# Effects of Subject Streaming on Students' Perceived Probability of Academic Success among Secondary School Students' in Tanzania

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**Abstract**

*The study investigated the effects of subject streaming on students' perceived probability of academic success among 396 ordinary secondary school students in Tanzania. The data were collected using a motivation to learn scale from Ilala and Moshi districts. The findings indicated that there was a statistically significant difference in students' perceived probability of success between schools and subject streams. The study also showed that school and personal variables had significant effects on students' perceived probability of success. The study concludes that subject streaming has a significant effect on students' perceived probability of success because it mediates students' perception of success between schools and subject streams. The study concludes that subject streaming has a significant effect on students' perceived probability of success.*

***Keywords*****:** *perceived probability of success*, subject *streaming*

## Introduction

In every secondary school students are divided into small groups for classroom teaching and learning. Subject streaming is one of the strategies in which students of a similar class level are grouped into subject streams or biases based on academic performance and/or consideration of other factors (Kususanto & Fui, 2012). Placement of students into subject streams is done by teachers with or without students' consent (Ndalichako & Komba, 2014). After being placed in such streams, students learn subjects designated for their stream or share certain subjects with students of other streams/biases (Kususanto & Fui, 2012; Kinyota, 2013). Sharing on the subject may be permanent or temporal depending on students' performance during terminal or annual examinations (Matthews, Richotte & McBee, 2013; Yassin, Shahrill, Jaidin, & Harun, 2015). Studies (Houtte, Dermanet & Stevens,

2012) report that teachers use standardized tests, key stage, midterm, or annual examination results in allocating students in subject streams.

## Types of streaming and associated concerns

A review of literature on streaming students' classroom instruction showed that streaming is dominated by students' ability or academic performance (Matthews, Richotte & McBee, 2013). This means that in most countries and schools, teachers consider students' academic performance to allocate them into a particular stream (Gentry, 2016). This practice falls within two major clusters: between class and within the class streaming (Kim, 2012). In between class streaming students are assigned into separate classes based on their performance in general or specific subjects (Matthews, Richotte & McBee, 2013). For instance, Form Three students are divided into science, commercial, and social science classes. On the other hand, within-class streaming involves dividing students' of the same class into specific sub-groups based on students' academic ability in certain subjects. For example, in the science stream, students' are sub-divided into high or low ability in chemistry or biology. This strategy aims at reducing students' ability differences and makes teachers divide their time among specific ability groups while other students engage in non-teacher-directed activities (Kim, 2012).

Grouping students based on academic ability or performance has been a subject of research and debate since the 1900s (Gentry, 2016; Johnston & Wildy, 2016; Matthews, Richotte & McBee, 2013). Advocates of the practice argue that such grouping allows teachers to tailor the learning content and pace closely to students' ability (Hornby, & Witte, 2014; Loveless, 2013). They also add that streaming separates high ability from low ability students who in most cases have behavioural problems and by so doing it raises academic performance (Hornby & Witte, 2014; Kususanto et al., 2010). Conversely, opponents of streaming argue that the practice has a weak link with academic and non-academic outcomes (Johnston & Wildly, 2016). They add that group homogeneity claimed by the advocates of this practice does not exist because students differ in a wide range of abilities within and between subjects (Hornby & Witte, 2014). Finally, opponents of streaming assert that the academic achievement differences observed between high and low-performing students are caused by instruction quality disparities between the two groups (Adodo & Agbayewa, 2011).

## Subject streaming in the Tanzanian context

Tanzania's secondary education follows a centralized education system administered by the Ministry of Education, Science and Technology (MoEST) and managed by the President's Office Regional Administration and Local Government (PORALG). Currently, secondary education subjects and instructional procedures are guided by the 2005 curriculum for secondary education issued by the Tanzania Institute of Education (TIE). The curriculum indicates that in the first two years (Form One and Two) of secondary education, students are required to take ten subjects. Thereafter, they sit r Form Two, National Assessment (FTNA) whose results are used in allocating students' into three streams. The curriculum indicates that at Form Three and Form Four, secondary subjects are organized into three subject areas/ biases of science, commercial and social science. There are seven core subjects of Mathematics, English, Kiswahili, Biology, Civics, Geography and History, and one or two elective subjects. The elective subjects include Physics and Chemistry for science bias and Bookkeeping and Commerce for commercial students. In that regard, students pursuing science and commercial streams are supposed to take the seven core subjects plus physics and chemistry for science and bookkeeping and commerce for commercial students'. Social sciences students are required to take seven subjects in which history is indicated as an elective subject for social science students at the same time it is one of the core subjects in the lower secondary level.

The placement of students' into subject streams is determined by average and/ or performance in specific subjects (Kinyota, 2013). In that regard, students with high average and performance in physics and chemistry are placed in science; those with moderate and high performance in the subjects of bookkeeping and commerce are placed in commercial stream. Finally, students who fail to meet the criteria set for science and commercial streams are automatically placed in the social science stream. It should be noted that failure to meet the criteria set for the two subject stream place social science students at the lower in the academic and social hierarchy. Consequently, social science students are perceived as students with low academic performance. The criteria and grades used to allocate students into subject streams remain unclear because literature shows that such criteria and grades vary between schools and academic years (Kinyota, 2013).

## Students perceived probability of success

Students' perceived probability of success refers to the extent to which secondary school students expect to perform well in their subject streams and/or succeed in life after schooling (Njoki, 2018). It involves students' evaluation of whether

or not they will get good grades, knowledge, and skills that will help them fulfil their career plans and goals during and after schooling. In support of the idea, Daniel and Watermann (2018) assert that students are more likely to engage in a particular level of education or educational task if the perceived benefit exceeds the cost. Students' probability of success is influenced by several factors: intention, cultural resources', ethnic groups, social-economic status, and sex (Daniel & Watermann, 2018). Differences in the level of the perceived probability of success also define why some students find it easy to engage in their learning task and gain good academic performance regardless of their level of academic ability (Musa, Nwachukwu & Ali, 2016).

Subject streaming creates academic and non-academic classes between students on a particular level. These classes are more likely to affect students' self-evaluation and expectations of academic and non-academic activities including the perceived probability of success. For instance, being in a high-performing stream, science students are more likely to view themselves as intelligent and therefore, have greater chances of success than commercial and social science students. However, the researcher is unaware of an empirical study that informs on students' differences in the perceived probability of success. This paper intends to fill this knowledge gap by investigating students' differences in the perceived probability of success between schools and streams. The paper also assesses the school and students' variable that affects the perceived probability of success.

## Research questions

1. Is there a significant difference in the perceived probability of success between students of different secondary schools streamed into science, commercial, and social science subjects?
2. Is there a significant difference in the perceived probability of success between science, commercial and social science students?
3. What are the school and students' variables that affect students' perceived probability of success in secondary school?

## Literature Review

### Students' perceived probability of success between schools

Students' expectations and perceived probability of success in secondary school vary remarkably across academic and social origins. The reasons for this difference could be explained by performance differences that determine their placement

into regular or high achieving schools (Daniel, & Watermann, 2018). Apart from academic performance, schools also differ in terms of type (single-sex or co-education), the criteria used in streaming (Kinyota, 2013), location, physical and human resources available (Cross, Frazier, Kim, & Cross, 2017). Such factors affect students' academic environment and ultimately shape their academic perceived success. The study by Cross, Frazier, Kim, & Cross (2017) mentioned barriers to students' success, such as peers, teachers, and the general school environment. On that part of the teachers', for example, participants cited behaviours such teachers being harsh, lazy, negative, biased, and incompetent. They added that there were many times in school when learning was not occurring and therefore affected their academic success.

## Students' probability of success between subject streams

Allocating students into subject streams based on academic performance has been reported to affect students' self-evaluation, expectations, and belief about success (Matavire, Mpofu, & Maveneka, 2013; Yassin, Shahrill, Jaidin, & Harun, 2015). This is due to the fact; individuals in each stream evaluate their academic abilities and probability of success with the allocated stream. Therefore, science students are more likely to evaluate themselves of higher ability in academic subjects and a greater chance of success, than commercial and social science students (Kususanto & Fui, 2012). Students' evaluation of academic ability is also likely to affect their beliefs and expectation of success in subsequent examinations (Musa, Nwachukwu & Ali, 2016; Njoki, 2018). The study by Ahmed, Taha, Alneel and Gaffar (2018) found that students with high academic performance had a more positive perception of education while low-performing students' had a negative perception of education. In other words, high-performing students had the higher perceived probability of success than moderate and low-performing students.

The study by Dramanu and Balarabe (2013) also found that, students who were convinced that they could succeed performed higher than those who doubted their academic abilities. Additionally, the study by Hamilton and O'Hara (2011) showed that streaming lower students' perceived probability of success, particularly among low-performing streams. This is due to the fact that being allocated in a less performing stream makes students feel they were academically weak and cannot succeed in academic activities. Highlighting the differences in success between science and social science students, Kususanto and Fui (2012) observed that teachers expected science students to have better academic performance and social science students to have disciplinary problems. Reciprocating the perception,

students, in science streams also perceived their teachers expected them to have high academic success while social science students' perceived their teachers did not expect them to have high academic success. This suggests that the students' perceived probability of success was translated from their teachers' expectations of success depending on the stream students were placed in.

**School and student-based factors that affect students' probability of success**

Existing literature on students' perceived probability of success suggests numerous factors which may affect students' perceived probability of success. The study by Schreiber, Agomate and Oddi (2017) reported that students' age and gender had a significant effect on the perceived probability of success. The study by Nix, Felker, and Thomas (2015) analysed gender and age differences in readings and mathematics success among primary school students. The findings showed that young males and females rated themselves similar in abilities in reading. However, young males were above females in their perceived ability and success in mathematics than verbal ability. This study suggests that perceived differences in abilities and success may also differ between subjects and sex. The study by Tolsma and Need (2010) observed that in general, female students estimated the chances of success eight percent lower than male students. However, on subject-specific estimates, female students estimated their chances of success by six percent in non-science fields somewhat higher than male students. Male students' estimated their chances of success twenty-one percent higher than females in science-related subjects.

This was also noted in the study by Voyles (2011) who found that gender was not a significant factor for mathematics and reading success. Conversely, in a similar study age was a significant factor for students' academic success for first and third-grade mathematics. The study also mentioned that factors such as students' intelligence, effort, preschool experiences, and social-economic status might affect students' academic success. The study by Mapuranga, Musingafi, and Zabron (2015) showed that, the school environment such as poor library facilities, scarce and outdated books, and lack of accommodation, number of classrooms, and number of students in the classrooms as factors that affect students' academic success. The study by Dedrick, Suldo, Roth and Fefer (2015) added peer networks and effective and caring teachers as significant school factors for students' success. The findings from previous studies suggest that students are more likely to differ based on the school environment. Students who perceive their school environment as supportive of academic success are more likely to have a high perceived probability of success than their counterparts in a less supportive environment.

## Theoretical Approach

### Expectancy -value theory

The current study is guided by the expectancy-value theory to explain differences in secondary school students' perceived probability of success. The theory proposes that an individual's performance, persistence, and choice are directly related to his/her expectations and value beliefs attached to a particular task (Panchal, Adescope & Malak, 2012). The expectations of success and values go together and the two terms form the root of the theory (Öztürk, 2012). Expectancy for success is the person's belief about how well he/she will do with the activity and the ability belief refers to an individual's self-evaluation of their current competence or ability to do the task (Wigfield, Tonks, & Klauda, 2009). Therefore, students' allocated in different subject streams based on academic performance are more likely to differ in self-evaluation and how they value similar or different subjects or academic tasks.

The theory suggests that a good way to motivate students in learning is to increase their expectancy for success and value school-related activities. Subject streaming creates and/or makes students more aware of their differences in terms of perceived competencies and expectations of success (Kususanto & Fui, 2012). The perceived competencies and expectations of success vary in terms of the ability stream a student is allocated. In support of the idea, Wigfield, Tonks, and Klauda, (2009) assert that, students' expectations of success and beliefs about ability are the strongest psychological predictors of performance. Similarly, students' beliefs about their ability and success can be significantly informed by the expectancies of success and the degree to which students from science, commercial and social science streams value their learning outcomes.

## Methodology

### Research approach and design

The study employed a causal-comparative research design under quantitative approach to investigate the effects of subject streaming on students' perceived probability of success among secondary school students in Tanzania. The approach and design chosen allowed the researcher to compare the effect of streaming on students between schools and subject streams. It also allowed a collection of data in the schools setting where manipulation of students was difficult or undesirable (Johnson & Christensen, 2017).

## Participants

The participants of this study included 396 Form Three students who were stratified into subject streams, school type, sex, location, and residential status and then randomly selected from eight ordinary level secondary schools in Ilala and Moshi districts. Among the sampled students, 41.4 percent and 58.6 percent of students were from rural urban secondary schools respectively. Among these, 76.5 percent were sampled from co-education and 23.5 percent from single sex schools. About four percent were boarding and 96 percent day students. Regarding subject streams, 46.2 percent were taking science, 21.7 percent commercial, and 32.1 percent social science. About 43.2 percents were males and 56.8 percent females. The sampled students were categorised into three age groups in which 0.8 percent were aged 12-14 years, 93.9 percent 15-17, and 5.3 percent 18 years and above.

## Instrument and data analysis

The data were collected using motivation to learn scale adapted from Githua and Mwangi (2003) students'. The collected data were coded and entered into Statistical Package for Social Science (SPSS) version 25 programme for analysis. Before the analysis process, all negatively worded items were reversed before reliability checking and other statistical analysis. The reliability coefficient using Cronbach coefficient alpha for perceived probability of success reached 0.75 and was suitable for data analysis in social sciences (Pallant, 2016; Tabachnick & Fidell, 2013).

Moreover, one-way between groups' analysis of variance and t-test were students differences in probability of success between schools and streams, sex, location, age and grade used in subject streaming. Additionally, hierarchical multiple regression measure was performed to examine schools and students personal factors which have significant effect on students perceived probability of success.

## Findings and Discussion

### Students' perceived probability of success between schools

The first research question sought to assess the differences in the perceived probability of success between students of different secondary schools. One-way between- groups Analysis of Variance (ANOVA) was performed to assess group differences between schools in the perceived probability of success using a perceived probability of success scale. Participants were categorized into eight groups according to their school pseudo names (Group 1: school A, to Group 8:

school H). The inspection of Levene's test of homogeneity of variance values was 0.18 indicating the homogeneity of variance assumption was not violated. The results are presented in Table 1.

Table 1: *Perceived Probability of Success between Schools*

| School Name | Mean | Std. Deviation | df | Sig. (2. tailed) |
|---|---|---|---|---|
| A | 8.4 | 4.18 | | |
| B | 7.7 | 3.80 | | |
| C | 8.0 | 3.92 | | |
| D | 7.5 | 3.28 | 7 | .011 |
| E | 9.1 | 3.78 | | |
| F | 9.2 | 3.79 | | |
| G | 7.6 | 3.47 | | |
| H | 10.6 | 3.65 | | |

Table 1 indicates that there was a statistically significant difference at $p< 0.05$ level in the perceived probability of success scores between students of the eight sampled secondary schools [$F(7, 388) = 5.044$, $p=0.000$]. The actual difference in mean scores between schools was large. The effect size was calculated using eta squared 0.08. Post hoc comparison using the Tukey HSD test indicated that school H was statistically significantly different from school A ($p=0.026$), school B ($p=0.021$), school C ($p=0.012$), school D ($p=0.000$), and school G ($p=0.000$). However, school H did not differ significantly from either school E or F. The findings suggest that subject streaming had a significant effect on the way students' evaluated and expected their success in academic and career plans and goals after schooling. Interestingly, the study showed that students in single-sex schools (both boys and girls) had relatively high mean scores of 9.1 for girls and 9.2 for the boys on the perceived probability of success. The mean score differences suggest that students in single-sex schools had a high level of the perceived probability of success than their peers in co-education schools.

Students' perceived differences between schools could be explained by a myriad of factors that make students of one school have a different perceived probability of success from those of other schools. This is supported by the findings from Dedrick, Suldo, Roth and Fefer (2015) who found that students' success was influenced

by multiple aspects including relationship quality between students and teachers, support from the family and significant other, peer relationships, and availability of human and physical resources. For example, in peer relationships, the students reported that being close to successful students provided academic assistance to lower-performing students through group discussion or peer tutoring. Macqueen (2013) in his study uncovered that streaming creates social as well as academic groups among students. Such groups affect students' interaction and support in academic and non-academic matters. In that situation, students are more likely to interact and support one another within than across subject streams.

Studies (Liwa, 2001; Posi, 2003) showed that secondary school students differ greatly based on the academic performance which determines the placement of students in high-performing schools or other secondary schools which they called regular. For instance, Liwa (2001) showed that streaming was more used in regular than in special schools or schools for high achievers. Therefore, students in special schools are more likely to have a high perceived probability of success than their counterparts in regular schools. Within the regular schools there are also regional and ward schools for girls, boys, and co-education. The findings of this study are also consistent with prior research on school factors that affect students' academic success (Cross, Frazier, Kim, & Cross, 2017; Dedrick, Suldo, Roth and Fefer, 2015; Mapuranga, Musingafi, & Zabron, 2015). This suggests that students placed in higher-performing schools would have high expectations of success and a greater perceived probability of success than those posted in regular schools. Likewise, students in regular schools those who are placed in science streams based on higher performance in FTNA are more likely to have a higher perceived probability of success than their peers in commercial and social sciences (Kususanto & Fui, 2012)

## Students' perceived probability of success between subject streams

The second research question assessed differences in the perceived probability of success between students in science, commercial and social science streams. One-way Analysis of Variance (ANOVA) was performed to explore students' differences in the perceived probability of success between science, commercial and social science. Participants were categorised into three groups based on their subject streams (Group 1: Science, Group2: Commercial, and Group3: Social Science). Inspections of Levene's test of variance for homogeneity of variance value 0.177 were greater than 0.05 indicating the homogeneity of variance assumption was not violated. The findings are summarized in Table 2.

Table 2: *ANOVA on Perceived Probability of Success between Subject Streams*

| Subject stream | Mean | SD | df | Sig. (2 tailed) |
|---|---|---|---|---|
| Science | 9.68 | 3.86 | | |
| Commercial | 8.33 | 3.83 | 2 | .00 |
| Social Science | 7.35 | 3.41 | | |

The mean difference is significant at $p < 0.05$.

Table 2 shows that there was a statistically significant difference at $p < 0.05$ level of the perceived probability of success between science, commercial and social science [$F$ (2, 393) =15.216, $p$=0.000]. The actual difference in mean score between streams was medium. The effect size, calculated using eta squared was medium 0.07. Post-hoc multiple comparisons using the Tukey HSD test indicated that science students were significantly different from commercial ($p$=0.015) and social science ($p$=0.000). However, students in commercial streams did not significantly differ from social science. This finding suggests that subject streaming had a significant effect on students' of each subject stream evaluation of academic competencies and expectancy of success in academics and life after schooling. Correspondingly, the differences in the mean scores indicate that science students have a high perceived probability of success followed by commercial and lastly social science students. The perceived level of probability of success related to the subject streams students were placed for teaching and learning. High performing students' were allocated in science, moderate performing in commercial and low performing in social science. This placement affected students' perception of success between subject streams.

The findings of this study are congruent to those obtained by Musa, Nwachukwu and Ali (2016) in which students' perceived probability of success underpinned differences in choice, effort, and other achievement-related behaviours. Students who were placed in high-performing streams were believed to be competent in their academic subjects and were likely to perform higher than their counterparts who believed they had lower competence in their academic subjects. Similarly, the study by Njoki (2018) showed that students who had a low perceived probability of success scored below average and in mathematics. The study concluded that perceived probability of success was a significant factor of students' motivation to learn in their respective subject streams.

In that regard, science students were expected by teachers and self-expected to be of higher academic success than commercial and social science students. Therefore, students' placement into the subject stream based on academic performance affects

how students self-evaluated their academic competencies and expectations of success in their respective subject streams (Matavire, Mpofu, & Maveneka, 2013). In a similar vein, Dramanu and Balarabe (2013) found that students who had a high self-evaluation on academic ability performed higher than those who doubted their academic abilities. This finding underscores how students feel about their academic competencies and expectation which correspond with their subject stream where they are placed. Being placed in a higher-performing stream enhances students' self-esteem and makes them think they are different from those placed in other subject streams. However, such beliefs and expectations do not necessarily make higher-performing students do better in all examinations and/or in all subjects of their respective streams. For instance, science students might be performing high in non-science than science subjects. Consequently, such students might pass the secondary education examination and get selected in non-science combinations.

**School and students' variables affecting perceived probability of success**

Hierarchical multiple regression was performed to examine the effect of subject streaming on students' perceived probability of success after controlling school and students' intervening variables. In performing the analysis, two blocks of independent variables were entered in the regression model. In block 1: school characteristics (school type, location, residential status, classroom organization, students' sex in single-sex schools, grade/score) were entered. In block 2: students' variables (Sex, age) were entered. Students' scores in the perceived probability of success scores were entered as dependent variables. The results are presented in Table 3.

Table 3: *Block Variables on Students Perceived Probability of Success*

| | | | | | Change Statistics | | | |
|---|---|---|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .220[a] | .049 | .034 | 3.781 | .049 | 3.308 | 6 | 389 | .003 |
| 2 | .246[b] | .060 | .041 | 3.767 | .012 | 2.423 | 2 | 387 | .090 |

Table 3 shows that school characteristics had a significant effect on students' perceived probability of success [$F$ (6, 389) =3.038, $p$=0.003] and accounted for 3.4 per cent of the variation on the model. After introducing students' characteristics (age and sex) the model explained an addition of 0.7 per cent of the variation in

students' perceived probability of success on the subject stream and this change was not significant [$F$ (2, 387) =2.423, $p$=0.090].

The findings suggest that the school variables had very small but significant effect on students' perceived probability of success in their respective subject streams. However, students' personal characteristics as a block of variables did not have a significant effect on students' perceived probability of success. Moreover, each variable entered in the two blocks was inspected to explore its independent effect on students' perceived probability of success. The summary of the hierarchical multiple regression models for each variable is presented in Table 4.

Table 4: *Summary of Hierarchical Multiple Regression of Covariates and Students Perceived Probability of Success*

| DV=Perceived Probability of Success | β Block 1 | β Block 2 | Sig. |
|---|---|---|---|
| Bock 1 | | | |
| Grades used in streaming | -.219 | | .008* |
| Location | .165 | | .005* |
| Residential status | -.035 | | .510 |
| Students' organization in classrooms | -.028 | | .767 |
| School Type | .036 | | .840 |
| Sex of students in single-sex schools | -.190 | | .022* |
| Block 2 | | | |
| Sex | | -.52 | .356 |
| Age | | -.111 | .030* |

The scores were significant at P<0.05

Table 4 shows that schools variables of grades/score that schools used in allocating students' into subject streams (β= -0.219, $p$=0.008), school location (β= 0.165, $p$=0.005) and sex of students in single-sex schools (β= -0.190, $p$=0.022) had a significant effect on students' perceived probability of success. Similarly, students' variable of age categories (β=-0.111, $p$=0.030) also had a significant effect on students' perceived probability of success. Further analysis was conducted to inspect the groups' differences in each of the four variables which had a significant effect on students' perceived probability of success.

Based on grade/score used in allocating students in the subject stream, the findings from ANOVA showed there was a statistically significant difference in the perceived probability of success between students in schools that set high, moderate, and low grades/scores [$F(2, 393) = 11.540$, $p=0.000$]. The actual differences in mean scores between groups were medium. The effect size, calculated eta squared was 0.06. A post - hoc comparison using the Tukey HSD test indicated that the mean score for school which uses high grade/score (M=7.71, SD=3.8) was significantly different from moderate (M=9.7, SD=3.9). Schools which set moderate grades were significantly different from those which have a low grade/score (M=8.0, SD=3.6). However, schools that have set high grades did not differ significantly from those which have set low grades/scores. The findings suggest that students in schools that set moderate grade/score in streaming students had a high level of the perceived probability of success followed by those in low grades/scores and lastly students in schools that set high grades.

In terms of age categories, the findings from ANOVA indicated that there was a statistically significant difference in the perceived probability of success for the three age groups [$F$ (2, 393) = 3.881, $p$=0.021]. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for students with age group 15-17 (M=8.8, SD=3.9) was significantly different from age group 18 and above (M=6.4, SD=2.2). Students with age group 12-14 did not differ significantly from those with 15-17 and 18 and above. The findings imply that students aged 12-14 years (young adolescents) had a high level of the perceived probability of success followed by those aged 15-17 (Middle adolescents) and lastly late adolescents aged 18 years and above.

Regarding location, findings from the independent sample t-test indicated that there was a statistically significant difference in scores for rural (M=7.9, SD=3.8) and urban [M=9.2, SD=3.8, $t$ (394) =3.24, $p$=0.001]. The magnitude of the difference in mean score was small (eta squared =0.03). The findings suggest that students in urban schools had a higher level of perceived probability of success than their peers in rural areas.

Based on sex, the findings from the independent sample t-test indicated that there was a statistically significant difference in score for boys only (M=1.27, SD=0.45) and girls only (M=1.44, SD=0.50), $t(91) =1.73$, $p$=0.002]. The magnitude of the difference was small (eta square calculated was 0.02). These findings suggest that students in girls' only secondary schools had a high level of the perceived probability of success compared to boys' only secondary schools.

These findings are similar to those reported by Schreiber, et al. (2018) that age and

gender were significant factors that affected the students' perceived probability of success. The findings of this study are slightly different from those of Njoki (2018) who found that students have 24 and 21 percent probability of success for males and females respectively. The findings suggest that male students had higher perceived probability of success than female students. In the current study, female students had a higher level of the perceived probability of success than male students. The differences in the findings of the two studies can be explained by the focus of the study and the nature of the studied students. Regarding the focus of the study, Njoki (2018) focused on students' differences in mathematics subject while the current study focused on students' perceived probability of success in all subjects designated for their respective stream. Gender had been also reported as a significant factor in students' evaluation of success in science and non-science subjects (Tolsma & Need, 2010). In such evaluation, male students tend to evaluate themselves high in science and mathematics subjects than non-science subjects (Kinyota, 2013; Tolsma & Need, 2010).

The findings are also matching those by Nix et al. (2015) in which the age of the students was a significant factor that differentiated students' grades in mathematics in grades one and three. However, the findings of this study are different from those reported by Voyles (2012) in which gender was not a significant factor for students' success in mathematics and reading. The difference in findings between the two studies can be attributed to the age of the participants and subjects under scrutiny. A younger student may not have a concrete idea of what academic success means in life compared to older students in secondary school. Finally, the findings of this study differ from that of Dedrick, Suldo, Roth and Fefer (2015) particularly on the factors which have a significant effect on students' perceived probability of success. In their study, they reported that factors such as students' hardworking, expectations, peer networks, caring teachers, and parental support had a significant effect on students' perceived probability of success. However, these factors were among the school and personal characteristics which affect students' perceived probability of success.

## Conclusion

This paper investigated the effect of allocating students into science, commercial and social science stream based on academic performance on students' perceived probability of success between secondary school and subject streams in Tanzania. The study has generated evidence that secondary school students significantly differ with respect to perceived probability of success between secondary schools.

The study has also indicated that subject streaming had a significant effect on perceived probability of success between subject streams. Students allocated in science streams were more likely to have higher self-evaluation and expectation of success followed by commercial and finally social science. The reason is that being allocated in a lower-performing stream, for example, alters students' beliefs about their academic ability, legitimate differential treatment, and expectations of success. These differences are later translated into motivation to learn and succeed in school subjects and life after schooling.

Finally, the study has indicated that school variables of location, students' sex in single sex schools, and grade used in allocating students in subject stream have significant effect on students' perceived probability of success. Specifically, students in schools which use moderate grades, those aged 12-14, students and urban areas and those in girls' only secondary schools had higher perceived probability of success than their counterparts in each category. It is recommended that teachers should be careful when allocating students into subject streams to minimize its effects on students' motivation to learn.

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