Main recent study topics on teacher-student interaction

Principales temas de estudio recientes sobre la interacción profesor-estudiante

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Abstract

Teacher-student interaction is a fundamental element in the training process at different educational levels (basic, technical, and professional) since it has a significant impact on academic performance, as well as on the socio-emotional areas of students and teachers. The objective of this article is to present a review of the main research topics of teacher-student interaction in recent years. The theoretical review was carried out in specialized databases and inclusion and exclusion criteria were considered. The results suggest that the main topics studied with respect to the teacher-student interaction can be classified into: the characteristics of the interaction, the effects of the interaction, and the influence on the interaction. Interaction characteristics: studies have focused on both general and specific aspects. Interaction effects: three large areas were found in which interaction effects arise, attitudes and behavior, academic development, and psychosocial risks. Influence on interaction: it arises from the influences of both the student and the teacher. This new and original classification of studies on teacher-student interaction can serve as a contribution to researchers and teachers to consider the various characteristics of the teacher-student relationship, as well as its influences on students and teachers, and some factors that can affect it. The limitations of the study and future lines of research are presented.
Keywords: Educational behaviour, Mental-health, Review, Teacher-student interaction, Teaching and training.

Resumen

La interacción profesor-estudiante es un elemento fundamental en el proceso de formación en los diferentes niveles educativos (básico, técnico, profesional), ya que tiene un impacto significativo en el rendimiento académico, así como en las áreas socioemocionales de alumnos y docentes. El objetivo de este artículo es presentar una revisión de los principales temas de investigación de la interac-

ción profesor-alumno en los últimos años. La revisión teórica se realizó en bases de datos especializadas y se tuvieron en cuenta criterios de inclusión y exclusión. Los resultados sugieren que los principales temas estudiados con respecto a la interacción profesor-alumno se pueden clasificar en tres categorías: las características de la interacción, los efectos de la interacción y la influencia en la interacción. Características de la interacción: los estudios se han centrado tanto en aspectos generales como específicos. Efectos de interacción: se encontraron tres grandes áreas en las que surgen efectos de interacción: actitudes y comportamiento, desarrollo académico y riesgos psicosociales. Influencia en la interacción: surge de las influencias tanto del alumno como del profesor. Esta nueva y original clasificación de los estudios sobre la interacción profesor-alumno puede servir de aporte a los investigadores y profesores para tener en cuenta las diversas características de la relación profesor-alumno, así como sus influencias en alumnos y profesores, y algunos factores que pueden afectarla. Se presentan las limitaciones del estudio y futuras líneas de investigación.

Palabras clave: Comportamiento educativo, Salud mental, Revisión, Interacción profesor-estudiante, Enseñanza y formación.

Introduction

This paper presents a review of the research around teacher-student interaction. This subject has been very little explored from a theoretical review approach such as the one it undertakes here, despite the importance that this subject has in any training process (Wubbels et al., 1985).

The teacher-student interaction influences the dynamics of the classroom, as well as the future of those involved, due to the transmission and construction of ways of proceeding based on the adoption of different decisions (Claessens et al., 2017). In this measure, it is considered convenient to make a first

approach to the subject by producing a review in order to analyze the topics addressed in the teacher-student interaction, and to contribute to the knowledge in the area that studies these human dynamics.

In the educational field, the subject can form a new ethic of existence, since it is precisely in the educational environment where ways of proceeding, attitudes, and life theories are played, and the human being is invited to mobilize, to question, to be built around its formation and becoming. The educational field is a space in which an exchange of knowledge occurs. Beyond that, in this field the possibility of training as a human being opens up through an exchange of emotions, ways of being and cultural characteristics. This is achieved in an interpersonal context, typical of the framework of significant relationships that are woven with others, which enable the transformation of fundamental values and positions that determine their existence.

Likewise, bearing in mind the continuous influence between teacher and student, it can be inferred that, in the act of training, both agents transform what happened in class and themselves into a dialectical interaction, as Ramírez et al. (2017, 2019) have pointed out in their proposal of the analytical method applied to pedagogy.

It is precisely through this link that each person's conception of their subjective experience and the significance of their actions are modified. Therefore, those decisions made within the framework of this interaction will be decisive for both parties as active agents of a training that can transcend the borders of the academy.

The word "interaction" means "mutual or reciprocal action or influence" (Merriam-Webster Dictionary, 2021). It is precisely this reciprocal influence between teachers and students that this text aims to highlight, reviewing the main topics investigated. For these reasons, it is considered convenient to make a first approach to the subject by producing a review in order to analyze the main

aspects studied around the teacher-student interaction, review the current state of the art, and as a contribution to the understanding of these dynamics.

Analyzing the main topics studied in the literature regarding the interaction between students and teachers will show the knowledge gaps in the area. Thus, the objective is to enable access to information and generate knowledge that can be used for future research on related topics.

Methodology

The review strategy used is the state of the art, based on the study of the knowledge produced around a topic, "which is part of documentary research (which is based on the analysis of written documents) and which aims to inventory and systematize the production in an area of knowledge" (Molina, 2005, p. 74). Specifically, it is a form of theoretical research (Jaramillo et al., 2019) that aids in reflecting on all advances that have been made in a certain area. To this extent, as Guevara (2006, p. 166) and Molina (2005, p. 74) mention, the state of the art can be considered an investigation of investigations, which allows for a deeper understanding of a problem, the definition of new susceptible situations, the development of new conjectures, and serves as a guide to possible emerging sources of research.

The realization of this review was carried out in the following phases (Molina, 2005, p. 74): (1) Contextualization: exploring the intellectual production made around the subject of this study; (2) Classification: establishing the parameters for the systematization of information; (3) Categorization: generating categories for the analysis of the information to facilitate its classification; and (4) Analysis: separating the different parts of the texts studied, and reaching new understandings of the phenomenon, which was previously fragmented.

The search for relevant literature was conducted using the following descriptors: *Teacher-student* (in TI title), AND *Rela-tionships* OR *Interactions* (in TI title), AND Psychology (in SU thematic terms) in EBSCO Discovery Service. The following databases were reviewed: Academic Search Complete (25 papers), Complementary Index (9), Directory of Open Access Journals (6), Education Research Complete (1), Psychology and Behavioral Sciences Collection (1), SciELO (0), Supplemental Index (1).

With the results, the texts were selected according to the following inclusion criteria: (1) referred to the teacher-student interactions; (2) published between 2016 and 2020 in peer-reviewed academic publications; (3) written in English language; and (4) with link to full text. Some papers were removed based on the following exclusion criteria: (1) repeated articles; (2) articles without relation to the subject studied; (3) not written in English; or (4) without access to the full text.

In a first general search, 370 articles were found. After applying inclusion and exclusion criteria, 73 texts were selected. After a more detailed review of the inclusion and exclusion criteria, 43 remained. Subsequently, articles were examined, and the relevant information was included in a Microsoft Excel spreadsheet with the following data: year, author, title, objective, method, results, country, educational level. Finally, the information was organized according to general themes in categories and subcategories. The categories and subcategories arose from a subjective interpretation, but the subject matter studied in each one of them was considered.

Results

The studies were carried out in different continents, distributed as follows: 19 in Europe, 8 in North America, 11 in Asia, 2 in Oceania. Two papers were written in two continents (Asia-America: Lei et al., 2016; and Asia-Europe: Sun et al., 2019) and one was conducted on three continents (Africa, America, and Oceania: Liebenberg et al., 2016).

Regarding the method, 32 of the articles consulted used a quantitative approach. On the other hand, seven of them had a qualitative approach (Blakey & Chambers, 2020; Henry & Thorsen, 2018; Lémonie et al., 2016; Sun et al., 2019; Turner and Christensen, 2020; Wong, 2016; Yu et al., 2018). The remaining four used a theoretical approach (meta-analysis: Lei et al., 2016; Vandenbroucke et al., 2018; systematic review: Quin, 2017; reflection: Anderson, 2018).

Regarding the educational level, only two studies were found at the preschool level (PSL); 13 were conducted at the primary school level (PL); 21 at the secondary school level (SL); and two at the higher education level (HL). In addition, two studies focused on the preschool and the primary levels (PSL and PL) and three on the primary and secondary levels (PL and SL) (Table 1).

Main topics studied in teacher-student interaction between 2016-2020

In relation to the main study topics of teacher-student interaction, three main themes were found and organized into three categories that, in turn, were divided into eight subcategories (Table 1).

Table 1.

Categories and subcategories produced by the theoretical review

Category	Subcategory	Papers
1. The characteristics of the teacher-student interaction.	1.1. General characteristics of the interaction.	PL: Ang et al. (2020). SL: Turner & Christensen (2020), Yu et al. (2018). PSL and PL: Bosman et al. (2018).
	1.2 Specific characteristics of the interaction.	PL: Wong (2016). SL: Sun et al. (2019). HL: Blakey & Chambers (2020).
2. The effects of teacher-student interaction.	2.1 Effects on attitudes and behaviors.	PSL: He et al. (2019), Soydan et al. (2017). SL: Aldrup et al. (2018), Henry & Thorsen (2018), Lan & Moscardino (2019), Nie et al. (2019), Wanders et al. (2020). PS and SL: Evans et al. (2019).
	2.2 Effects on academic development.	PL: Granot (2016), Vandenbroucke et al. (2018). SL: Lémonie et al. (2016), Quin (2017), Raufelder et al. (2016b).
	2.3 Effects on psychosocial risks.	PL: Di Stasio et al. (2016), Elledge et al. (2016), Hughes & Im (2016), Lei et al. (2016). Poulou (2020). SL: Liebenberg et al. (2016), Luo et al. (2020), Sulkowski & Simmons (2018). PL and SL: Longobardi et al. (2019).

Category	Subcategory	Papers
3. The influences on teacher-student interaction.	3.1 Student influences.	PL: Hajovsky et al. (2017). SL: De Laet et al. (2016), Pielmeier et al. (2018), Taghvaienia & Zonobitabar (2020). PSL and PL: Magro et al. (2020). PL and SL: Timmermans et al. (2019).
	3.2 Teacher influences.	PL: Denessen et al. (2020), Hoogendijk et al. (2020), Pakarinen et al. (2018). SL: Engels et al. (2016), Jiang, R. et al. (2018), Jiang, S. et al. (2019), Tsai et al. (2020). HL: Anderson (2018).

Source: Own elaboration.

1. The characteristics of the teacher-student interaction

The studies grouped in this first category sought to define the characteristics of the teacher-student interaction. In turn, this first category is divided into two subcategories: General characteristics of teacher-student interaction and Specific characteristics of teacher-student interaction.

1.1. General characteristics of the teacher-student interaction.

This first subcategory includes studies that covered general elements of teacher-student interaction. These studies focused on the variables or categories that attempt to account for this relationship as a whole. The most significant findings in each study are presented.

Ang et al. (2020) developed a model for the teacher-student relationship from the student's perspective in a primary school in Singapore. The model included up of three factors: satisfaction, instrumental help, and conflict. The satisfaction and instrumental help factors were positively related to the sense of belonging to the school, and were not significantly or negatively related to aggression. The conflict factor was negatively or not significantly related to the sense of belonging to the school, while it was positively related to aggression. For their part, Bosman et al. (2018), in research with students from kindergarten to sixth grade in Netherlands, posed three general elements of the quality of teacher-student interaction: closeness, conflict and dependency. Authors found than the lower the verbal capacity and the greater the externalizing behavior of the students, the less close they were to the teachers. In addition, the higher the teacher-student dependency, the lower the performance test scores and the lower the motivation. Consequently, authors conclude that teachers should encourage close teacher-student interaction, helping students to be more independent and autonomous.

Turner & Christensen (2020) took as a point of reference for the teacher-student interaction model in the USA the motivational support teachers in high school offered for student engagement and student uptake or engagement, based on four principles: "(a) supporting competence, (b) offering autonomy, (c) fostering belongingness, and (d) making learning meaningful" (p. 257). Furthermore, Yu et al. (2018), in the USA, point out two fundamental themes in the teacher-student interaction in high school from the perspective of the students: the teacher's attention (that the teacher captures the presence and needs of the students with simple gestures such as calling them by name, which implies closeness and respect) and the interest of the teacher (interacting and connecting with students, fostering growth and learning, caring for them, offering additional help, adapting to their needs, liste-

ning to them). The authors suggest that these attitudes generate positive interactions, which in turn respond to the adolescent's developmental needs, such as autonomy, competence, and connection.

These studies seem to indicate fundamental elements of the general teacher-student interaction during school. In this sense, it is important that teachers take care of the academic and personal aspects of the teacher-student relationship, such as support, satisfaction, help, closeness, respect, care, listening, autonomy, competition, and connection. In general, teachers' attitudes could foster students' sense of belonging to the school and generate greater behavioral engagement. These attitudes can be manifested through simple but fundamental acts such as: dialogue with students, listening to them, calling them by name, etc. Furthermore, it seems important that teachers help students to manage conflict, aggression, and dependency, avoiding negative teacher-student relationships.

1.2. Specific characteristics of the teacher-student interaction.

This second subcategory included the studies that seek to identify specific characteristics in the teacher-student interaction. These studies focused on specific variables or categories, and they did not attempt to describe the relationship as a whole.

Sun et al. (2019) explored teacher-student interactions in secondary school in the context of positive relationships with teachers and their students in China, and teachers and their students the Netherlands. Unlike teachers in the Netherlands, Chinese teachers were frequently perceived with (1) dominant or interpersonal behavior, and (2) a behavior that tended to be quite stable. According to the authors, these results imply it is important to take into account the cultural differences in the classroom. For example, dominant behavior, which tends to be low in positive relationships in Western contexts, tends to be high in Eastern teacher-student relationships, due

to the acceptance of stronger hierarchical relationships. Furthermore, these results indicate that it is not possible to generalize the results of studies on teacher-student interaction from one culture to another (similar conclusions in Lei et al., 2016). For his part, Wong (2016) found something similar when he studied the power relations between teachers and students in primary school in China. This author concludes that there are unbalanced power relations between teachers and students, and attributes the cause to the traditional culture of respect, exam-oriented teaching and religious culture of China. However, he poses that there are some exceptions in which balanced power relations, curriculum reform through values, and some school cultures are encouraged.

At the higher education level, Blakey & Chambers (2020), in New Zealand, consider that several activities between teachers and students in health sciences are carried out in small groups, through which they develop the knowledge and thinking of students, cultivate the professional values, and protect students from abuse (disrespect for the dignity or interference in the learning process, as a result of the positioning of the student within a specific hierarchy context). The authors found two basic characteristics to describe an effective teacher-student relationship in this specific context: (1) friendly behavior; (2) but not "friends", that refers to (1) a relation with "gentle humor, guidance and enquiry into wellbeing" (p. 60), (2) avoiding "possible inappropriate connections" (p. 61).

From this first category, the importance of a positive approach of teachers towards students in western education is highlighted, as well as teacher-student interactions based on basic social skills such as respect and trust, which include specific skills such as support, listening, courtesy, confidence, the appreciation of their thinking and their ability to contribute to class, among others. These suggestions are consistent with Raufelder et al. (2016a), who found in Germany that basic education students expect teachers to be mentors, that

is, to take care of academic aspects of their training, but also consider personal aspects. The authors suggest that mutually considering the socio-emotional factors of students and teachers seems to be fundamental to generate meaningful interactions, which are the basis of any learning relationship. Similarly, Ciuladiene & Raudeliunaite (2015) found, in Lithuanian schools, that respect and trust on the part of the teacher were the elements most valued by students; the worst valued was the lack of respect for his point of view.

2. The effects of teacher-student interaction

Research in this second category focuses on determining possible effects of teacher-student interaction in three areas: attitudes and behaviors, academic development, and psychosocial risk.

2.1. Effects of teacher-student interaction on attitudes and behaviors.

In this first subcategory, effects of teacher-student interaction on different attitudes and behaviors were found.

In one study with preschool children in Turkey, Soydan et al. (2017) studied the predictive power of the variables: children's cartoon preferences, parents' attitudes, and teacher-student relationship for determining the level of physical and relational aggression in children. The authors report that the first variable with predictive capacity was cartoon preferences; the second variable was the mother's democratic attitude and, finally, the teacher-student relationship. This data suggested that, at preschool age, children receive less influence from the teacher-student relationship for physical and relational aggressive behaviors. Similarly, He et al. (2019), in China, found that the type D personality of the teacher was not significantly related to the hyperactive behaviors of the children in kindergarten; however, a type D personality of at least one parent did. This phenomenon is probably due to the great importance that

parents have for young children, and the greater attachment they have with them.

For their part, Henry & Thorsen (2018), in Sweden, found that the moments of contact in the initial teacher-student relationships in English class in secondary school can have immediate influences on the commitment and motivation of the students, while in the mature relationships the influences of teacher-student relationships "on learning behavior may be less pronounced and involve unconscious motivational processes" (p. 1). Also, Wanders et al. (2020), in secondary schools in the Netherlands, found that the more positive the teacher-student relationships and the student-student relationships, the greater the social participation of the students. The authors also found that students whose parents had a higher education benefited more from positive relationships with teachers, in relation to social participation. In addition, Engels et al. (2016), in Belgium, found that positive teacher-student relationships in secondary students were significantly associated with greater behavioral engagement. Negative teacher-student relationships, greater sympathy, and higher popularity among peers were associated with lower behavioral engagement. The results show, according to the authors, that teachers and peers are different sources of influence, who play independent roles in students' behavioral engagement.

From a different perspective, Lan & Moscardino (2019), in China, compared the well-being (learning engagement, satisfaction with peer relationships, and school satisfaction) of secondary school students who lagged with the well-being of students who did not stay behind. The authors found that students who lagged reported lower scores in satisfaction with peer relationships. Both groups scored the same in the other two variables (learning commitment and school satisfaction). Also, the authors found that in a negative teacher-student relationship, students with high levels of grit show more participation in learning and school satisfaction than those

students with low levels of grit. Likewise, Nie et al. (2019), in China, found that the teacher-student relationship was associated with hope, and hope was linked with satisfaction with the life or well-being of secondary school students.

From the perspective of teacher, in Germany, Aldrup et al. (2018) found a significant relationship between teacher-student interaction and teacher well-being in secondary school. In addition, they found significant links between teacher-rated student misbehavior, increased teacher burnout, and decreased enthusiasm.

It is emphasized that the positive teacher-student interaction is a key point for different relevant aspects of the education environment, such as the teacher wellbeing and the teacher affective responses to perceive student conflict behavior, from the perspective of teachers. Similarly, Veldman et al. (2016), in the Netherlands, found that the job satisfaction of teachers is positively related to the fulfillment of their aspirations in the teacher-student relationship.

Moreover, positive teacher-student interaction is important for the sense of belonging of students to their class at school, for the social participation of students and their commitment and motivation in class, and for students' wellbeing.

These results are broadly consistent with different studies such as Russian et al. (2016), in the USA, who found that the emotional support from the teachers to the students at the beginning of the school year improved the behavioral commitment and motivation during the year. Also, Abacioglu et al. (2019) and Geerlings et al. (2019), in the Netherlands, found that a greater multicultural attitude of the teacher implies a greater commitment of students to diversity in the classroom. It was emphasized that the example and the congruence between the teacher's saying and doing has implications on the attitudes and commitment of students to the classes in general, and their contents.

On the other hand, it is possible that the teacher-student interaction has weaker influence in preschool students than in the school students, and that the level of grit would be important as a protective factor against negative teacher-student influence.

In summary, within the interaction, the teacher transmits values, in addition to knowledge, that is, attitudes, ways of life, which is something very important.

2.2. Effects of teacher-student interaction on academic development.

This second subcategory included the effects of teacher-student interaction on the student's cognitive development and academic achievement.

In the cognitive development area, Granot (2016), in Israel, explored the incidence of maternal attachment and teacher-student attachment relationships in the adaptation of primary school students with learning disabilities and attention deficit hyperactivity disorder. The paper describes a significant relationship between safe teacher-student relationships and the reduction of student behavior problems, as well as an increase in the learning competencies of affected students regarding their executive functioning. Also, a relationship was found between maternal attachment and reduced internalization of problem behaviors. Vandenbroucke et al. (2018), in Belgium, through a meta-analysis of 23 studies, found evidence of the importance of teacher-student interactions in the classroom for the executive functions of children (associated with general executive functioning, working memory and inhibition).

These studies are coherent with the results obtained by Chen et al. (2016), that found in the USA two important results on the role of teachers' questions in the development of argumentative skills and conceptual understanding in early elementary science classrooms students: (1) as teachers used the research approach based on arguments, they began to use more participatory roles;

(2) consequently, the students reached more complex levels in their cognitive responses. These authors recommend fostering dialogues in class. Also, Mauri et al. (2017), in Spain, found a relationship between joint reflection with university students in the classroom and a higher quality of their individual reflections.

These studies emphasize the importance of teacher-student interaction through dialogue, argumentation, and analysis (Ramírez et al., 2017, 2019) to increase complex thinking and reflection capacities, typical of executive functions.

In the area of academic achievement, Quin (2017), in Australia, studied 46 articles in a systematic review and found that a positive relationship between teacher and student in adolescence contributes to academic performance and "higher levels of psychological engagement, […] and school attendance and reduced levels of disruptive behaviors, suspension, and dropout" (p. 373). Furthermore, Lémonie et al. (2016), in a secondary school in France, using the psycho-phenomenological method, found that teacher empathy in teacher-student interaction is essential for learning swimming. The authors suggest that it is very important to reflect on the nature of the teacher-student interaction and how to make it mutually agreeable to achieve good learning. Moreover, Raufelder et al. (2016b), in secondary schools in Germany, found that student motivation based on the desire to please a specific teacher moderates the association between teacher-student relationships and intrinsic motivation. This means that when adolescents find a preferred teacher, they choose to be more academically motivated. This compensates for the negative effects on students' intrinsic motivation, caused by another low-quality teacher-student relationships. The consequence of higher intrinsic motivation is "higher academic achievement" (p. 745).

These results are consistent with Krsti (2015), in Serbia, that found the student's "attachment to teacher and the quality of student-teacher socio-emotional interaction as factors that foster teaching and learning" (p. 167). Also, they are consistent with Fauth et al. (2019), who, in elementary science education in Germany, found that the teacher-student relations and teaching based on teacher competence (knowledge of pedagogical content, self-efficacy and enthusiasm) were positively related to the interest of students and to student performance.

These studies suggest that positive teacher-student relationships are directly related to higher academic achievement, and negative teacher-student relationships are related to low achievement.

2.3. Effects of teacher-student interaction on psychosocial risks.

This third subcategory includes the effects of teacher-student interaction on psychosocial risks such as bullying, peer rejection and victimization were found.

Di Stasio et al. (2016), in Canada, found that greater social comparison and competition are related to bullying and victimization in children. They add that it is important to build "strong relationships between students and teachers to help prevent bullying and victimization" (p. 207). Likewise, Elledge et al. (2016), in the USA, highlight the protective role of the positive teacher-student relationship in children who are actively rejected by their peers and who, therefore, have a higher risk of being victimized by them. In this sense, Hughes & Im (2016), in the USA, pose that "The relationship of children with their teacher can also influence the sympathy of their peers and reputations indirectly through the direct effect of teacher-student interactions on the participation in the classroom" (p. 3). The authors found that strengthening the teacher-student interaction mitigates the tendency to peer rejection. In addition, Lei et al. (2016), in China and the USA, through a meta-analysis of 57 studies with students in primary school, found that affective teacher-student relationships (whose

indicators were closeness, warmth, support, empathy, trust, sensitivity; and conflict, negativity, and anger) are linked to the reduction of externalized behavior problems in the students. Furthermore, the authors found that teacher-student relationships with negative affect have a greater power to influence, than teacher-student relationships with positive affect. Likewise, Poulou (2020), in primary school in Greece, found a significant predictive relationship between negative teacher-student relationship and students' emotional and behavioral difficulties. Also, Sulkowski & Simmons (2018), in the USA, found that a positive teacher-student relationship in high school protects against peer victimization as well as its negative psychosocial effects (such as depression, anxiety, and stress). These findings are consistent with Han et al. (2018), who found that teacher-student relationships "have a significant protective, but limited, effect on the relationship between bullying and suicidality" (p. 292).

Luo et al. (2020), in China, found that when secondary students perceived a positive teacher-student relationship while receiving a low level of emotional warmth from their parents, they experience greater academic pressure. The authors conclude that it is important to improve teacher-student relationships and increase parents' perception of warmth towards students to reduce academic pressure.

Nevertheless, in some situations, parents are not capable of providing emotional support. Liebenberg et al. (2016), in Canada, New Zealand and South Africa, found that teacher-student relationships and educational environments can contribute to building resilience capacity in adolescent students from marginalized areas, enhancing protection against family and community risks. For their part, Longobardi et al. (2019), in Italy, found that a positive teacher-student relationship contributes to reducing the externalization and internalization of psychological symptoms during three moments of school transition:

from kindergarten to primary school, from primary to middle school, and from middle to high school.

From this category, the importance of the teacher-student relationship as a protective factor for children and adolescents was highlighted in different risk areas such as maladaptive behaviors, bullying, rejection, and suicide. Moreover, it is necessary to support teachers to construct good relationships with their students.

3. The influences on teacher-student interaction

This category includes the studies that refer to the effects of some variables on teacher-student interactions from the side of students and from the side of teachers.

3.1 Students' influences.

From the student side, Magro et al. (2020), in the USA, started from the basis that the teacher-student relationship reflects the quality of the child's early maternal care. However, the authors found that the relationship between early maternal sensitivity and teacher-student closeness faded from kindergarten. What did remain in primary school was the relationship between early care and teacher-student conflict. Children who have suffered insensitivity in their care seem to interpret early interactions with caregivers (at home) and teachers in a negative way, present behavioral problems, and bond with their teachers in a conflictive way. In a related sense, De Laet et al. (2016), in Belgium, found that the higher the offending behavior and the lower the behavioral commitment, the higher the dissatisfaction of adolescents with their teachers, which in turn further increased their adaptation problems. Adolescents with more adjustment problems experienced less subsequent affiliation with their teachers.

In primary school, Hajovsky et al. (2017), in the USA, found that "latent teacher-student closeness decreased for both genders

over time […] but latent conflict increased for males" (p. 119). Furthermore, "math and reading achievement had medium reciprocal effects […] and previous math achievement had small to medium effects on subsequent teacher-student closeness" (p. 119). These results suggest that time implies less closeness in the teacher-student interaction, but this interaction is somewhat strengthened if academic achievement is obtained. Furthermore, Pielmeier et al. (2018), in Germany, found that high school students' self-concept about their math skills influences teacher-student verbal interactions in the classroom. In addition, greater precision in the teacher's judgment of student achievement was related to greater elaboration of the questions that teachers asked students with low pre-achievement academic levels. Likewise, Timmermans et al. (2019), in the Netherlands, found a significant relationship between student performance, parents' education, closeness and ethnicity, with the teacher's track recommendations in primary and secondary education. They also found that teachers differ in how they weigh conflict and dependency when making track recommendations. This study shows the interpersonal nature of teacher expectations, and the incidence of multiple factors (mentioned above) on the teacher-student relationship.

Another important issue is psychological problems, such as depression, in students. Taghvaienia & Zonobitabar (2020), in Iran, found that positive intervention (a therapeutic approach based on the principles of positive psychology) had positive effects on reducing the symptoms of mild/moderate depression and strengthening the teacher-student relationship in Iranian high school girl students. Specifically, with this intervention, the students increased their communication and confidence, and decreased their alienation and depression.

All this research shows that different student factors influence teacher-student interaction. However, teacher related factors can also exert an influence of their own, which will be covered in the following section.

3.2 Teacher influences.

Jiang, R. et al. (2018) studied the relationship between teacher justice and identification with the class (sense of belonging to their class at school) in a secondary school in China. Two mediators were considered: the belief in a just world and the teacher-student relationship. The authors found that teacher justice has a positive effect on the students' sense of belonging to the class, mediated by the configuration of their belief system that affirms the possibility of a fair world and, consequently, a positive relationship with teachers. Based on these findings, the authors recommend that teachers be aware of how their unfair behaviors can negatively affect teacher-student relationships, students' beliefs, and students' psychological commitment at school. In addition, they recommend helping teachers to: (1) establish a fair system of rewards and punishments in the classroom; (2) establish communication with students through an impartial approach; and (3) promote and increase participation of all students in decision making in the whole class. Also, Jiang, S. et al. (2019), in a secondary school in China, found a relationship between teacher justice and altruistic behavior, mediated by the teacher-student relationship. The authors posed that a perceived teacher injustice promotes a negative teacher-student relationship. Like the previous study, this study indicates that teacher justice and the teacher-student relationship strengthen psychological engagement between students and their groups. These results appear to be related to Gasser et al. (2018), in Switzerland, which found that the teacher's emotional support is positively related to the teacher's perception of justice in those students with a high degree of academic disengagement. Thus, both in the East and the West, the teacher's perception of justice seems to be relevant for students.

On the other hand, Evans et al. (2019), in

the UK, found that primary and secondary school teachers' mental representations of their relationships with students determined their affective responses to behavior they perceive as problematic. Similarly, Pakarinen et al. (2018), in Finland, found a significant relationship between a higher score in externalizing problems of primary school students, and an increase in conflicts reported by teachers in the following 2 years. The authors suggest that the characteristics of the students influence the quality of the teacher-student relationship because teachers express more anger and helplessness towards children they perceive as disruptive, thus generating negative and colder relationships with them. The authors suggest that it is important for students to intervene on teachers' cognitions so that the way they interpret students' behavior problems does not put the relationship with them at risk. Moreover, Denessen et al. (2020), in the Netherlands, found that teachers' expectations about the performance of specific primary school students have an impact on their interactions: teachers gave more direct turns and more directive feedback to students with low performance in mathematics and to those for whom teachers had lower expectations.

Pedagogical methodology also has an important role in teacher-student interaction. Tsai et al. (2020), in Taiwan, found that, for high school students, the flipped classroom methodology can increase "student performance, learning motivation for civic education, citizen participation, better teacher-student interactions, peer interactions" (p. 1). The flipped classroom methodology implies that "the in-class direct teacher instructing and the out-of-class students' homework are switched" (p. 1).

Cultural practices can influence teacher-student interactions as well. Anderson (2018), in Japan, points out two specific factors that affect teacher-student interaction in the intercultural university context of Japanese students with English teachers: (1) when taking turns, students in Japan must spend a lot of time in silence (unlike what happens in North American universities); (2) the way in which students address teachers, sometimes by their first name, with or without title, which some consider highly inappropriate in certain English-speaking contexts. Some teachers feel that they are not considered teachers, they feel confusion and discomfort, and they express frustration at the difficulty of changing these practices. The author poses that what is at stake is courtesy, which implies a recognition of social distance and power or status.

Several authors have suggested the need to create programs that help teachers build better teacher-student relationships. In this sense, Hoogendijk et al. (2020), in the Netherlands, found positive effects of the Key2Teach program in primary school teachers that work with students with externalized behavioral problems, and in those students as well. The Key2Teach program has two phases. In the first phase, teachers improve their perception of the mental representations of the relationship they have with students with externalized behavioral problems. In the second phase, teachers improve their interaction skills. The authors found that this program has direct effects on behavior problems and an indirect effect on hyperactivity problems.

In sum, it is important than teachers (and maybe students too) are aware of these different intertwined factors in teacher-student interaction, to take care of it. For example, Ali et al. (2019) found in Pakistan that conflicts between professors and their dissatisfaction with university resources generate negative behaviors towards students, affecting teacher-student interactions, learning outcomes and, eventually, mental health. Surely, there are other factors, but the ones presented in this research can help draw attention to the issue from a psychological perspective.

Conclusions

The results of this review suggest that the main topics studied regarding the teacher-stu-

dent interaction are: (1) the characteristics of the interaction; (2) the effects of the interaction; and (3) the influence on the interaction.

Research that studied the characteristics of the teacher-student interaction was found to focus on general aspects and propose models of such interaction based on items like satisfaction, instrumental help, and conflict (Ang et al., 2020); closeness, conflict, and dependency (Bosman et al., 2018); and motivational support and student engagement (Turner & Christensen, 2020). Some studies were found to focus on other specific aspects such as cultural differences and power relations (Sun et al., 2019; Wong, 2016).

Regarding the effects of the teacher-student interaction, three major areas were found which are essential for the healthy development of children, youth, and adults. (1) Attitudes and behavior: engagement (Engels et al., 2016; Henry & Thorsen, 2018), influence (Soydan et al., 2017; He et al., 2019), social participation (Wanders et al., 2020); student well-being (Lan & Moscardino, 2019; Nie et al., 2019), teacher well-being (Aldrup et al., 2018). (2) Academic development: academic achievement (Lémonie et al., 2016; Quin, 2017) and executive functioning (Granot, 2016; Vandenbroucke et al., 2018). (3) Psychosocial risks: academic pressure (Luo et al., 2020), bullying, peer rejection, and victimization (Di Stasio et al., 2016; Elledge et al., 2016; Hughes & Im, 2016), negative affect (Lei et al., 2016; Poulou, 2020), resilience (Liebenberg et al., 2016), school transition adaptation (Longobardi et al., 2019).

Lastly, the influence on the interaction has been studied both from the student and the teacher's perspectives. (1) From the student's perspective: academic performance (Hajovsky et al., 2017; Timmermans et al., 2019), adjustment problems (De Laet et al., 2016; Magro et al., 2020), closeness, ethnicity, and parents' education (Timmermans et al., 2019), depression (Taghvaienia & Zonobitabar, 2020). From the teacher's perspective: cultural behaviors (Anderson, 2018), mental

representations y expectatives (Denessen et al., 2020; Evans et al., 2019; Pakarinen et al., 2018), pedagogical methodology (Tsai et al., 2020), teacher justice (Jiang, R. et al., 2018; Jiang, S. et al., 2019), training program (Hoogendijk et al., 2020).

This new and original classification of the research on teacher-student interaction can serve as an organization route to this important field; in addition, it can be a useful contribution to the researchers. Moreover, it can be an eye opener for teachers, and to consider the diverse characteristics of the teacher-student relationship, its influence on students and teachers, and the factors that affect it.

In summary, according to the studies reviewed, it can be observed that the teacher-student interaction has been a topic of interest in recent years, specially through quantitative approach, a little less in qualitative, mixed, and theoretical approaches.

To the author's knowledge, most of the research has been oriented towards the effects of interaction on students, and very little has been oriented towards studying the effects on teachers. Likewise, few studies explore these items in Central and South America, as well as in Africa (only one study was found in Africa and none in Central and South America). Also, there are relatively few recent models of teacher-student interaction, which constitutes a gap in knowledge since the qualitative and quantitative approaches provide contextual and experiential elements from the participants themselves, which allows the capture of elements, logics, or dynamics, which otherwise might remain unknown. Moreover, only four articles were found in the preschool level and two articles from higher educational levels, which is interesting and constitutes a research necessity due to the challenges faced in teacher-student interaction in those levels. In this sense, works with university teachers or students like Laudadío, & Mazzitelli (2018), in Argentina, are relevant. However, it is important to publish in English and use standardized keywords so that research and

publications have a greater reach and visibility from these Spanish speaking regions.

Kenning (2019) considers that studies on the teacher-student relationship are relatively few, and that more research needs to be done, which appears to be true. Furthermore, according to Krstic (2015, p. 171), most of the research focuses on the relationship between individual variables of the interaction (for example, the relationship of anxiety with academic performance, as in Manchado & Hervías, 2021) or on the dynamics of educational and pedagogical- interaction, or in specific acts of said interaction, but not in emotional interaction.

It is important to carry out more research on the teacher-student interaction, with the aim of deepening the understanding of the dynamics, the senses, and the meanings in this type of interaction that are fundamental in the development of the human being in basic and professional levels. Finally, it is remarkable that there are few studies found about teacher-student interactions in higher education level in recent years.

As limitations of the study and future lines of research, it is highlighted that this paper does not focus on the methodological quality of each of the articles, since its interest was to review the topics studied, not the rigor with which they did so. However, it is important to do so in future studies in order to have a better understanding of the seriousness and depth of the advances in the field of study. It is also important to note that this study is very broad, so it did not separate or compare different educational levels, such as preschool, primary, secondary, and higher education levels. Finally, it is necessary to warn about a possible bias that may be found in the proposed categorization, because this proposal is based on the objective analysis of the research, but the names of the categories have been chosen subjectively.

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