Analysis of Social Networks of Students' Learning with a Focus on Their Performance

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Abstract: The low performance of students in high school is a problem that has had considerable growth due to the constant transformations generated by the current pandemic. The formation of groups to develop collaborative work in the classroom is a rich tool that can effectively develop Collective Knowledge, provided there is planning. Furthermore, through the analysis carried out, we realised that the way the learning occurs affects the students' performance and can be reorganised by the teachers to enable a better group (and even individual) development within the group.

1 INTRODUCTION

Low school performance is already an old problem (Moura et al., 2020). Based on this reality and related articles, we seek to determine how socialinteractions and school performance influence the formation of tribal and selective participation. In this way, understanding how these social networks are built can help us to understand and delimit the main difficulties and individual deficits, which may allow us to elaborate strategies for an integral development of individuals within groups since a low level of collaboration results in a low level of participation (Delbem et al., 2014).

We observed collaborative working relationships in creating the metrics to map these social networks' tangency (Xavier, Jr., 2004). The formation of groups to develop collaborative work inthe classroom is a rich tool that can effectively develop Collective Knowledge. Therefore, understanding how social interactions and school performance influence the formation of these interactions is relevant. Moreover, the act of understanding how these social networks are built can help us to understand and delimit the main difficulties and individual deficits of each student, which can allow us to elaborate strategies for the full development of each individual within groups since a low level of collaboration can result in a low level of interaction.

Our main goal is to create a method to promote and operate this integration. For that purpose, we collected data, 40 social networks were analysed, and the degree of interrelationship between groups. This provided us with the means to develop metrification and implement Collective Knowledge construction in the classroom.

The applied experiment analysis data found a strong correlation between networks of friendships and their grades. This allowed us to verify that retained students do not fit in with students with similar grades. We also found that students with good grades have many bonds of friendship. However, these bonds are weak because they revolve around interest in grades.

The Collective Knowledge applied by the teacher should collaborate with the interrelationship of the students and, consequently, with the strengthening of bonds and grades. Although social media increases

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connectivity among students, it is noticeable that the collective work in person lacks low quality. Furthermore, participating should promote ways of integrating – of being close to - the native and non-native capacities of each student.

Therefore, the solution presented to the problem of tribal participation aiming to improve the student's performance is the improvement of the articulation of native instances, which must be activated through interrelationship and collaboration. The article's discussion has organized the propositions to reach our goal, divided into the following sections. Section 2 and 3 present the conceptual foundations. Section 4 describes the methodology used to conduct the study presented in this article. Section 5 displays the data analysis and its results. Section 6 presents the related articles. Moreover, section 7 presents the conclusions andfuture work of this research.

2 PERSONALITY CLASSIFICATION

The primary literature chosen for this research isthe Psychogenetics by Prof. Xavier (Xavier, Jr., 2004), which originates in Piagetian psychogenetics, studying the genesis of intelligence. The study is adopted with the primary motivation of interest in deepening human functioning, having as its imperative's: cognition, metacognition, and interactions.

Prof. Xavier's Psychogenetics points out that it studies how the "Person System" develops, studies the genesis of human functioning and development in its age groups, and researches the fruition or intentionality of immaterial operations. It also states that psychogenetics enters the universe of observable and measurable sciences. (Delbem et al., 2014). Thus, a scenario of study and research has been created that generates words reserved for this area of science with the meanings that articulate among themselves.

The Psychogenetic Theory states that human nature is interactive; in his words, interactive development is a diachronic process. Therefore, its' understood that diachrony is a fundamental element in interrelational development. (Xavier, Jr., 2004) Thus, we found some words reserved for this area of study in this research. For better understanding, we elucidated their meanings whenever necessary.

The respect the selective participation we may say that is analogous to the practical communitysince its grouping often takes place informally among the students; all those involved have a final goal to be achieved; the members form interaction relationship mechanisms to achieve the proposed goal and, through these interactions, create a shared repertoire.

About tribal participation, the constitution of informal groups occurs similar to the selective grouping, but the shared practices and their objectives may vary. This means that although tribal groupings have objectives, they are exclusively a priority for that group of young people who group automatically. As far as the results of the two types of participation are concerned, we can say that the productivity considered in the different objectives can differentiate concerning the collaborative work and its production.

In strictly tribal groupings, we highlight communication and cooperation. This is because the members of these groups associate themselves not with an objective and its development but with common affinities and tastes. This creates a robust inter relational bond between the members but specifically disregards the productive capacity. Therefore, these groups have inter relational solid and collaborative bonds as their characteristics.

Although they may occur as practical communities, different, selective groupings tend to occur in the face of a specific activity, challenge, or need. In this case, the communication between the members already has a character of commitment to the objective. Coordination is a fundamental characteristic because, once because of the objective, the members are divided to solve the problem according to their primary skills. After the division of tasks, the group tends to operate to fulfil their role, and thus, together, they cooperate simultaneously and synchronously.

Xavier (Xavier, Jr., 2004) explains that psychogenetics is a structuralist approach. It focuses on the universe of global and partial human behaviours observable through the structures of Vital Energy mobilised in them psychogenetics studies reality since it approaches the "Human Person System," contextualised in the ecosystem.

3 COLLABORATIVE PRODUCTION IN ANALYSIS OF SOCIAL NETWORKS

One of the aspects that marks the 2.0 generation of the Internet is the idea of co-authorship, that is, collaborative production. This is because cyberspace is an environment of production and consumption in an expanded way. The collaborative production is achieved through co-authoring, which we can call cyberculture (Fuks, Hugo; Pimentel, 2011).

Collaborative groups are those in which the components share the decisions made and are equally responsible for the quality of what is produced together.

However, the mere existence ofcollaboration does not mean that there is, in fact, a culture of collaboration, says Damiani (Damiani, 2008). That is because alternative ways of collaboration may not constitute collaborative cultures, although they involve working together. After all, they present competing subgroups or only occasional jointactions.

The model (Fuks, Hugo, Pimentel, 2011) classifies the systems that support group work into three dimensions: communication, coordination, and collaboration. This classification gave rise to the 3C Collaboration model, which was later formulated. In this model, cooperation strictly refers to operating together, while collaboration refers to doing all the work together, which involves communication, coordination, and cooperation.

The benefits of collaborative work among students have been presented by several researchers (Colaço, 2004). Among the significant gains of the implementation of these works in the educational process is the socialisation among students - which includes the learning of communicational modalities and coexistence -,the control of aggressive impulses, the adaptation to the established norms - including the learning related to the performance of social roles -, the overcoming of self-centeredness - through the progressive relativisation of the own point of view -, the acquisition of aptitudes and abilities - including improvements in school performance -, and the increase in the level of school aspiration.

The network concept can be recognised through its effectiveness, both from the static and dynamic use points. The fixed point of use exploits the network's structure, while the dynamic point exploits the system that constitutes the network. The analysis of social networks establishes a new paradigm since the study of the behaviour or opinions of individuals depends on the structures in which they are inserted. Thus the unit of analysis is not individual - sex, class, age, gender, between others. - but the whole is built through the interpellation ofthen whole. (Deroy-Pineau, 1994). This structure is illustrated and apprehended concretely by the network of relationships and limitations that weigh on individuals' choices, orientations, behaviours, and opinions, as (Bezerra et al., 2014) explains.

Social networks are an essential part of humanity (Delbem et al., 2014) (Moura et al., 2020). These networks are based on the interrelationships between humans seeking a common goal, between entities and can be mediated and metrified usingtechnologies (Silva et al., 2018). The observation andresearch to raise patterns of connection between social groups and how connections are established between individuals are already found in current research. However, no metric can see how social interactions within specific networks interfere with academic development.

The basic premise of information technology is management through the epistemic-ethical posture of the individual in the exercise of hisautonomy in social media (Delbem et al., 2014). Its starting point is the 'Inter-relationship' as a marker of cognitive development. Thus, interaction precedes and determines knowledge. Therefore, it is investigated what to do, live together, collaborate, produce, know, get to know each other, and reciprocate. In short, the interrelationship.

Therefore, the operations of academic subjects carried out in virtual spaces by adolescents maintain the concreteness of proprioception coming from the instantiated functioning in 'somesthesia.'The virtual space aggregates the conceptual data, but without losing the corporal reality, it only changes the state from real to virtual, preserving the experience of contact with the actual object (Fuks, Hugo; Pimentel, 2011).

4 PROPOSED METHODOLOGY

We analyse the built social networks from the data collection to identify patterns and characteristicsthat can be metric, proven, and altered. From the verification of these patterns, the computational ingenuity succeeds, which, assembled on the relevant topics that were mathematised in the empirical phase, serve as an instrument for mapping and automatic analysis of social networks and behavioural patterns of participation.

In the first instance, the mediators of data collection and analysis are the researcher and the teachers trained to monitor and collect data directly. In the second instance, using experiments for data collection is done by the teachers of the networkand their respective coordinators. However, the researcher's sole responsibility is the data analysis and mapping of social networks. Moreover, in the third instance - after the development of the computational engine - the teachers and pedagogical teams of each school are responsible for the collection of digital data, which should be placed directly on the developed platform that should map and make the analysis of social networks and the patterns of participation

found, giving as proposal the best possible selective participation within that analysis.

The first part of our research was the stage of the bibliographic survey regarding the topics of interest: psychogenetics, analysis of social networks, and collaborative systems. This deepening andtheoretical background stage covered our problem's definition, the hypothesis's formulation, and the proposed solution. The systematic bibliographic review was carried out in the scientific's base (ACM, IEEE and Springer).

The second stage of the research includes the metrification survey to analyse social networks formed by collecting students' data. After identifying the participation patterns and the topics of social network analysis that would be considered for the metrification of these patterns, the validation stages were followed, such as the pilot experiment and the elaboration of the collaborative work method. This stage still verifies the feasibility of creating participation patterns and their analysis. In constructing the computational engine, the agile development process is used. The requirements are collected as a concept, functionality, user history (students and researchers), analysis of individual and group metrifications, and tests with selective participation proposals.

Based on the analysis of social networks, the organisation of selective groups is part of the third stage. It corroborates the enturmation's model, which potentially includes the best native instances of the students. All development is based on data analysis and empirical collaborative work, whose psycho-pedagogical evaluations constitute a theoretical and operative educational reference.

5 RESULTS AND ANALYSIS

Through the results gathered in the initial experiment, it was noted that the main difference highlighted for the differentiation of these groupingsis the planned coordination. It has interrelation[1] as a fundamental premise in human development;interaction precedes and determines knowledge. Thus, psychogenetics investigates doing, living together, collaborating, producing, getting to know, and reciprocating, in short, interrelationship. Based on the3C model, we propose some of the main differences that we believe are distinct in both groupings, which can be observed in the following subtopics.

5.1 Mapping of the Self-centred Social Network

For the metrification of students' social networks, a questionnaire was first elaborated appliedindividually to the previously selected students, considering that they have studied together since the sixth grade of elementary school II. This questionnaire considers the students' preferences in several psychic and motor activities and a previous spontaneous survey of their networks of friends. In constructing these networks, it was possible to show which friends were for specific activities - in sports, collaborative digital games - such as RPG, school work, proximity to residence, between others). Data collection from egocentric networks was carried out using the questionnaire below:

Table 1: Questionnaires applied.

Application questionnaire template			
Student:			
Age:			
Friend of:			
Applied questions	Yes	No	Which one
Do you practice any sport?			
Do any friends play on your team?			
Do you play video games or online games?			
Do you usually play alone or in a group?			
Do any classmates live near your home?			
Like to read? If so, what genre?			
Do you do any kind of artistic activity?			
Social media you use:			

Because of this reality, we followed the participation. We analysed the social networks of 40 students to metrify the degrees of the interrelationship among the groups to implement collective knowledge in the classroom. Furthermore, one of the main challenges found for the development of this experiment was the participation between the native psychic and somesthetic students.

5.2 Creation of the Complete Social Network

After these findings returned from the comparative data between the interview and observation, the data were analysed within Cytoscape (2020)[1], an open-source software platform for viewing complex networks. After constructing the graphs of the social networks built with the help of the software, the following metric was analysed and calculated: In-degree (which is the degree of entry of the vertex). It was calculated based on the number of friends of each

[1] https://www.answerminer.com/

student and based on their relationships. For example, a student x can have a number y of friends and a number z of friends of works only, so first, the total entry-level was raised and then subdivided between friends of worksand personal friends.

Although this relationship between the number of friends and grades was evident in the graphs, we sought a means to prove, based on data, that this relationship was indeed strong and therefore should be considered. For this, we used the Pearson Correlation Coefficient - CCP.

Initially, to calculate the CCP, we used the online AnswerMiner3 automatic calculation platform. However, after several test calculations, including the use of the same data, we noticed that there was a slight divergence of results between one round and another; with this, fearing the compromise of the truthfulness of the research and considering increasing its reproducibility, we decided to create a specific CCP calculator for this work.

Therefore, based on the metrics of social network analysis and the CCP calculation, we propose a formal system that has ruled for analysing interactions and their representations. According to psychogenetics (Delbem et al., 2014), psychism and somesthesia are propositional concepts. Thus, psychism groups the competencies for so-called "superior" activities, while somesthesia groups the bodily functions correlated to the so-called "human" activities.

As we have already seen, tangency is the articulation of these two instances, and it is understood as an articulation of the evolutionary structure, measurable by seasonal diachrony. The articulation is the meeting of two energies, which can be understood as hybridization4 because the energies co-exist in complementing one within the other. They do not merge into one another (Xavier, Jr., 2004).

Therefore, it can be understood that a higher density in one instance does not require damage to the other because one instance has no quota to the detriment of another. Therefore, articulation is summed up as being the regulation between somesthesis and psychism, and tangency is the balance between both. This thing that is understood as "native" is the predominant energy in the individual that can also be called a pioneering competence, which is the individual's strong point.

5.3 Complete Social Network

In this first graphic representing the first high school grade (Figure 1), we can observe how their networks are structured. With that, we can conclude that: 1 - student number 13, located in the right median corner, has the highest average in the class. We can also observe a large number of entries he has.

However, although he considers all the entries as reciprocal friendship, the vast majority of the entries consider him only as a work friend and not as a personal friend, as can be observed by the pink arrows.

Another essential piece of data that we can observe in this graph is the relation of the students (numbers 05, 06, and 03) located in the upper left corner, the trio's grades are below average, and they do not relate to anyone in their class. For this more profound analysis, the first year of High School was considered because it is a class where the students have lived together in class since the sixth year of Elementary II. That is, they keep the same group as the previous year and keep the interrelations with the friends who were approved. This fact leads us to consider a cause-and-effect relationship between low performance because they do not interact with their colleagues in the current grade.

Figure 1: A Detailed analysis of the social networks offirst-grade high school students.

The other two series (Figure 2) are presented here only in their simplified form to highlight the issues discussed in this research. After structuring the social networks of each room and analysing the data according to the graph theory, the comparative tables were constructed with the information gathered to prepare the graph of the Pearson's Correlation Coefficient.

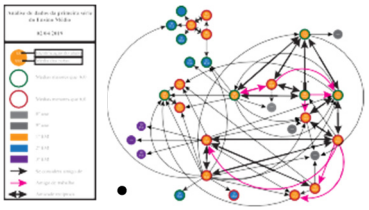


Figure 2: Social network graph of High School First Grade students.

Based on the detailed chart, we can consider a way of approaching to improve student performance, being the implementation of a model of induced collaborative work, where the teacher should naturally

include student number 13 to work with the students (numbers 05, 06 and 03); this way the network of interest for his grade is broken and the failed students have the opportunity to produce and be approved.

In chart one, we have the number representing the student, which is a standardised numbering and does not correspond to the actual call number made to make it impossible for the student to be recognised by an external agent. As can be observed, there is a positive linear correlation between Input Grades and Notes. In detail, this means that the higher the Entry Grade number, the higher the student's grade, i.e., the more friends the student has, the better chance of achieving a grade.

As can be seen, there is a positive linear correlation between Input Degrees and Notes. In detail, this means that the higher the Entry Grade number, the higher the student's grade, i.e., the more friends the student has, the better chance of achieving a grade. Considering that Pearson's correlation coefficient in the 2nd year MS analysis is 0.8030, we can conclude that this correlation is strong.

Table 2: Analysis input degree x grade 1st High School and Pearson correlation coefficient for input degree x grade.

Student	Input degree	Grade	Student	Input degree	Grade
1	6	58,9	9	4	62,6
2	6	70,5	10	5	65,9
3	2	49,0	11	5	58,4
4	4	57,5	12	6	73,9
5	2	56,9	13	9	76,1
6	1	35,0	14	4	49,2
7	4	50,0	15	4	57,3
8	4	64,8	16	5	37,7
			17	3	56,6

After the data collection of the experiment, it was evidenced that there is a strong correlation between the networks of friendships and the grades, which allowed us to verify that repeat students do notget in touch with students of the grade they are in andthat students with good grades have many bonds of friendship. However, these bonds are weak since they are only interested in grades. The Collective Knowledge applied by the teacher should collaborate for the interrelationship of the students and, consequently, in the fortification of the bonds and the grades.

5.4 Validation of the Social Network

As an answer to this problem of low school performance, we propose a collective work, together with the teaching staff of the whole school network, that they work, with the use of a Crowdsource tool, considering that the school network has several different cities and states. In this way, crowdsource enable all teachers to work collaboratively, sharing their experiences and building workgroups that they use in their daily classroom. Thus, based on the exchange of the various and different experiences of teachers supported by the Crowdsource tool, we can build a unique method that includes all the benefits of the various experiences reported.

After using Crowdsource to solve this problem, we hope to build a method that promotes interaction between students, enabling the split with the traditional method, based on the exposure of content solely from the teacher. After the interview, the teachers started an observation, considering the data collected, where everyone was previously instructed. This observation was intended to confirm or refute the interview data.

Based on the reports of teachers who have followed the development of students since the sixth grade of elementary school II, it was possible to see how interactions occur. These reports provided data that confirmed much of the information gathered in the interview, reinforcing the informed social networks.

This, considering that the interrelationship between students is a great facilitator in the construction of knowledge and cognitive, affective, and social development, we believe that this shared method can also improve relational, dialogical, and argumentative skills, which enable a joint reflection and favour the creation and strengthening of the bondsof friendship.

5.5 Validation of the Results

As an answer to this problem of low school performance, we propose a collective work with the teaching staff of the whole school. After developing the method for optimal groupings is completed, we resume Social Network Analysis based on its parameters. We choose the most appropriate metrics for the diagnosis and organisation of students according to their native instances.

Using the method developed with the teachers specifically to solve this problem of the students' academic performance, we created a comparative graph to demonstrate the effects of the new groups on

the performance of each individual. There was a considerable improvement when comparing students' grades before and after applying the method based on social network analysis. The metrics used to prove this hypothesis were constructed according to the realities considered a priority within the educational environment.

We can see how each metric is viewed individually theoretically. However, after a detailed analysis of the data that resulted from applying the applied methodology, we built a comparative table of these metrics before and after the new grouping model.

This table can analyse the groups' gains after applying the method. The first fact that we can notice the difference is the absenceof a small component after applying the method. That means an evident division among the students before applying the participation method, which formed closed relationship groups that made the interaction between certain groups difficult. With the new method, everyone becomes part of the Giant Component. What this means is that the proximity among the students has been so strengthened that there are no more excluded groups

Indegree and Outdegree also increased almost 100% concerning previous data. The application of the methodology which caused this was an increase in interaction between students in the classroom, which justifies the disappearance of the Small Component; Betweenness Centrality decreased because the importance of some specific nodes also decreased; that is, the information runs similarly among all members of the network reducing the dependence of specific nodes for the dissemination of information; Network Connectivity has also been enhanced thanks to the degree of interaction that has increased and eliminated the Small Components.; Clustering Coefficient also had a drop due to the strengthening of the participation. All this data can be visualised in the table below that provides the average of the metrics explained above.

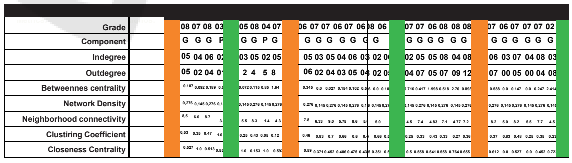
6 RELATED WORKS

As we can see today, students have a greattendency to spend their hours in cinemas andsocial media. However, schools have great difficulties implementing technology as a support and incentive for learning (Moura et al., 2020). The present work proposes one more possible way to use technology as a pedagogical aid tool. As with other sectors of society, education was improved with technology. In the virtual school, social network environments allow learning communities to group and exchange experiences among students (Marinho et al., 2015).

Other authors have already proposed using social network analysis as a basis for school performance. In 2011 (Fuks, Hugo, Pimentel, 2011) analysed the social networks of an undergraduate course and how the influence of the student reflects on their performance. The experiment took place in six months. Students were offered a social networking site with games and collaborative work as a tool. After the students' use, the researcher generated a graph with four measures of the public network and nine of each student. The individual measurements obtained were used as predictors for evaluating the students' performance. All tests and analyses have a common opinion about the potential of structural metrics aspredictors of school performance analysis, and it is a helpful tool. (Fuks, Hugo, Pimentel, 2011).

In the school environment, social networks allow predicting the success of educational learning with their tools, offering results that can direct the teacher's attention to theirs teaching practice. Through the analysis of the environment, modification tools are added to the physical environment in which the research actors are inserted (Sousa-Vieira et al., 2018). Furthermore, students with better performance generate greater engagement due to their prestige and influence. It is also noticeable that the involvement of students with other people in the platform (networking) partially predicts its outcome (Liu et al., 2018).

Table 3: Metrics analysis.



Grade	08 07 08 03	05 08 04 07	06 07 07 06 07 06	08 06	07 07 06 08 08 08	07 06 07 07 07 02
Component	G G G P	G G P G	G G G G G G	G	G G G G G G	G G G G G G
Indegree	05 04 06 02	03 05 02 05	05 03 05 04 06 03	02 00	02 05 05 08 04 08	06 03 07 04 08 03
Outdegree	05 02 04 01	2 4 5 8	06 02 04 03 05 04	02 05	04 07 05 07 09 12	07 00 05 00 04 08
Betweennes centrality	0.107 0.092 0.189 0.0	0.072 0.115 0.85 1.64	0.345 0.0 0.027 0.154 0.102 0.5	6 0.0 0.10	.716 0.417 1.998 0.518 2.70 0.893	0.588 0.0 0.147 0.0 0.247 2.414
Network Density	0,276 0,145 0,276 0,1	0,145 0,276 0,145 0,276	0,276 0,145 0,276 0,145 0,276 0,1	6 0,145 0,27	,145 0,276 0,145 0,276 0,145 0,276	0,276 0,145 0,276 0,145 0,276 0,145
Neighborhood connectivity	8,5 6.0 8.7 3.	5.5 8.3 1.4 4.3	7.8 6.33 9.0 5.75 8.6 5.	5.0	4.5 7.4 4.83 7.1 4.77 7.2	8.2 5.0 8.2 5.5 7.7 4.5
Clustiring Coefficient	0,53 0.35 0.47 1.0	0.25 0.43 0.05 0.12	0.46 0.83 0.7 0.66 0.6 0.	0.66 0.5	0.25 0.33 0.43 0.33 0.27 0.36	0.37 0.83 0.48 0.25 0.35 0.23
Closeness Centrality	0,527 1.0 0.513 0.55	1.0 0.153 1.0 0.593	0.59 0.371 0.452 0.406 0.475 0.43	5 0.351 0.5	0.5 0.558 0.541 0.558 0.764 0.655	0.612 0.0 0.527 0.0 0.452 0.722

Aluno	Nota	Componente	Grau de entrada	Grau de saída	Centralidade de intermediação	Densidade da rede	Conectividade de vizinhança	Coeficiente de agrupamento	Centralidade de aproximação
01	8	G	5	5	0.107	0,276	8.5	0.53	0.527
02	8	G	6	4	0.189	0,276	8.7	0.47	0.513
03	7	G	3	4	0.526	0,276	7.0	0.40	0.558
04	8	G	5	4	0.115	0,276	8.3	0.43	0.513
05	7	G	5	8	1.64	0,276	4.3	0.12	0.593
06	6	G	5	6	0.345	0,276	7.8	0.46	0.590
07	7	G	5	4	0.027	0,276	9.0	0.70	0.452
08	7	G	6	5	0.102	0,276	8.6	0.60	0.475
09	8	G	6	8	0.306	0,276	7.3	0.35	0.575
10	7	G	6	5	0.104	0,276	8.6	0.56	0.527
11	7	G	5	7	0.417	0,276	7.4	0.33	0.558
12	8	G	8	7	0.518	0,276	7.1	0.33	0.558
13	8	G	8	12	0.893	0,276	7.2	0.36	0.655
14	7	G	6	7	0.588	0,276	8.2	0.37	0.612
15	7	G	7	5	0.147	0,276	8.2	0.48	0.527
16	7	G	8	4	0.267	0,276	7.7	0.35	0.452
17	7	G	6	10	0.578	0,276	7.1	0.34	0.612

	Nota	Componente	Grau de entrada	Grau de saída	Centralidade de intermediação	Densidade da rede	Conectividade de vizinhança	Coeficiente de agrupamento	Centralidade de aproximação
Antes	5,47	G e P	3,17	3,23	0,579	0,145	5,510	0,52	0,548
Depois	7,29	G	5.88	6,17	0,404	0,276	7,705	0,42	0,546

Figure 3: Metrics for group analysis.

7 CONCLUSIONANDFUTURE WORK

In the development of this article, we seek to understand how the grouping of students occurs through the method presented, and we can regroup students so that there is an improvement in the processes of participation. The analyses were carried out in high school.

Thus, we found the method presented aboveas a solution to the problem of tribal participation aimed at improving student performance improving the articulation of native bodies, which should be triggered through inter-relationship andcollaboration. We seek to develop a method to promote and operationalise this integration among students to increase their school performance.

However, our research cannot be continued and applied in the long term by the pandemic, so we recommend that we suggest a reproduction of this research on a larger scale as future work. We also recommend a reproduction in elementary school in the early years to note a difference in behaviour in different age groups and an article that is a manual of applying the method. We also recommend replicating this method during the pandemic for online education.

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