

This is an open access article under the Creative Commons Attribution 4.0 International License

> PROBLEMS OF EDUCATION IN THE 21<sup>st</sup> CENTURY Vol. 80, No. 2, 2022 339

# ISSUES IN SUBJECT COMBINATIONS CHOICE AT ADVANCED LEVEL SECONDARY SCHOOLS IN RWANDA

# Kizito Ndihokubwayo, Fidele Ukobizaba, Edwin Byusa

University of Rwanda College of Education (UR-CE), African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS), Rwanda E-mail: ndihokubwayokizito@gmail.com, ukobifidele@gmail.com, byedwin@yahoo.fr

# Jean Claude Rukundo

JICA Education Project for Mathematics Simulated software (Sakura-Sha), Rwanda E-mail: rukundo3@gmail.com

# Abstract

The present study explored the issues related to subject combinations choice at advanced level secondary schools in Rwanda. Three schools with various subject combinations were conveniently selected from three districts in Rwanda. Two hundred and thirty-eight participants, including 211 students (grade 10 to 12), three director of studies (DOS), and 24 teachers, were selected purposively to participate in this study. A survey questionnaire for students, interviews with DOS, and focus group discussions with teachers were employed to collect qualitative and quantitative data for triangulation purposes. For instance, a questionnaire was used to reveal students' choice of their subject combinations, a DOS interview to learn how combinations are assigned to students, and teacher FGD to learn difficulties students face due to assigned subjects. Quantitative data were analyzed with descriptive statistics, while qualitative data were analyzed using thematic analysis methods. The results analysis revealed that some students studied what they chose, while others were given what to study based on their performance or influenced by their parents' preferences. Therefore, students reported that they struggled to perform successfully at A' level while they used to perform well at the O' level. It was noticed that what some students learn at A' level have a negative effect on their future life. This study recommends that (i) the career development stakeholders should sensitize students about the impact of the wrong choice, (ii) Rwanda Basic Education Board (REB) should train career guides to help students choose their best combinations, and (iii) students' interests should be given preference than their performance.

**Keywords**: advanced level secondary, career path, Rwandan schools, students' choice, subject combinations

# Introduction

In 2008, Rwanda got several reforms where the instructional language shifted from French to English in all schools. Basic education shifted from six years (primary level) to nine years (until ordinary level secondary school) of education (MINEDUC, 2008). In 2012, a 12-year basic education (12YBE) was established, where nine9-year basic education (9YBE) remained compulsory education. Students who study many subjects, including science, mathematics, social sciences, and languages, in compulsory education have a good background and are prepared for specialization. After compulsory education, the last three years of secondary education (advanced level) allow students to select fewer subjects. Some either go for science/ mathematics or social science/humanities, while others go for languages and literature. However, the choice policy or assignment of these subjects is an interesting research topic. As it is seen from the Rwanda Basic Education Board (REB) curriculum framework (REB, 2015, p. 19),

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022 340

apart from other types of schools such as teachers training colleges and TVET schools, upper secondary school subject combinations are in three categories such as science, humanities, and languages with a total of seventeen different subject combinations (see Appendix A).

Other schools specialized in primary teaching have also been reformulated from one option of primary teaching where students had to study all subjects to 4 combinations which are Teaching Mathematics and Science (TSM), Teaching Social Studies (TSS), Teaching Modern Languages (TML), and Early childhood Education (ECE). Nursing is re-newly introduced in secondary school, while accountancy, agronomy, and veterinary were conglomerated in TVET schools like other subjects such as electricity, plumber, electronics, computer, carpentry, construction, music, drama, and so on.

For students to complete their secondary school, they have a set of subjects available for them that they have to choose from which ones to learn (Fullarton & Ainley, 2000). Career choice is a challenging task for students since their choices influence the profession that they will do in their future life. Thus, students find themselves in the dilemma of which subjects to choose since their choices must be in line with their ability to successfully perform the learning subjects (Edwards & Quinter, 2011). It was realized that the unemployment and high unemployment rate recorded after students' graduation from colleges is linked to the wrong choice made by students when they were in their high schools (Pascual, 2014). Similarly, the study that was done in Rwanda (Itangishatse et al., 2021) revealed that high school students were not well monitored to pursue their future careers after graduation even though the main academic qualification for students between 16-19 years old determines the students' future life, secondary schools' advanced level (A-Level). An A-Level is regarded as the main career destination, employment and/or higher education (Rodeiro, 2007).

Furthermore, trying to understand why there is a decline of senior high school students enrolled in science subjects, Lyons and Quinn (2010) collected ideas from teachers who argued that today students are less interested in science subjects, students do not have enough information related to science careers, students choose less demanding subjects, science subjects require tough tasks, and there is a perception that science careers are poorly paid. Ukobizaba et al. (2020) studied teachers' behaviors towards vital interactions that attract students' interest to learn mathematics and career development and found that there was no link between teachers' behaviors and career path; however, they suggested that teachers should train their students in a way they will perform successfully in their careers of interest. Besides, Borchert (2002) suggested that the exploration of career choice should be a positive effort done by high school students themselves. The author added that a truthful, constructed informed, and substantive career choice process would result in the meaningful, productive, satisfying career choices. The explored literature was limited in the study subject and labor market relationship, the reason why this study will inform researchers of the effects of study subject to learner performance and labor market.

The social cognitive career theory (SCCT) guided this study by explaining the mechanisms that influence career paths and academic performance (Nugent et al., 2015). This theory is a relatively new theory that is meant to explain the three interconnected aspects of how basic academic and career interests develop, how educational and career choices are made, and how academic and career success is reached (Lent et al., 2006). Therefore, SCCT is referred to in investigating the students' choice of learning subjects towards a career path orientation. It is believed that career path analysis shows individual self-efficacy and positive outcome expectations linked to an individual's vocational interest (Cunningham et al., 2005).

Based on trends of reformulating subject combinations, the present study intends to explore the issues emanating from these reforms. The researchers were interested to know the difficulties faced by students who study under these combinations, whether they choose them by themselves or are assigned to them, and the effect such assignments may bring to their performance. This study explores the subject combination choice policy ever made in Rwanda. It informs policymakers to rethink the assignment of combination to certain learners and the effects the decision may cause.

PROBLEMS OF EDUCATION IN THE 21<sup>st</sup> CENTURY Vol. 80, No. 2, 2022 341

Therefore, the specific research questions that guided this study were:

- How do students choose the subject combinations they are studying in?
- What are the students' perceptions of their capacity to learn in their subject combinations?

## **Research Methodology**

### General Background

This study used a survey design and a mixed-method (Fraenkel et al., 2012). We surveyed 211 students, interviewed three directors of studies (DOS), and discussed with 24 teachers from three schools. The first school located in Kayonza district has three subject combinations (PCB, HEG, and LKK), the second school located in Rwamagana district has five subject combinations (PCB, MCB, PCM, MEG, and HEG), and the third school located in Rulindo district has three subject combinations (HEG, MEG, and MCE). Schools were selected using convenient sampling technique, depending on the accessibility of each of the authors. For each school, we administered questionnaires to students, interviews to DOS, and focus group discussions to teachers to triangulate data. The interview for DOS–as they involve in school administration–focused on a school's procedure owning a combination, how students are assigned in those combinations, and the assignment effects. A focus group discussion for teachers focused on the relationship between previous combinations and current combinations, matching current combinations, and effects affecting students toward assigned combinations.

#### Research Sample

These 211 secondary school students involved in the study were from grade 10 to grade 12. Forty-one percent are male, while 59% are female students. These students are from seven different subject combinations, five of science, one of social science, and one of the languages. Science (PCM, PCB, MCB, MCE, and MEG contributed to the sample of 149 (71%) students, Social science (HEG) 54 (26%), and Language (LKK) 21 (10%) (see Table 1).

Gender	Ν	%	Subject Combination	Ν	%	
Male	86	41	PCM	16	8	
Female	125	59	PCB	34	16	
Total	211	100	MCB	13	6	
			MCE	42	20	
			MEG	31	15	
			HEG	54	26	
			LKK	21	10	
			Total	211	100	

Table 1

Sample Size (N) of Students

PCM: physics-chemistry-mathematics, PCB: physics-chemistry-biology, MCB: mathematics-chemistrybiology, MCE: mathematics-computer science-economics, MEG: mathematics-economics-geography, HEG: history-economics-geography, and LKK: Literature-Kiswahili-Kinyarwanda

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022 342

#### Data Collection

Prior to surveying the respondents, the purpose of the research was introduced. Voluntary participation was compromised with DOS, teachers, and students, and the confidentiality of their information was promised to them. The data were collected in the beginning of 2019. Questionnaire administered to students took 40 minutes; the interview to DOS lasted about 30 minutes, while focus group discussion lasted between 40 and 60 minutes. Students took the survey in their classrooms, the interview was done in the DOS office, while the focus group discussion was done in the staff room (one focus group discussion in each school).

#### Validation of Instrument

For validation, face validity was used. The questionnaire was handled to one small classroom of grade 11 students from the school near the University of Rwanda College of Education in Kayonza district. The initial questionnaire was composed of nine items. After analyzing data from the pilot, it was decided to rearrange the number of items and add two more items to make more consistency, and triangulate data. The sub-questions of item-5 were not numbered, and the school was before the government. Items 10 and 11 were after item 5, and items 7 and 8 were added. In item 6, "I perform well in these subjects," is replaced by "I based on marks. For reliability and trustworthiness, two researchers have coded the data independently, and most of the categories presented were similar to each of the two researchers.

### Data Analysis

Descriptive statistics (Fraenkel et al., 2012) was used to analyze quantitative data and content analysis (Krippendorff, 1989) to analyze qualitative data. For instance, percentages were used to presenting students who chose the schools and combinations by themselves and those who were assigned to them. Themes were categorized based on students' written opinions (for example, why they think is the reason to choose or be assigned in a certain combination), perceptions of DOS, and teachers on students' performance based on their combinations. These threads came up from data and were decided based on research questions.

## **Research Findings**

#### The Way and the Reason why Subject Combinations are Assigned

Since we collected data at the beginning of 2019, students sampled completed their ordinary level in 2016 (those who were in grade 12), 2017 (those who were in grade 11), and 2018 (those who were in grade 10). We asked the students if they were studying at the school, they had chosen themselves, and most of them replied, "no." Forty-three percent of students said they had chosen the school they are in themselves during school selection according to the subject combinations which were there, after the ordinary level (grade 9), while 57% said the schools they are studying in were different from what they have chosen.

When it comes to choosing a subject combination, we found that 80.5% have selected the combination themselves. However, 19.5% did not have a chance to select the combination they pursued. Some of them were assigned in the combinations by the government, while others were assigned by the school (see Figure 1).

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022 343

# Figure 1 Subject Combination Selection



Students were asked why they chose such combinations and their perceptions about why they were given them.

The reasons why students selected a subject combination range from interest to parental dedication. The most revealed reason students prefer to study a certain subject is an interest. About 97.2% of students select subject combination because they like it, 86.7% have a good performance in those subjects, 76.6% for the job, 53.3% because the subjects are easy for them, and 39.7 because of their parents' wishes (see Table 2).

# Table 2

## Reason behind Why Students Chose a Subject Combination

	I chose my combination because	Strongly agree	Agree	Disagree	Strongly disagree	Total	% of students
1	I perform well in these subjects	57	60	16	2	135	86.7
2	l like it	102	38	3	1	144	97.2
3	My parents advised me to choose it	11	41	41	38	131	39.7
4	When you study this, you get job	48	54	25	6	133	76.7
5	The subjects are not difficult	26	39	40	17	122	53.3

*Note*: The % of students is calculated based on the number of students who agree and strongly agree. Note: the total number of students reflects those who responded to the question

The students who were given the combinations as they requested were not different from why they selected such combinations. The reasons range from the performance to the interest. Students think the cause to be given the chosen combination was the score they got in the national examination at the end of grade 9, their interest, and career outlook.

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022 344

Some students were sure of the reason for the given combination, while others were guessing. Students who were confident of the reason said: "Yes, they gave me what I selected because my performance was better in History, Geography, and other related subjects." "Ordinary level performance showed that I can complete PCM at Advanced level. They gave me PCM because I performed well mathematics, physics, and chemistry at an ordinary level." The cause to be given the chosen combination is that "the grades in the National exam I scored marks in Geography and Mathematics better than other subjects." Counter wise, students who were not sure of the reason said: "Maybe because I chose it, or even I got enough marks." "They gave me the combination I chose maybe because of the marks I got during my examination of Senior 3; I think also it was because of the performance of all candidates who were needed in that combination." "Because it is authentically useful in my life, I guess it is because of marks." "It was due to the availability of combinations."

Most of the students have a reason why they should engage in a certain subject combination. For instance, those in science are inspired to become medical doctors, those in social sciences to become business entrepreneurs, and those in languages to become language interpreters. Students from science subject combinations wished to undertake science because of jobs and careers such as medical and aviation. "During the national examination (2016), I performed mathematics, chemistry, and biology, and I wish to become a doctor in medicine to take care of patients." "I performed well in all the courses; I selected mathematics, physics, and chemistry as a way of expressing my wish to be a pilot." "My combination will play a big role in becoming a stewardess. I want to know more about the aviation industry."

Students from science and social science combinations believe in their combination as a source of jobs and carrier in business management, politics, lawyer, and leadership. "I prefer to continue in this combination with respecting the future job vacancies, and I did this as to plan and to put my dreams into the reality of future business manager, I want to become a big businessman and have own business." "I have chosen this combination (MEG) because I used to like history and geography when I was in the ordinary level, and I actually have a dream to become an Economist." "I decided to study MEG because in my future I want to be a business girl, and MEG helps you to know how resources are used in the economy." "I was given HEG because they have seen abilities in me. I think I prefer to continue my study in law, political science, etc., which inspired me to choose this combination. I would like in future to become a leader or lawyer."

Students from language combinations believed in their combination as a source of jobs and carrier in language fluency and translation. "I like the LKK combination; it will help me speak the language very well." "The combination of literature, Kinyarwanda, and Kiswahili helps to know the languages; it will help me advance my career as I wish to be an interpreter." Some students believe in their subjects as destiny, such as the key to advancing their studies to university, future dreams, favorites, and enjoyment. "The most cause is to help me in my future for what I want to study in university." "I especially like Geography. I liked it since senior one and because I got good marks in the two studies (Mathematics and Geography), especially Geography, and I was given MEG. These subjects are my favorites." "I am studying this combination due to the marks I got in my national exam, and maybe it was my journey to my destiny." "I based on my grades, my future dreams, my preference, and what I thought was best to satisfy the capacity of my knowledge." "I have chosen this combination because I think that it will help me to fulfill my dreams, which I have to perform in the future, and it is the most understandable for me." "When I was in ordinary level, I saw that these lessons are the ones I know better than others; therefore, I prefer to study them." "I had performed well in those three subjects, and also I really enjoyed them, even I wish I would apply one of these subjects in my career." "I have passed some of its subjects needed to pass the exam, and my teacher who taught me told me that I do have the potential to do it."

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022 345

# Reasons Why Students Are Not Given the Combination they Chose and Effects on their Career

Some students got high scores in national exams, but they were not given what they chose. Table 3 displays perceived reasons and negative effects on their career.

# Table 3

Effects of Choosing Combination for Students Depending on High Scores

Assigned combination	Reason	Effect of student career
РСМ	I passed well in math as well as I was good at math, physics, and chemistry	My target or dreams will not match if I do not take university studies hence also getting experience as long as it could be my first time to work. It is difficult.
MEG	I scored high marks in the National exam and got good grades in Geography and Mathematics better than other subjects	It will affect my career because I studied what I did not want to learn
MEG	-	I like a combination for LKK. I was thinking to improve my arts and had the target to study journalism in the university

Some students got low scores in national exams, and they were not given what they chose. Table 4 displays perceived reasons and negative effects on their career.

## Table 4

Effects of Choosing Combination for Students Due to Low Scores

Assigned combination	Reason	Effect of student career
MEG	-	It affected my career because my target was to be a pilot. I wanted to study MPG, but now I study MEG
MEG	Peer pressure and my parents were the ones that encouraged me to go there, but it was not my choice. At first, I chose WDA <sup>1</sup> , and then my parents told me that I would study it later. Also, the school leaders chose it for me after realizing that these subjects were the ones I succeeded highly compared to the other subjects.	I am not strongly capable of succeeding well in these lessons; therefore, I am not proud of my combination. My dreams will not become true on what I was wishing
LKK	-	I don't like these subjects; I think after studying, I will go to study in WDA schools to get a job.
HEG	Influence of parents	I lost my self-confidence
HEG	Because of poverty	I will not be what I want to be

1 WDA: Work Force Development. WDA is in charge of Technical and Vocational Education and Training (TVET)

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022 346

MCE	I don't know the reason why they selected MCE for me; maybe they thought it could be the best one	I won't be the one I wanted to be, a journalist, but I will be a $\rm DJ^2$
MCE	They thought it could be the best combination for me	I wanted to become a dentist, but I won't be able to fulfill my dream because my career deteriorated, anyway I will be a DJ because I study MCE
MCE	Because the government based on marks I got in the national exam	The performance will be low, and in the future, I will not get a job easily
MCE		Because I didn't choose it, it can cause to have low marks
MCE	I think of the performance	I don't like it, my career will go down and destroy my future
MCE	The government chose the same lesson that I success in high level	I will become a manager instead of my dream of a medical doctor
MCE	The main cause to be given the combination that I didn't choose is because I didn't get enough marks in ordinary level	I will lose because I could perform well other which I had chosen

The research finally studied how students perceived their capacity to acquire studies from their subject combinations and the extent they liked what they study. We have found that 22.6% and 69.7% of students ranked very high and high their capacity to acquire their studies from their combination. Eventually, 46.8% of students ranked the extent they like what they study between 75-100, 42.3% ranked it between 50-75. However, 7.7% of students still rank low and very low their capacity of acquiring their studies from their combination while 10.9 still rank the extent they like what they study below 50% (see Figure 2).

# Figure 2





2 DJ: Disk Jocker

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022 347

#### Processes of Assigning a Subject Combination to Students by Government

In the interview, DOS told us that a school needs to apply from REB to get a combination. Rwanda Basic Education Board (REB) inspects the fulfillment of four requirements before allowing the school to have a certain combination. These requirements are the number of rooms, materials related to the requested combinations, qualified teachers, and the labor market. For instance, if a school needs to open a combination of PCB, it should avail room where the students will study in; put in place physics, chemistry, and biology laboratory; qualified physics, chemistry, and biology teachers; and the needs of studying these subjects in the location of school (for example, no other school has this combination in the area).

Due to how students select combinations, DOS revealed that in Senior 3, students are given lists of schools and hosted combinations to choose. After the national examination, REB assigns students based on performance and the choice of students. However, REB matters on performance than students' interest. This affects much students' learning as they are not motivated. One DOS emphasized the respect of one's interest than his/her performance. "Students who are in their chosen combination, even if they are at low performance, but because of the interest they have in it, they try to perform and succeed."

Some parents also interfere in their children's choices. Parents think of their elder children who work in a certain career; they recommend young children follow it.

Teachers revealed their perceptions about previous and current combinations in group discussions with teachers. In fact, before 2009, students went for two [core] subject combinations, while after 2009, they went for three [core] subject combinations. Students are not happy with their combinations, especially those who were not given the selected combination. "The current combinations make students lose the interest of other minor lessons. Three major subjects are heavy to them and make them dodge minor lessons focusing on examinable subjects."

Due to matching subjects, teachers told us that students perform less because of the low link between subjects such as MEG (Mathematics and Geography or Economics and Geography). "Students are not motivated to study MEG and are not willing to focus on Mathematics. They just want to relax with only Economics and Geography, and this affects their performance." Teachers testified that the link between mathematics and physics and geography make students perform MPG than those in MEG.

Teachers claimed the low level of knowledge due to lack of required infrastructure and specialty regarding effects affecting students toward assigned combinations. "Schools do not afford lab materials, enough books, and other active learning techniques such as field trips to fulfill the needs of their subject combinations; therefore, these facts make students learn little and unable to compete on the labor market."

#### Discussion

Referring to our research findings, some students did not fully participate in choosing their subject combinations as parents, schools, friends, and REB obliges them their combinations. Some students asked their colleagues to choose combinations for them, while others went with the majority of prestige attached to subject combinations. As the results of our research, we found some students who opted for sciences to please their family, despite being better at arts, and they are really struggling now at A' level, while at O' level they used to perform well. Only learners should be the first ones involved in choosing a subject combination for themselves. For instance, some teachers emphasized that learners should be given enough explanations and time and be guided while choosing a combination.

Comparing the way combinations were settled before and after 2009, it is totally different, and many students and teachers appreciate the way lessons are allocated, but they complain

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022 348

about the way combinations are given. Many students study what they did not choose rather than their preference. Some students said that the government and parents chose combinations for them, and these have a negative impact as they may cause low performance in class. Some students regret what they study due to the way they were given a combination in A' level. And they suggested having a way of changing combinations for students who got a combination they do not want. For instance, some students said that they joined their combinations. After attending a few lessons, they started complaining that certain subjects were difficult to comprehend and asked to change the combination. This means students were misguided either by their peers, teachers, REB, or parents. This was also witnessed by teachers.

The selection that students made on the subjects to learn influences students' chance to access higher education, vocational training, and education or labor market opportunities; Students from the higher social-economic background are likely to take subjects that will allow them to pursue higher learning and the profession, while students from the less socioeconomic background tend to take courses that lead them to vocational education and training or often join labor market without any further formal education or training (Fullarton & Ainley, 2000). However, while carrying a study on 200 students about considering the determinants of selecting geography as a discipline: The case of senior secondary school students in Ilorin, Nigeria, Akintade (2011) found that only 48% of students were taking geography because it linked with their future career. At the same time, 35.0 % of students agreed that they chose to take geography because they enjoyed the geography lessons and that teachers' attitudes towards geography attracted their interest in the subject. While developing a model of factors contributing to Science, Technology, Engineering and Mathematics (STEM) learning and career orientation, Nugent et al. (2015) concluded that the value and interest that students have towards STEM subjects influence their self-efficacy and performance in those subjects. The students' interest in STEM subjects also influences youth-expected outcomes towards career orientation. Authors further argued that such interest is influenced by support groups such as educators, peers, and family members.

It is always good to think about the future career and choose the combination wisely. It does not matter whether your whole family studied for one profession or what your friends are saying. It is recommended to choose the subject you love and that you can pass well. Once you are interested in learning subjects, you will always enjoy attending the class, you will likely read deeper, and you will succeed in becoming a professional in your career. Note that the chosen combination today will influence students' future life. The career development stakeholders should sensitize students about the impact of the wrong choice. When a student makes a good choice of a combination, she/he likes, this will motivate the student to pass and understand the content that will result in success, that will improve the quality of education within the Country. REB should train career guiders who should help students in turn to choose their best combinations. Students' interests should be given more weight than students' performance.

#### **Conclusions and Implications**

In this study, the issues in subject combinations choice at advanced level secondary schools in Rwanda were studied. The study revealed that some students study what they chose and want to study. Students were given what to study based on their performance. This study focused on how students choose subject combinations they are studying in and whether these subject combinations affect their career path and global market competition. However, subject consistency and relationship in a given combination and the heaviness or difficulties to study these subjects need further investigation. Rwanda Basic Education Board has a unit of Career Guidance and Counseling in the department of Teacher Development Management and Career Guidance and Counseling that is in charge of helping learners to develop their careers. Therefore,

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022

it should transfer its involvement and role in advising students about selecting combinations based on the careers that the students want to develop. Students have to be trained on how to choose a combination earlier, and this can reduce some impact of choosing their combinations. The study tackled how subject combinations affect students' career paths and global market competition in non-exhaustive manner. Such exhaustive study is needed. Deep investigation of the heaviness of studying many major subjects and the subject correlation are of further research interest.

# Acknowledgments

All participants are acknowledged.

## **Declaration of Interest**

Authors declare no competing interest.

## References

- Akintade, B. O. (2012). Considering the determinants of selecting geography as a discipline: The case of senior secondary school students in Ilorin, Nigeria. Ozean Journal of Social Sciences, 5(1), 1–8.
- Borchert, M. (2002). *Career choice factore of high school students*. University of Wisconsin-Stout. Cunningham, G. B., Bruening, J., Sartore, M. L., & Fink, J. S. (2005). The application of social cognitive
- career theory to sport and leisure Career Choices. *Journal of Career Development*, *32*(2), 122–138. Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). McGraw Hill.
- Fullarton, S., & Ainley, J. (2000). Subject choice by students in year 12 in Australian secondary schools. Longitudinal surveys of Australian youth research report. Australian Council for Educational Research.
- Itangishatse, J., Ndihokubwayo, K., Byiringiro, J. C., & Uwurukundo, M. S. (2021). Rwandan female students towards being entrepreneurs after high school. *Voice of Research*, 9(4), 32– 42. https://doi.org/http://www.voiceofresearch.org/Doc/Mar-2021/Mar-2021 6.pdf
- Krippendorff, K. (1989). Emerging trends in content analysis. In E. Barnouw, G. Gerbner, W. Schramm, T. L. Worth, & L. Gross (Eds.), *The international encyclopedia of political communication* (Vol. 1, pp. 403–407). Oxford University Press. http://repository.upenn.edu/asc\_papers/226
- Lent, R. W., Brown, S. D., & Hackett, G. (2006). Social cognitive career theory. In Greenhaus, J., & Callanan (Ed.), *Encyclopedia of career development* (pp. 750–754). Sage.
- Lyons, T., & Quinn, F. (2010). Understanding the declines in senior high school science enrolments. National Centre of Science, ICT and Mathematics Education for Rural and Regional Australia (SiMERR Australia), University of New England.
- MINEDUC. (2008). *Nine years basic education implementation fast track strategies* (Issue November). http://mineduc.gov.rw/fileadmin/user\_upload/9\_year\_B\_E.pdf
- Nugent, G., Barker, B., Welch, G., Grandgenett, Neal, Wu, C., & Nelson, C. (2015). A model of factors contributing to STEM learning and career orientation. *International Journal of Science Education*, 37(7), 1067–1088. https://doi.org/10.1080/09500693.2015.1017863
- Pascual, N. T. (2014). Factors affecting high school students' career preference: A basis for career planning program. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, 16(1), 1–14.
- REB. (2015). Competency Based Curriculum-Summary of Curriculum Framework Pre-Primary to Upper Secondary. Ministry of Education. http://reb.rw/fileadmin/competence\_based\_curriculum/ syllabi/curriculum\_framework\_final\_printed.compressed.pdf
- Rodeiro, C. (2007). A level subject choice in England: Patterns of uptake and factors affecting subject preference. University of Cambridge.
- Ukobizaba, F., Ndihokubwayo, K., & Uworwabayeho, A. (2020). Teachers ' behaviours towards vital interactions that attract students ' interest to learn mathematics and career development. African Journal of Educational Studies in Mathematics and Sciences, 16(1), 85–94. https://doi.org/10.4314/ajesms.v16i1.7

PROBLEMS OF EDUCATION IN THE 21st CENTURY Vol. 80, No. 2, 2022 350

## Appendix A

Subject Combinations at Rwandan Advanced Level Secondary Schools

Category		Subject combination		
Science and Mathematics	1	Mathematics - Physics - Geography (MPG)		
	2	Physics - Chemistry - Mathematics (PCM)		
	3	Physics - Chemistry - Biology (PCB)		
	4	Biology - Chemistry - Geography (BCG)		
	5	Mathematics - Economics - Geography (MEG)		
	6	Mathematics - Computer Sc Economics (MCE)		
	7	Mathematics - Physics - Computer Science (MPC)		
	8	Mathematics - Chemistry - Biology (MCB)		
Humanities and social	1	History - Economics - Geography (HEG)		
sciences	2	History - Geography - Literature in English (HGL)		
	3	History- Economics - Literature in English (HEL)		
	4	Literature in English - Economics-Geography (LEG)		
	5	Religious Education - History - Literature in English (REHL)		
	6	Religious Education - Geography - Literature in English (REGL)		
Languages	1	Literature in English - French –Kinyarwanda (LFK)		
	2	Literature in English - Kiswahili - Kinyarwanda (LKK)		
	3	Literature in English - Kiswahili - French (LKF)		

## **Appendix B**

Students' survey (Please Write, Circle or Tick into space or box next to the correct answer or the statement)

- **1.** Gender 1. Male 2. Female
- **2.** Combination: .....

3. Which year did you complete the ordinary level? .....

- Do you study at the school you have chosen? Yes No 4. Did you select the combination yourself?

Yes

No, the government selected for me

No, the school selected for me

5. (If yes in 5) why did you choose such a combination?

	Statements	Strongly agree	Agree	Disagree	Strongly disagree
1	I perform well in these subjects				
2	I like it				

		IN THE 21 <sup>st</sup> CENTURY Vol. 80, No. 2, 2022
3	My parents advised me to choose it	351
4	When you study this, you get a job	
5	The subjects are not difficult	
6	Other ()	
	<ul> <li>7. (If no in 5) What do you think was the cause to be given the combination you did not choose?</li> <li>(If no in 5) I to have do in the first terms of terms of the first terms of terms</li></ul>	
	<ul> <li>8. (If no in 5) what do you think will affect your career?</li> <li>9. How is your capacity to acquire your studies from your combination?</li> </ul>	
	1. Very high Very low2. High Very low3. Low410. To what extent do you like what you study?0-25% 25-50%25-50% 	

PROBLEMS OF EDUCATION IN THE 21<sup>st</sup> CENTURY Vol. 80, No. 2, 2022 352

Received: November 25, 2021 Revised: February 15, 2022 Accepted: March 26, 2022

Cite as: Ndihokubwayo, K., Ukobizaba, F., Byusa, E., & Rukundo, J. C. (2022). Issues in subject combinations choice at advanced level secondary schools in Rwanda. *Problems of Education in the 21st Century*, 80(2), 339-352. https://doi.org/10.33225/pec/22.80.339

<i>Kizito Ndihokubwayo</i> (Corresponding author)	PhD in PER, Researcher, The University of Rwanda College of Education (UR-CE), African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS) Kayonza, Rwanda Email: ndihokubwayokizito@gmail.com Website: https://aceitlms.ur.ac.rw/ ORCID: https://orcid.org/0000-0002-2566-8045
Fidele Ukobizaba	The University of Rwanda College of Education (UR-CE), African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS) Kayonza, Rwanda. E-mail: ukobifidele@gmail.com ORCID: https://orcid.org/0000-0003-1502-2395
Edwin Byusa	The University of Rwanda College of Education (UR-CE), African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS) Kayonza, Rwanda. E-mail: byedwin@yahoo.fr ORCID: https://orcid.org/0000-0001-9602-029X
Jean Claude Rukundo	The JICA Education Project for Mathematics Simulated software (Sakura- Sha) Kigali, Rwanda. E-mail: rukundo3@gmail.com