College Students and Perceptions of Their Learning Styles*

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ABSTRACT

In a universe with advancing technology, the college class needs to reinvent itself. Therefore, in order to understand whether students benefit from recognizing their learning style (LS) and, consequently, learning with specific techniques corresponding to each style, interventions were carried out in courses in the Psychology and Nutrition programs in a non-profit university in the metropolitan region of Porto Alegre - RS. Overall, 22 students participated in an evaluation using the Perceptual Learning Styles Preferences Inventory by Joy Reid. The findings reveal that 57% of the participating students have an auditory learning style. Based on the interventional approaches in line with the students' learning styles, the large majority of them benefited and responded positively to the proposed methods.

KEYWORDS

College students. Learning styles. Teaching methods.

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Estudantes Universitários e as Percepções de seus Estilos de Aprendizagem

RESUMO
Em um universo de avanço da tecnologia a aula universitária precisa se reinventar. Sendo assim, para compreender se estudantes se beneficiam ao reconhecer seu estilo de aprendizagem (EA) e a partir disso, aprendem com técnicas específicas correspondentes a cada estilo, foram realizadas intervenções em disciplinas dos cursos de Psicologia e Nutrição em uma universidade comunitária na região metropolitana de Porto Alegre - RS. No total, participaram 22 estudantes que foram avaliados através do Levantamento das Preferências Perceptuais em Estilos de Aprendizagem de Joy Reid. Achados revelam que 57% dos estudantes participantes têm estilo de aprendizagem do tipo auditivo. A partir de abordagens interventivas distintas em sintonia com os estilos de aprendizagens dos estudantes, a grande maioria deles se beneficiou e respondeu positivamente aos métodos propostos.

PALAVRAS-CHAVE
Estudante universitário. Estilos de aprendizagem. Métodos de ensino.

Estudiantes Universitarios y las Percepciones de Sus Estilos de Aprendizaje

RESUMO
En un universo de tecnología avanzada, la clase universitaria necesita reinventarse. Por lo tanto, para comprender si los estudiantes se benefician al reconocer su estilo de aprendizaje (AE) y de eso, aprender con técnicas específicas correspondientes a cada estilo, se realizaron intervenciones en asignaturas de los cursos de Psicología y Nutrición en una universidad comunitaria de la región metropolitana. de Porto Alegre - RS. En total, participaron 22 estudiantes que fueron evaluados a través de la Encuesta de preferencias perceptivas de Joy Reid en estilos de aprendizaje. Los resultados revelan que el 57% de los estudiantes participantes tienen un estilo de aprendizaje auditivo. Desde diferentes enfoques de intervención en línea con los estilos de aprendizaje de los estudiantes, la gran mayoría de ellos se beneficiaron y respondieron positivamente a los métodos propuestos.

PALAVRAS-CHAVE
Estudiante de pregrado. Aprendiendo estilos. Métodos de enseñanza.

Introduction

With the ease of access to technology and information, and considering learning in skills-based higher education, the need for changes in teaching and learning processes is highlighted. Thus, it is necessary to better understand which is the most effective way to teach so that the student learns best. This is justified, because training a competent professional, who learns the content and can apply it efficiently when in his/her professional practice is the central objective of any academic training. From this, several authors have proposed to research learning styles and how the student can benefit from a teaching that pays attention to their styles, which can generate more time in class (BARROS, MONTERIO e MOREIRA, 2014; NEGREIROS *et al.*, 2016; SONAGLIO *et al*., 2013).

The learning process has been studied (BECKER, 2012; DEWEY, 1971; FREIRE, 2003; MORIN, 2005; REGO, 2001; REID, 1987) for a long time and there are several approaches that establish concepts such as how each individual behaves when assimilating information, how they interpret it, the difficulties they face in understanding what was presented to them, what resources they prefer to use and what methods they have.

In this direction, as evidenced (2011, p.77), "[...] knowing how to learn allows for better quality learning, because teaching can become more effective. Therefore, teaching and learning are two closely linked constructs". Thus, studying Learning Styles (LEs) aims to perceive the personal characteristics of the individual and the conditioning around them (DUNN and DUNN, 1999). According to Felicetti (2011), knowing the learning styles of students allows us to describe better teaching conditions, thus providing different educational approaches in order to better meet the learning needs of each one. Such styles are understood on the basis of text revision, with important names of the area that help to understand and classify the EA (NEGREIROS *et al*., 2016).

Learning styles are individual processes used to understand and retain information, generating gains in knowledge or skills. Thus, teachers need to find appropriate ways for teaching and learning processes to occur by adopting teaching strategies that are closer to the learning styles of students to stimulate and maintain their good performance (JESUS *et al*., 2017).

In Higher Education, the methodology used by the teacher can intervene, either as a facilitator or not, in the learning process. The transition from high school to higher education breaks with the behavioral structure of the past, which now in higher education requires another way of acting and being a student. It requires an autonomy, whether of studies or behavior, since the development of the student, in this degree of teaching, seeks the critical sense and commitment to studies, aspects with which they have difficulties due to the culture of high school and the lack of approach or knowledge of their own style of learning.

A relevant factor in the formation of health professionals is the teacher's ability to relate theoretical knowledge to the practice he has as a professional. The possibility for the student to visualize professional performance at the same time as acquiring theoretical knowledge allows him/her to better develop the knowledge. However, sometimes the relevance of knowledge over applied teaching methodology is highlighted (ZANON, OLIVEIRA & QUEIROZ, 2009).

The proposal presented here has as its principle the motivation of researchers to get to know their students better. This concern was intensified after the conclusion of the modules related to teaching and learning of a postgraduate course directed to teachers. The updating of the curricula of the university in question was also a strong incentive to seek to get to know the student better and to propose this research, with a view to applying teaching methods more geared to the learning styles of students, as well as enabling them, through self-knowledge, to have a better academic performance. Therefore, the central objective of this work was: to understand whether students benefit from recognizing their learning style (EA) and from this, learn with specific techniques corresponding to each style

The study of learning styles serves to work on the differences in styles that are inferior or indifferent to each student according to their subjectivity (NEGREIROS *et al*., 2016), as well as to propose methods that are more appropriate to the population studied, so that there is more significant learning. The proposal of an intervention based on the different learning styles makes it possible to respect the individuality of the students, which favors their centrality in the process, the creation of an environment that favors self-knowledge and the awareness that students learn in different ways and this presupposes the exploration of different working strategies by the teachers (TAPIAS *et al*., 2011). To know which style is used by the student, structured questionnaires can be used, as proposed by Reid (1987) when studying North American university students. In this direction, we present the methodology outlined to this study that made use of the one initially proposed by Reid (1987).

Methodology

This study is a prospective approach that aims to identify the learning styles of students from two classes, one from the Nutrition course and the other from the Psychology course of a university located in the metropolitan region of Porto Alegre, Rio Grande do Sul.

Joy Reid's (1987) Survey of Perceptual Preferences in Learning Styles was applied to identify visual, auditory, kinesthetic and tactile learners and whether learning is preferably in groups or individually. The questionnaire is self-applicable and was constructed from 30 questions, with answers varying in a likert[1] scale of five alternatives, between which I fully agree and totally disagree. Mazuroski Jr *et al.* (2008) used the same questionnaire and described each of the learning styles (Table 1) on which the questionnaire was based.

[1] Likert scale: commonly used in opinion polls, where by answering the questionnaire respondents specify their level of agreement or disagreement with the statement. (LUDWIG, et al, 2015, p.09)

Table 1. Description of learning styles according to Mazuroski Jr *et al* (2008)

Visual	You learn best by seeing the words in books, on the board and in workbooks. Remember and understand information and instructions better if you read them. You don't need so much oral explanation and can often learn by yourself from the book. You should take notes from lectures, lectures and oral instructions if you want to remember the information.
Listening	Learn by listening to spoken words and through oral explanations. You can remember information by reading it out loud, or by moving your lips as you read, especially when you are studying new material. You benefit from listening to recordings, lectures and class discussions. You also benefit from producing recordings to listen to later, teaching for colleagues, and talking with teachers.
Cinesthetic	Learn best from experience by becoming physically involved in classroom experiences. Remembers information well when actively participating in activities, field classes, and role-plays during class. Combinations of stimuli - for example, an audio recording along with an activity - help to understand new material.
Tactile	You learn best when you have the opportunity to participate in experiences in which you "get your hands" on materials. Experimenting in a laboratory, handling and building models, touching and working with materials provide the best learning situations. Taking notes or writing instructions can help you remember information, and physical involvement in school activities can help you understand new material.
Group	You learn more easily and are more successful at exercises when you study with at least one other colleague. Values group integration and class work with colleagues and remembers information better when working with two or three colleagues. The stimulus you receive from group work helps you learn and understand new information.
Individual	You learn best when you work alone, think best when you study alone and remember the information you learn alone. Understands the subject better when you learn it on your own and progresses more in learning when you work on your own.

Source: Adapted from Mazuroski Jr *et al.* (2008).

After the collection, the data were analyzed according to the score used by Mazuroski Jr. *et al.* (2008), where learning preferences are classified as main (from 38-50 points), minor (from 25-37 points) and indifferent (from 0-24 points). Minor learning styles indicate areas in which the learner can operate as well as the learner, learning in many different ways, and therefore it may be interesting to experiment with these forms. Indifferent learning styles indicate that the learner may have difficulty learning in that way. In this case, you can either target learning at your most dominant styles or try to develop some of the skills that can enhance learning styles in indifferent areas.

According to Reid (1987), students should have the opportunity to evaluate themselves against their learning styles and be encouraged to diversify their preferences. In other words, students should not necessarily use or be subjected only to the styles they have been assessed as preferred. The experience with other learning styles can be enriching if well conducted by an attentive teacher.

At the end of this phase, teaching strategies were used in accordance with the styles identified and, after this intervention, students were asked about this strategy, checking whether they were appropriate and whether they resulted in more learning.

The classes were chosen because they were subjects in which the authors were acting when the research question arose. We chose to maintain the approaches according to each course profile, using the usual tools of each discipline and teacher.

The proposal was applied in the Psychology course with the students of the History and Epistemological Bases of Psychology course, allocated in the first semester of the course that had 30 students enrolled. The class was characterized by being a participatory and mutually supportive group and had a friendly and cooperative relationship with the teacher during the semester. The questionnaire on learning preferences was applied and evaluated in class and the students were informed about the interventional activity that would take place during the semester.

The questionnaire used by the Nutrition course was built on Google Forms and made available on the Google Classroom platform, used as a tool by the Dietetic Technique II course of the fourth semester. The 20 students enrolled were invited verbally and through the Google Classroom platform to answer the questions. The result of the analysis was sent by e-mail to each student individually.

Questionnaire Application

The intervention made by the Psychology course, was held in a Shared Business, a room of bold visual, favored creativity and group work. Upon arriving at the room, the students found a table with several colored post-its, chrome books, modeling clay, pens, crayons and leaves, material that would be used in the activity. Eleven students participated in the intervention, one of whom had to leave class before the end of the activity, so it was disregarded.

On the day of the intervention, in the first 25 minutes of the Psychology course, the instrument was applied to the students who were not present on the previous date. After the application, an expository class on modern trends in Psychology began, lasting 1 hour and 30 minutes. In order to continue the intervention, the students made a survey of the instrument, (re)knowing its learning style, which is presented in Chart 2 below.

In the Nutrition course, 20 students responded to the survey about their learning styles and the results are shown in Chart 3.

Results and Discussion

As can be seen in Chart 2, seven students (70%) had prevalence by the auditory method, being in five (50%) situations the preponderant; six (60%) had kinesthetic, being in three (30%) the most relevant; and four (40%) had the tactile profile, being the most prevalent in two (20%) students. When the prevalence in group or individual style is analyzed, five (50%) students learn better through the group and two (20%) individually.

The teacher read what each of these styles represents so that the students could understand the proposal of the exercise that would come after the class. At the end of the reading the students commented that they identified with the conclusion suggested by the survey. Only one student who had a high prevalence of tactile and medium synesthetic style imagined that this second one seemed more accentuated.

Table 2. Description of the learning styles (main and indifferent) of the Psychology course sample (n=10).

STUDENTS	MAIN	INDIFFERENTS
1. Man	No preferences, balance in responses	Tactile
2. Man	Hearing, Kinesthetic, Group	-
3. Woman	Hearing, Kinesthetic, Group	-
4. Woman	Hearing, Kinesthetic, Group	-
5. Woman	Hearing	-
6. Man	Kinesthetic, Auditory, Tactile, Group	
7. Woman	Kinesthetic, Individual, Tactile, Hearing	Group, Visual
8. Woman	Tactile, Visual and Kinesthetic	Group
9. Woman	Tactile, Group and Auditory	-
10. Man	Kinesthetic and Group	-

Source: The authors, 2020.

Still about the students of the Psychology course, they met in groups according to their learning style: five members of the auditory group, three of the synesthetic and two of the tactile. Student nº 3 showed a predilection for individual work, so it was suggested that she develop the activity in this way. However, when she started, she decided to join the rest of the group. Student nº 1 presented similar and minor results in all learning methods which indicates that any of the areas favors him as an apprentice, except the tactile one, which had an indifferent score. This student had a higher score in the auditory group, so he developed the activity with them.

Among the 20 students in the Nutrition course, 12 (60%) responded to the survey on learning styles and the results are described in Chart 3.

Table 3. Description of the learning styles (main and indifferent) of the Nutrition course sample (n=12).

STUDENTS	MAIN	INDIFFERENT
1. Woman	Individual, Auditory and Kinesthetic	-
2. Woman	Group, Auditory, Kinesthetic/Visual	Individual
3. Woman	Individual and Visual	Group
4. Woman	Individual, Kinesthetic, Auditory	-
5. Woman	Individual and Visual	Group
6. Man	Hearing, Kinesthetic	-
7. Woman	Kinesthetic, Auditory and Individual	-
8. Woman	Kinesthetic, Tactile and Visual	-
9. Man	Auditive and Visual	-
10. Woman	Individual and Auditive	Group
11. Woman	All (main: kinesthetic and tactile)	-
12. Woman	Tactile, Group, Kinesthetic, Hearing	Individual

Source: the authors.

The preference for learning auditory methods was indicated by 9 (75%) students in the Nutrition course. Then came the preferences Cinesthetic (8; 66.7%), Individual (7; 58.3%) and Visual (6; 50%). The preferences with lower representation in this class were the Group and Tactile, which were present in only 3 (25%) of them.

Regarding the styles considered indifferent by the two classes, 8 (36.36%) students presented a score lower than 24 for some form of learning, being 5 (22.72%) with difficulty in Group methods, 2 (9.1%) for Individual methods and 1 (4.54%) for Tactile and Visual methods.

Dunn and Dunn surveys (1979) involving students showed that only 20-30% of the young students were auditory learners, 40% visual and 30-40% tactile/kinesthetic, visual/tactile, or other combination. The results differed from those found in this survey. Many participants can be conjectured, among them aspects related to the vast media repertoire that permeates contemporaneity, unlike what happened in years past when Dunn and Dunn studied. In response to the explanation for the difference between the research, Dorsey and Pierson (1984) concluded that age and work experiences influence learning preferences and that, especially after 33 years the most apparent preference is kinesthetic.

Reid (1987), in his studies at US universities found a strong preference for kinesthetic and tactile learning styles, while group learning was negatively associated. These results were similar to those observed in this study, where 14 (63.6%) students preferred kinesthetic styles and the largest number of styles considered indifferent were also the Group styles,

represented by 5 (22.72%) students. The author also separated the preferences according to the area of study of the student and verified that only those who were from nature science courses were classified as visual learners, while students from the humanities area were the least oriented in this sense. In the same way it was seen that among the students of the Psychology course there was no preference for visual learning (n=1; 10%).

Also, according to Reid (1987) the areas more related to auditory learning style were: computer science, nature science, business, and medicine, matching what was observed in the Nutrition course (n=9; 75%). Engineering and computer science were significantly more tactile than human students in the studies of Reid (1987). The author demonstrated that, except for students of natural sciences, the others indicated that individual learning was the least preferred style. In the present research the group style (Psychology n=5; 50% versus Nutrition n=3; 25%) prevailed over the individual style (Psychology n=1; 10% versus Nutrition n=7; 58.3%) only in the Psychology course.

Intervention

From the analysis of the learning style, presented above, it was proposed that the students of the Psychology class could imagine, based on the history of psychology (content of the whole discipline-past) and modern trends (actuality, new possibilities of doing psi-present), how the job market will be, the challenges and possibilities of acting when they graduate (future). Each group should follow a conduct according to the teacher's suggestions that aimed to enable learning for that profile identified in the previous analysis. At the end of the discussion with the group, which lasted one hour, the class would meet again for a round table.

The auditory group met at Shared Business sitting in chairs around a circular table that favored eye contact. It was suggested that the group read aloud a text published in the 1990s about the psychologist's work, accompanying the reading with their finger, that in the background they play an instrumental song and that they develop a discussion on the subject. To start the activity, one student suggested a classical music and commented that she was used to studying at home like this. Two other students commented that this was not a common practice for them. Initially, the group started reading the text individually, without vocalizing. After ten minutes, most had not made much progress in reading it. The student who suggested the music commented that it was distracting her, because instead of reading the text, she was attentive to the melody, which she enjoyed a lot. The others reported not having noticed the music. At this moment, one of the students said that she concentrated more when someone read it to her, so a colleague of the group suggested reading it out loud. So, they concluded the reading quickly and spontaneously began to discuss the aspects that the text raised in them. The discussion deepened and generated the expected result, with the involvement of all the students. The group was able to extrapolate the objective of the activity, contextualizing their speech with the knowledge acquired in other courses. The group proved to be quite autonomous, not noticing the presence of the teacher around. At the time of the presentation, the group chose to tell their colleagues what they had discussed.

The kinesthetic group was composed of three students, one of them being the most participative student of the classes during the semester. It was recommended that they develop the activity in a room that had comfortable armchairs and a soft carpet, besides a meeting table with several chairs. For this group it was suggested that they sit in the chairs or on the mat so that they are comfortable and take frequent breaks. The group started the activity in the chairs, but preferred to move to the meeting table, kept at the tip of the table by this outstanding student. The tip to take breaks was not followed. The group's task was to create something practical that would discuss the topic of the class. Although applied to the discussion, they found it difficult to create something out of it. Every time the teacher went to check the activity, they tried to comment on something or ask for her opinion. The discussion was done quickly and not in depth, and the group showed more concern about what they would present to the class. This was the group that was most dispersed from the activity. Two students collaborated most while the outstanding student participated only when the teacher approached. With no idea how to proceed, the group requested the presence of the teacher, who suggested that they create something with the modeling mass or develop a brief online survey, using the Chromebook to organize the percentages and present the data. From that, they developed a questionnaire that was sent to known as WhatsApp, getting a total of 20 respondents. At this time of research elaboration and practical development of the activity, the group proved to be more organized and focused. To understand how the group works it is important to understand the position that the outstanding student occupied in the class. It is understood that their attitudes created expectations in the colleagues who counted on their participation and leadership and, because they did not do it and nobody else took this place, the group was unable to focus on the activity in its beginning. At the time of the presentation the group used graphics to present the research and commented on the main results. It was noticeable that the outstanding student tried to engage more in this moment, however, he could not deepen the discussion of the research.

The tactile group was moved to a space that had a high round table and stools and was next to the other two rooms. It consisted of a young student who was very active in the classes and another student who was older and more reserved. The proposal was that they develop a manual activity to present to their colleagues. This group was more complex than the others because the students did not seem to be able to express themselves clearly and reach a consensus. Based on suggestions of using modeling clay and the idea of developing a game, both were interested in the second option. The most communicative student took on the task, developing it practically on her own. She proposed and executed a memory game made of post-its with questions and answers about the history of psychology.

After the conclusion of the intervention, the students were invited to give feedback from the class based on some questions that were answered individually. When asked how they felt, all responded positively, such as "better than expected" (student #3), and that it was necessary "to leave the comfort zone" (student #6). The student who was the leader of the tactile group reveals that:

> At first, I felt very excited, it seemed fun and challenging. Upon receiving the instructions, I confirmed my first thoughts. The most challenging moment was getting the connection with the colleague. As for the activity, objective, rules... after establishing, I loved the creative part. (Student #8)

All the students in the auditory group indicated that group discussion was an important part of the process, and one of the students discovered during the experience that this means of learning favored him. Two students revealed that music distracted them at the time of reading. One of them put on a headset and listened to another song, which made it easier to read the text. When asked if the students usually use this type of activity to study, the majority signaled that they did not and when pointing out whether the activity seemed easier or more difficult, the student's speech exposed the thought of the majority: "I find it easy. I identified myself a lot at various moments of the activity, the learning became more natural". (student number 5). When asked if the way their group performed the activity helped when compared to other more usual means of learning in class, only two indicated that it was indifferent: "I liked the way we learned, but I also really like learning from a 'teaching' teacher (student #5) and "Yes, it helped me. Especially the debate, because I was given some ideas and points of view" (student #2).

In view of the results of the learning preferences of the students in the Nutrition class, a class was planned that took into consideration the following points: individual, auditory and kinesthetic activities, since they were the most related to this class. The class duration was 3 hours, counting the break and included: expository-dialogue class, podcast, video, site search with smartphones, use of the Mentimeter site for word cloud formation and awareness activity with the creation of a message for a possible patient. At the end of the class the students present (n=11) were asked to answer the following questions:

- What did you think of today's activities (Mentimeter, Podcast, Website, writing a Message to a Patient, Videos, Dialogued Expository Classroom)? Please justify.
- How do you usually study? What kind of activities do you use?

It is important to note that, in order not to embarrass the student, the answers were not identified.

The first question was whether the methods chosen really fostered the student's interest. The use of Mentimeter, a Swedish platform that allows interactivity during presentations, was known by few students and the feedback was positive, being considered interesting and "very cool", allowing visualization and understanding of the subjects discussed in class and allowing the exposure of opinion and should be used more, because it has much potential to be explored since students use the cell phone a lot. Only one student said he thought it was cool but did not see the benefit of the activity.

Regarding the podcast, an audio was placed so that everyone could listen together. The activity was considered dynamic, an excellent way to bring good content and that depending on the theme can attract attention. Two students said that they would like to visualize the

content, not just listen, possibly falling into the visual preference rating of learning. It was signaled that the podcast could be shorter and this was noticeable in class, when after 8 minutes the class started to be dispersed (the total time was 12 minutes).

The use of the site survey was not new to the students and the answers were related to the specific site that was used, with emphasis on the observations that it brought up to date and that can be useful depending on the area of professional desire. This signals the importance of the activities and examples used in the classroom being in line with the profession being studied in order to arouse the student's interest. One student reported that he did not like it very much, because he does not like studying on the Internet.

The activity that used message writing for an inpatient to receive along with the meal (the class dealt with hospital food) received many compliments, being considered "very nice", fantastic, "very nice", made it possible to demonstrate the feelings and reflect, which allowed the student to feel in the patient's place (some received the message). Other evaluations said it was a good idea to be used in practice and more activities like this would be welcome. Only one student said he did not like it very much.

The video shown was intended for students to see how hospital food is treated as a priority in some places like Switzerland, so it was in French, but the aim was for them to observe the preparation of the food and the assembly of the dishes. Still the linguistic and cultural issue was pointed out by some students: "first world video, could bring the two sides", "had the language hindrance, took the attraction", "although the video was in French was interesting". One student pointed out that he had missed a visit to a hospital to get to know the reality. But he was also positive for others, being considered great and interesting, because it allowed the visualization of possible practices to make the food more attractive to the patient and brought a new content and many preparation ideas, besides being visual.

The lecture was considered positive by all. Praise as creative, dynamic and always with something different in the proposed activities. The use of visual resources together with the exhibition was well received and productive for memorization. One student commented that he liked it because he enjoys debate and another "it's good for us to lose the shame of talking". The most frequent use of the tools used was requested because they are very instigating.

The second question corroborated with the result of the questionnaire, as the vast majority of students answered that they study alone and only 2 answered that to help a colleague they can study in pairs or groups. The use of background music while studying was also cited by 2 students. Cerqueira (2000) in her doctoral thesis, on learning styles in university students, comments on Rita and Kenneth Dunn's studies where one of the environmental stimuli for learning is sound and that there is variability between students' preferences, with some preferring absolute silence while others seem to benefit from music or sounds from television.

The activities used for study varied: material that teachers pass on, research sites, videos, construction of abstracts and schemes, reading books, listening to audios/podcast. With the exception of one student, the others cited two or more ways of studying. He pointed out that several uses the Internet and one student reported only using the Internet to study. It is also important to point out that one student wrote that he is looking for simple and relaxed ways to learn and another said that the more interactive and dynamic the class is, the better. These reports can be an indication for classes that involve different teaching-learning strategies.

Conclusions

From the intervention carried out, it was possible to identify that the majority of students favor auditory learning (57.15%). There was also the difficulty of the students in placing themselves in a more active learning position, since the best functioning occurred in the most passive behavior group, which they are used to since the beginning of the learning process.

It was possible to notice the preference for dynamic classes, which involve various activities, mainly auditory and which the students can carry out on their own. The auditory students, in the intervention carried out in the Psychology course, corroborated positively the listening of instrumental music. Most of them had not tried to study in this way and concluded that in this way, they managed to keep their attention focused on the whole activity.

The activities proposed in the disciplines were quite distinct: one used more technological resources and the other "doing to learn", in a more artisanal way. Regardless of the interventions made, most students liked the proposals and benefited from learning the content from their learning style. Therefore, it is understood that it is necessary to break with the student-passive position, showing students in practice how knowledge can be acquired in an easier and more interesting way when they take ownership of the learning process.

To obtain more accurate data on the effectiveness of using sample-oriented learning methods would require more time to apply research, and a greater number of participants could also influence the research and class dynamics. The use of the questionnaire proved to be a good tool for identifying the preferences and learning difficulties of university students. As it is practical, it is possible to apply it at the beginning of every semester, thus developing classes that satisfactorily meet the needs of the students.

References

BARROS, R.; MONTEIRO, A. R.; MOREIRA, J. A. M. **Aprender no ensino superior:** relações com a predisposição dos estudantes para o envolvimento na aprendizagem ao longo da vida. Rev. bras. Estud. pedagog. (*online*), Brasília, v. 95, n. 241, p. 544-566, set./dez. 2014.

BECKER, F. **Educação e Construção do Conhecimento**. 2.ed. Porto Alegre: Penso, 2012.

CERQUEIRA, T. C. S. **Estilos de aprendizagem em universitários.** Tese de Doutorado, Faculdade de Educação, Universidade Estadual de Campinas, Campinas, São Paulo, 2000.

DEWEY, J. **Experiência e educação.** Tradução Anísio Teixeira. São Paulo: Editora Nacional, 1971.

DORSEY, O. L., Pierson, M.J. **A descriptive study of adult learning styles in a non-traditional education program.** Lifelong Learning: An Omnibus of Practice and Research, 7, 8-11, 1984.

DUNN, R.; DUNN, K. **The complete guide to the Learning Styles Inservice System.** Boston: Allyn and Bacon, 1999.

DUNN, R. S.; DUNN, K.J. **Learning styles/teaching styles:** Should they . . . can they . . . be matched? Educational Leadership, 36, 238-244, 1979.

FELICETTI, V. L. **Comprometimento do estudante:** um elo entre aprendizagem e inclusão social na qualidade da educação superior. 298 f. Tese (Doutorado em Educação) - Pontifícia Universidade do Rio Grande do Sul, Rio Grande do Sul, 2011.

FREIRE, P. **Cartas a Cristina:** reflexões sobre minha vida e minha práxis. 2. ed. São Paulo: UNESP, 2003.

JESUS, E. M. S.; SANTOS, D. V.; VIEIRA, M. L. C.; CARVALHO, A. A. **Metodologias de ensino e os estilos de aprendizagem na graduação em farmácia:** um estudo piloto. Revista on line de Política e Gestão Educacional, v.21, n. esp. 1, p. 621-639, out./2017.

LUDWIG, J.P. *et al.* Strategic planning: analysis of efficiency methodology applied through Likert Scale. **Espacios,** vol. 36, nº 16, 2015

MAZUROSKI Jr., A. *et al.* **Variação nos estilos de aprendizagem:** investigando as diferenças individuais na sala de aula. ReVEL. Vol. 6, n. 11, agosto de 2008.

MORIN, E. **Os sete saberes necessários à educação do futuro.** 10. ed. São Paulo: Cortez, Brasília. 2005.

NEGREIROS, F.; SILVA, E. H. B.; LIMA, J. A. **Estilos de aprendizagem no ensino superior:** um estudo com universitários ribeirinhos do Piauí. Revista Educação e Emancipação, São Luís, v. 9, n. 3, ed. especial, jul./dez. 2016.

REGO, T. C. **Vygotsky:** uma perspectiva histórico-cultural da educação. 12. ed. Petrópolis: Vozes, 2001.

REID, J. M. **The learning style preferences of ESL students.** TESOL Quarterly, 21(1), 1987.

SONAGLIO, A. L. B.; GODOI, C. K.; SILVA, A. B. **Estilos de aprendizagem experiencial e aquisição de habilidades:** um estudo com discentes de graduação em Administração em instituição de ensino superior. Administração: Ensino e Pesquisa. RIO DE JANEIRO, V. 14 No 1 P. 123–159, 2013.

TAPIAS, M. G.; CUÉ, J. L. G.; VIVAS, M.; RINCÓN, J. A. S.; GARCÍA, C. M. A.; DIOS, M. S. A. **Estudio comparativo de los estilos de aprendizajes del alumnado que inicia sus estudios universitarios en diversas facultades de Venezuela, México y España.** Revista Estilos de Aprendizaje, n.7, v.7, p.1-27, 2011.

ZANON, D. A. V.; OLIVEIRA, J. R. S.; QUEIROZ, S. L. **O "saber" e o "saber fazer" necessários à atividade docente no ensino superior:** visões de alunos de pós-graduação em Química. Ens. Pesqui. Educ. Ciênc. (Belo Horizonte), Belo Horizonte, v. 11, n. 1, p. 140-159, June 2009.