

Experimental design in Behavior Analysis: discussion on its use in inclusive educational interventions¹

Priscila Benitez^{a*} 
Camila Domeniconi^b 
Ricardo M. Bondioli^b 

^a Federal University of ABC Santo André, SP, Brazil

^b Federal University of São Carlos, Center of Education and Human Sciences São Carlos, SP, Brazil

Abstract: The application of inclusive educational interventions by educational agents to special education students should be systematically evaluated to ensure future replication of procedures and results from the use of an adequate experimental design. The aim was to analyze how applied researches can contribute to the arrangement of more systematic inclusive educational interventions, based on the use of experimental designs in Behavior Analysis; to discuss decision making for choosing a design and the impact of this choice on the data collected and on the knowledge to be produced, especially from the involvement of different educational agents in the application of pedagogical interventions with students with ID or ASD. It discusses the guarantee of a design that evaluates the results of interventions applied by agents and the difficulty to identify a design that assures with scientific precision the impact of each intervention applied.

Keywords: experimental design, school inclusion, research methods.

The target audience for special education defined in the National Policy on Special Education from the perspective of Inclusive Education (Ministry of Education, 2008) involves students with disabilities, global developmental disorders and high skills/giftedness. Regarding this audience, those who present some cognitive condition, such as intellectual disability (ID) and, in some cases, global (or pervasive) developmental disorders (PDD), seem to have need of greater educational support throughout the inclusion process in the regular classroom, mainly with relation to curricular flexibilization and performance of a collaborative special education teacher together with the general education teacher (Benitez & Domeniconi, 2018; Benitez, Gomes, Bondioli, & Domeniconi, 2017).

The process of school inclusion of students with ID and PDD (such as: Autism Spectrum Disorder [ASD]) has led to reflections on the strategies adopted in this scope, such as the benefits provided to each student. In order to guarantee the access and permanence of a student in the regular school, it is necessary, basically, to create conditions for promotion of teaching and learning of social and pedagogical contents. For this to occur, it is necessary to list the different educational agents involved in this process.

According to the normative guidelines (Ministry of Education, 2010), students with disabilities and PPD enrolled in the regular school of the public or private educational system, at any level, stage or modality of education, are entitled to a support professional that will accompany them during all activities to be performed within the school. Especially with regard to the student with ASD, Law No. 12.764 (2012) guarantees the right to specialized supervision in the regular classes if such need is proven.

The guidelines provided by the Technical Note of the Special Education Secretariat (SEESP) No. 19/2010 (Ministry of Education, 2010) and Resolution No. 2/2001 (Ministry of Education, 2001) emphasize that the support professional has to work coordinately with the student's general education teacher and with the multifunctional resource room teacher, who is responsible for the Specialized Educational Assistance (SEA), among other professionals within the school context. The need for the professional occurs according to the specificity presented by each student and in terms of functionality.

Therefore, for a successful inclusion of a student in regular classrooms and in regular schools, it is necessary the development of an articulated work between the different teachers (from the general education teacher to the Specialized Educational Assistance teacher), support professionals, parents, coordinators, community in general, among many other educational agents (Almeida-Verdu, Fernandes, & Rodrigues, 2002; Benitez

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* Correspondence email address: priscila.benitez@ufabc.edu.br



& Domeniconi, 2015, 2016, 2018). Ensuring the inclusion of any student from this joint work means to increase the possibilities for the student to remain in the regular school, which could meet the reductionist demands that only focus on space offer and physical resources as the only necessary elements for the inclusion (Espote, Serralha, & Scorsolini-Comin, 2013).

The work with each agent establishes an opportunity to intervene with the student in different (formal or non-formal) educational dimensions and with different teaching objectives, depending on each agent's function specificity in the interpersonal relationship established with the student, which allows including social (Camargo & Bosa, 2009; Sanches & Oliveira, 2011; Sant'Ana, 2005) and pedagogical skills (Benitez & Domeniconi, 2018; Sanches & Oliveira, 2011). In this spectrum of possibilities, the bibliographical survey conducted by Benitez and Domeniconi (2015) throughout 2013, in relation to different educational agents' performance, verified studies more focused on teaching of social behavior than on teaching of pedagogical behavior.

The survey was conducted by means of national studies published on journals classified as Qualis A1 and A2, in Psychology and Education areas, found with the descriptors "school inclusion" and "educational inclusion." The basic premise was the identification of characteristics that described the national educational agents' performance in the inclusion process. With regard to the different agents' performance in terms of promoting pedagogical repertoires for students with ID and ASD enrolled in regular schools, it was possible to conclude that if such interventions are systematized and have the same goal in common, they can be evaluated systematically in terms of their effectiveness, besides favoring higher quality inclusion process and increasing the possibilities of extension to other contexts and populations.

In Behavior Analysis, an intervention is seen as effective when the behavioral strategies used have sufficient effects on the modification of behaviors considered socially relevant, depending on the verbal community in which the student is inserted (Baer, Wolf, & Risley, 1987; Heron, & Heward, 2007). Evaluating the dependent variables (DVs) proposed in the intervention in function of the manipulation of independent variables (IVs) is a way to identify whether the proposed experimental method was adequate enough to evaluate the results.

In order to systematically demonstrate the relationship between IVs (interventions described in detail and, in the case of this study, pedagogical interventions applied by educational agents) and possible gains (DVs, such as the educational agent's performance in the application of the intervention and the performance of the student with ID or ASD in the pedagogical activities), aiming at reproducing

procedures and results, it is necessary to program an experimental design adequate to the proposed objective (Alberto & Trouman, 2009; Cooper et al., 2007; Sidman, 1976). This means that the activities of educational agents should predict interventions that could be described in terms of their IVs and DVs.

The experimental design assists in describing, predicting and controlling the target behavior (behavior to be taught) and its respective variables (the functional relationship), as well as guaranteeing credibility in results, internal validity, external validity and intervention reproduction, from the balancing of the probabilistic dispositions of the environment (Alberto & Trouman, 2009; Andery, 2010; Cooper et al., 2007; Cozby, 2003). In this context, programming an experimental design allows meeting a social demand without disregarding the scientific aspect, since the evaluation of the DV (behavior to be taught) is a goal, producing data that can be replicated from the use of systematically described procedures (in this case, the IVs used in the study) (Velasco, Mijares, & Tomanari, 2010). It is essential to explain that the experimental methodology can be used in different contexts, involving or not scientific research, such as, for example, those involving professional activities in clinical psychological practice, sports, inclusive special education, among other activities. Thus, this work is aimed at showing how experimental designs in Behavior Analysis are fundamental from the point of view of decision making in applied situations, especially in the intervention scope, involving professional practice, regardless of whether such practice is linked or not to the development of scientific research.

The use of experimental designs in Brazilian applied research still seems to be unusual, especially in the Psychology field. The systematic review of the literature conducted by Costa et al. (2012) identified, in the scientific production mapped on the formation of Brazilian psychologists, studies based on opinions and developed from an internal perspective, despite the use of experimental designs. Understanding how applied research in the area of Brazilian inclusive special education can be planned according to scientific rigor and through the establishment of each IV and DV, especially with regard to the involvement of educational agents in the application of pedagogical interventions, has become the questioning focus of this study. Experimental work in applied research does not have the same meaning as experimental work in professional interventions, although it is strongly recommended that professionals use such knowledge of applied research in their professional practice in order to propose effective interventions that guarantee socially relevant behavioral changes (Baer et al., 1987). Thus, what is proposed as discussion of this study involves the dialogue between (1) the contributions of the applied research that used experimental design in Behavioral Analysis, in the inclusive special education

scope, and (2) the professional practices of interventions applied in this context, in order to analyze how such research can contribute to the arrangement of more systematic professional interventions in this educational modality of education, aiming at proposing effective interventions.

By retaking the discussion about the importance of the involvement of the several educational agents in the inclusive process of students with ID and ASD, one inquires about how each intervention applied by each agent, while IV, can affect the learning of each student's new behavioral repertoires, from the measurement of each specific DV intended for intervention. For example, the collaborative special education teacher's role in the regular classroom, together with the general education teacher, can be considered an IV that affects the performance of the student with ID or ASD in activities collaboratively planned between such teachers while DV. In this context, it is evident the discussion about the experimental design role in Behavior Analysis in the decision-making and result evaluation process in applications, especially in the school inclusion scope.

This study aimed to analyze how applied research can contribute to the arrangement of more systematic professional interventions in the area of inclusive special education, based on the use of experimental designs in Behavior Analysis. It is therefore a question of discussing the decision-making process for choosing a design and the impact of this choice on the data collected and on the knowledge that is desired to be produced in the inclusive special education area, especially from the involvement of the different educational agents in the application of pedagogical interventions with students with ID or ASD. Thus, the proposal is to defend the use of experimental designs in Behavior Analysis as an intrinsic part of the decision-making process of inclusive educational interventions, with the purpose of generating more consistent results in terms of learning of students with ID and ASD.

The text was organized into three subsequent topics that address (1) the experimental design in Behavior Analysis and its use in inclusive educational research, (2) the challenges of ensuring the use of experimental design in interventions involving different educational agents, considering school inclusion as a complex social process involving multiple social segments (Almeida-Verdu et al., 2002; Benitez & Domeniconi, 2016), and, finally, (3) final considerations. In addition, there was a non-systematic search for studies that involved the proposed theme between 2011 and 2019 on digital libraries, as well as in physical ones.

Experimental design: discussion on its use in inclusive educational interventions

Proposing an experimental design requires to think mainly about two conditions: a) one in which the IV is

present, denominated experimental condition, with the introduction of the inclusive educational intervention, and b) one in which the IV is absent, in the case control condition (baseline), aiming at evaluating habitual behavior, without any manipulation, such as, for example, evaluating performance in the pedagogical activities of special education students during the activities carried out in the daily school life, without introducing the systematized intervention through the involvement of the different educational agents, which would be, in this case, the IV. When designing the intervention, it is essential to specify: a) the number of special education students that will be attended and the educational agents involved (parents, teachers, extracurricular professionals, etc.); b) how many conditions will be proposed (control and experimental), and c) in which order of presentation each condition will be presented and for how long (Sampaio et al., 2008).

The way of combining the control and experimental conditions creates opportunities for different forms of DV measurement and IV introduction. Thus, two main designs documented in the literature refer to the group (between subjects) and to the single subject (within subject) (Alberto & Trouman, 2009; Cooper et al., 2007; Cozby, 2003; Matos, 1990; Sampaio et al., 2008). The group design is traditionally used in the Social Science and Psychology fields. In this type of design, students are divided into two groups: a) one that will be exposed to the control condition (control group), and b) one that will be exposed to the experimental condition, that is, to the intervention exposure (experimental group). The study of the single subject, in turn, has been widely defended in the literature (Matos, 1990; Sampaio et al., 2008; Sidman, 1976), due to the understanding of Sampaio et al. (2008), that "behavior is a phenomenon characteristic of individual organisms, which interact with the world in a unique way" (p. 154).

The single-subject design is directly related to the findings predicted in the assessment guidelines of the Brazilian inclusive special education, emphasizing that the teacher can propose differentiated assessments that allow comparing student performance with the student himself/herself. That is, the teacher, before starting the activities, evaluates the special education student's initial performance in relation to the set of pedagogical activities proposed; and, after teaching intervention, there is a reevaluation of such performance in order to verify its change in that set of pedagogical activities before and after teaching, verifying whether it reached the pedagogical objective designed for the student at that moment instead of comparing his/her performance with the average of the classroom where he/she are enrolled (Almeida-Verdu, Rodrigues, & Capellini, 2008; Ministry of Education, 2006; State Secretariat of Education, 2001).

The single-subject design presents different strategies, and in order to define which will be used,

it is necessary to identify which problem situation to be investigated, or rather, the research question to be answered and, in the case of applied research or professional interventions, identify the target behavior to be taught. By retaking the problem situation presented previously, and considering school inclusion a complex social process involving different educational agents (Almeida-Verdu et al., 2002; Benitez & Domeniconi, 2016), how to investigate the effect of each intervention applied by each educational agent in the promotion of pedagogical repertoires with students with ID and TEA? How to define an experimental design in Behavior Analysis?

A series of single-subject designs is documented in the literature. Nevertheless, it is important to emphasize that this work did not pretend to exhaust such discussion,

which means that the designs discussed here do not refer to the totality presented in the literature. Therefore, the discussion involved applied research that used experimental designs based on the Brazilian inclusive educational perspective (Almeida, 2003; Lourenço, Hayashi, & Almeida, 2009).

Within the framework of single-subject designs (Table 1), the following stand out: A-B, A-B-A, A-B-A-B (or reversal design, with or without multiple treatments, without withdrawal), B-A-B, multiple baseline (between behaviors, situations or subjects), mobile criterion, multiple probes, and multielementary or simultaneous alternating treatments (Alberto & Trouman, 2009; Cooper et al., 2007; Cozby, 2003; Matos, 1990; Sidman, 1976).

Table 1. Characterization of experimental designs in Behavior Analysis, in the inclusive special education context

Design	Application in inclusive special education
A-B	(A) means control condition (or baseline) and (B) intervention (or teaching). The SEA teacher (for example) assesses the student's performance in the activity that is intended to be taught, in the most natural way possible, without providing any hint or type of help, and then applies the intervention.
A-B-A	The teacher evaluates the student's performance (A), teaches the activity using tips (intervention-B) and re-makes the assessment (A) to compare performance before and after intervention (B).
A-B-A-B or Reversal design	The teacher evaluates the student's performance (A), teaches (B), re-evaluates, as done in the first condition (A), and teaches again (B). The proposal involves successive comparisons between evaluation and intervention conditions for the same pedagogical objective.
B-A-B	The teacher teaches activity with tips (B), evaluates (A), and teaches again (B).
Multiple baseline	It implies that the evaluation will be done seeking to maintain in isolation the effects of the interventions in the scope of the behavior, situations or subjects.
Mobile criterion	Teaching procedure divided into phases that evaluate the student's performance increase or reduction in tasks, which have modified reinforcement criteria according to each stage of teaching.
Multiple probes	Repeated evaluations are performed throughout the intervention, according to the teaching proposal designed.
Alternating treatments	Also called multielementary or simultaneous, they allow evaluating the relative contributions of individual components of an intervention package.

Among the characteristics of each design described in Table 1, the discussion is about the possibilities of use in the special inclusive education scope. The main characteristics of the mobile criterion design involve a teaching procedure divided into phases that evaluate subject's performance increase or reduction in tasks that present modified reinforcement criteria according to each teaching phase (Lourenço et al. 2009).

The multiple baseline design allows evaluating more than one dependent variable (Alberto & Trouman, 2009; Almeida, 2003, Cooper et al., 2007, Lourenço et al., 2009), such as: using a multiple baseline between behaviors to answer the research question proposed would be useful to evaluate the applicator's behavior in function of the behavior of the student with ID or ASD in the accomplishment of the pedagogical activities or, also, in a multiple baseline design between subjects, to compare performance among students or between situations, with variation of activity application environments, such as regular classroom, specialized educational service room, and at home. The multiple-probe design is a multiple baseline variation (Almeida, 2003; Lourenço et al., 2009).

For example, the study by Walter and Almeida (2010) used a multiple-probe scheme to evaluate an alternative and expanded communication program, and applied by mothers with children with ASD. The quantitative analysis of the data considered the levels of support, orientation and supervision offered by the researcher during mothers' data collection, for application of the teaching program with the children with ASD. The collection started with a baseline with the three mothers in their homes. The first mother was then exposed to teaching both at the special school and at home, while the two others waited for the intervention to begin. Thus, the first mother was exposed to the maintenance session and the other two to the probe sessions. The second mother started the intervention while the third mother stayed waiting for it. Soon after, the maintenance session was reproduced with the first mother for the second time and with the second mother for the first time. The second probe session was performed with the third mother, exposing her to the intervention, while the others remained waiting for later exposure to the maintenance sessions again. As a conclusion, the mothers used the communication program as a way to meet the communication demands of their children with ASD in their homes.

In general, the review proposed in the study by Lourenço, Hayashi and Almeida (2009) systematized the repeated occurrence of the four experimental designs most used in theses and dissertations defended in a graduate program in special education, namely: multiple baseline ($n = 9$), A-B ($n = 8$), A-B-A ($n = 3$), and multiple probe ($n = 1$). These data are in agreement with the findings analyzed by Almeida (2003) in his review of

theses and dissertations defended in Brazilian graduate programs.

The alternating-treatment design, in turn, allows evaluating the effect of different interventions that could be applied by different educational agents, aiming at teaching of basic pedagogical skills. Certainly, the design can be used in other contexts, especially for teaching social behavior. From this design, it is possible to investigate the most effective interventions for the students, as well as the possibility of comparing the effect of each proposed intervention in the scope of the classroom, of the ASD, or even of what is developed at home, since it allows evaluating the effect of two or more teaching interventions, comparing the effectiveness of each of them separately and in possible combinations.

In addition, the alternating-treatment scheme allows evaluating the relative contributions of the individual components of an intervention package, as well as the parametric investigations with different values of an alternating independent variable used to determine the different effects of a target behavior (Alberto & Trouman, 2009). If the situation proposed for analysis involves the evaluation of different interventions, such as those mentioned above involving the different educational agents, would alternating treatments be a viable design to measure the effect of each intervention?

With regard to the use of this design with studies that basically aimed to teach reading, it was possible to find in the literature the studies of Morgan (qtd. in Cooper et al., 2009), Singh and Singh (1985), and Singh (1990). Morgan (qtd. in Cooper et al., 2009) compared the effects of two types of contingent reinforcement to increase the accuracy of writing skills in fourth grade children with the purpose of controlling and quantifying the different effects of reinforcement in this type of task, from three teaching interventions: no game (the writing test was applied with five words and then the participant returned to the classroom), game (each participant who presented a high score in the test received a certificate of achievement), and game plus (after the test, the participants played and those who won received a small gift, for example, sticker, pen, and others). Each intervention was applied on a different day. The analysis of the results showed that the no-game condition was the one in which they presented fewer correct answers. From these data, the author discussed the importance of the alternating-treatment design to evaluate the effects of each intervention and discussed the programming of consequences to increase students' performance.

The study by Singh and Singh (1985) provided an example of the use of alternating treatments to broaden the reading repertoire. In the procedure, a baseline phase was inserted to evaluate the relative effectiveness of two procedures reducing the number of errors in oral reading by adolescents with ID.

During the alternating-treatment phase of the study, three different conditions were presented each day, in separate sessions of five minutes each: control condition (similar to baseline), word supply condition, and word analysis condition. All participants had fewer errors for both conditions. Subsequently, Singh (1990) used the alternating-treatment design to measure the comparative effect of two error correction procedures in oral reading of individuals with ID. Students read an unfamiliar passage with 100 words, three times each day. One of the correction procedures employed was called word supply (the teacher provided the correct word, the student repeated one time and continued reading), and the other was the sentence repetition (the student repeated the word, then the teacher read the rest of the sentence and reread the entire sentence). The whole procedure provided three phases: baseline, alternating treatments (with both corrective procedure interventions), and then the treatment in which the participant presented the highest performance, considered as the effective treatment, was reapplied. As a result, the analysis revealed that the whole sentence repetition correction procedure was more effective when compared with the word supply procedure for each of the three students.

In view of the described studies, problem proposed in the present study was understood as challenging, regarding the choice of an experimental design in Behavior Analysis that could guarantee the involvement of the different educational agents in the accomplishment of pedagogical activities in different combinations, in order to operationalize the role of each of them in the process of teaching and learning pedagogical repertoires with students with ID and ASD.

How to ensure the use of the experimental design in interventions that involve distinct educational agents?

Since it involves multiple interventions, the alternating-treatment design could be a viable and adequate alternative to compare the different effects of interventions applied by different educational agents and, therefore, progress in obtaining replicable data from operationally described and experimentally controlled procedures. Regarding the limitations presented by this design, it is important to point out that even though previous studies, such as those of Morgan (qtd. in Cooper et al., 2009), Singh and Singh (1985), and Singh (1990), have defended the idea of adopting this design to teach basic pedagogical skills through reading ability teaching with the objective of identifying promising interventions, among three interventions applied together (as in the three studies cited), a variable not identified in the studies and present in the literature on teaching of reading behavior in the Portuguese language (Souza, Rose, & Domeniconi, 2009) referred

to the possibility of syllabic recombination, due to the syllabic structure of the Portuguese language, besides the occurrence of learning generalization.

This effect seems to make it difficult to identify the most effective intervention for all students, since when exposed to a reading teaching procedure with the increase of the number of words to be taught (that is, with the gradual exposure to the increase of the number of words), students can demonstrate rapid acquisition in reading regardless of the current experimental intervention (that is, regardless of application context, teaching material and applicator). It is in this direction that the number of alternating interventions to be applied by each agent can contribute even more to the students' rapid acquisition of reading, which can, on the one hand, be a positive aspect in order to obtain rapid learning, especially when it comes to the population investigated (students with ID and ASD) and, on the other hand, a critical aspect in relation to the identification of the most effective intervention (using the hypothesis that involved a joint action among the largest possible number of educational agents), since students can learn by recombining syllables and begin to read new words, regardless of the intervention they are exposed to.

Although the manuals consulted (Alberto & Trouman, 2009, Cooper et al., 2007; Cozby, 2003) do not have restrictions on the number of interventions to be applied, it is recommended that they are not many ($n < 3$). Discussing the question of the alternation of interventions for teaching of basic reading skills, from the involvement of educational agents, in different places, with differentiated pedagogical strategies and according to each agent's function, it is believed that the number of interventions (in particular, the number of variations proposed in the structure of each intervention, between educational agent, teaching material [pedagogical strategy] and the application context) may make it difficult to understand which would be the most promising intervention for reading teaching, in addition to not guaranteeing an effective control for the beneficial effect that the repetition of the task itself has on the performance of those who perform it repeatedly (that is, the learning set effect).

Although previous studies (Morgan qtd. in Cooper et al., 2009; Singh & Singh, 1985; Singh, 1990) have defended the idea of teaching pedagogical skills through alternating treatments, the objectives proposed by each were not directly aimed at reading behavior teaching, since they manipulated more refined aspects, such as correction procedures and consequences for participants' responses. On the other hand, studies developed in an alternating-treatment scheme that predicted the teaching of social behaviors (such as obedience and discipline teaching) showed more easiness to identify the target intervention (McCullough, Cornell, McDaniel, & Mueller, 1974).

Although the alternating-treatment scheme is an advantageous tactic regarding the equalization of the effects of undesirable variables throughout the different interventions that can be planned and applied, it is necessary to consider the possibility of interactions between the different elements analyzed simultaneously (Andery, 2010; Velasco et al., 2010), as in the case of the problematization proposed in this study. In addition, studies developed on behavioral assumptions aimed at teaching reading for different students generally use group designs to evaluate the effects of different interventions or treat interventions as a teaching package applied with multiple baseline designs, or A-B, A-B-A-B, A-B-A (Mauad, Guedes, & Azzi, 2004), without specifying the effectiveness of the best intervention to be proposed by educational agents.

Final considerations

This theoretical essay had as premise to problematize the use of the experimental design in Behavior Analysis in the area of inclusive special education, in order to investigate the effect of each intervention applied by each educational agent on the promotion of pedagogical repertoires with students with ID and ASD. Therefore, the purpose of the article was to describe the designs used in this research context, as well as discussing the decision-making process for choosing a design, and the respective impact of that choice on the data collected and on the knowledge that is desired in the inclusive special education area. The theoretical body created the conditions to discuss: a) proposals of designs that evaluate the results of the interventions applied by agents in pedagogical tasks, and 2) difficulties related to the choice of a design that ensures, with scientific precision, the impact of each pedagogical intervention applied by each agent. The proposed discussion made it timely to reflect on the importance of the role of the experimental design in Behavior Analysis in the decision-making and result evaluation process in professional practices included in the inclusive special education scope.

This situation refers to the challenges posed in conducting applied research involving the teaching of socially accepted behaviors in a given verbal community (Cooper et al., 2007) and the target audience of Brazilian special education (Ministry of Education, 2008).

Nevertheless, in the face of such challenges, the proposal of a close dialogue between the scientific findings and the specialized educational area becomes a fertile ground for future reflections, aiming at proposing diverse

questions presented by parents and teachers, in their social contexts of performance. This discussion allows us to approach the field of research with the provision of services that occur in natural contexts of teaching, such as at home and school (Lourenço et al., 2009), creating opportunity to discuss the use of experimental work in applied research and professional interventions. Through the discussion proposed, it is understood that professional practice can produce modifications of socially relevant behaviors when designed with systematic rigor of applied research, through the use of experimental designs in Behavior Analysis.

The partnership between applied research and professional practice can contribute to the construction of an interdisciplinary science by means of questions that can be answered systematically and with scientific rigor (Lourenço et al., 2009). This means that educational agents can identify the causal relationships between an educational intervention (in this case, description of VI) and student performance (which is predicted by the measurement of a DV), provided that there is consistency between data collection and analysis, through the use of a research design in Behavior Analysis (Albert & Troutman, 2003; Lourenço et al., 2009).

Another complementary strategy commonly used in applied research refers to the use of anecdotal observations added to the effects of the experimental design adopted in the proposal. It is a way of direct and continuous observation, in which the educational agent registers a descriptive analysis sequentially sequenced on the behaviors of interest, with emphasis on the antecedent and consequent conditions of the behaviors defined as target of the study and its natural environment of occurrence (Cooper et al., 2007). Future studies may advance the discussion of the scientific aspects of an applied research, relating the use of the design to other strategies, such as observations.

Therefore, choosing an experimental design in Behavior Analysis that contemplates the problem-situation discussed in the scope of the study generates reflections on the difficulty of finding a design that ensures, with scientific precision, the impact of each intervention applied to the students, in order to scientifically ensure the role of each intervention when it comes to repertoires involving recombination (such as reading). There is identification of the need for more data of this nature, as well as new designs to provide new analyzes and empirically prove the effect of each intervention on the pedagogical skills teaching for students mentioned above, in the scope of special inclusive education.

Delineamento experimental em Análise do Comportamento: discussão sobre o seu uso em intervenções educacionais inclusivas

Resumo: A aplicação de intervenções educacionais inclusivas por agentes educacionais em estudantes da educação especial deveria ser sistematicamente avaliada, para garantir replicação futura dos procedimentos e resultados, a partir do uso de um delineamento experimental adequado à proposta. O objetivo foi analisar como pesquisas aplicadas podem contribuir no arranjo de intervenções educacionais inclusivas mais sistemáticas, a partir do uso de delineamentos experimentais em Análise do Comportamento; discutir a tomada de decisão para a escolha de um delineamento e o impacto dessa escolha nos dados coletados e no conhecimento que se deseja produzir, especialmente a partir do envolvimento dos diferentes agentes educacionais na aplicação de intervenções pedagógicas com estudantes com DI ou TEA. Discute-se a garantia de um delineamento que avalie os resultados das intervenções aplicadas por agentes e a dificuldade de identificar um delineamento que assegure com precisão científica o impacto de cada intervenção aplicada por cada um deles.

Palavras-chave: delineamento experimental, inclusão escolar, métodos de pesquisa.

Plan expérimental en Analyse Comportementale: discussion sur son utilisation dans les interventions éducatives inclusives

Résumé: L'application d'interventions éducatives inclusives par des agents de l'éducation à des étudiants de l'éducation spécialisée devrait être systématiquement évaluée afin de garantir la reproduction à l'avenir des procédures et des résultats de l'utilisation d'un plan expérimental approprié. L'objectif était d'analyser en quoi la recherche appliquée pouvait contribuer à l'arrangement d'interventions éducatives inclusives plus systématiques, fondées sur l'utilisation de modèles expérimentaux dans l'analyse comportementale; discuter de la prise de décision pour le choix d'un design et de l'impact de ce choix sur les données collectées et les connaissances à produire, en particulier grâce à la participation des différents agents de l'éducation à la mise en œuvre d'interventions pédagogiques auprès d'élèves présentant un IDD ou un TSA. Il traite de la garantie d'un plan qui évalue les résultats des interventions appliquées par les agents et de la difficulté d'identifier un plan qui assure avec une précision scientifique l'impact de chaque intervention appliquée.

Mots-clés: plan expérimental, inclusion scolaire, méthodes de recherche.

Diseño experimental en el Análisis de la Conducta: discusión sobre su uso en intervenciones educativas inclusivas

Resumen: La aplicación de intervenciones educativas inclusivas por agentes educativos a los estudiantes de la educación especial debería ser sistemáticamente evaluada para garantizar la futura replicación de los procedimientos y resultados a partir del uso de un diseño experimental adecuado a la propuesta. El objetivo del texto fue analizar cómo las investigaciones aplicadas pueden contribuir a la disposición de intervenciones educativas inclusivas más sistemáticas, a partir del uso de diseños experimentales en el Análisis de la Conducta; así como discutir la toma de decisiones para seleccionar un diseño y el impacto de esa elección en los datos recolectados y en el conocimiento que se desea producir, especialmente desde la participación de los diferentes agentes educativos en la aplicación de intervenciones pedagógicas con estudiantes con DI o TEA. Se discute la garantía de un diseño que evalúe los resultados de las intervenciones aplicadas por agentes y la dificultad de identificar un diseño que garantice con precisión científica el impacto de cada intervención aplicada por cada uno de ellos.

Palabras clave: experimental diseño, inclusión escolar, métodos de investigación.

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