The impact of teacher-student interaction on student academic outcomes

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Abstract:

      The school environment plays an important role in the academic success of students. Teacher-student interaction is one of the factors influencing the results of students at school. Study on teacher-student interaction is based on the perceptions of teachers and students on the impact on the results in grading students. The main aim is to determine the relationship between teacher-student interactions and student achievement. The study also analyzed the gender differences between groups regarding the perceptions and the impact on student grades. The study included a sample of 180 students of classes tenth and two biology teachers in a high school in Durres city, Albania. The participants included were 98 females (54.5%) and 82 males (45.6%). The Biology subject was selected based also on the literature as the subject in which the sample will be focused during the completion of the instrument. The results of this study showed that the teacher-student interaction has an impact on students' grades. No statistically significant differences resulted in perceptions of teachers and students on the interaction between them but, differences were observed when compared teachers with their respective students and between male and female students. Pearson correlation analysis showed a positive relationship between the variables, where the greater the teacher-student interaction, the higher are the grades of students. From this correlation were found gender differences, in females the impact of the relationship with their biology teacher in grade, is stronger than among males. This study can serve as an incentive for further studies in this area in Albania.

Key words: teacher–student interaction; gender; academic outcomes; adolescence; feedback.

INTRODUCTION:

Commitment and the achievements in school are important components of competence during adolescence. This is one of the tasks charged to and how a teacher organizes and manages teaching can promote or undermine academic competence, social and development pathways of students.

Teacher-student interactions is one of the factors influencing students' academic outcomes at school. (Nugent, 2009) The way students perceive their interaction with the teacher sometimes results different from what teachers think about themselves. (Potvin et al., 2009) Changes in perceptions exist among students, how they see their relationship with their teachers.[1] Organizing and leading the class is a process of managing the class about aspects such as: planning of teaching, the use of human and material resources, use of space and time, creating the climate control, discipline, conflict resolution to realize the aims of education. (Dibra, 1999) Boys earn a profile more consistent identity and exhibit a downward trend for the possibilities of engagement during adolescence and this uncertainty is reflected in behavioral problems. Only in their late adolescence, boys achieve more opportunities reconsidering the current possible alternatives to engage with. In general, teen girls are more mature in terms of identity formation in the early adolescence, but they reach boys only in their late adolescence. Engagement levels remain stable throughout the period of adolescence for both boys and girls. Adolescents' current commitments increasingly are explored as they grew older, as we found growing in depth exploration between late

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[1] Geary, D. (2015, January 26). Girls lead boys in academic achievement globally. *University of Missouri- USA* .

adolescence among boys and girls. Compared to boys, girls have a strong preference to keep the existing social bonds. (Klimstra et al., 2010) Feedback is one of the most influential factors in learning and academic achievement. Its impact can be positive and negative depending on the student teacher assessment. Giving assessment score through a feedback can help students to understand, engage, and develop effective strategies for learning. (Hattie & Timperley, 2007)

Students need to be encouraged by teachers in order to have an active processing of information by students during the lesson and to set specific goals and clear. In this way the student and teacher interaction will positively influence the effective learning.

METHODOLOGY:

This quantitative study investigated the correlation between teacher-student interactions and students' achievement. In the high school selected to conduct the study population tenth grade students is the relatively small, about 397 students. For this reason, representative sample was selected using the simplified formula Yamane[2] determining sample size. According to this formula, for categorical data and continued considering a margin of error of 5% with a 95% level of confidence. In order to sample was as representative as possible for this population, was selected a total of 180 persons. Quantitative research was conducted utilizing QTI instrument, to measure teacher behaviors into two versions for teachers and students for a specific subject. Biology was the subject selected for this research and it includes also the two biology teachers as important part of the sample. Students' grades on this subject

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[2] Israel, G. D. (Qershor, 2013). Determining Sample Size. Agricultural Education and Communication Department, UF/IFAS Extension, University of Florida. Web: https://edis.ifas.ufl.edu/pdffiles/PD/PD00600.pdf.

were collected based on students self-report as part of the instrument.

The following objectives and research questions are tested:

Objective 1: To analyze the perception of teachers and students about student-teacher interaction.

Research Question 1: Is there a difference in the perception of teachers and students about the teacher-student interaction?

Objective 2: Determine whether there are gender differences among students and between teachers about these perceptions.

Research Question 2: Is there a gender difference among students and between teachers about these perceptions?

Objective 3: Determine whether there is a correlation relationship between teacher-student interactions and student outcomes.

Research Question 3: Is there a correlation relationship between teacher-student interactions and student achievement?

Objective 4: Determine whether there are gender differences regarding the impact of students' perception of their teacher to their results.

Research question 4: Are there gender differences regarding the impact of students' perception of their teacher to their results?

QUESTIONNAIRE ON TEACHER - STUDENT INTERACTION

The *Questionnaire on Teacher-Student Interaction (QTI)* is a self-reporting questionnaire designed to assess teacher behavior inside the classroom, their interaction with their students and the varied perceptions or responses to these interactions. QTI is designed by two-dimensional model of Leary: Impact

(dominance-submission) and proximity (co-contradiction) and its eight sectors. In the DC-sector, the Dominance aspect prevails over the Co-operation aspect covering teacher enthusiasm, motivating, and the like. The adjacent CD-sector includes more co-operative and less dominant perceptions; the teacher shows helpful, friendly, and considerate behavior. (Figure 1.) The original version of the QTI was developed in the early 1988 in the Netherlands by the authors Wubbels, Creton, and Hooymayers and had 77 items. Later, an American version of QTI was developed by Wubbles and Levy with 64 voices. Internal consistency to eight groups of statements is over 0.80. (cited by Fisher & Rickards, 1998 & Wubbles et al., 2006) The version that was used for the purpose of this study is the 48-question, Australian version which uses a five Point Likert Scale. (Fisher, Fraser & Cresswell, 1995). With the author's permission to modify and use this instrument and based on Tisome Nugent's study (2009), were made the necessary changes for this research. According to Fisher and Rickards (1998), teacher's behavior is grouped in two dimensions: first the Proximity dimension, which measures cooperation versus opposition and the second, the Influence dimension, which measures dominance versus submission. The four domains addressed by the QTI are Dominance, Submission, Opposition, and Cooperation. These are further divided into eight scales: Leadership, Helping/Friendly, Understanding, Student Responsibility or Freedom, Uncertain, Dissatisfied, Admonishing and Strict.

The internal consistency and reliability is evaluated by Alpha Chronbach coefficient. Questionnaire teacher-student interaction (QTI) reliability coefficient is α = 0.89 for the 48 items included in this questionnaire in both its versions.

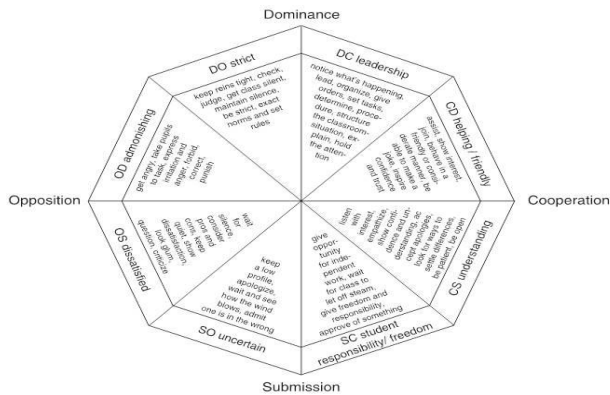**Figure 1. Model of Interpersonal Teacher Behavior.**

DATA COLLECTION

After setting the questionnaire for this study, it was their translation and adaptation from English to Albanian language with the help of a person specialized in translation. Questionnaires were then spread, actually 30 students in 11th class , aged 16-17 years school similar to the age group selected for study and their biology teacher. It was granted the permission to administer the instrument in students and their teachers by the Regional Education Directorate, Durres, then permission which is given verbally by the school director. Finally is getting the permission from the biology teachers to administer the instrument during their biology lessons and the students' approval to participate in the study. Participants were informed about the anonymity and confidentiality of their data. They had to complete the data related to age, gender and biology grades. Teachers also had completed their data related to age, gender, years of service and their level of certification. Study subjects were taken voluntarily.

All the data were analyzed by statistical package for social sciences (SPSS) version 20.0.

DISCUSSION OF FINDINGS

The study analyzed the responses of teachers and students to determine the possible relationship between teacher-student interaction and the finding of students in the subject of biology. Results of this study showed a correlation relation between teacher-student interaction and students' grades. Also gender differences were observed between groups with respect to certain QTI scales. The results are similar to the study conducted by a researcher from the University of Florida, Tisome T. Nugent in 2009, a doctoral dissertation. Because of the limited number of the sample in that school, we can not make generalizations for all tenth classes or for other schools in the country. Below we will discuss the main findings of the study, based on previous studies of other authors cited in the literature.

Characteristics of respondents

The study included a total of 180 people, who are students aged 15-17 years. Participated 98 females (54.5%) and 82 males (45.6%). Their mean age was 15.6 years. Most of the participants, 75.6% (136 participants) were aged 16 years, 33 students aged 15 then 18.3% of the sample and 11 students are aged 17 years and comprise 6.1% of the participants. 54.4% of participants were females and 45.6% are males, respectively 98 female students and 82 male students. In the tenth school classes selected for the study, the two teachers were females, where the teacher A is 31 years old and teacher B is 45 years old. A teacher teaches six classes tenth and teacher B teaches five classes, 11 classes this level. Both teachers have more than 6 years of work and less than 10 years of work (by questionnaire 6-10 years) and have a university degree by 4-year university system in the Department of Biology. Teacher A teaches to 99 students which represent 55% of the sample and B teacher teaches to 81 students which represent 45% of

the sample. In the tenth school classes selected for the study, two teachers teach sex female, where the teacher A is 31 years old and a teacher B is 45 years old. Teacher A teaches six classes tenth and teacher B teaches five classes, 11 classes this level. Both teachers have more than 6 years of work and less than 10 years of work (by questionnaire 6-10 years) and have a university degree by 4-year university system in the Department of Biology. Teacher A teaches to 99 students which represent 55% of the sample and teacher B teaches to 81 students which represent 45% of the sample.

Based on the results of students in the subject of biology, they are substantially lower. 66.1% of the sample under the average in the case of biology is under note 7 and it reflects the overall level resulting 6.9 average. Grade 8 is about 16% of the sample, with 12% grade 9 and grade 10 a very small percentage of about 6%.

Teracher-student interaction perceptions
Is there a difference in the perception of teachers and students about the teacher-student interaction?
To achieve the first objective, it was analyzed the changes in the perception of teachers and students about the teacher-student interaction. Analysis was performed by t-test combined groups for each of the scales of the questionnaire. Comparing the means of student and teachers for every level, is not noticed a huge difference between the groups. On the scales of leadership, being strict, uncertainty, helping / being friendly, understanding, dissatisfaction and admonishing, teachers perceive themselves higher than reported students. This result is similar to study (Nugent, 2009), where generally the degree teachers see themselves in more positive light than they are seen by their students. In this research, the biggest differences are associated to the degree of responsibility / freedom of students to which the latter ones perceive teachers as giving responsibility and discretion rather than report

teachers. The same thing happened with the degree of understanding (p <0.01) where students perceive teachers as less understanding than teachers perceive themselves. An interesting finding was found when compared students' perceptions with those of their teachers. Teacher A in almost all scales had similar results with students to whom she teaches. In contrast to the teacher A, for the teacher B had significant differences in the perceptions that students have about their teacher-student interaction. Studies have shown that teachers have less than three years of experience, student academic achievement is below average (83.3%) compared with the teachers who have over 12 years of experience in teaching and student academic achievement is higher (100%). (Kosgei, 2013) Teachers in this research have various age but have the same level of certification and years of experience and it can not be determined whether these are some of the factors that have influenced the results. Further studies will be suggested to analyze a little more internal aspects of the student-teacher interaction, including a qualitative approach in other subsequent studies.

Gender differences

Is there a gender difference among students and between teachers about these perceptions?

To achieve the second objective regarding the identification of gender differences perception of teachers and students was conducted t-test according to gender only for the group of students, as teachers are both females and in this case can not have a statistical analysis. From the literature it is said that in high schools students have gender bias against their teachers mainly those providing scientific subjects. Male students report estimations significantly lower for female teachers of science: physics, biology and chemistry, while female students report underrate only female teachers in physics. (Potvin et al., 2009) In contrast, in our study male students generally perceive

biology teachers (females in our case) as close to the ideal and with more positive considerations than female students. As stated by studies boys have more positive attitude in the school of science than girls, although this effect is stronger in physics than in biology and attitudes of girls to science are significantly less positive than boys. As referred by studies boys have more positive attitude in the school of science than girls, although this effect is stronger in physics than in biology and attitudes of girls to science are significantly less positive than boys. Although boys are more inclined positively in terms of science, so that more of them choose to study it and tend to follow the subject in the curriculum after the age of 16 years, their academic achievements compared to girls are lower. (Osborne, et al., 2003 & Geary, 2015) This may be why why boys have more positive perceptions than girls because they have such approach even to biology as a scientific subject. However might have affected other factors that can be studied in the future.

Teacher-student interactions and student achievement
Is there a correlation relationship between teacher-student interactions and student achievement?
To determine the relationship between variables, teacher-student interactions and student achievement data was analyzed with the Pearson correlation. By statistical processing of the data received from the instrument students of QTI, it emerges a relatively weak positive correlation between teacher-student interactions and student outcomes.

Pearson coefficient was (r = 0.3) but statistically significant level of p = 0.01. So, the greater the teacher-student interaction, the higher are the results of students in grades.To a similar conclusion has concluded study (Nugent, 2009), but the relationship between the variables r = 0.08 was not statistically significant at the level of p = 0.05. The satisfaction, the importance of the subject, proximity, the efforts and teachers influence have a positive effect on students'

motivation. (den Brok et al., 2005) At the total quoted in biology student results are below average, under grade 7 are 66.1% of the sample and this can be an indication of low connection between the correlation of teacher-student interaction and grades. Teachers need to let students know that they can succeed and that they need a better management of the the class, so they may have success in the classroom. They can show the students that they have the ability to do good things. (Boynton & Boynton, 2005) In this aspect, it seems reasonable to consider the motivational factors that influence student results. Ninth grade is a critical period for the success of students in school. The transition to a school with a big environment may have an impact on how students react to this change. (Cooper & Hayes, 2005) Adaptation to the environment in school and engagement in learning in general are main mediators connecting relationships with teachers and peers at school with academic achievement. (Zimmer-Gembeck et al., 2006)

Gender differences and teacher-student interactions impact
Are there gender differences regarding the impact of students' perception of their teacher to their results?
Another finding interesting following the correlational analysis on the relationship between variables were differences between female and male students in the study. To female students, the influence perceived on the interaction with the biology teacher resulted stronger than in males. To this effect it is statistically significant (r = 0.4) at p = 0.05, while for males the impact resulted weaker but statistically significant level of p = 0,01. This result was expected, based in what researchers say about the impact of teacher-student relationships and academic achievement. Boys are more likely than girls to have no good impression from part of teachers despite of the subject. Gender differences to self-reporting of student engagement in specific

subjects are similar to gender differences to test scores. (Dee, 2007)

Another study with students and teachers of minority communities showed similar results according to which Hispanic-American girls who have a positive view of teachers have a good academic performance. (Crosnoe et al., 2004) The greater the teacher-student interaction, the more students will be motivated to engage in classes with teachers assigned. It urges the need to develop further researches on Albanian schools regarding teacher-student interaction and impact on student results. Similar studies can make new and important findings on the other factors that affect the academic success of students.

CONCLUSIONS:

This study aimed to analyze the interaction teacher-student and the impact on results on grade students. To fulfill the objectives was used quantitative methods. Part of of this study were 180 tenth graders to high school (Durres) and their two biology teachers, of whom 98 women (54.5%) and 82 men (45.6%). Interaction between teacher-student and student grades found a weak correlation relationship but statistically significant. This participant in the study means that the greater interaction of students with their teachers, the higher are their grades in the subject of biology. One of the teachers had similar perceptions of teacher interaction with students than the other. Other differences were also found between the group of students in which males generally have more positive perceptions of their biology teacher than females. On the influence of interaction with the teacher to grades, this resulted stronger in female students than among those males. This study was based on other studies previously committed by foreign researchers and some of the results are similar to results of other studies.

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