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Academic buoyancy of science student in senior high school: analysis and implications for academic outcomes

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Abstract. Academic buoyancy is a very important ability to be possessed by students in the face of the typical academic setbacks and challenges in the daily life of students at school, but in the development of academic buoyancy of students are still questionable. The purpose of this research is to find out the academic buoyancy of science students and to find out the academic buoyancy of science students based on gender and also age at high school level. This research uses mix methods approach with concurrent embedded strategy. The sample of research involves 289 students of science class XI of senior high school in Bandung City on Academic Year 2017/2018 using random sampling. The findings of the study showed that science students need to have higher academic buoyancy compared to other students, the male students of science have higher academic buoyancy than female students of science, and the science students who have higher academic buoyancy are at age of 18 and 15. These results are presented in an implication analysis for academic outcomes.

1. Introduction

Academic success is a dream for every student, parents and educators. Academic success begins with small successes against everyday challenges and obstacles to create and achieve great success. From an asset-oriented perspective in the context of positive psychology was born the concept of academic buoyancy [1,2]. Academic Buoyancy is a capability intended for students with typical experience of: poor performance values, typical anxieties of daily stress, threats to self-confidence resulting from poor grades, low self-esteem, low learning motivation, low academic involvement and inadequate performance on working school tasks [3].

An important component in adapting to academic daily challenges lies in the students' ability to be buoyancy in the face of academic challenges. Research on academic buoyancy focuses more on the extent to which students can meet the daily academic struggles and challenges facing most students at school [2]. Academic buoyancy is an individual's ability to be able to deal with the typical academic downturn and daily academic challenges in school life. Individuals who have academic buoyancy have the believes and self-confidence to accomplish the task (confidence), the ability to make the plan (coordination), self-commitment in completing the task (commitment), ability to understand problems, also seek solutions to problems (composure), and self-control beliefs in order to successfully do the task (control) [2,3].

Students who fall into the category of adolescents are a vulnerable age, and face a very risky challenge, because at this age, the adolescents are in transition, the adolescents need the support and guidance of the surrounding people, rational reasons and also the model in their development. The

adolescents nowadays face demands and expectations, not just on their personal, social and career-orientation but also on their academic, as well as obstacles, challenges and temptations, which seem more and more complex than those of past generations [4].

Research on variables affecting academic buoyancy based on biographical backgrounds is not widely found, only on the influence of gender (male and female sex). In this research try to know variable of determinant of academic buoyancy based on biographical background (gender, interest and age) in science student in senior high school.

Previous studies have shown that challenges, obstacles and even academic demands are always present in everyday life of students especially in students with science majors [5]. Most of the students in science education experience academic challenges, setbacks, and stress from daily life at school [6]. Students experience high difficulty in every semester of learning [7], get stressful about the burden of tasks assigned by teachers at school [8], difficulty of preparing for daily repetition [9], anxiety and fear of failing on the examinations to be faced [9,10,11] low time management in learning [9], low-motivation learning [11], and feel boredom in learning at schools [10], even for senior high school students who want to enter universities and face test exams to be the most tension and challenge source for students [10,12-14].

It is important for science students in schools to not only understand the academic difficulties that are faced, but the main one is the adaptive way that students should understand and do [2, 3, 6]. An important component in adapting lies in the ability of science students to be buoyancy in the face of academic challenges. Academic buoyancy provides a framework for students to react to the day-to-day academic challenges at school in a way that confidently understand their own lessons, perform daily tasks and daily self-efficacy, are able to make planning in learning, tasks, and target of daily recital (planning), make the maximum effort in understanding the lesson, do the tasks and persistence (persistence), not easy to feel anxious when faced with the task and the daily test that is difficult (low of anxiety) and understand the factors of success or failure in academic (uncertain control) [2, 15]. The positive relationship between the five processes is used in academic buoyancy to improve confidence, coordination, commitment, composure, and control so as to lead individuals to academic success every day [16].

2. Methods

The research approach used is mix methods approach that is approach which combine quantitative method and qualitative method. This research uses quantitative method as main research method (primary) and qualitative research method as supporting research method (secondary). Research strategy with mix method approach with concurrent embedded strategy, that is strategy which applying one phase of quantitative and qualitative data collection at one time, has primary method which is the main method that guide and more dominantly used in research, while secondary method has role as supporting method.

Quantitative research method is used to know the profile of academic buoyancy of science students in Public Senior High School in Bandung while qualitative method is used in preliminary study stage, and exploring the academic buoyancy of science students, comparing academic buoyancy of science students with other students and trying to know the academic buoyancy of science students based on gender and also age at senior high school level.

3. Result and Discussion

An illustration of the tendency of academic buoyancy of students in science class grade XI of public Senior High School in Bandung is grouped by sex, age, and specialization. Here are the results of analysis by sex:

Table 1. Distribution of Frequency in Academic Buoyancy of Science Student Class XI Public Senior High School in Bandung on Academic Year 2017/2018 Grouped by Sex.

Academic Buoyancy of Students	High	Medium	Low	Total
Male	19 (19%)	66 (66%)	15 (15%)	100 (100%)
Female	28 (14.81%)	127 (67.20%)	34 (17.99%)	189 (100%)
Sum				289

Based on the results of qualitative findings through the interviews with some homeroom teachers that, students who become champions of the class, have academic performance, and also have higher academic value are mostly male students, although women also show a high performance and academic value. But the more likely to appear is male students. Informants also did not hesitate to provide the results of the midterms test and final exam of the last year semester to be observed and proved to be superior is the male students although with a small amount in each class.

The results of quantitative and qualitative analysis indicate that male students have higher academic buoyancy than female, this can be a consideration in analyzing students' academic buoyancy changes. Apart from gender, the picture of academic buoyancy tendency of students of science class XI of Public Senior High School in Bandung is also compared with students of Social specialization. Here are the results of the analysis in table 2.

Table 2. Distribution of Frequency in Academic Buoyancy of Science Student Class XI Public Senior High School in Bandung School on Academic Year 2017/2018 Grouped By Major.

Academic Buoyancy of Students	High	Medium	Low	Total
Science	36 / 18.28%	134 / 68.02%	27 / 13.70%	197 (100%)
Social	13 / 14.13%	59 / 64.13%	20 / 21.74%	92 (100%)
Sum				289

The Findings of qualitative analysis research both field observation and interview with teachers of Public Senior High School in Bandung as a whole lead that both in terms of attitude, performance, and value are also based on the five aspects of academic buoyancy of students who come from the interest of science is superior and show higher academic buoyancy compared to students from social. The results of quantitative and qualitative analysis indicate that the students of science have higher academic buoyancy than the students in social specialization, this can be a consideration in determining changes in students.

The results of quantitative and qualitative analysis indicate that the students of science have higher academic buoyancy than the students in social specialization, this can be a consideration in determining changes in students. In addition to gender and specialization, the academic buoyancy trend of students in grade XI from Public Senior High School 6 Bandung is also grouped according to student's age, the following analysis results in table 3.

Table 3. Distribution of Frequency in Academic Buoyancy of Student Class XI Public Senior High School in Bandung School on Academic Year 2017/2018 Grouped by Age.

Student's Age	High	Medium	Low	Total
15	2 (28%)	4 (57%)	1 (14.28%)	7 (100%)
16	28 (17.66%)	108 (67.92%)	23 (14.46%)	159 (100%)
17	17 (14.17%)	79 (65.83%)	24 (20%)	120 (100%)
18	2 (33.33%)	3 (50%)	1 (16.67%)	6 (100%)

The findings of qualitative analysis research based on interviews with teachers and field observations on the conditions and circumstances in the field of Public Senior High School in Bandung, especially for class XI of science that more students at the age of 16-17 and more than that age is usually the students who get scholarship and accepted at Public Senior High School in through that path, those students are not much but tend to usually older than the other friends in their class, it because some of them usually dropped out from school. In the students who get the scholarships tend to show academic performance and higher academic value than other students, and more mature students place themselves. The results of quantitative and qualitative analysis indicate that 18 years old students have higher academic buoyancy than the age of 15-17, this can be a consideration in determining changes in students.

Another more specific finding is that in the early education years students have a high motivation in implementing every indicator of the proven aspects of the observation from student values is very high at the beginning of school entry or level, while in the middle years, students experience saturation and various other activities as well as problems in the internal of each individual, this is also evident from the observation of student's value data to decline in the middle semesters. At the end of the study with the growing age based on the observation of student value data rise again. These findings reinforce the findings of the quantitative result that students at the beginning and the end of the study period have high academic buoyancy that is influenced by motivation and conditions in the student's academic buoyancy.

The biographical background is an information that can explain the individual and become the finishing of one individual with another individual, having differences and allowing to be the reason for the achievement and also the setbacks experienced by each individual. Biographical background (gender, specialization, and age) can also be a determinant variable in this study to gain more information and implications on students' academic outcomes to be better understood. In this study only discusses three things: by sex, concentration and age.

Based on sex, men and women who fill the academic buoyancy instruments are shown in Table 4:11. Based on modeling analysis of rasch, there are more male students who have academic buoyancy in high category. A total of 19 (19%) of 100 students showed high categories, while women as many as 28 (14, 81%) of 189 students showed in the high category. The results show that males are stronger and have more ability in dealing with academic declines and challenges than women.

These results reinforce the results of previous research that is based on the results of Martin & Marsh's research [16], men in acting and behave more prior to the logic of thinking than the feelings, when getting a decrease in him both it reacts to the social environment and the process of interpersonal relationships in the environment, men tend to think rationally in addressing and doing an improvement and making learning, while women are processed in feelings so that it is slower to act on improvement and self-learning as well as the ability to deal with it. Therefore, when men are criticized for academic detention, or when they do not experience any feedback on male academic decline, they are not often subjected to burdens and material grief but are immediately transformed into internal motivation, while women will be more in feelings of sadness and feel hurt at the feeling of making women longer to cultivate it into internal motivation.

The findings of this study in accordance with the previous theoretical reference that male students have a higher percentage of academic buoyancy when compared with women means that male students

are more able to face the decrease and academic challenges in daily life in school even though the number of female population is much more than the number of men.

The result of specialization is shown in table 4:12 where the percentage of scores show more students who are interested in science have mostly academic buoyancy in the category of high and medium. While the students of social's specialization have percentage of the score results were higher in the low category although in the medium category also have a balanced percentage with the students of science. This indicates that students in social are more vulnerable in facing the decrease and academic challenge in daily life in school when compared with students who come from science's specialization.

Analysis of the results that cause students who come from social's specialization is lower in academic buoyancy ability than the students who come from the science. One of the theories that become the amplifier is due to the epithet or labeling on each different interests with the positive and negative epithet or can be said stereotypes. Reveals that student's epithet or labeling tends to perform actions appropriate to the epithet given to them, although certainly not all such students. Positive epithets provide a positive force for thinking and behaving, whereas negative epithet or labeling provides negative and positive feedback. Epithet or labeling is very influential on the resulting action, based on theoretical reference the results of qualitative analysis turned out to have become a stereotype of students interested in social studies and even the sources directly create a separate epitome to students who come from social specialization with the title of "mager" students or the meaning of students who lack movement, it is because the attitudes and behaviors in social student's academic performance are very low even included in every aspect of academic buoyancy, other than that, another appellation for students interested in social studies is a "B" student which has the meaning of ordinary students that has no advantages and things to be proud of.

The results of qualitative findings analysis based on interviews from students that at the time of student interest with high test scores more directed to enter science's one from the interest of social, information from a number of students, also that the number of teachers in Public Senior High School 6 Bandung is mostly the lecturer of science, the results of data observation from teachers in Public Senior High School 6 Bandung was truly showed more teachers for the interest of science. This is a driving force for students to have more academic buoyancy skills because teachers who teach science's class are more complete than the social's one. Besides that, the process of guidance of interest with the input of the students of science interest is better than the student of social's interest because of the negative stereotypical understanding when the student enter social's interest. This quantitative and qualitative analysis can be taken into consideration in analyzing the form and analysis of the development from student academic buoyancy to be more developed.

Meanwhile, frequency distribution table of analysis result based on student age can be seen the fluctuation value at every age, starting from up to down. Based on these data indicates that the age of individuals at the age of 16 and 17 indicates that age in inconsistent individual academic buoyancy state, while at the age of 18 and 15 indicates that high level of academic buoyancy despite of very few students. Ros & Broh (2000) in their study said that age is a significant predictor to know the state of a self although every expert believes that maturity and success does not base on age.

Weiner (2010, p.23) reveals that during adolescence is an irregular period that means that adolescence is an unstable period in either understanding, feeling, or in action. Filled with live trials in adolescence, there is also a tendency for behavior to violate more norms and habits that are easily influenced by environmental and media habits. The Weiner's theory reinforces the result of inconsistent values at the age of 16 and 17, thus showing lower values from the age of 15 and 18.

The results show that the age of 18 and 15 is consistent with Martin Colmar, David & Marsh's [3] motivational theory, that students at the beginning of their education have a high motivation that leads to high academic buoyancy as well, but in the middle of the study, students experience decreased motivation due to various factors and tend to decrease student academic buoyancy, while at the end of the study the students have high motivation again because of high demands (at this time not many are able to trigger high motivation again) but tend to try to increase motivation so that academic buoyancy was re-owned. This theoretical reference reinforces the research findings that the age of 18 with the value of higher academic buoyancy but with a number that is not much related to the motivation of each student.

The results from the overall analysis by sex, concentration, and age proved to be a determinant variable in the student's academic buoyancy. This can be taken into consideration in the analysis of student academic buoyancy in the development of academic buoyancy in more depth.

4. Conclusion

There are differences of students' academic buoyancy of science's interest based on gender, specialization and age. This study contribute that gender, concentration and age, become the determinant variable of student academic buoyancy that affects the implications on the academic outcomes of students influenced by academic beliefs, academic planning, academic diligence, the ability to control oneself toward academic anxiety, and the most contribute for the future we have understand the things that can make success and not success in academic.

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