Magic and communicative competencies in the educational context. A systematic review

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Abstract

Illusionism and magic tricks can be used as pedagogical strategies to promote social, personal, and cognitive skills, but the effects of magic on the development of communication skills in the educational field continue to be explored, which is why this study seeks to investigate How the use of magic tricks in classrooms can contribute to strengthening communicative interactions between the teacher and students. For this purpose, through a systematic review of the literature, 28 documents obtained from the Scopus and ProQuest databases, written on any date in English, Italian, Portuguese, and Spanish, were analyzed, discarding those of doubtful scientific credibility or those that did not contribute to answer the research question. The results reveal the symbolic power of acts of magic, which can become acts of language and, consequently, assume a pragmatic, cognitive and strictly communicational function, which facilitates the creation of a climate of trust and cooperation in the classroom and engages students both cognitively and emotionally. It is also inferred that the truly important aspect underlying the use of magic tricks in the classroom is the communicative impact that gravitates around them. The article ends by showing suggestions for future research aimed at deepening knowledge of this object of study.

Keywords: magic, illusionism, communication, teaching, education

1. Introduction

The passing of the 21st century has raised the importance of developing various competencies in individuals. Communication, as part of these competencies, has aroused a growing interest in research as the teachability of communicative skills and their inclusion in the curriculum have been investigated (Jacobson-Lundeberg, 2016).. That is, the role of education remains prominent in encouraging competencies in teachers and students that can respond to the needs of this century. The search for and implementation of new strategies in the classroom is therefore one of the necessary steps for such a process; reading activities (Spektor-Levy et al., 2008), problem-based learning (Spektor-Levy et al., 2008) problem-based learning (Nurulaeni & Smaniati, 2019) collaborative work and jigsaw techniques (Halimah & Sukmaye et al., 2019). (Halimah & Sukmayadi, 2019; Tuluham & Yalcinkaya, 2018) have emerged as pedagogical proposals for the development of communicative skills.

On the other hand, illusionism and magic tricks as pedagogical strategies have been implemented by some teachers revealing the promotion of social, personal, and cognitive skills in students (Spencer, 2012). The approach to communication skills, however, has not been fully explored. Even so, it is worth noting that in the studies developed by Spencer (2012) and by Sui and Sui (2007) it was observed that, in addition to the aforementioned benefits, magic was able to improve conversational fluency and relationships among students. These findings would then pose a research alternative of great interest, assuming that illusionism could be used as a pedagogical tool for the development of communication skills in teachers.

When inquiring about definitions and fields of application of magic, it is found that contemporary magic, also called illusionism, is capable of provoking the marvelous experience of the impossible without the need for the audience to believe that what they are observing is real. Today's illusionists have inherited a diversity of methods and techniques that have stood the test of time and have perfected them by purely empirical means. A magic effect□ usually called a trick□ is the result of a series of techniques, tools and resources that have to be communicated to an audience eager to see such an impossible effect. It therefore becomes a dramatic game, as defined by Cervera (1983)It is a playful activity in which children engage collectively to reproduce actions that are so familiar to them that they make them the plot of their play" (p.24).

In recent years, new research programs have emerged that use illusionism and magical effects to investigate what is going on in the mind (Kuhn et al., 2008, 2016; Kuhn & Land, 2006; Macknik et al., 2010; Rensink & Kuhn, 2015).. These efforts have focused primarily on the roles of attention, perception, and visual cognition, although a limited number of the studies have examined the relationship between other higher processes and illusionism (Danek et al., 2014; Subbotsky, 2010a).. From the implications of magic for attention, it has been seen that research on inattentional blindness and change blindness (Mack & Rock, 2000) illustrate that unless we pay attention to objects or features in our environment, we simply do not perceive them attentively or consciously. It is precisely this lack of attention that is one of the tools used by magicians to manipulate the spatial and temporal attention mechanisms of spectators, and generate illusions while exploiting errors in memory to strategically manipulate what and how we remember the past, and prevent us from discovering how the tricks were done (Kuhn, 2019); this is called attention diversion, from misdirection, and involves a wide range of psychological principles, often counterintuitive, that magicians exploit to create their magical effects (Kuhn et al., 2014).

This interest in investigating the scope of illusionism in the areas of cognition, memory and attention, allow us to determine that magicians have demonstrated competence in taking advantage of scientific knowledge when necessary, and thus creating new types of

distraction and improving methods (Dawes, 1979; Steinmeyer, 2004).. Even early work on inattentional blindness, which was not originally presented as relevant to sleight-of-hand, was quickly applied by magicians to the creation of new tricks (Lamont & Wiseman, 1999). This link between psychology and magic would allow the latter to be studied as an object of scientific knowledge since scientists have long relied on specific magical knowledge and used it creatively for a specific purpose in the interest of psychological research (e.g., (Besterman, 1932; Hodgson & Davey, 1894; Johansson et al., 2005, 2006; Jones & Russell, 1980; Wiseman & Greening, 2005; Wiseman & Lamont, 1996; Wiseman & Morris, 1995).

Magic effects can additionally act as effective and possibly unique strategies for educational interventions, given that they possess-both cognitive and emotional☐ attributes associated with pedagogical interventions, such as the potential to elicit feelings of curiosity, surprise, and interest (Leddington, 2016; Parris et al., 2009; Rensink & Kuhn, 2015; Subbotsky, 2010a, 2010b).. In this educational setting, studies have observed how some of the effects of magic can promote well-being, improving self-esteem, mood, as well as motor skills (Bagienski & Kuhn, 2019; Lam et al., 2017; Wiseman & Watt, 2018), as noted above. This starting point can provide teachers with tools not only to increase their overall well-being and transmit it, but can also be instruments that enable and enhance communication to and with learners.

In this latter aspect of communication, the particular use of magic has focused on the implementation of verbal and nonverbal communication strategies to ensure that the audience does or does not remember the most important details of a magic routine. This fits largely with research on memory illusions. (Loftus, 2005). However, the effects of magic on improving communicative efficiency in the educational context remain unexplored. Communication in education has emerged as one of the main skills that teachers must possess in order to interact with younger generations to promote positive relationships, cooperation and purposeful learning (Nessipbayeva, 2012).and, in students, to guide them towards self-empowerment, problem solving and critical thinking (Jacobson-Lundeberg, 2012). (Jacobson-Lundeberg, 2016).

For this reason, based on the importance of communication in the educational environment, this study seeks to investigate how the use of magic tricks in the classroom can contribute to strengthen the communicative interactions between teachers and students.

2. Materials and methods

To achieve the purpose of the research, a systematic review of the scientific literature accessible through the Scopus and ProQuest databases was carried out. A systematic literature review is understood as one that explicitly uses systematic methods to compile and synthesize the findings of individual studies that address a clearly formulated question (Higgins & Thomas, 2019); in this case, the research question is formulated as follows: what are the possible contributions of magic to the development of teachers' communication skills?

This question clearly identifies the unit of analysis that guided the literature review, being specified in the following terms: influence of magic in the development of the communicative skills that are carried out in the pedagogical practices, assuming the existence of a parallelism between the communicative skills of the teacher and the efficiency of the communicative interactions of the teacher with his students.

The research is exploratory because it does not attempt to describe or explain the cause-effect relationships that may exist between magic and the strengthening of communicative

skills, but to investigate what has been written on the subject to try to understand the possible contribution of both constructs (magic and communicative skills) and to generate a hypothesis that can later be subjected to empirical verification. Likewise, due to the nature and purpose of the research, it is of the documentary type because only data obtained from secondary sources were used to identify the findings and generate conclusions.

Regarding the selection process of the documentary units on which the literature review was made, publications written in English, Italian, Portuguese and Spanish were admitted, which dealt with the development of communicative competencies through the use of magic, both in the educational context and in other professional scenarios. For this purpose, the review included articles focused on the use of magic tricks in various areas of the health sciences, as it was understood that the principles that operate in this context can also be applied in the educational setting. Doctoral dissertations and communications presented at congresses were also included, with no restrictions as to the date of publication or the country in which the studies were carried out.

The reviewed papers evidenced a combination of qualitative and quantitative methods with a predominance of empirical studies conducted under the modality of case studies (e.g., Cullen & Backwell, 2018; González-Puelles & Fragueiro, 2018; Kumar et al., 2020; McGoran, 2005; Ogren, 2014; Pravder et al., 2022) and action research (e.g., Ikhsanudin et al., 2019; Sowder et al., 2013; Spencer & Balmer, 2020).. The results helped to identify patterns that deepened the understanding of the relationships between the use of magic tricks and teachers' communication skills.

Undergraduate and Master's Degree Final Projects were excluded, as were monographs, reports and other academic papers of little scientific relevance for the purposes of the review. Fundamentally, the reasons for not considering these documents were that they were limited to reproducing content obtained from secondary sources, as well as the absence of guarantees regarding the methodological rigor with which they were prepared or when the conclusions were not supported by the results. We also discarded articles that contained some of the search terms in the title or in the keywords, but alluded to them in a figurative sense; for example: *"Making Magic", "Classroom Magic"* and *"Math Magic"*, since they did not contribute to deepening the object of study.

Data extraction was performed by coding the content considered relevant for the purposes of the review. This process counted with the collaboration of an information analyst who performed an independent check of the included studies and assessed the risk of bias, finding no discrepancies that merited arbitration by a panel of researchers. Throughout the review process, special attention was paid to retrieving as many documentary units as possible that met the inclusion criteria; for this reason, an appropriate range of key terms was included to cover all possible ways in which studies could be retrieved to achieve the purpose of the review, including the use of terms extracted from other studies. For this purpose, the core search terms were: *"teaching", illusionist", "communication", "communication skills", "magic", "magic trick"* with their equivalent translations in other languages, but were enriched with others taken from key words identified in relevant articles: *"engagement", "humour"; "learning challenges", "academic skill"* and *"improvement"*.

The studies included in the review passed the screening process after analyzing the abstract and key words. This preliminary analysis was carried out with the intention of validating their relevance with respect to the object of study, selecting only those documents that presented a close relationship between magic and communicative

competencies, either expressly or tacitly. Documents that used the word "magic" metaphorically were also discarded, as well as those in which magic or communicative competencies were mentioned subtly, in a tangential manner or without much relevance in the discourse.

After applying the inclusion and exclusion criteria, and in accordance with the PRISMA 2020 statement guidelines (Page et al., 2021). (Page et al., 2021)the documentary sample on which the analysis was based consisted of a total of 28 publications that passed the screening process and whose contributions were considered for the established purposes (Figure 1). The article search and selection process ended on December 12, 2023.

Figure 1. Flow of the literature search and selection process.
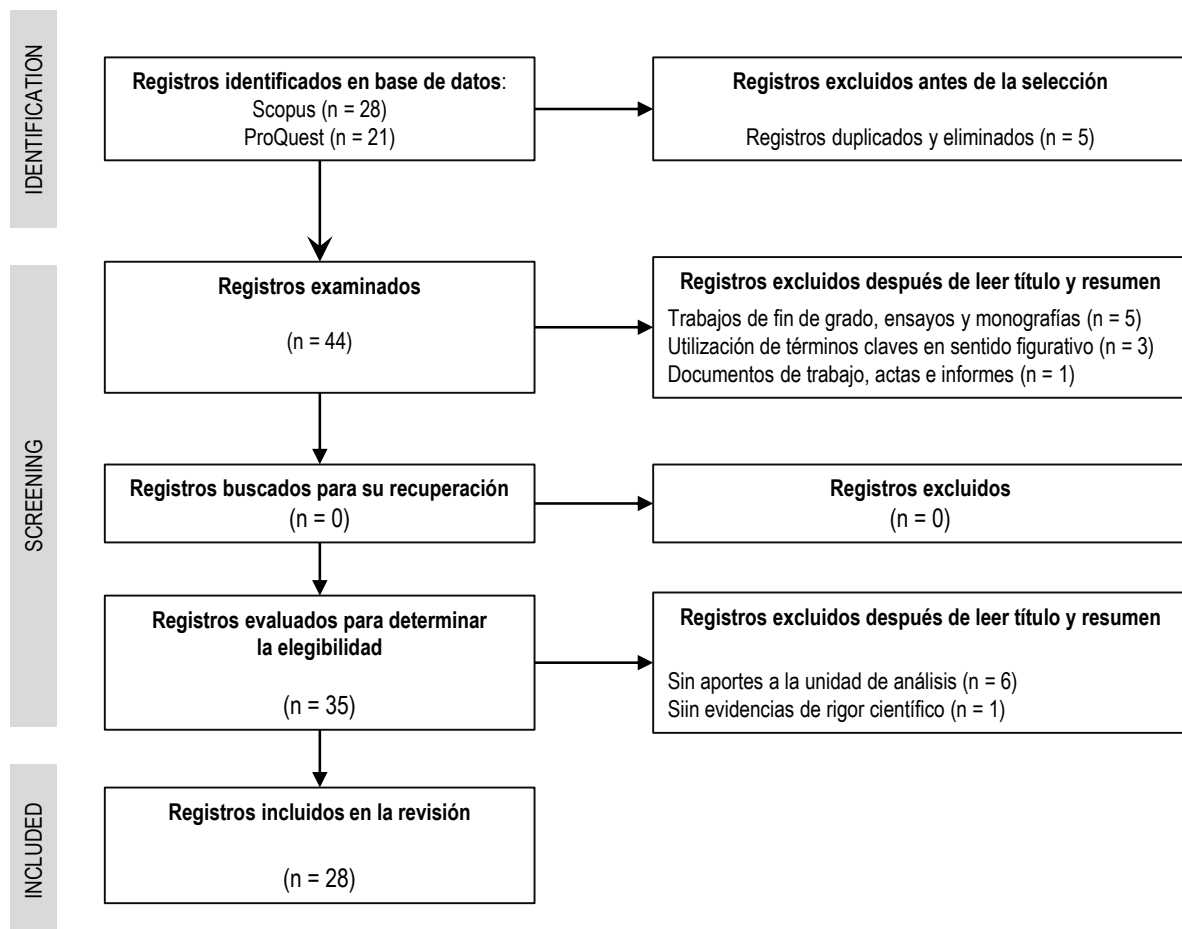
Records excluded because of their low relevance to answering the research question or because they did not show evidence of scientific rigor were: Ufnar and Shepherd (2020), McGoran, (2005) and Margolis et al. (2014).

Given the nature of the object of study and the purpose of the review with a single unit of analysis, the results obtained were grouped according to the disciplinary area to which they belonged and the type of studies carried out (empirical and non-empirical), as shown in Table 1. However, in order to carry out the analysis and synthesis process, all the documentary units were treated in an integrated manner. This facilitated the construction of a discourse that brought together the current state of knowledge on the link between magic and communicative competencies in the pedagogical field.

Table 1. Records included in the literature review (sorted by author).

First author, year	Article title	Disciplinary area			Type of Study	
		Education	Health	General	Empirical	Non-empirical
Alcántara et al. (2016)	Effect of interaction with words on the vital signs and nonverbal communication of hospitalized children.		●		●	
Baum and Dooley (2013)	**Doctors and magicians: What we can learn from wizards**		●			●
Broome (1995)	**Magic in the classroom**	●			●	
Clerici et al. (2020)	Healing magic		●			●
Clerici et al. (2021)	Illusionist techniques as a complement to psychological support for children with cancer		●		●	
Cullen & Backwell (2018)	**Positive psychology: From the classroom to the world,**	●			●	
González-Puelles & Fragueiro (2018)	**A classroom experience based on magic games as a pedagogical tool in primary education.**	●			●	
Hall & Pais (2018)	**Mathematical magic in the classroom**	●			●	
Ikhsanudin et al. (2019)	**Using Magic Trick Problem-Based Activities to Improve Students' Engagement in a Listening Class**	●			●	
Ilić-García et al. (2022)	Comparing the structures of storytelling and magic for science communication with an agent-based model	●			●	
Jeder (2015)	**Implications of Using Humor in the Classroom**	●				●
Kuhn et al. (2016)	Don't be fooled! Attentional responses to social cues in a face-to-face and video magic trick			●	●	

Author (Year)	Title				
	reveals greater top-down control for overt than covert attention				
Kumar et al. (2020)	Attitude of higher secondary school teachers towards the Use of magic tricks in the classroom.	•		•	
Lesser & Glickman (2009)	**Using magic in the teaching of probability and statistics**	•		•	
Li & McCalla (2020)	**The Design and Development of a Magic-Based Teaching Method in Facilitating Creative Design Thinking**	•		•	
Li et al (2023)	**Exploring the influence of magic performance on design creativity**	•		•	
Liendo (2015)	**Discourses, subjectivity and interculturality**		•		•
Lim (2019)	**Using math magic to reinforce algebraic concepts: an exploratory study.**	•		•	
Meagher et al (2023)	**Case: Demystifying Magic with STEM**	•		•	
Paredes and Garcia (2022)	Nonverbal communication and illusionism: a classroom application.	•		•	
Pravder et al. (2022)	An Innovative Program Using Magic to Provide Early Clinical Experiences for Preclinical Medical Students: Goals, Experiences, and Results of the MagicAid Program.		•	•	
Quemba (2018)	**Magic, humor and creativity to enhance mathematical thinking in the classroom**	•		•	
Sowder et al (2013)	**When Magic Becomes Art: Educating Teachers**	•		•	
Spencer (2012)	**Hocus Focus: Evaluating the Academic and Functional Benefits of Integrating Magic Tricks in the Classroom**	•		•	
Spencer & Balmi (2020)	**A Pilot Study: Magic Tricks in the ELL Classroom Increasing Verbal Communication Initiative and Self-Efficacy**	•		•	
Stenner (2022)	**Trust me, i'm an illusionist.' a critical response to Keith**		•		•

	Frankish's illusionism and its place in contemporary philosophy of mind.		
Zapf (1989)	**Puzzles and Power: Magic as a classroom resource for social work educators**	●	●
Zech et al. (2015)	Communication with children: Practical hints and tools for the anesthesiology routine.	● ●	

3. Results

Of the 28 papers analyzed, 22 were empirical; that is, they answered their research question by gathering data from primary sources (interviews, questionnaires, observations, measurements, etc.) and six of them were not empirical (they extracted information from the literature and from their authors' own reflections). The main contributions of each study were tabulated by author, year of publication, type of study and main contribution made (Table 2) and then presented in narrative form. In some cases, the description of the results refers exclusively to an individual study; in others, the results of different studies that were associated with each other around their thematic units were integrated. In this way, an attempt was made to construct a discourse with greater significance and heuristic richness.

Table 2. Results ordered by type of study and author

Author, year	Type[1]	Major contributions to the literature
Alcántara et al. (2016)	E	Playful interaction involving magic tricks, among other elements, has positive effects on children's nonverbal communication, expressing relaxation, openness and joy in the interaction.
Clerici et al. (2020)	E	Illusionism has the ability to strengthen communication and interpersonal relationships by being like a bridge that breaks down barriers and creates an atmosphere of trust and complicity.
Clerici et al. (2021)	E	Magic tricks can be useful for communication and building trust and cooperation. Magic tricks are an interactive way to engage the child emotionally and intellectually.
Cullen & Backwell (2018)	E	Activities involving magic are useful for the language learning classroom because, as a positive psychology activity, it offers great opportunities for improvement in several components of the PERMA model or theory of well-being, including positive emotions, engagement, relationships, and meaning. In that sense, as a language learning activity, magic acts in the classroom are intrinsically motivating, and when used in a personalized way it generates awareness of sensory language and narrative skills, builds confidence among students, and can provide an excellent practice opportunity for writing, speaking, listening, and presentation skills.

González-Puelles & Fragueiro (2018)	E	The field where most documentation has been found on the union of magic with teaching has been in mathematics.
		One of the most important advantages of educational magic, which influences the teaching-learning process, is the reciprocal relationship that is generated; that is, using it to explain certain contents that cannot be directly observed.
		The playful nature of magic makes the contents better assimilated. By using illusionism in the classroom, it is possible to focus the students' attention and once this concentration is achieved, they will be curious about what the teacher is going to explain. Therefore, it is a pedagogical and didactic tool that adds intrigue, curiosity, amazement and motivation to the teaching-learning process.
		For teachers, one of the advantages of magic games is their great versatility, since they can be adapted to what is needed at each moment, according to the students, stage and subject.
		Magic is a pedagogical tool that increases students' concentration, enhances motor skills, promotes self-esteem, develops improvisation and creativity, increases self-confidence, and enhances personality and communication.
Hall & Pais (2018)	E	Faced with students' lack of motivation, detachment and failure in relation to mathematics subjects, the authors decided to use magic tricks in their classes to awaken students' interest, captivating them and stimulating a taste for mathematics. The use of mathematical magic tricks in the classroom, with the purpose of motivating students to learn mathematics, proved to be effective. Students were curious about the new tricks and were positively surprised by the relative simplicity of their explanation.
Ikhsanudin et al. (2019)	E	Activities based on magic trick problems are an important factor that could invite students' intellectual engagement in an English listening comprehension class.
		The creative implementation of magic tricks to engage students in classroom interaction is a good option for creative teachers. Some issues to consider when implementing this strategy are comprehensible input, dynamic group, authentic communication, and learning styles.
Ilić-García et al. (2022)	E	Magic has a structure that can favor communication, generate interest and curiosity in the content being communicated, increase emotional bonding with the audience, and facilitate the retention of information.
Kuhn et al. (2016)	E	Eye movement is an element of nonverbal communication that has the capacity to influence the audience's attention.

Kumar et al. (2020)	E	Magic tricks in the classroom break the ice, increase student receptivity, create an environment conducive to learning, break the monotony, increase the teacher's credibility with the student, and keep students awake, energetic and excited.
		In communication, magic can foster interaction between teacher and students, develop presentation skills, improve storytelling skills, promote clarity and accuracy, and stimulate critical thinking and discussion.
		Teachers value magic tricks for teaching and students better perceive teachers who use it to enhance teaching.
		Magic tricks represent one of the elements of humor that can be used effectively at all levels of teaching, due to the fact that it allows to broaden the understanding of students, increase credibility, sympathy, professional image, communication skills and effectiveness of teachers, providing stress relief and creating an environment of confidence .
Lesser & Glickman (2009)	E	Magic tricks provide visual demonstrations to complement traditional chalkboard-based lectures, and offer the opportunity to engage students in participatory activities in math class. Potential benefits include a focus on conceptual understanding and the development of critical thinking.
Li & McCalla (2020)	E	Magic performance is used not only as a stimulus to enhance students' creativity and facilitate design flexibility, but also as a tool that guides the design process, which allows fostering students' awareness of their thinking fixation and involving them in creative design
Li et al. (2023)	E	From the students' perspective, observing the magic performance not only creates a unique cognitive dissonance that is conducive to creating a psychologically safe environment that helps relax the constraints of cognitive fixation, but also helps establish a learning community that facilitates divergent thinking and supports creative expression .
Lim (2019)	E	The effectiveness of magic activities depends on how they are implemented. The activity should be presented as "magic" in a fun atmosphere where students are intrigued and eager to learn the trick underlying the magic. Having captured the students' interest, the instructor can now challenge them to discover the trick for themselves. Students should be given plenty of time to think.

Meagher et al (2023)	E	By definition, magic is: "the power to influence events through mysterious and/or supernatural forces" . As educators, we have a responsibility to improve our students' knowledge and understanding of the world around them, and integrating science and engineering standards with literacy standards may be one of the most effective ways to teach about real life and address common misconceptions . The magic is demystified as students learn to use science and engineering concepts and practices to solve real-world problems that arise in the stories .
Paredes and Garcia (2022)	E	Illusionism techniques facilitate teachers' non-verbal communication in the classroom through visual, auditory and mixed elements.
Pravder et al. (2022)	E	Magic facilitates precise communication to achieve the desired effect, initiate and maintain conversations, and improve interactions with patients.
Quemba (2018)	E	The research project entitled magic, humor and creativity to enhance mathematical thinking in the classroom, is a didactic strategy to enhance mathematical thinking and the formation of students with mastery of mathematical processes, skills, procedures and concepts. The project was developed in an official institution, based on the constructivist pedagogical model. The study population consisted of 21 third grade students. The main objective of the project focused on developing mathematical thinking through a didactic proposal mediated by magic, humor and creativity in children.
Sowder et al (2013)	E	Good teaching depends more on a natural ability to communicate than on any understanding of pedagogy .
		Effective teaching practice arises from the intentional fusion of knowledge, experience and reflection, although this union may be partially influenced by the teacher's personal attributes. This forces one to appreciate the influence of affective dimensions in the educational setting, to recognize the importance of making open connections between knowledge of instructional strategies and effective classroom practice, and to uncover classroom decision-making processes in the face of diverse student tensions and histories.
Spencer (2012)	E	Magic can be used to help students with learning difficulties, improving their ability to relate to their peers and improving their self-esteem.

Spencer & Balmi (2020)	E	Instructional practices for English language learners (ELLs) are multifaceted. They must address everything from communication skills to learner motivation. As a means of tapping into students' curiosity, learning to perform simple magic tricks is a creative, task-based approach to language instruction that promotes students' self-confidence and engages them in authentic interactive language. Learning a magic trick becomes a means of helping students use the language skills they already have, as well as a source of new language skills. Teaching simple magic tricks to ELLs is an approach that increases students' communication and leads to improvements in academics, self-confidence, resilience, and social skills.
Zech et al. (2015)	E	Children are more suggestible and more receptive to magic-based interactions. Magic can contribute to the elements of nonverbal communication.
Baum and Dooley (2012)	NE	Magicians are good communicators because they use verbal and nonverbal communication to hold the attention of their audience and create a memorable experience.
Broome (1995)	NE	Magic in the classroom is a motivational and educational tool to develop self-esteem and promote group dynamics. Using magic in the classroom allows the student to learn and feel successful at the same time. The educational benefits of using magic in the classroom are many. In addition to teaching academics and literacy, magic can be instrumental in helping students learn a process for achieving mastery based on practice; develop self-esteem and reduce performance anxiety in a positive way; develop team spirit through trust and group cooperation; improve organizational skills through repetition, memory and sequencing; develop creativity; learn to differentiate between illusion and reality; and take pride in belonging to an established team.
Jeder (2015)	NE	Humor has a special role in the classroom being considered an effective and appreciated tool for teaching. Hence, developing a sense of humor and fostering quality humor among both students and teachers are ways in which the school would gain more value, in the sense that would provide the necessary tools to create and maintain well-being, stimulate thinking, imagination and positive emotions, etc. as goals or objectives of an authentic education.

Liendo (2015)	NE	The essential tool for substantiation, argumentative interpretation and intervention is language, understood and pointed out as the first and most important human mediation.
		What is most relevant in the communicative act is not the content of the message but the subjects involved and, fundamentally, the receiving subject, who is not an empty, passive and malleable receptacle that can be filled with information but, rather, an active subject as the center of decisions and transformations. In other words, what is decisive is not the message to be transmitted, but the totality of the subject's interventions in that message.
Stenner (2022)	NE	The magician's skill is to manipulate impressions. The audience is fascinated by the fantastic nature of the trick and the more incredible and contrary to common sense, the better.
Zapf (1989)	NE	Magic is a skillful frustration of our perceptual expectations and, as an empirical introduction to cultural awareness, it can be a useful resource in the educational context to directly challenge students' closed view of the world and allow them to immediately experience the disorientation that results from it.
		Magic presents itself as a potential resource for social work educators in the classroom. The full impact of magic as a teaching tool cannot be adequately conveyed in print, as its appeal lies precisely in its immediate experiential quality .

Note 1: Type of study: E = Empirical Study; NE = Non-Empirical Study.

The results obtained are described below.

One of the most relevant non-empirical studies is that of Baum and Dooley (2013) who express that magicians are good communicators because they use verbal and nonverbal communication to hold the attention of their audience and create a memorable experience. The authors argue that healthcare professionals can improve their interactions with patients by adopting the communication techniques of magicians. This article opens the discussion on the possible contributions of illusionism to communication techniques, in this case between a physician and a patient. At first glance, the relationship between physicians and educators is distant; however, both professions make use of communication to improve the outcomes of their services.

In the same context and based on a literature review, Zech et al. (2015) explored the particularities of children's comprehension and proposed tools for interacting with children in a medical setting. The authors posit the use of children's fantasy, creativity and dissociation ability to give indirect suggestions, metaphors, stories, refocus attention, and interpret disturbing noises and influences. To achieve the above, they propose the use of magic tricks that can generate interaction with the patient and create magical associations with elements of the context, such as operating lights (e.g., the sun or a planet) or the heart rate monitor (e.g., devices that help in health care). The authors claim that children are more suggestible, so they receive magic-based interactions better, and argue that magic can contribute to nonverbal communication elements such as context.

In keeping with this approach, Clerici et al. (2020)after studying the use of magic in pediatric health care settings, conclude that illusionism has the ability to strengthen communication and interpersonal relationships by being a bridge that breaks down barriers and creates an environment of trust and complicity. The authors add that magic captures the patient's attention and keeps them engaged, which facilitates the transmission and understanding of information.

More recently, on a purely educational plane, Paredes and García (2022) studied how illusionism techniques facilitated nonverbal communication of teachers in the classroom. Among the results, they found visual, auditory and mixed elements that favor communication. Regarding visual elements, the authors highlight that they draw students' attention to a specific point of interest; for example: moving to attract students' attention, showing interest in a specific object so that students also become interested, or generating novelty with elements that appear and generate contrast. On the other hand, auditory elements refer to sound to attract students' attention. A final type of element is the mixed element, which combines both visual and auditory elements, and is embodied by commands. Giving commands to students also captures their attention.

The above remarks are supported by the assessments of Stenner (2022). (2022) when he states that the ability of a magician is determined by his capacity to manipulate impressions. Such ability emerges from the communicative acts and manifests itself through language, understood as the first and most important human mediation (Liendo, 2015). Hence, from a theoretical perspective and according to the aforementioned author, unlike what is generally thought, the most relevant in communicative acts are not the contents of the messages that are transmitted, but the subjects involved, mainly the receiving subjects, who, beyond being passive and malleable, assume the role of active subjects when configured as centers of decisions and transformations.

The idea underlying this way of understanding the communicative fact lies precisely in the how and why of communication; that is, in its intentionality. Thus, in the educational field, good pedagogical practices depend more on the natural ability to communicate than on any understanding of pedagogy (Sowder et al., 2013).. From this point of view, which involves such significant categories of analysis as persuasion and intentions, acts of magic acquire a greater dimension in the interaction between teachers and students. This new dimensionality of magic has its roots in the power attributed to it to influence events through mysterious and/or supernatural forces (Meagher et al., 2023)as well as its ability to thwart expectations and challenge initial awareness of one's own cultural patterns, teach about real life, and address widespread misconceptions. So much so that, for Stenner (2022) audiences are fascinated by the fantastic nature of the trick, and the more unbelievable and counterintuitive it is, the better. It is in this immediate experiential quality that the appeal of magic resides and makes it a potential resource for educators and a teaching tool. (Zapf, 1989).

The use of illusionism techniques for educational purposes is not new. This can be seen in the contributions of Broome (1995) who supported the presentation of magic tricks in the classroom as a mechanism that improved students' organizational skills through repetition, memorization and sequencing. Although Broome's assertions do not directly relate magic to the communicative action of the teacher, the link between the two elements is tacit. In addition to the purely academic aspects, the author also favored the use of magic for educational purposes as it could be instrumental in helping students develop self-esteem, team spirit, confidence in themselves and others, cooperation and creativity; as well as helping them reduce anxiety and learn to differentiate between illusion and reality.

The studies included in the review add evidence to the reasoning and hypotheses put forward by the aforementioned authors. In this regard, Alcántara et al. (2016) described the effects of a playful interaction through nonverbal communication between health professionals and hospitalized children. The playful interaction consisted of professionals dressing up as clowns and performing magic tricks and other activities such as juggling, singing and comic performances. Among the results, the authors found statistically significant alterations in the following nonverbal communication behaviors of the hospitalized children.

- Posture: Initially, the children's posture was sideways or backwards. During the interaction, the posture was directed towards the clowns showing openness to interpersonal relationship.
- Eye contact: Before the interaction the children's eye contact was absent or defiant. During the interaction eye contact was regular, indicating greater connection with the practitioner.
- Facial expression: Before the interaction, the children's expression was null or predominant. During the interaction the children's expression was smiling.
- Furniture or objects: The children, prior to the interaction, used furniture or objects as barriers, e.g., drapes over their head or covering their body. During the intervention the children used the objects to join or removed them completely.
- Energy level: Before the interaction, the energy level was apathetic, drowsy, cyclical or restless. During the interaction the energy level was alert with positive feelings.

The authors conclude that the playful interaction involving magic tricks, among other elements, had positive effects on children's nonverbal communication expressing relaxation, openness and joy in the interaction . However, despite the advances shown in the study, the authors did not analyze the effect of the different elements of the interaction on nonverbal communication. Therefore, it is not possible to determine whether the use of magic tricks, the clown costume, the humorous interactions or all together generated the improvement in nonverbal communication.

Another interesting study is the one published by Kuhn et al. (2016)who employed a magic trick to assess change blindness: a measure of participants' attention. In the experiment, a magician visibly changed the color of the cards; however, before making the change, he used a social cue (he asked a question while making eye contact to divert the participants' attention to his face). This resulted in more than 70% of the audience not noticing the color change on the cards. The authors reveal the importance of eye movement as an element of nonverbal communication that has the ability to influence the attention of the audience.

In addition, Kumar et al. (2020) studied teachers' attitudes toward the use of magic tricks in the classroom. The assumptions underlying the research are that magic tricks benefit classroom climate and communication. In terms of classroom climate, they facilitate breaking the ice, increasing student receptivity, creating an environment conducive to learning, breaking monotony, increasing teacher credibility with the student, and keeping students awake, energetic, and excited. In terms of communication, magic can foster interaction between teacher and students, develop presentation skills, improve storytelling skills, promote clarity and accuracy, and stimulate critical thinking and discussion. The study revealed that teachers value magic tricks for teaching, while students better perceive teachers who use magic to enhance teaching.

This has been demonstrated in fields such as mathematics, where there is abundant documentation on the link between magic and education. For example, Gonzalez-Puelles and Fragueiro (2018)after a study conducted in the context of primary education, conclude that one of the great advantages of using magic tricks in the teaching-learning process is the reciprocal relationship that is generated, which implies the construction of a communicative interaction to explain certain contents that cannot be directly observed. Other advantages highlighted by the authors refer to the playful nature of magic and its positive influence on the assimilation of knowledge; likewise, by using illusionism in the classroom, it is possible to focus attention quickly and curiosity will grow before what the teacher is going to explain. Therefore, intrigue, curiosity, amazement and motivation emerge as the elements that are implicit in a pedagogical tool that contributes to the teaching-learning process.

Another study associated with the use of magic for teaching mathematics was conducted by Hall and Pais (2018)who decided to use magic tricks in their classes to awaken students' interest and stimulate their liking for that subject. The results of that study demonstrated the effectiveness of resorting to magic in the classroom as a way to overcome students' demotivation, detachment and academic failure, since they were curious about the new tricks and were positively surprised by the relative simplicity of their explanation. Of course, to implement this strategy successfully some fundamental issues must be considered, including: comprehensible input, dynamic group, authentic communication, and learning styles (Ikhsanudin et al., 2019)..

These results corroborate what was stated years earlier by Lesser & Glickman (2009) regarding the possibilities offered by magic to engage students in participatory activities in mathematics class, including its influence on conceptual understanding and the development of critical thinking. In this way, the authors make clear the relationship between magic acts and the way in which they communicated the contents. In similar terms, Lim (2019) when he argues that the effectiveness of magic activities depends on the way they are implemented, as they should be presented in a fun atmosphere where students feel intrigued and eager to know the underlying trick of the magician. Then, once the teacher has successfully captured the students' interest, he or she can challenge them to discover the trick for themselves.

From this perspective, according to Quemba (2018)the combination of magic, humor and creativity constitutes a didactic strategy that facilitates the development of mathematical thinking and the formation of students with mastery of processes, skills, procedures and concepts in this area. This conclusion was reached by the author after analyzing the results obtained from an investigation in which 21 third grade children participated in an educational institution whose pedagogical model was based on constructivism. In relation to the above, humor, which can be propagated from acts of magic in the educational environment, could provide the necessary tools to create and maintain well-being, stimulate thinking, imagination and positive emotions (Jeder, 2015) as goals or objectives of an authentic education. Following this author, humor is considered an effective and appreciated tool for teaching; for this reason, developing a sense of humor, both in students and teachers, and fostering quality humor, are ways in which the school could obtain greater value.

This is consistent with the findings of Kumar et al. (2020) when he points out that magic tricks represent one of the elements of humor that can be used effectively at all levels of teaching. The author bases his assertions on the fact that magic allows expanding students' understanding, increasing credibility, likeability, professional image. communication

skills and effectiveness of teachers, providing stress relief and creating an atmosphere of trust.

Now, the benefits of using magic as a tool that can promote communicative interactions between teachers and their students are not exclusive to the mathematical discipline, although this is the discipline in which its use has been best documented for educational purposes. (González-Puelles & Fragueiro, 2018).. Other areas, such as language teaching or the application of creative design techniques, have also been studied in terms of the application of magic. It has even been used to help students with learning difficulties, managing to improve their ability to relate to their peers and increase their self-esteem (Spencer, 2012).

With regard to language teaching, specifically the learning of English as a foreign language, Spencer & Balmi (2020) argue for the multifaceted nature of instructional practices by pointing out that these should address everything from communication skills to learner motivation. The aforementioned authors advocate performing simple magic tricks as a creative way to tap into learners' curiosity, use the language skills they already have, promote self-confidence, and engage them in authentic interactive language, which enhances communication skills, produces academic improvements, and fosters social skills.

Also in this line of argument is the research of Cullen & Backwell. (2018). The authors frame magic acts as a positive psychology activity that is useful for language learning. Drawing on the PERMA model or well-being theory, they advocate the use of magic given the great opportunities for improvement it offers in terms of positive emotions, engagement, relationships, and meaning. In that sense, according to the authors, as a language learning activity, magic acts in the classroom are intrinsically motivating and, moreover, capable of generating awareness of sensory language and narrative skills.

To delve deeper regarding the use of magic for educational purposes, it is worth citing the works of Ikhsanudin et al. (2019), when they refer that activities based on magic trick problems represent a factor that could motivate students' intellectual engagement. Also relevant are the contributions of Li & McCalla (2020) who defend the idea that magic performance is used not only as a stimulus to enhance students' creativity, but also as a tool that allows fostering students' awareness of their thinking fixation and involving them in creative design. More recently, Li et al. (2023) highlights that, from the students' perspective, observing magical performance not only creates cognitive dissonance that is conducive to creating a psychologically safe environment for flexing the boundaries of cognitive fixation, but also helps establish a learning community that facilitates divergent thinking and supports creative expression.

On the other hand, Clerici et al. (2021) revealed that magic tricks can be useful for communication and relationships in aspects such as trust, cooperation and ice-breaking. With these conclusions, reached after studying how psychologists can use magic tricks to communicate with children with cancer, the authors highlight that magic tricks are an interactive way to engage the child emotionally and intellectually, in addition to helping children concentrate on the trick and forget other aspects, such as their physical conditions. It also shows that something impossible is possible, changing the modal level from being unable to being able.

Maintaining this common thread, Ilić-García et al. (2022) studied the effectiveness of scientific storytelling with a magic-based structure that they compare with other structures. The authors argue that magic has a structure that can favor communication. In addition to

the structure, magic can help to generate awe and wonder in the audience, creating interest and curiosity regarding the content being communicated, as well as being able to generate an emotional bond with the audience and facilitate the retention of information. These authors, based on the ideas and approaches presented by renowned magicians such as Tamariz, Ascanio, Pareras, Vernon, Tarbell and Acevedo, describe the structure of a magic show that can be used for scientific communication. This structure is made up of eight steps:

- First step: the communicator must recognize the state of the audience and understand how it affects the communication.
- Second step: the communicator must clearly establish an initial state. In magic it is important to contrast the initial state with the final state; therefore, it is relevant to clearly establish the initial state.
- Third step: it consists of clarifying the concepts and objects necessary for communication.
- Fourth step: you must prepare the moment to introduce the change and make it happen at the indicated time.
- Fifth step: make a disclosure of the change.
- Sixth step: the communicator must present the final state, which is the opposite of the initial state.
- Seventh step: clarify the change that has occurred in a way that is easy to understand.
- Eighth step: the communicator should pause for the person to understand what has just happened.

The results of testing science communication with a science-based structure and comparing its effectiveness with other narrative techniques (e.g., Aristotle's three-act structure, Christopher Vogler's 12-step structure, and Dan Harmon's eight-step structure) showed that the proposed structure had higher audience retention and attention span than the other structures. However, none of the structures studied exceeded 50% comprehension. This demonstrates that elements of verbal and non-verbal communication, present in the way a *show* or magic trick is presented, contribute to audience retention and comprehension.

Finally, Pravder et al. (2022) described the implementation of a program to help medical students have early magic-based clinical experiences. The program sought to strengthen the following activities: creating an empathic environment to the patient, introducing the physician to the patient, appreciating team members, and enhancing wellness. In the program, students learned how to perform five to six basic magic tricks and how to interact with patients. At the end of the training, they received a magic therapy kit called *MagicAid*. The training was supplemented with online videos. The authors argued that magic has valuable features in the doctor-patient relationship, including: accurate communication to achieve the desired effect, attention/distraction during procedures, initiating and maintaining conversations, and improving interactions with patients. The results demonstrated benefits in the participants' communication skills such as: greater comfort when speaking with patients and their families, making eye contact, speaking in a positive manner, smiling during interactions, initiating and maintaining conversations, empathy, among other aspects that improve the relationship and communication with the patient.

4. Discussion and conclusion

The literature reviewed not only reflects the importance of communication in physicians, teachers and students, which is beyond dispute, but also reveals that there is more interest in the field of health than in the field of education to improve communication skills through magic. In the context of education, the use of magic tricks as a tool to develop communicative competencies is nourished by the experiences provided by the health sciences, which implies an opportunity for researchers in the field of education to address this object of study in order to improve the communicative efficiency of teachers.

However, apart from these considerations, studies show the symbolic power of magic acts, which can become acts of language and, consequently, come to assume a pragmatic, cognitive and strictly communicational function. In this regard, the power of magic to maintain the attention of audiences has been highlighted, using verbal and non-verbal communication techniques involving auditory, visual and mixed elements.

This would force us to appreciate the influence of the affective dimension, to recognize the importance of making open connections between pre-established ideas and those we wish to transmit, and to value the decision-making processes in the face of the various tensions and stories that intertwine among the audience and shape the context. This is of crucial importance in the academic environment if one accepts the idea that magic, in the classroom, is a motivational and educational tool to develop self-esteem and promote group dynamics, on the one hand; and on the other hand, to facilitate the student to learn and feel successful at the same time.

Thus, the use of magic tricks helps to develop the ability to concentrate on the content being taught, and to strengthen the commitment of the students, which facilitates the transmission and understanding of the information. Therefore, not only the interaction between teacher and students is benefited, but teachers can also improve their communication and persuasion skills, promote clarity and accuracy of content, and stimulate critical thinking and discussion.

A final aspect that stands out is how magic acts can contribute to creating a climate of trust and cooperation in the classroom, engaging students both emotionally and cognitively. Perhaps this is the reason why students better perceive teachers who perform magic tricks to enhance teaching. This would involve further studies aimed at identifying the indicators that students use to make these assessments.

In summary, in light of the assessments of the different authors cited, and after investigating the contributions of magic to the development of teachers' communicative skills, the hypothesis emerges that what underlies the use of magic in the classroom is what the teacher manages to communicate. In other words, the truly important aspect behind magic tricks is closely linked to the communicative impact that gravitates around them. In this regard, such impact is oriented in two dimensions: the first one is related to the contributions of magic to foster students' interest and concentration, and thus contribute to create the favorable conditions demanded by the classroom environment. The second dimension refers to the use of magic acts as a means to facilitate students' understanding of the contents. In any case, according to the analysis of the literature reviewed, magic is imbricated in what the teacher wishes to communicate and in the way he/she performs the communicative act; these elements are fundamental in the teaching-learning processes.

Although the above arguments are supported by the results obtained during the literature review, they need to be further refined as there may be discrepancies depending on the educational level, teacher attitudes, pedagogical approach and learning environment.

These limitations are coupled with the scarce literature that addresses the link between the use of magic and the communicative efficiency of teachers, as well as the absence of a substantive theory that explains how the sociocultural characteristics of the educational context condition the use of illusionism techniques in the classroom, as well as their influence on motivation, academic performance and the strengthening of communicative skills.

Additionally, the limitation in the search process should be considered, since the selection of the studies did not consider scientific production written in other languages, so that teaching experiences that could be significant to clarify the existing relationship in the triad "magic-communication-education" have not been considered.

Finally, from the results obtained and considering that the use of magic tricks in the classroom could strengthen the communicative interactions between the teacher and the students by activating their emotional and relational aspects in a relatively short time, other lines of research aimed at understanding the structural and symbolic elements involved in the possibilities of using magic for pedagogical purposes are opened, as well as the characterization of the desired profiles, both of teachers and students, for the adequate and effective application of illusionism techniques in the classroom, in order to strengthen the efficiency of the communicative interactions that take place in the teaching-learning processes.

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Conflicts of interest: The author declares that he has no conflicts of interest.

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