oral, written, games, among others. In addition to different conceptions of learning styles, such as Gregorc (1979), Kolb (1984), Felder-Silverman (1988) and Neil Fleming (1992). The discussions on evaluation presented here were based on Jussara Holffmann's theory of Mediating Evaluation and Professor Cipriano Luckesi's Learning Evaluation. We also sought to understand how, based on the understanding that students and teachers have of learning styles, as well as the mechanisms to use their innate abilities in favor of acquiring knowledge, it would be possible to use them in assessments, achieving with it performs better. To follow this path, a didactic sequence with the theme Acid Rain was applied. Even though it was carried out in the area of chemistry, the results obtained in this study can help educators in any discipline, both in Elementary and High School.

Keywords: Learning Styles, Assessment, Methodologies, Education.

INTRODUCTION

This article aims to reflect on two important points for education: learning styles and assessment. There is a dialogue here about the points of intersection between these two areas. And we analyzed the extent to which

learning styles interfere with assessment.

We understand that evaluating goes far beyond listing questions in order to observe whether brain synapses were performed in a desirable way or not. To evaluate is to guide the path having as a compass the answers obtained through the instruments used to verify learning. Through them, it is also possible to measure the speed of this information and check whether the deepening of the content is in accordance with the class.

This is because it is not just about what type of evaluation instrument must be applied. The question is much deeper. Based on what? When to evaluate? How will this test be? What is the purpose of this assessment? Who will it be destined for? And as trivial as these questions seem to be, they are not. These questions often arise in the minds of most educators when they stop to reflect on assessment. This is because undergraduate courses, in general, do not prepare their graduates to assess safely.

Until recently, in schools throughout Brazil, especially in the interior, the existence of different evaluation currents was not discussed. There was the idea that the evaluation was an important moment, because in it, the teacher could verify who actually "learned" and thus classify (segregate) the class, dividing it between the good students (those who know, who learn, who are intelligent and therefore deserve attention) and bad students (those who do not learn, are not intelligent), therefore, giving them attention would be a waste of time since they would not advance (Diaz, 2011, p. 46).

From the 2000s, evaluation theories grew. This moment was seen as part of the learning process. It began to be seen that through evaluation, the teacher can practice action-reflection-action, changing the methodology, the language, changing the speed, in short, adjusting, when he realizes that his objectives

are not being achieved. For Luckesi (2011), even when preparing the evaluation, the teacher must face it with scientific rigor, being very clear about what he wants to know through the students' answers. In a way that makes it easier for the teacher to map the difficulties of the students and also what they have already assimilated.

THEORETICAL REFERENCE

Here we will discuss four types of assessment, namely, Oral test, written test, game assessment and online assessment. The proposal that there be different evaluation methodologies is because, as psychopedagogy explains, human beings learn through different methods, as well as each one expressing itself better through a different way, the different types of arts (music, painting, sculpture, theater, etc...) are proof of that. However, when the individual externalizes his knowledge at school, his particularities are suppressed and everyone is placed in the same package as if they were robots, for which the button is turned on and he prints the report of what he has read, observed, learned. However, teaching-learning is established in a dialogical relationship between teacher and student for the production of knowledge and experience for both, something that Freire calls "bringing the other to the intimacy of the movement of his thought" (Freire 1996, p. 132). After the process of synchronizing the thoughts that would be learning, it is time to quantify how much the student has learned. However, this is not such a simple task, like a thermometer that measures a person's temperature and regardless of the part of the body where the meter is placed, the temperature will be the same. In the case of the evaluation, which would be a kind of learning meter, both the measurement (evaluation instrument) and the reading (interpretation of data obtained through the evaluation instrument) are much

more complex.

LEARNING STYLES

According to psychopedagogy (Saldanha, Zamproni, Batista, 2016, p.1) there are at least 3 types of human beings, with regard to the way of learning, they are: visual, auditory and kinesthetic, which make up the acronym VAC, which are called learning styles.

The VAC theory was developed by Fernald and Keller and Orton-Gillingham (Saldanha, Zamproni, Batista, 2016, p.1). In addition to them, other scholars researched and developed theories about learning styles, such as the experimental learning theory formulated by Kolb in 1984, for which he created the Learning Style Inventory (LSI). The LSI is a kind of questionnaire to identify how students learn to then think about what type of methodology to apply with each group to favor learning (Schmitt and Domingues, 2016, p. 363).

Chart 1 below provides a summary of Kolb's theory. In it, the author distinguishes 4 ways of learning: concrete experience, reflective observation, abstract conceptualization, active experimentation. Having made the classification, Kolb suggests some possibilities of activities that would be better absorbed by each group, which result in a high percentage of learning.

In 1979 Gregorc creates the style outlier theory, for him the learning styles indicate how the mind of the individuals of each group works, namely, Concrete Sequential - SC, Concrete Random - AC, Abstract Random - AA and Abstract Sequential - SA (Schmitt and Domingues, 2016, p. 367). Like Kolb, Gregorc's objective with this division, as can be seen in Figure 1:

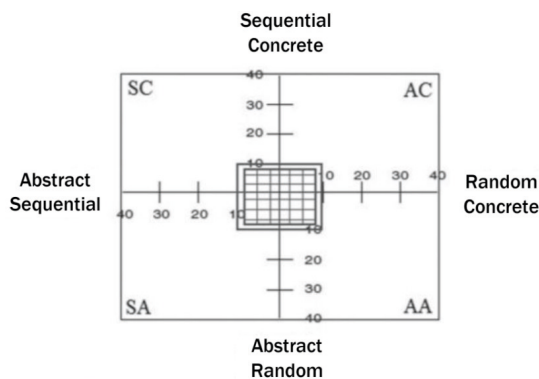


Figure 1 – Gregorc learning model

Source: GREGORC, A. F. Learning/teaching styles: their nature and effects. NASSP Monograph, 1979.

In 1988 Felder-Silverman perfected the Kolb questionnaire and created the Learning Index Questionnaire. He “defines learning styles as the qualities and preferences of individuals in the way of receiving and processing information” (Schmitt and Domingues, 2016, p. 371). Classifying them into active, sensitive, visual and sequential.

In 1992 Neil Fleming created the VARK method, which is a learning style mapping technique (Visual, Aural-Read, Write and Kinesthetic), in which there is a personal in-depth interview, use of checklists and the VARK questionnaire. (Schmitt and Domingues, 2016, p. 373). Table 2 below shows some examples of both study techniques and evaluative methodologies that are most suitable for each learning style according to the VARK method.

From this brief description of each method, it is possible to perceive the need for a plurality of evaluative activities in order to adapt to each learning style. This adequacy is relatively new and challenging, however, as Freire suggested that “creators and students who are creative, instigating, restless and curious can provide possibilities for new paths for teaching” Freire (1996, p. 6). Adapting assessment to the student’s way of learning is an innovation with a view to improving educational practice,

culminating in a contribution to education as a whole.

To facilitate the identification of students belonging to each Saldanha learning style, Zamproni, Batista (2016) made a brief and didactic description of the learning styles.

a) Visual style: In this group are students who have the ability to know, interpret and differentiate visually received stimuli. From the visualization of the images, it is possible to establish relationships between ideas and abstract concepts.

b) Auditory Style: Students with an auditory style have the ability to know, interpret and differentiate stimuli received through spoken words, sounds and noises, organizing their ideas, concepts and abstractions based on spoken language.

c) Kinesthetic Style: We found in this group students who have the ability to know, interpret and differentiate the stimuli received through body movement. (Saldanha, Zamproni, Batista, 2016, p.2)

Schmitt and Domingues (2016, p. 363) explain that learning styles provide a characterization that helps plan more effective strategies in relation to students’ needs, giving a new meaning to teaching.

ORAL ASSESSMENT

Oral assessment allows for a plurality of voices and opportunities. This way, a student who is visually impaired, for example, who in a traditional exam would need a companion, a reader to help him answer the evaluation (a situation that can cause embarrassment), not to mention that this context makes it difficult for his own voice to be evidenced, as well as its autonomy. This student, in the oral verification of learning, would become the protagonist of his own discourse, since he would not need another person to express his thoughts, his

knowledge.

Similarly, there is much advantage in oral assessment for the dyslexic. Which, in general, sees their performance impaired in the written test due to their difficulties. In orality these negative characteristics do not appear. Enabling the dyslexic student not to have their potential diminished by the disability.

Thus, the learning process is related to a cognitive alteration (Vygotsky, 1993), thus there is a transformation of students' knowledge which occurs through languages. Such a situation brings an indication to teachers of the need to use different languages, as well as multiple procedures and strategies, not only in the teaching stage, but it is also necessary that this multiplicity occurs in the evaluation stage. This multiplicity of forms corroborates the thinking of Borba et al (2005, p. 51) when they claim that the diversity of teaching strategies favors the student's cognitive process.

EVALUATION THROUGH DIGITAL GAMES

Since the 16th century (SOARES, 2004, p. 35) games have been used as didactic resources. Now, however, they are also used as evaluative instruments. And with the advent of Digital Didactic Resources (RDD) it was realized that some digital games could be used for didactic purposes. Not all.

This happens because most of them are classified as TDIC's - Digital Information Technologies (LEITE, 2005, p. 56), that is, they were not created for pedagogical purposes. Some of these resources are possible to adapt to education, others are not. However, with RDD this does not happen, they are technology at the service of teaching, since they were already designed for educational purposes.

One reason for suggesting digital games as an assessment tool is that they bring with

them a characteristic of assessment that is often denied: learning while being assessed. According to Quinn (2005, p. 45) digital games allow learning to occur at its best, that is, when the learner is active, interested, contextualized and, above all, feeling like a participant in his own learning.

The present research applied the evaluation by games through Kahoot, which was developed in 2013, it is also available in the application version, reaching the mark of more than 50 million downloads (according to data from the Play Store on 07/11/ 2023).

In the current version, only teachers need to create an account on the site, which is used to formulate their questionnaires (called kahoots) and archive them. Students access the game using the PIN number available on the teacher's account (Dellos, 2015, p. 50).

Victal and Menezes (2015, p. 4) explain that "the data collected during the game end up being lost due to the lack of an environment and resources for their interpretation to produce important information for the evaluation process." This does not happen with Kahoot because when finished playing (evaluating the class) the teacher can click on the kahoot played, then on report, then on report options and choose download report. The site will generate an Excel file with all the information about the class performance. Perhaps this differential occurs because Kahoot was already conceived for didactic purposes.

Another pedagogical characteristic of Kahoot that contributes a lot to the conception of Luckesi (2012) who sees the evaluation as a scientific instrument for the improvement of the teaching practice, is the fact that the site gives the information (in graph and in percentage) of the question that its less students got it right. As well as information on which students had the most difficulty during the assessment and those who did not

complete it (probably due to problems with mastering the subject, although it could also be due to connection problems, since the game is online). As you can see in figure 2:

This range of information fully responds to the questions raised by Victal and Menezes (2015, p. 2) about the feasibility of using digital games as evaluation tools. “How to monitor and collect game data that demonstrate learning? How to enable information to be used so that teachers can evaluate players and evaluate their own content? How can the results of this assessment be properly used?”

It is worth noting that this context is in line with Freire’s statement (1996, p. 6) “creative, instigating, restless and curious educators and students can provide possibilities for new paths for teaching”. Ramos, Cardoso and Carvalho (2020, p. 4) share this Freirean thought when they state that “the use of Kahoot provides an alternative means for the teaching-learning process to occur in an assertive and differentiated way”.

WRITTEN TEST

Seeing a printed written test makes one reflect on how many times during the process (semester, unit, etc.) the teacher heard the famous phrase: “is this going to be on the test, teacher?” Such a question provokes the reflection that more than a concern of the student, it refers to the test as a ferment of psychological torture or a bargaining chip for the attention of the class.

To instigate a change in attitude towards this, NUHS and TOMIO wrote an article entitled the written test as an instrument for assessing science student learning, in which they encourage thinking about this assessment methodology with the following questions.

What are the tests for? What do the tests allow to assess? How does a test need to be designed to assess science learning? Who is the test “grade” for? What are the meanings

that Science students and teachers attribute to the test in the Science learning process? (NUHS and TOMIO, 2011, p. 261)

However, the idea is not to preach that the written test must not be applied, or that it is old-fashioned. It must be formulated in such a way as to make the “student an active subject in the elaboration of his knowledge and, thus, his preparation and the objectives foreseen for it need to be in line with the new socio-historical-cultural requirements for teaching.” (NUHS and TOMIO, 2011, p. 261). Including external tests such as the International Student Assessment Program (Pisa); National System for the Evaluation of Basic Education (Saeb); Prova Brasil and the National High School Exam (Enem) are written and students must prepare and train for them.

The ideal would be to have the objective when elaborating the question, as well as to have criteria for its correction. An example of this is the SABE test (Baiano Education Assessment System) whose questions are based on descriptors, which are worked on by teachers in the classroom.

Campos and Nigro (1999, p.71) explain in a practical way how to ask questions. They classify the questions in the written tests into 2 groups: true problem or open problem and false problem or closed problem. In addition, the proposition of real problems needs to arouse the perplexity and interest of the students, favoring them to develop different skills and a taste for “doing” well. This would improve the student’s self-esteem and confidence to face and explain new facts.

ONLINE TEST

This evaluative instrument arises from a very particular social and technological context. It has been taking shape from the advancement in communication, with the popularization of the computer, followed by the expansion of the internet and the reduction

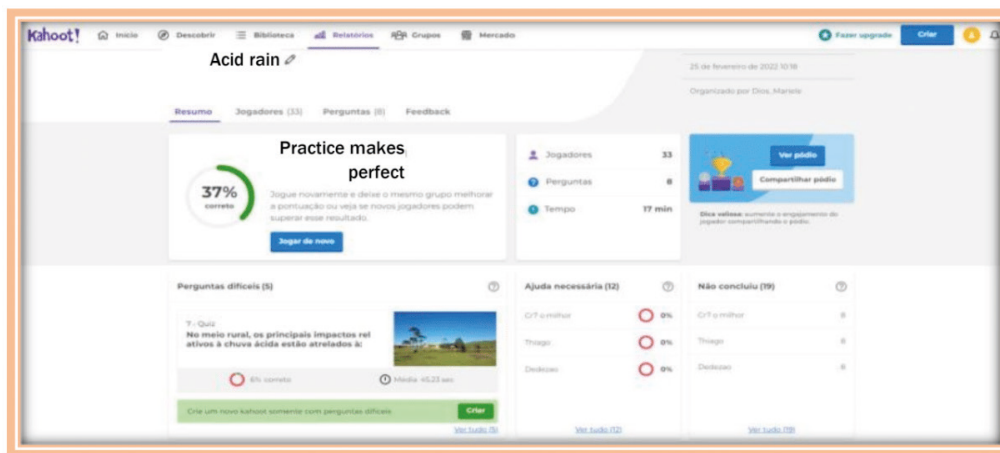


Figure 2 – Print of the Kahoot reports page

Source: <https://create.kahoot.it/user-reports/live-game/34ea0440-ca36-4f21-9826-96b9f238760f/de91cb10-5bb4-421c-bce4-7bfbc3743c0a/1645795099581/summary>

Experience Concrete	Observation Reflective	Conceptual Abstract	Experiential Active
Lesson examples	Questions for reflection	Lectures	Classroom examples
Problem sets	Storm of brainstorming	<i>Paper</i>	Laboratories
Reading	Discussions	Analogies	Case studies
Movies	Juris	Text readings	Home assignments
Simulations	Newspapers	Projects	Projects
Laboratories		Models of Construction	Field work
Observations		Critical models	
Fieldwork			

Table 1 – Activities integrated into the Kolb learning process

Source: KOLB, D. A. Experimental learning: experience as the source of learning and development. New Jersey: Prentice-Hall, Englewood Cliffs, 1984. SVINICKI, M. D.; DIXON, N.M. The Kolb model modified for classroom activities. College Teaching, v. 35, n. 4, p. 141–146, 1987.

Visual	Auditive	Reading/Writing	Synesthetic
Diagrams	Debates. lectures	Books. texts	Case studies
Graphs/Images	Discussions	Leaflets	Models Work
Lectures	Conversations	Reading articles	Speakers guest
Videos	Audio CDs	Written comments	Demonstrations
Resolution of exercises	Audio and video	Development of summaries	Physical Activity
Internet research	Seminars	Essays	Resolution of exercises
Practical lessons	Music	Multiple choice	Lectures
Projections (slides)	Dramatization	Bibliographies	Practical Lesson

Table 2 - List of teaching techniques and learning styles VARK

Source: FLEMING, N. D. Teaching and learning styles: VARK strategies. Christchurch, New Zealand: N. D. Fleming, 2001.

of its costs, accompanied by the emergence of mobile phones and their application in education. In 2003 Moran already spoke about it “increasingly powerful in resources, speed, programs and communication, the computer allows us to research, simulate situations, test specific knowledge, discover new concepts, places, ideas”. (MORAN, 2003, p.44)

This type of investigation has intensified in recent years, especially due to the isolation proposed by the COVID-19 pandemic. And the emergence of technological innovations that make these assessments possible, such as Google Forms. Santos and Araújo (2012, p. 2) clarify that there are many online assessment methodologies, such as: chats, discussion lists, forums, webfolios, online class diaries. Not to mention that these tools can work both synchronously and asynchronously, which generates a new range of analysis possibilities. For Kenski, 2008 these innovations in online assessment interfaces are necessary, not to mention natural. Kenski (2008, p.29) emphasizes that “technologies change all our actions, conditions of thinking and representing reality and, specifically, in the particular case of education, the way of working activities related to education”. Teaching in the context marked by this advance requires rethinking teaching in its multiple dimensions, since new demands emerge and demand from the school, the teacher, the student and society, knowing how to deal with these transformations, and use them in their favor.

According to Santos and Araújo, 2012 online assessment instruments allow the entire path to be mapped, including the fact that many of them save and keep the responses. The evaluation then constitutes the exchange of knowledge that is diagnosed, criticized and reoriented. This concept of evaluation fully dialogues with what Hoffman, 2000 and Luckesi, 2000 suggest, who see evaluation with

scientific rigor for decision-making, that is, new referrals, new guidelines, new scenarios.

METHODOLOGY

The investigation described here was a field research because it was carried out through direct observation with the participants to capture information (GIL, 2010) about which evaluation instrument they obtain better results. This research had the inductive method, formulated by the Englishman Francis Bacon (GRUBBA, 2012) as an approach method, as it departed from the specific to the general. So that the inductive method is a form of reasoning that starts from the observation of specific cases in order to reach conclusions that may or may not be true.

Regarding its nature, this research is classified as qualitative and quantitative (quali-quant) since it went into the field not only looking for numbers, but also to describe and understand the phenomena related to the problem, as well as seeking to solve it.

It was structured in 9 meetings with 3rd year students, made up of 32 students, 15 boys and 17 girls. Of these, 10 live in the rural area of the district and 22 in the urban area.

The first meeting was a presentation of the research, followed by the choice of participants on the topic to be worked on.

In the second moment, the chosen theme was informed and an expository class was given on acid rain.

In the third moment, a video was shown to reinforce the subject, then the online written test was applied.

The fourth meeting was the application of the evaluation in the form of a game. The application chosen for this was Kahoot, due to its interactivity and the tabulation of data it does.

In the fifth moment, he adapted to the hot potato game in order to do the Oral test through it. For that, a student stayed outside

the room pausing the music, when it stopped, the student who had the box in his hands answered one of the 10 questions that were in the box. This activity took longer than expected, so it was not possible to complete it, it was not possible to hear all the participants.

The sixth activity was the printed written test. There was also the seventh meeting, in which the students did the oral evaluation and filled out a form reporting in which type of evaluation they believed they had performed better (because until that moment they had not yet received the results of the evaluations), as well as in which they adapted better.

In the eighth moment, they answered the questionnaire to find out what their learning style was according to the VAC method.

In step 9, it was explained to the students that 10 volunteers were needed to continue with the research and participate in an interview. Those who were willing to continue were asked questions about: how do you study (do you need silence? Can you learn with noise? Do you have difficulty concentrating?); You realize that you can absorb the content better when you read something about it; when reading and writing; when listening to the teacher, a podcast, news, or something related to the content; or when you do some work on the subject?; And when you show what you've learned, how do you express yourself better? (writing about the subject – report, research, conceptual map, etc; speaking – conversation wheel, seminars, debates, etc; producing material about it such as video, newspaper, podcast, for example). At the end, the interviews were closed by thanking the participants for their collaboration.

In the discussion of the results, a table was made containing the grade that each student obtained in each evaluation modality, in order to have a global view of the performance of each one.

Afterwards, the result of the 10 students

who volunteered to be interviewed was compared with the diagnosis obtained by the VAC method, their most successful test and the information they gave in the interview about the way they learn and the way they express themselves, with the aim of to see if there is indeed a relationship between the student's learning style and the evaluative methodology.

In the end, the results of the questionnaires and the interview underwent static treatment, through which the data obtained with these instruments were tabulated in graphs and analyzed. And, the data analysis technique applied was the content analysis method.

RESULTS AND DISCUSSION

The relationship between assessment and students' learning styles will be discussed below. For this purpose, students were asked about their perceptions about the tests and about the way they perceive they are learning. For example, in which of the evaluation methods used during the research did you perform better?

There was a variety of responses, predominantly for the online written test (as shown in Graph 1 below). It is thought that this is due to the newly acquired habit of carrying out evaluation activities in this format, since it was the most used during the COVID-19 pandemic. And this methodology continues to be widely applied, including at the school where the data for this research was collected.

Next, we sought to find out which type of assessment they identified with most. In this question all methodologies were voted. Making a comparison with the previous methodology, it is noticed that the students consider that the best result is not always obtained in the evaluation that they most identify with.

This is because in the previous question only 3 methodologies were voted. And in this

the 4 techniques received votes. Comparing Graph 1 with Graph 2 (which deals with the evaluative modality with which the student most identifies, that is, with which he feels more comfortable performing) accentuated differences can be seen.

When asked which test they were most successful in (graph 1), 42.9% responded in the online written test, but when it came to identification with the proposed activity, the Online test dropped to 35.7% (graph 2). And, the Oral test, which until then had not been mentioned, appears with 7.1% of the votes. The other modalities maintained the index of 28%.

However, one of the objectives of this investigation was to compare the results obtained by the students in the oral assessment, in the assessment by games, in the printed written test and in the Online test, in order to verify in which of these modalities the students obtained better results; To achieve this objective, the data resulting from the tests were compiled in Table 1, in order to facilitate the visualization and identification of which was the best result for each student. As it can be seen below:

Based on this information, it was possible to submit the results to the theory of Learning Styles, with the aim of confirming the hypothesis that students achieve better performance in the type of test that explores more the communicative ability through which their cognitive better understands the information received. However, to achieve this goal, it was necessary to know the learning style of each student.

Thus, after the students had taken the learning style test and had realized by which means they were able to acquire better quality inputs, the test result was compared to the performance that the students obtained in the different assessment styles, as described in the table below.

This comparison was one of the driving forces behind this research, since the idea is to prove whether the way students acquire knowledge and the way they are asked to express it interfere with their performance in their assessments.

Table 2 below shows the comparison between the VAC questionnaire and the best result obtained.

The VAC theory was developed by Fernald and Keller and Orton-Gillingham (1921) and assumes that learning occurs through the visual, auditory and kinesthetic (tactile) senses, that is, most students have a preferred style for learning content. from the most varied disciplines, and a balanced mixture of the three styles may occur (SALDANHA et al., 2016, p. 1)

Evidences of these mixtures of learning styles are also manifested through Table 2, which shows that 4 students were classified, according to the VAC test, with 2 learning styles.

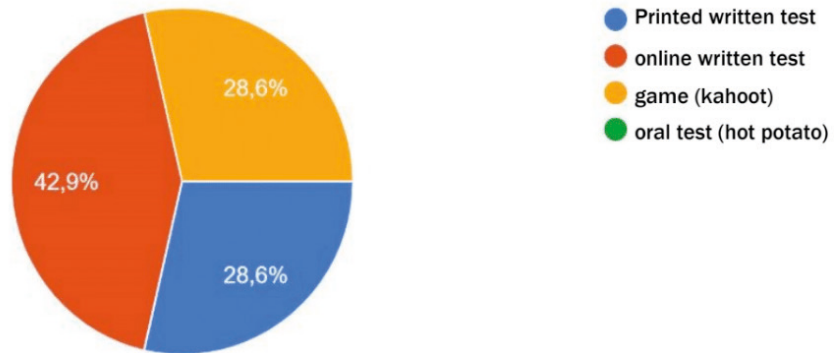
The gaps in the second column of the table refer to students who were not present on the day the VAC test was applied. 12 participants were detected as visual. Of these, 3 had better results in the printed test, 3 in the online test, 3 in the oral test, 1 online and oral test, 2 by games. It could be observed that 3 types of tests had a performance tie of 25% among participants who have the visual learning style.

Among the participants, 8 students were identified as kinesthetic according to the VAC test and 1 visual and kinesthetic, of these, 3 stood out in the oral evaluation, 1 in print, 1 in online. The kinesthetic and auditory in the online test and the visual and kinesthetic achieved 100% accuracy in both the oral and printed test.

Despite the plurality, in the group of kinesthetics it is possible to have clarity, as well as a line that relates evaluations to learning style. Because 37.5% scored higher in

Which of the evaluation methods during this research do you think performed best?

14 responses

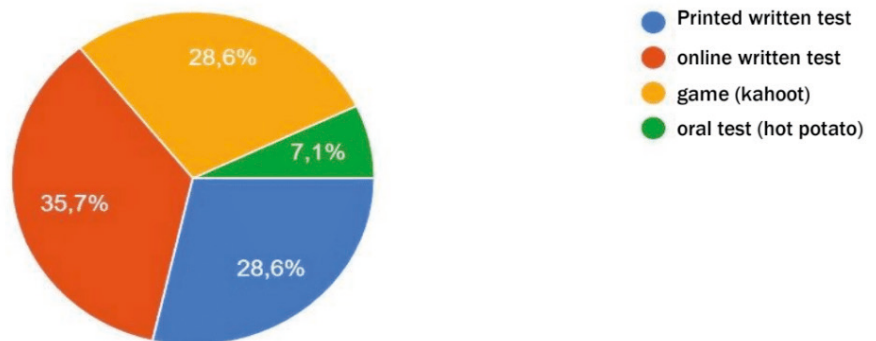


Graph 1: In which of the evaluation methods did you obtain the best performance?

Source: graphic generated by Google Form, 2022

Which type of evaluation did you most identify with?

14 responses



Graph 2: Which type of assessment do you most identify with?

Source: graphic generated by Google Form, 2022

Student ID Number	Online test %	Test by games %	Oral test %	Printed test %	Best result
E1	80	75	95	80	Oral and Online Test
E3	60	62,5	100	80%	Oral test
E4	-	-	-	60%	Printed test
E6	-	-	100	-	Oral test
E7	-	-	-	30	Printed test
E8	-	-	-	90%	Printed test
E9	100	62,5	-	90	Online test
E10	40	-	-	-	Online test
E11	80	62,5	100	100	Oral and printed test
E12	80	50	-	80%	Printed test
E13	-	12,5	-	30	Printed test
E14	80	37,5	-	70	Online test
E15	80	62,5	95	100	Printed test
E16	-	62,5	85	80	Printed test
E17	-	62,5	-	-	Test by games
E18	40	-	-	50	Printed test
E19		37,5			Test by games
E20	20	37,5	80	50	Oral test
E21	100	37,5	85	50	Online test
E22	20	-	-	-	Online test
E23	-	50	0	40	Test by games
E24	80	37,5	100	70	Oral test
E25	-	50	85		Oral test
E26	100	-	90	60	Online test
E27	-	62,5	-	90	Printed test
E28	-	62,5	-	60	Test by games
E29	60	62,5	85	70	Oral test
E30	-	50	-	40	Test by games
E31	-	12,5	70	20	Oral test
E32	80	87,5	100	100	Oral and printed test
E33	-	62,5	100	60	Oral test

Table 1: Comparison with the results obtained by the students in each evaluation

Source: Own authorship, 2022

Call number	Learning style (vac test)	Best result
E1	Visual	Online and Oral test
E3	kinesthetic	Oral test
E4	kinesthetic	Printed test
E6	kinesthetic	Oral test
E8	Visual	Printed test
E11	Visual	Printed test
E14	Visual	Online test
E15	auditory and kinesthetic	Printed test
E17	Visual	Test by games
E18	Visual	Printed test
E20	kinesthetic	Oral test
E21	Visual	Online test
E22	kinesthetic	Online test
E24	Visual	Online test
E25	Visual	Oral test
E26	auditory and kinesthetic	Online test
E28	Visual	Test by Games
E29	Visual	Oral test
E31	visual and auditory	Oral test
E32	visual and kinesthetic	Oral and Printed Test

Table 2: Comparative table between the VAC test and the Best Success Evaluative Activity

Source: Own authorship, 2022

the oral assessment; 12.5% in print and 12.5% online. Perhaps because in this evaluative methodology the student stands out, he is the protagonist of the situation. And as kinesthetics in general like movement, staging, which is strongly related to oral expression, they interacted better in this modality. Since the oral activity that was proposed, in addition to being in a game format, brought the student to the forefront. According to Gardner (2000, p. 58) "Bodily-kinesthetic intelligence: refers to the use of physical knowledge for the integration and balance between body and mind, to express an emotion, to play, or to create a new product".

As for the auditory ones, no participant was detected who had this learning style as a priority. The 3 cases that appeared were E15 and E26, which are auditory and kinesthetic; and E31, which is auditory and visual, as most

individuals have a little bit of each style. In this case there was no predominance of any modality, appearing the oral exam, the printed test, including the evaluation by games.

With regard to evaluation through games, 5 students stood out in this methodology (E17, E19, E23, E28, E30). Of these 60% did not take the VAC test. The other 40% is all visual. There seems to be a direct relationship here between game assessment and visual learning style.

Such results reinforce the hypothesis that the diversity of evaluation typologies is necessary so that all students have the same conditions, to be evaluated with tests that favor the abilities of individuals, as well as those that represent a higher challenge index, both situations with equality for all.

Some of the professors who are reading this work right now may be wondering: - But why do I want to know that?; - how will it be

useful to me in my teaching practice?; well follow the answers.

Information about learning styles concerns the way the brain works when storing information. Knowing this mechanism helps from the lesson plan to its execution. When we are studying something (regardless of the channel we use for this). This information goes to our working memory, which is located in the Prefrontal Lobe (it has the capacity to store only 5 to 7 items). Figure 4 shows the location of the Prefrontal Lobe region and the information that it has a small data storage capacity.

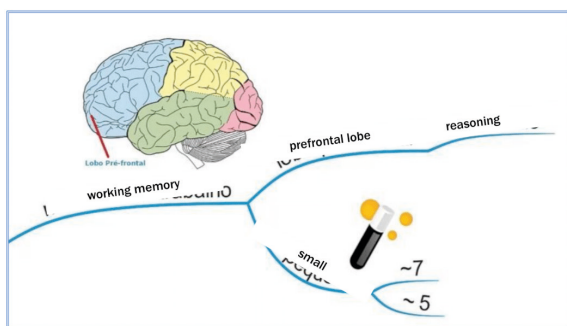


Figure 3 - Location of the Prefrontal Lobe
Source: ``Ginástica do Cérebro``, 2021¹

When the person wants to fix what he is learning, he sends the information learned to the hippocampus, which is responsible for making the associations between the various sensory information, that is, between what the person sees, hears, feels, touches, etc. The hippocampus then selects what it deems appropriate to send to long-term memory. And at this point lies the core of the pedagogical discussion of learning styles.

The more channels used to upload information, the more likely the hippocampus will send the information to long-term memory. Not to mention that this memory is not located in a specific point of the brain like the others. It is scattered across it. When an already consolidated memory is activated,

1. Link: <https://ginasticadocerebro.com.br/o-cerebro-feminino-potencialidades/>
2. System responsible for emotions, present only in mammalian brains.

several areas of the brain are activated. Which shows us that in order to be successful in permanently storing memory, it is better to associate information with different sensory zones, including emotions, since the limbic system ², facilitates this transfer of content to long-term memory.

FINAL CONSIDERATIONS

We understand that the different types of evaluation methodologies would be intended to favor or instigate students when expressing their knowledge. Favor in the sense of helping to understand how your brain absorbs, registers, consolidates and externalizes information. And to instigate, because even though he is aware that a certain evaluation methodology is not the one that most benefits him, according to his learning style, the fact that he now has more knowledge of neurological processes, motivates him to challenge himself, to expand.

However, the pedagogical character of guiding the learning present in the assessments is rarely worked on in basic education units, in the configurations that oriented teachers Cipriano Luckesi and teacher Jussara Hoffmann. In part, this problem starts with teacher training, at undergraduate level. Being encouraged by the education secretaries with regard to continuing training that little work on evaluation in the guiding and/or reorienting bias of the learning path.

We seek here to point out that assessment, in its multiple functionalities, also carries with it the possibility that students are assessed according to their innate abilities, taking into consideration, the learning style to which they belong. Like a printed test for the visual ones, oral test for the auditory ones and manual evaluations for the kinesthetic ones.

This does not mean that the teacher will have to prepare different types of assessments

for each content. No way. Teaching is already overloaded to the extreme with so many attributions, often with no return from both students and institutions. What we suggest is that the educator has, as well as uses, a wide range of evaluation methodologies, so that all components of the class are exposed to the same amount of evaluations that facilitates expressing their knowledge, as well as that all are subject to the same amount assessments that challenge you to externalize your learning.

Because when the class is subject to only one type of verification, for example, it is always a seminar, or it is always a written test, it only favors one group in relation to the learning style.

The present investigation has an innovative character when relating these two areas of teaching, in which, during its elaboration and

execution, it was verified that yes, there is a direct relation between the type of evaluation and the learning styles. Therefore, it is suggested that there be more investigations on this topic in order to scrutinize the mutual interference between these two major areas of education.

It was also observed the gain that education would have if both teachers and students were aware of the neurological mechanisms involved from obtaining information to its consolidation in long-term memory. Such knowledge applied and replicated in educational institutions would result in an increase in the quality of information stored, precisely because it knows how to favor brain synapses for this.

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