Improving the communicative competence of prospective teachers through illusionism: A practical application of magical techniques

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Abstract

This study aims to enhance communicative competencies in future teachers, a frequently neglected area in educational training by integrating illusionism as an innovative pedagogical tool. A quantitative analysis was conducted using a validated questionnaire across three dimensions to assess the communicative competence levels of 81 trainee teachers (mean age x=20.92 years and dt=2.58). Cluster classification and biplot methods (HJ Biplot and MANOVA Biplot) were employed to compare pre- and post-intervention measurements after incorporating card magic training sessions within a motor skills subject. The results identified three distinct clusters demonstrating significant and positive effects on future teachers' training following the illusionism intervention, notably surpassing programs lacking this approach. Enhanced self-confidence and security emerged as directly correlated with improved communicative competencies. The first cluster exhibited particularly developed communicative competencies, especially regarding control and security over the communicative process (non-verbal) linked to the emotional dimension. Illusionism, through adapted magic effects effectively improves students' communicative skills by fostering self-confidence and emotional management. This research suggests that illusionism creates a motivating and innovative environment for more effective communication, addressing identified deficiencies in teacher communication skills and providing a structured methodology for enhancement.

Keywords: Cluster, Communication, Communicative competencies, Education, Future teachers, Illusionism.

Contents

Contribution of this paper to the literature
This study's originality lies in its unique integration of illusionism as a pedagogical tool to enhance communicative competencies in future teachers. This innovative approach, linking magic effects to emotional management and non-verbal skills, is a novel contribution to teacher training.

1. Introduction

1.1. Education as a Communicative Process

One of the main characteristics of communication in the educational context is its interactive nature. Thus, teachers and students establish different communication processes between them. Similarly, in this context, education implies a set of teaching and learning processes transmitted through communication. Communication is present in all spheres of the educational process. This implies the need for good control and management of teachers' communication skills which is a major factor in their professional development together with a positive attitude and adequate mastery of the content to be taught. Communication, knowledge, and attitudes are three closely related elements and significant predictors of effective classroom interaction (Osakwe, 2009).

Therefore, it becomes necessary on the part of teachers to have a good command of communication skills that make the teaching and learning process a meaningful and effective process. In this sense, communication competence is understood as the set of skills that enable the appropriate participation of the subject in specific communicative situations (Beltrán, 2004). In addition, they are the basis for maintaining a positive climate in the educational community (Tejada Fernández, 2005). Perrenoud (2004). This type of competency is necessary for good teaching practice. Thus, communicative competence constitutes the operational and methodological underpinning to solve, through language, the problems that arise in pedagogical practices (Vasilyeva & Nikitina, 2018).

Similarly, Sowder, Leavitt, Smith, and Tanase (2013) argue that good teaching depends more on a natural ability to communicate than on any understanding of pedagogy. Indeed, from its good use comes the achievement of an improved emotional classroom climate of engagement, relationships, and meaning (Cullen & Backwell, 2018). In this referential context, the teacher through his communicative ability increases the attention of his students and exerts influence on their behaviors. One of the main skills that future teachers must possess is associated with building healthy relationships with their students requiring for this purpose the mastery of linguistic, sociolinguistic, and discursive components as well as non-linguistic areas linked to communicative competence. It is therefore a matter of creating situations that facilitate learning (Castellá, Comelles, Cross, & Vilà, 2007) in which the teacher must know and perfectly manage verbal and non-verbal communicative resources (Sanz, 2005). In this sense, communication is perceived as "a complex phenomenon, not only because it encompasses different areas but also because its very essence implies correlation, interaction and interdependence" (Aguado, 2004) being pertinent to approach it from an interdisciplinary perspective in which the definition of communicative competence unites sociological and epistemological aspects (Woods, 2007).

Currently, it is essential to recognize the communication issues that numerous teachers experience (Camacho & Sáenz, 2000). Therefore, it is necessary to address the training of teachers in this field of communication, providing new ways of training that allow a coherent improvement of these skills as a methodology.

1.2. The Art of Illusionism in the Service of Education

Based on the above description, the basic concept of communication's existence and, consequently, of teacher communication skills in the relevant context emerges. This same communicative need is proper to another activity whose initial purpose could present a different approach. According to Tamariz (1981) illusionism is the art of the impossible and the fascinating. Furthermore, Tamariz (1981) insists on the idea that the magician's ability is linked to his communicative competence. Through this art, one can alter human perception and cognition, control attention, and influence choices (Kuhn, Amlani, & Rensink, 2008).

At this point, it is possible to establish a comparison between the art of illusionism and education as far as the value of the communicative fact is concerned, this being one of the most relevant aspects in both processes. According to Tamariz (1981) a professional magician shows how to communicate and transmit starting from five points: look, voice, hands, body and feet. Del Pozo (2021) states that both magicians and teachers are obliged to be "great communicators to correctly develop their profession, facing the challenge not only of transmitting information but also of moving their audience" (p. 35).

This close relationship between illusionism and education is arousing the interest of the scientific and educational community considering illusionism as a useful educational tool to increase attention and facilitate learning retention (Ikhsanudin, Sudarsono, & Salam, 2019; Spencer, 2012; Wheatley, 1998) including the promotion of science and mathematics (Hall & Pais, 2018; Lesser & Glickman, 2009) the transmission of educational messages and increasing skepticism about the paranormal and boosting creative thinking (Wiseman & Watt, 2020a, 2020b). Similarly, it is shown as a form of effective classroom management that plays a vital role in the teaching and learning process (Mkhasibe & Mncube, 2020). This complexity is illustrated when education is thought of as communication (Biesta, 2017).

Despite the growing interest of the scientific community, no work seems to be found today that investigates the capacity of illusionism to improve the training of future teachers. Therefore, this article aims to analyze the training possibilities of illusionism to improve the communicative skills of future teachers.

2. Methodology

2.1. Design

The study is designed as a quasi-experimental one to assess the effects of illusion techniques on the communication skills of future teachers. Two groups were considered: one experimental (EG) and one control (CG) from the same subject (taught on two different campuses with identical curricula) of the Bachelor's Degree in early

childhood education training program dedicated to working on motor competence. Given the creative and motor nature shared by both the subject and magic, it was considered an optimal and propitious space for the development of this intervention. Different sessions were designed in which students had to learn to put into practice a "magic effect" of the specialty of card magic, that is magic that is performed with cards or playing cards.

The research posed two measurements (pre- and post-test) by questionnaire of the communicative competencies of the students at the beginning and end of the subject with a total of 28 theoretical and practical sessions. The intervention based on card magic was initiated using a direct teaching style with two sessions oriented to learning the instructions and the necessary techniques of one of the magic effects. Next, the practice and staging of the aforementioned effect were worked on emphasizing the aspects related to communication and body expression.

The study was conducted following Organic Law 3/2018, of December 5, on the Protection of Personal Data and Guarantee of Digital Rights and with the ethical considerations required for this type of non-invasive research. Ethical review and approval were not required for this study due to the considerations described above. Informed consent was obtained from all subjects involved in the study and the authors declared no conflicts of interest.

2.2. Population and Sample Selection

As indicated above, we started from a population composed of student teachers as future teachers in training. The sample was selected by convenience among the students enrolled in the subject of the official curriculum belonging to the second year of the early childhood education degree at the University of Salamanca (Spain), specifically from the Faculty of Education (Education campus, Salamanca) and the Faculty of Sciences Education (Zamora).

The selection of this sample is particularly relevant due to the specific training these students receive in the educational field which provides them with an adequate theoretical and practical framework to understand and reflect on the variables analyzed in the research. In addition, the diversity of training contexts within the same university allows contrasting possible differences according to the academic environment, enriching the findings of the study and favoring the generalization of the results in the field of teacher training. There are a total of 81 students between the two campuses mentioned above with the following distribution. On the one hand, 8 students and 37 female students at the Campus Viriato, Zamora, and a total of 11 male and 25 female students at the education campus, demonstrating the predominantly female character of this degree program. The sample has a mean age of x = 20.92 years and a dt = 2.58.

2.3. Instrument

A questionnaire created and validated in the context of this research was used to obtain data on communication skills in the pretest and posttest phases. This questionnaire, composed of 37 items measured on a Likert scale from 0 to 10 (0 strongly disagree and 10 strongly agree), measures the self-reported scores achieved in three major dimensions of the communicative process.
1. Control and security over the non-verbal communicative process (20 items).
2. Insecurities in the verbal communicative process (12 items).
3. Emotional management in the communicative process (6 items).

These dimensions were validated using a theoretical review and submission to a committee of experts in communication as a theoretical construct; analyzing an exploratory factor analysis, as a factorial construct (internal structure) and using an analysis of internal consistency, the Cronbach index of each one being 0.94, 0.83 and 0.74, that is, excellent, good and acceptable reliability, respectively.

2.4. Data Analysis

The analysis presented begins with the descriptive analysis of the three main theoretical variables that represent the three dimensions of the questionnaire. These have been calculated using the median of the different scores provided by the students participating in the study for each item.

Secondly, the participants in the study were classified because on their responses to the different items of the questionnaire. For this purpose, the items were analyzed using an HJ-Biplot (Galindo, 1985, 1986; Galindo & Cuadras, 1986) which allows us to represent graphically and in reduced dimension both the column elements (variables-items) and the row elements (students) of a matrix. Next, the HJ-Biplot coordinates were used in a hierarchical cluster analysis following the ward method for the constitution of 3 well-differentiated clusters.

In the third and final step, the results of the questionnaire were analyzed using a two-way MANOVA Biplot (Amaro, Vicente-Villardón, & Galindo-Villardón, 2004; Amaro, Villardón, & Galindo-Villardón, 2008; Gabriel, 1995) considering the variables phase of the study (pretest and posttest), study group (EC and magic) and the clusters resulting from the previous phase. The phase and study group variables were merged into a single variable with pretestEC, pretestMag, postestEC, and postestMagic values to facilitate this analysis.

3. Results

3.1. Descriptive

According to Figure 1, at the beginning of the research work, the students in the control group (CE) showed moderate values in the first dimension, 6.4 points out of 10 in control and security of the non-verbal communicative process and 7 points in the experimental group (magic application). At the same time, low values indicated insecurities about the verbal communicative process (3.1 and 2.5 points in each group respectively). Meanwhile, in the third dimension, referring to emotional management, high values were shown with 8 points out of 10 in each of the groups.

The same graph shows different values for the different dimensions after the intervention in both groups. The first dimension, increasing in both groups seems to be higher in the magic group although with lower growth. The second dimension decreases in both cases with a greater decrease in the illusionism group. The third dimension increases its value only in the illusionism group while it decreases slightly in the CE group.

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These data seemed to indicate at first that the inclusion of illusionism in the training of future teaching professionals strengthens the communicative skills of teachers both in terms of increasing their control and non-verbal confidence and in terms of decreasing their insecurities when putting their verbal skills into practice.
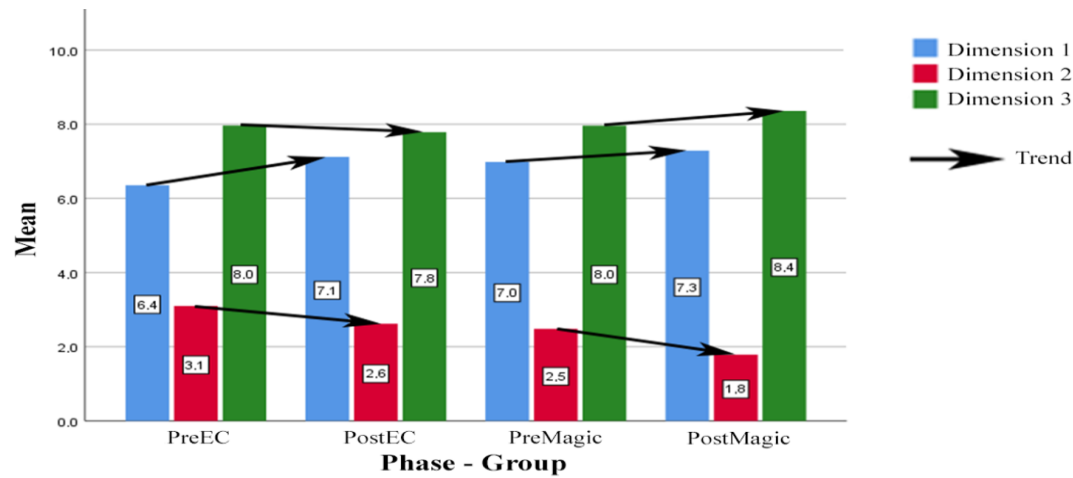

Figure 1. Evolution of the dimensions according to the groups and study phase.

3.2. Explanation of the Clusters

A cluster classification was generated from the coordinates of an HJ-Biplot analysis which allows us to simultaneously analyze the behavior of a set of variables (columns of a matrix) and a set of cases or individuals participating in the study (rows of the data matrix) to further study the differences between study participants.

On the one hand, this has allowed us to confirm the structure of variables that give rise to the dimensions analyzed due to the relationship between each of them on a plane formed by the projection on a reduced space of the hypercloud generated by the set of items under study. On the other hand, classify each individual within a well-differentiated group (i.e., showing external heterogeneity and internal homogeneity). The result, which can be seen in Figure 2 is a classification into three clusters capable of explaining in more detail the behavior of the sample studied.

As can be seen in the figure, the distinction between clusters is given by their distribution along the abscissa axis (Axis 1) which absorbs most of the information (33.97%) provided by the 1-2 planes. If we think in extremes, we realize that from left to right, we find the opposites of control and security (left) and lack of control and insecurity (right) in the communication process.

At the same time, the analysis also reveals that the items of the first dimension (marked on the figure with the letter A) correlate strongly with the items of the third dimension (marked with the letter C) in the construction of the graphical result. This means that greater control and security over the communicative process (nonverbal) on the part of future teachers is accompanied by greater and better emotional management of the communicative process as a whole. Its inverse reading is also interesting since the absence of this emotional dimension in communication seems to be translated into an increase in insecurities and lack of control over the verbal and non-verbal process.

This space is generated as we have said different behavioral profiles in the communication process. The first of these profiles represented by cluster 1 on the left of the graph and in purple brings together those future teachers who claim to have more developed communicative competencies. In terms of their level of control and security over the communicative process (non-verbal) which is linked to the emotional dimension.
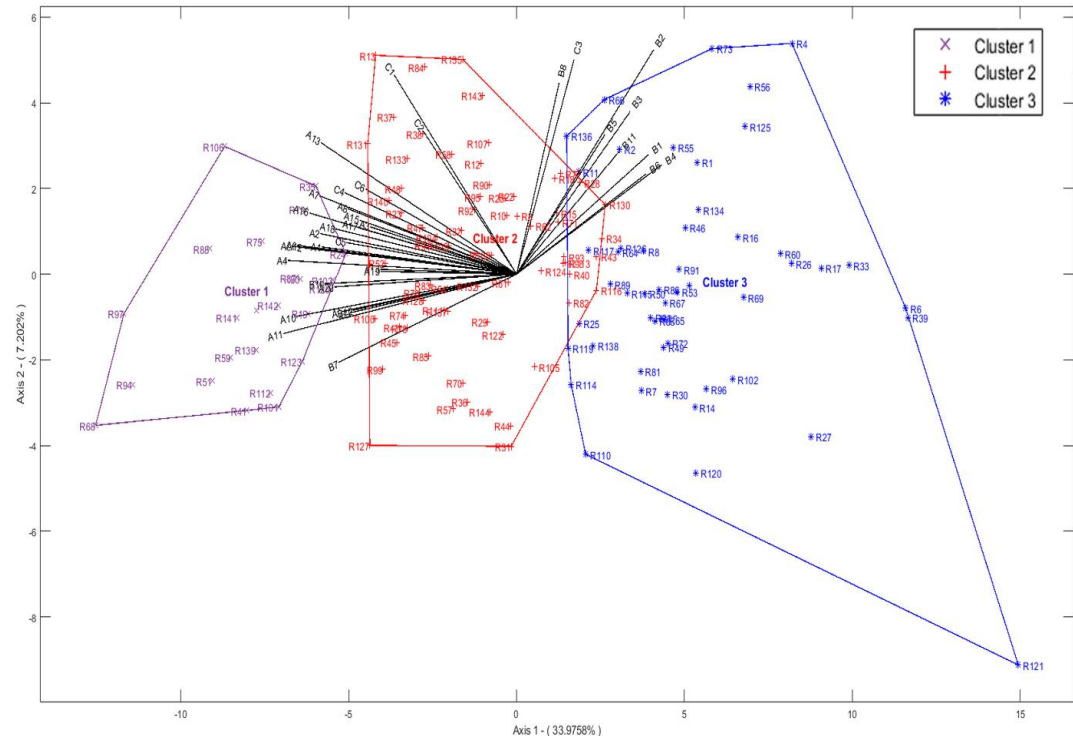

Figure 2. HJ-Biplot and cluster classification.

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According to Figure 3, a simple descriptive glance at this cluster shows that it is indeed a subgroup that stands out for very high levels in dimensions 1 and 3 and, in contrast, practically null in dimension 2. With more moderate values in dimensions 1 and 3 and somewhat higher in dimension 2, we find cluster 2, which is positioned in the center of the HJ-Biplot graph showing an intermediate position between both extremes. On the other hand, cluster 3 includes those people who present more disadvantages in the development of their communicative competencies with higher levels of verbal insecurity and medium levels in their emotional dimension.
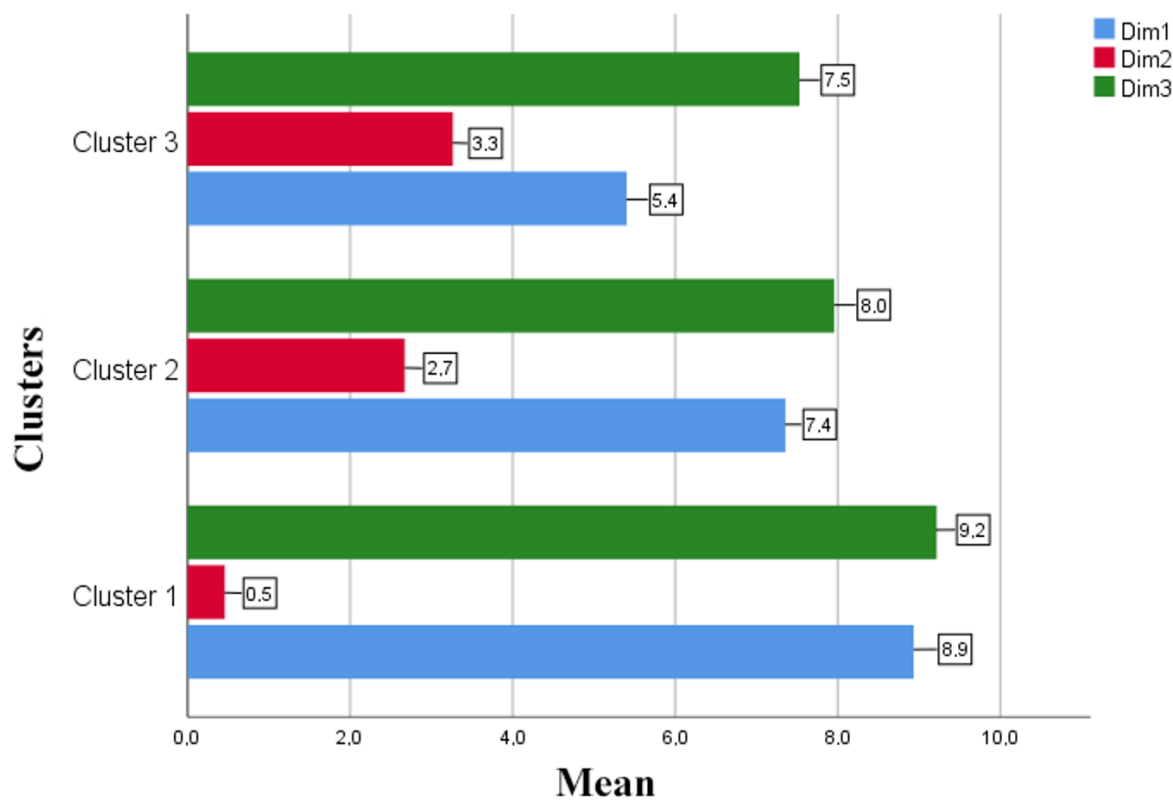

Figure 3. Descriptive of the dimensions according to the cluster of membership.

From this preliminary observation of the data, it is possible to characterize and outline the results obtained. In view of a more detailed analysis and, above all, more focused on answering our research questions, we will use these profiles (clusters) to see the effect that the sessions designed through the magic effects have had on these teaching competencies.

We use the MANOVA biplot analysis which allows us to represent again rows (cases) and columns (variables) of a matrix in a reduced dimension graphic space jointly and in optimal representation conditions. Unlike the HJ-Biplot, which seeks to construct its axes on the directions of maximum variability, the MANOVA Biplot focuses on constructing the space on the axes of maximum separation between groups. On the one hand, this allows us to know whether or not there are differences between the groups of a matrix (clusters and class groups in our case). On the other hand, to find out which variables are responsible for these differences.

In the MANOVA Biplot analysis, these groups are represented by a point in the Cartesian plane (Barycenter) surrounded by a circle (confidence limits at 95.5%). In the form of vectors, the variables point to those groups in which there are significant differences, thus allowing us to project on each of the aspects under study. Thus, the MANOVA Biplot shows that each cluster has its behavior before and after the intervention. At the same time, in some cases, significant differences are observed between the pretest and the posttest while others do not seem to point to major changes.
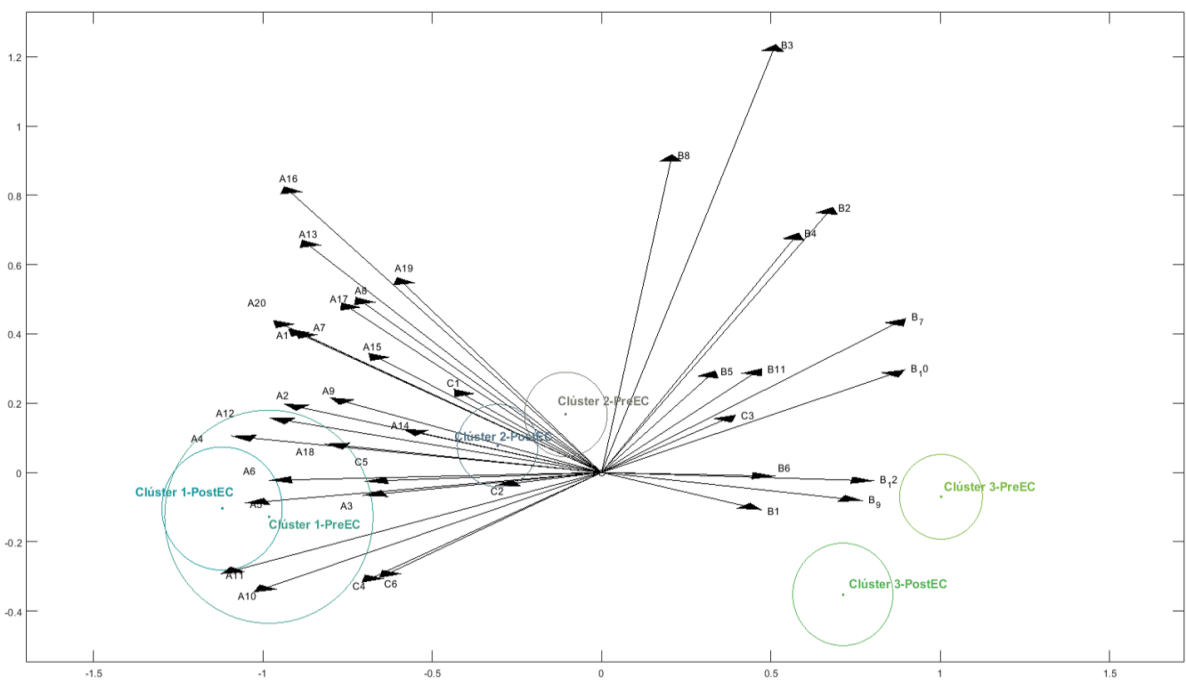

Figure 4. Two-way MANOVA Biplot comparing the clusters in each phase of the study with the control group.

Figure 4 illustrates what has happened with the control group (remember, those who have not been subjected to the training with magic effects). Indeed, the behavior of the different profiles has been different. In essence, they remain in the same positions as in their initial configuration. However, the third cluster (those who presented more difficulties and a lower level of teaching communication skills) has been significantly altered by the teaching effect since both groups (cluster 3 PreEC and cluster 3 PostEC) are markedly separated. This indicates a change along the items of dimension 2 (with letter B in the graph) which refers to the dimension of insecurities in maintaining a verbal discourse. Thus, this teaching mainly served to reduce these insecurities among the group with the highest level while there appeared to be no change in the rest.

Meanwhile, in the group that did receive the specially designed training using magic effects as illustrated in Figure 5, the differences are much more noticeable. In the previous case, the clusters tend to stay within the same area respecting the distribution along the first axis. However, in each of them, the differences between the first measurement (pre-test) and the second (post-test) are significant, especially in the case of the extremes.
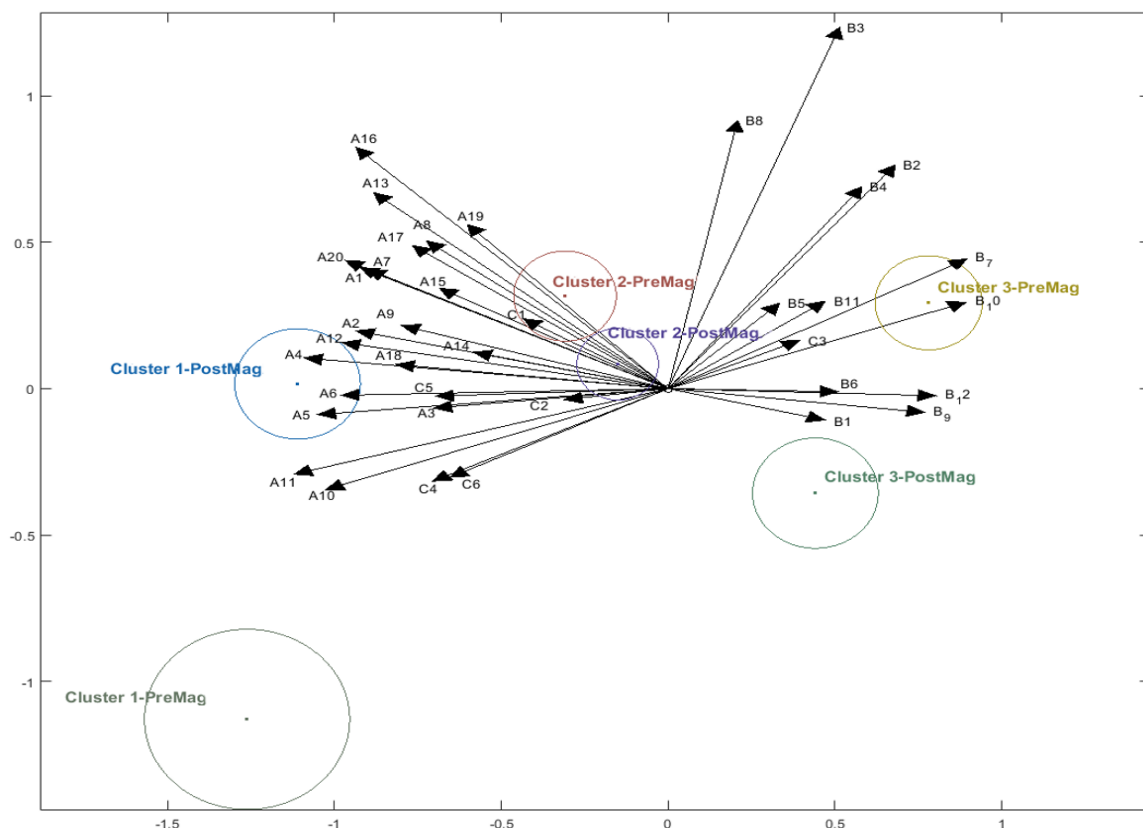

Figure 5. Two-way MANOVA Biplot comparing the clusters in each phase of the study.

If we go into greater detail, we can see that for the first cluster, if the pretest group is projected onto the different vectors, it can be seen how some items maintained lower scores than others of the same dimension. In the post-test, these scores are higher in all the items of the dimension. Thus, the training brought about a rather drastic change in terms of communicative competencies with a generalized improvement.

In the case of cluster 2, the quality of moderates is maintained and they are, at the same time, those who change the least after the training. Although we could think of slight, minimally significant differences on some items, the projection on a complete dimension does not allow us to be sure of this with total certainty. Nevertheless, there is a tendency towards improvement that could indicate that with more training time, this group would also benefit from change.

Finally, cluster 3 shares certain similarities with what has already occurred in the control group. In short, due to the design of this instrument capable of measuring the communicative competencies of future teachers, three profiles of teachers' communicative competence can be generated capable of classifying students. This classification is also useful for understanding the effects of training on these competencies. It has been possible to compare the effects of training designed by means of magic effects by comparing two measurements taken before and after the intervention. The results highlight significant differences between the two periods with larger effects than those found in the control group. In other words, illusionism as a resource and didactic methodology in the training of future teachers is perfectly applicable and effective.

4. Discussion

In view of the results obtained and as stated by Camacho and Sáenz (2000) problems in communication among teachers are perceived which are attributed to different causes. This is a problem that generally affects teachers in training in different specialties. Ortega and Fuentes (2015) have revealed that physical education (PE) teachers in training do not express a positive perception of the degree of development and mastery of communicative competence for their future professional performance by admitting numerous limitations and considering training received during the degree insufficient. The results of this study shed light on this aspect by showing that a good number of future teachers fall into clusters 2 and 3 those who have the most problems with some aspect of communicative competence.

This research starts from the fact that communication is a process that does not only consist of a mere transmission of content where the presence of emotional aspects, both the teacher and the student must be considered. In this way, the emotional competencies defined by Vaello (2009) are revealed as necessary elements to

be a good teacher. In this regard, it is worth highlighting that the improvements achieved in teachers are related in a relevant way to the emotional aspects contained in the corresponding study dimension. It is notable that they are also the aspects that most concern teachers in the educational context and in relation to their own communication.

The analysis of the data shows that on the three analyzed dimensions of the communicative process, the main hypothesis is corroborated that illusionism is capable through the adaptation of magic effects in the training of future teachers of improving the communicative skills at all student levels. Following this analysis, we can affirm that self-confidence has a direct influence not only on perception but also on the improvement of aspects such as the clarity and coherence of speech, both in its verbal and non-verbal form. Pérez and García (2020) indicate that teachers who exhibit high levels of personal security are more capable of structuring their messages understandably and persuasively. Similarly, in a direct way, security can be related to non-verbal communication which is important in communication processes. Personal security allows for better management of body language which reinforces credibility and the impact of the message transmitted.

It can be inferred that self-confidence is a significant starting point for the communication process. In this way, feeling safe will make the teaching and learning process more effective. Rodríguez (2018) states that students are more likely to get involved and participate in classes led by teachers who project security since they feel more comfortable and valued in their learning process.

Regarding the application of techniques and resources from the world of illusionism, it is reflected in the results that these make up an effective compendium of tools for improving communication as a process since they make special reference to the factors described above, related to confidence and security about themselves. A study conducted by Yuen, Spencer, Kirklin, Edwards, and Jenkins (2021) at the University of Alabama at Birmingham (UAB) revealed that teaching magic tricks to children and adolescents with attention deficit hyperactivity disorder can significantly improve their self-esteem and trust.

Similarly, Kolb's (1984) theory of experiential learning which emphasizes the importance of active and practical learning in the creation of knowledge and skills highlights the relationship between illusionism and these factors. According to the author, learning is the process by which knowledge is created through the transformation of experience. In this context, illusionism acts as a practical tool that allows individuals to experience and overcome challenges, thus improving their self-confidence. However, Genard (2014) points out that illusionism and oratory share the need to tell effective stories to capture and maintain the audience's attention. This same author maintains that the ability to tell stories is not just an addition to the presentation, but the vital core of public speaking. Illusionism is, therefore, a valid methodology for the transmission of content. Because of the results, it can be stated that it is also a pedagogical tool. Data indicates that it is a specific tool for working and improving communicative skills understanding these as both verbal and non-verbal resources as well as others related to the connection and involvement with students.

The use of illusionism can be focused on the objective of implementing both verbal and non-verbal communication strategies. This refers directly to research on memory illusions by Loftus (2005). The use of illusionism and the consequent improvement in communicative skills allow the teacher to connect with younger generations, promoting positive relationships, cooperative aspects, and purposeful learning (Nessipbayeva, 2012). Additionally, students could be guided toward self-empowerment, problem-solving, and critical thinking (Jacobson-Lundeberg, 2016).

According to Behnke and Sawyer (1998), in the practice of illusionism, you can face and overcome the fear of speaking in public which reduces your stage anxiety and improves your communicative performance in the classroom. Self-confidence and the absence of fear mean that higher levels of communicative efficiency can be achieved.

The frustration could be corrected if the teaching of public speaking competence is proposed at the university level and previously in the primary and secondary education stages (Bados, 1991). Morales and Sánchez (2020) highlight that a self-confident teacher not only communicates more effectively but also motivates students to achieve higher academic performance. Similarly, this improvement in self-assurance and confidence could be adaptable to students. According to Wiseman and Watt (2020b), participants who learn magic tricks experience a significant increase in their confidence. It is worth noting in this sense that the process of mastering a magic trick and successfully presenting it in front of others increases perceived self-efficacy which in turn improves general self-esteem.

5. Conclusion

The review of the literature reveals a lack of training for future teachers in terms of communicative competence. At the same time, illusionism is proposed as a good candidate to make up for this lack.

At a methodological level, a learning situation is designed in two groups with pre- and post-test measurements in which one of them was subjected to training based on magic effects. It was necessary to design a questionnaire capable of measuring the levels of communicative competence in terms of verbal and non-verbal control and security, including the emotional aspect of communication. The use of this questionnaire was shown to be valid and reliable when it came to delimiting the three dimensions observed in this research: aspects of body control, lack of verbal control and the emotional aspect of communication.

It has been confirmed that communicative competence is not homogeneous and that there are three profiles among future teachers. The research carried out shows that after the application of illusionism in the training of teachers, their communication skills improve significantly in the three dimensions even among those with a good communicative level. It is confirmed that the improvement was even greater in those teachers who perceived that they communicated less effectively.

Illusionism is thus presented as a useful tool for improving communicative competence. The application of magic effects and their implementation in the classroom offers a significant improvement among teachers in training. This improvement is mainly due to an increase in self-confidence, better emotional management and greater verbal and non-verbal control.

Illusionism applied to the educational context also helps to create an innovative and motivating space that generates more effective and enriching communications.

5.1. Future Lines of Research

This research opens a new avenue of exploration of illusionism within teaching action. On the one hand, an exhaustive study of the different applications of magic effects to improve communicative skills is necessary. On the other hand, it is worth asking what other uses this art could have as a teaching tool.

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