PSU - Journal of Engineering, Technology, and Computing Sciences (JETCS)
(Vol. No. 2, Issue 1 pp. 1-9, June 2020)

Academic Track Recommendation in Preparation for Senior High School Using Discriminant Analysis

Joben D. Tuazon[1], Kristine J. Obongen[2], Jonathan S. Bagusto[3], Beverly F. Castillo[4], Mark Ghian S. Garces[5], Paul Andrew V. Roa[6]

College of Computing, Pangasinan State University – Urdaneta City Campus
tuazonjoben14@gmail.com[1], kristinejuescaobongengmail.com[2], nilvictus@gmail.com [3], beverlyfortezcastillo@gmail.com[4], markghiangarcesII@gmail.com[5], paulandrewroa@gmail.com[6]

Abstract – *This study aimed to classify the Senior High School (SHS) students based on the final rating grades (grade 10) of the Rosales National High School, Juan G. Macaraeg National High School, Benigno V. Aldana National High School, and Pangasinan State University – Urdaneta Campus Senior High School students in Filipino, English, Mathematics, Science, and Araling Panlipunan using discriminant analysis. The data were gathered at the respective aforementioned schools, Academic Track strands were treated as the dependent variable with 4 groups namely ABM (Accountancy, Business, and Management), GAS (General Academic Strand), HUMSS (Humanities and Social Sciences), and STEM (Science, Technology, Engineering, and Mathematics). The gathered data were analyzed using the Statistical Package for the Social Sciences (SPSS).*

Using discriminant analysis, the results show that the researchers' predictions or the independent variables did not discriminate well the Senior High School students. The classification results reveal that only 49.3% of the selected cases were correctly classified and this means that the performance of the model is 0.7% unsatisfactory. Three discriminant functions were obtained in the analysis the first function has an eigenvalue of .289, the second function has an eigenvalue of .099 and the last one has an eigenvalue of .046; therefore, the first function has the strongest discriminating power. The first discriminant function was the useful function among the three discriminant functions for the classification of Wilk's Lambda value which is significant. Since the first function has the highest ability to discriminate, the dependent variables that have the best effect on the classification were determined which are English, Mathematics, and Science.

Keywords – *Academic Track Recommendation System, Discriminant Analysis, Track Strand Recommendation*

.

INTRODUCTION

Technology is a body of knowledge devoted to creating tools, processing actions, and extracting materials. The term "Technology" is wide, and everyone has their way of understanding its meaning. We use technology to accomplish various tasks in our daily lives; we can describe technology as products and processes used to simplify our daily routines, we used technology at work, we use technology for communication, transportation, manufacturing, securing data, scaling businesses and the most important is in education. We use technology to extend our abilities, making people the most crucial part of any technological system. Because education plays a vital role in shaping successful people. It allows us to become productive members of a civilized society by acquiring all the necessary skills [1].

Public schooling on a state level began in 1790 when Pennsylvania became the first state to require free education. This service was extended only to poor families, assuming that, wealthy people could afford to pay for their education. New York followed suit in 1805. In 1820, Massachusetts was the first state to have a free-tuition high school for all, and also the first to require compulsory education. By the late 1800s, public education had spread to most states, in a movement often referred to as the common school movement. After World War I, urban populations swelled, and vocational education and secondary education became part of the American landscape. By 1930, every state had some sort of compulsory education law. This led to increased control of schools by cities and states. By the year 1930, 50 states had passed the laws making education compulsory, and in 1965, the Elementary and Secondary Education Act (ESEA) was signed, granting a large federal expenditure to each state to sustain local K–12 systems [2].

The education system of the Philippines has been highly influenced by the country's colonial history. That history has included periods of Spanish, American, and Japanese rule and occupation. The most important and lasting contributions came during America's occupation of the country, which began in 1898. It was during that period that English was introduced as the primary language of instruction and a system of public education was first established—a system modeled after the United States school system and administered by the newly established Department of Instruction [3].

In a historic moment for advocates of educational equity, the Former President of the Philippines Benigno Semion Aquino III approved the Republic Act (RA) 10533, signing into law the K to 12 program on May 15, 2013. K to 12 is an educational program under the Department of Education (DepEd). K to 12 program replaced the 10-year basic education curriculum, which consisted of six years in grade school and four years in high school that concentrated on the English language and Filipino, the sciences, arithmetic, and mathematics. The goal of the new curriculum is to give Filipino students enough time to master skills and concepts so that they are ready for tertiary education when the time comes [4].

It aims to bring Philippine Education to the next level so we can match up with the rest of the world. It focuses on teaching the kids the necessary skills centered on Science, Sports, Technology, Arts, Home Economics, and Mathematics.

In the year 2016, the first batch of students graduated from Junior High School to Senior High School. Now under K to 12, students have the right to choose from tracks based on what they want to pursue. The choice of career track will define the content of the subjects a student will take in Grades 11 and 12. Each student in Senior High School can choose among three tracks: Academic, Technical-Vocational-Livelihood, and Sports and Arts.

The Academic track prepares the students who want to take up their studies in college. Includes three strands: Business, Accountancy, Management (BAM); Humanities, Education, Social Sciences (HESS); and Science, Technology, Engineering, Mathematics (STEM).

K to 12 is a program designed to address the unique and individual interests of the students for their future careers. K to 12 program equip the students with these skills they need to succeed because all of them deserve a career-focused education.

Quality education is the best that the government can offer, which leads to quality employment for a better quality of life. But lawmakers should still be in the observation for the advancements in the current status of the students. As of January 2019, the Philippine Statistics Authority Labor Force Survey showed a 5.2 percent unemployment rate from 5.3 percent of the previous year. Meanwhile, the survey also showed employment grew to 94.8 percent, up from 94.7 percent in the preceding year. Further, according to the data of the Philippine Statistics Authority in 2018, 29.4 percent of 682,080 junior high school level graduates of the old curriculum were unemployed; and, one of the main reasons was having a lack of skills needed by various industries.

In order to help the upcoming Senior High School students in choosing academic track strands, the researchers aimed to formulate a model for the recommendation system that was developed to help the students in decision making.

This study aims to formulate and derive the specific model for academic track recommendation using discriminant analysis, and to develop the "Academic Track Recommendation Preparation for Senior High School Using Discriminant Analysis" system.

OBJECTIVES OF THE STUDY

The main objective of this study is to develop a LAN-based Academic Track Recommendation Preparation System for Senior High School Using Discriminant Analysis to determine the recommended strand that suits for grade 10 students based on their final rating grade.

Specifically, the study aims to:

1. Determine the necessary data needed in the system such as:
   - A. Background of the Respondent:
     - a. Age
     - b. Sex
   - B. Final rating grades in:
     - a. English
     - b. Mathematics
     - c. Science
     - d. Filipino
     - e. Araling Panlipunan
   - C. General Weighted Average (GWA)
2. Create a model.
3. Develop the system using Rapid Application Development (RAD) methodology.
4. Test the acceptability/usability of the project using Website Analysis and Measurement Inventory (WAMMI) in terms of:

ISSN 2599-462X (Print) www.psurj.org/jetc ISSN 2599-4638 (Online)

a. Attractiveness
b. Control
c. Efficiency
d. Helpfulness
e. Learnability

MATERIALS AND METHODS

Research Design

The researchers used the Rapid Application Development Methodology to design and develop an "Academic Track Recommendation Preparation for Senior High School Using Discriminant Analysis" System. The reasons for using this methodology are the following: it makes the entire development process effortless, assists the clients in taking quick reviews, and encourages feedback from customers for improvement.

The key benefit of a RAD approach is fast project turnaround, making it an attractive choice for developers working in a fast-paced environment like software development. This rapid pace is made possible by RAD's focus on minimizing the planning stage and maximizing prototype development. By reducing planning time and emphasizing prototype iterations, RAD allows project managers and stakeholders to accurately measure progress and communicate in real-time on evolving issues or changes. This results in greater efficiency, faster development, and effective communication [5].

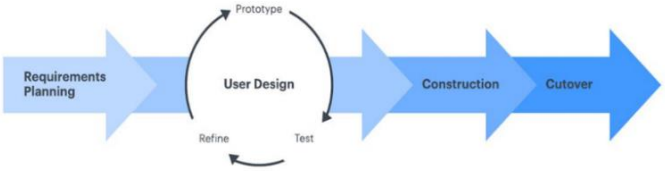

Figure 2. Rapid Application Development Model

It consists of four phases namely requirements planning, user design, rapid construction, and cutover. Figure 2 shows the RAD model.

Requirements Planning. During this stage, developers, clients (software users), and team members will communicate to determine the goals and expectations for the project as well as current and potential issues that would need to be addressed during the building of the system.

In the first phase, the researchers gathered data that was needed in the development of the proposed system, the researchers of the system brainstorm, plan, and analyze the gathered information to develop the system.

User Design. During this phase, clients work hand in hand with developers to ensure their needs are being met at every step in the design process. The users can test each prototype of the product, at each stage, to ensure it meets their expectations.

In this phase, the researchers used diagrams in order to represent all the processes and requirements of the system.

Rapid Construction. The software development team of programmers, coders, testers, and developers work together during this stage to make sure everything is working smoothly and that the result satisfies the client's expectations and objectives.

This phase is the actual development of the system. In this phase, the developers started programming, coding, unit integration, and system testing. During this phase is the prototyping. In RAD, users continue to participate and can still suggest changes or improvements as actual screens, or reports are developed.

Cutover. This is the implementation phase where the finished product goes to launch. It includes data conversion, testing, and changeover to the new system, as well as user training.

This was the last phase of the process where the researchers and developers implement the developed system and test its usability.

Population and Locale of the Study

The researchers conducted an initial interview for them to identify the number of students in Pangasinan State University – Urdaneta City Campus (PSU-UCC), Juan G. Macaraeg National High School (JGMNHS), Rosales National High School (RNHS), and Benigno V. Aldana National High School (BVANHS) that offers senior high school education with ABM (Accountancy, Business, and Management), HUMSS (Humanities and Social Sciences), General Academic Strand (GAS) and STEM (Science, Technology, Engineering, and Mathematics). The respondents of this study are the students of the mentioned schools. The overall population considered in the study is 1,762 students. The gathered data from the respondents helped the researchers achieve their goal to develop the system.

Table 1 shows the actual number of respondents who are involved in the Academic Track Recommendation Preparation for Senior High School Using Discriminant Analysis system.

Table 1. List of Respondents

ISSN 2599-462X (Print) www.psurj.org/jetc ISSN 2599-4638 (Online)

SCHOOL		HUMSS	STEM	ABM	GAS
RNHS	Rosales National High School	553	155	63	
JGMNHS	Juan G. Macaraeg National High School	55	75	24	98
PSU-UC	Pangasinan State University Urdaneta Campus	232	272		
BVANHS	Benigno V. Aldana National High School	139	28	68	

Sample Size

The size of the population and the amount of error a researcher is willing to tolerate is what determines the size of the sample. For situations where the researcher wants to come up within a certain percentage point of error, Slovin's Formula can be used to calculate the sample size of the population involved in the study, if the entire population had been surveyed, results will become more accurate.

Slovin's Formula $n = N / (1 + Ne^2)$, where n is the sample size, N is the population size, e is the margin of error and 1 is a constant value.

$n = N / 1 + Ne^2$
$n = 1762 / 1 + (1762 * .01^2)$
$n = 1762 / 1 + (1762 * .0001)$
$n = 1762 / 1 + 0. 1762$
$n = 1762 / 1. 1762$
$n = 1498.0445502466$

Therefore, having a population of 1,762 and a 1% margin of error, the researchers needed 1,498 respondents to have a good result for the "Academic Track Recommendation Preparation for Senior High School Using Discriminant Analysis" system.

Data Instrumentation

The researchers used different techniques and instruments in gathering data and information to achieve and obtain the objective needed in this study.

Master List. It is a collected list of everything that falls into a particular category. The category can be broad or narrow. The researchers gathered the students' master list to identify the requirements needed in the study such as their age, gender, and final grades in English, Mathematics, Science, Filipino, and Araling Panlipunan.

Records. A record refers to all the numbers and statistics that institutions, organizations, and people keep as a record of their activity. In this study, records (Form 138) of the students were analyzed for the researchers to produce an output, to have a basis for recommending academic track strands. This tool is useful for the study because records are unbiased.

WAMMI Questionnaire. WAMMI measures user satisfaction by asking visitors to your website to compare their expectations with what they experience on the website. This tool was used to evaluate the system's usability and effectiveness based on the evaluation of the users.

Table 2. Likert Scale

NUMERICAL EQUIVALENT	STATISTICAL RANGE	DESCRIPTIVE EQUIVALENT	DESCRIPTIVE INTERPRETATION
5	4.20 - 5.00	Very Strongly Agree	Usable
4	3.40 - 4.19	Strongly Agree	Usable
3	2.60 - 3.39	Agree	Usable
2	1.80 - 2.59	Disagree	Not Usable
1	1.00 - 1.79	Strongly Disagree	Not Usable

The responses that will be ranging from 2.60 – 5.00 were be interpreted as usable, for which the system has met the requirements of the users. Responses ranging from 1.00 – 2.59 were described as not usable for it gives a poor evaluation of the system.

RESULTS AND DISCUSSION

The researchers gathered data at PSU-UCC, JGMNHS, RNHS, and BVANHS. The gathered data such as age, sex, final rating grades in English, Filipino, Mathematics, Science, and Araling were needed to produce the model of the developed system.

Creating the Model

Table 3. Final ratings (grade 10)

Subjects	Minimum	Maximum	Mean	Std. Deviation
FILIPINO	75	99	88.93303065	4.63
ENGLISH	76	92	88.2292849	5.08
MATH	77	93	87.67934166	5.15
SCIENCE	76	96	87.61620318	5.2
AP	77	97	89.52270148	4.67
GWA	77	95	89.14694949	4.18

As seen in Table 3, the lowest final rating of the senior high school students in their subjects was 75 and 99 for the highest rating in the Filipino subject.

Table 4. Academic Track Strands of Senior High School of PSU-UCC, JGMNHS, RNHS, and BVANHS

ISSN 2599-462X (Print) www.psurj.org/jetc ISSN 2599-4638 (Online)

Strands	Frequency	Percent
STEM	530	30.08
HUMSS	979	55.56
ABM	155	8.8
GAS	98	5.6
TOTAL	**1762**	**100.04**

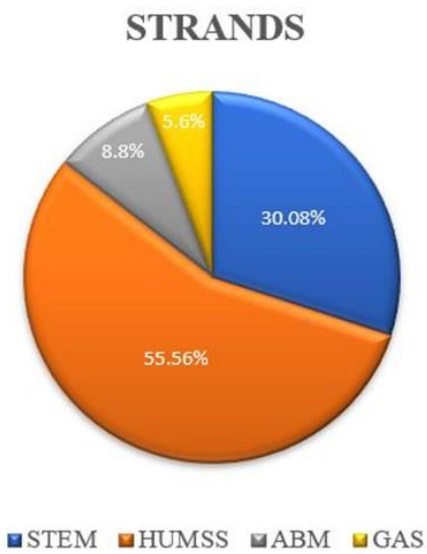

Figure 3: The Distribution of Strands under Academic Track of Senior High School

Figure 3 shows that the Humanities and Social Sciences (HUMSS) strand has the highest count of enrollees accounting for 55.56% (979 out of 1762) of the students; the Science, Technology, Engineering and Mathematics (STEM) strand has 30.08%; the Accounting, Business, and Management (ABM) strand has 8.8% and the General Academic Strand (GAS) has the lowest count of enrollees which is 5.6%.

Table 5. The population of enrolled students based on their chosen strands and schools

SCHOOL		HUMSS	STEM	ABM	GAS
RNHS	Rosales National High School	553	155	63	
JGMNHS	Juan G. Macaraeg National High School	55	75	24	98
PSU-UC	Pangasinan State University Urdaneta Campus	232	272		
BVANHS	Benigno V. Aldana National High School	139	28	68	

The presented data in the previous table describes the number of enrolled students per strand. The RNHS HUMSS strand has 553 students, STEM has 155 students, and 63 students for the ABM. The JGMNHS has 55 students in HUMSS, 75 students in STEM, 24 students in ABM and has the highest number of enrollees in GAS that is 98 students. The PSU-UCC has 232 students in HUMSS and 272 enrolled students in STEM. Lastly, BVANHS has 139 enrolled students in HUMSS, 28 students in STEM, and 68 students in ABM.

Table 6. Distribution of the students according to their profile

Profile		Frequency	Percentage
Strands			
	STEM	530	30.08
	HUMSS	979	55.56
	ABM	155	8.8
	GAS	98	5.6
Sex			
	Male	714	40.52
	Female	1048	59.48
GWA in SHS			
	84 and below	278	15.78
	85 to 90	696	39.5
	91 to 94	655	37.17
	95 and above	133	7.55

Strands. The Academic track was categorized into four strands: STEM, HUMSS, ABM, and GAS. As shown in the table above, it could be noticed that the majority of the respondents took the HUMSS strand having a frequency of 979 or 55.56% while STEM strand has 530 or 30.0%, ABM strand has 155 or 8.8% and GAS has 98 or 5.6% of the respondents.

General Weighted Average (GWA). On the same table, the majority of the GWA of students range from 85 to 90 has 39.5% with the highest frequency of 696, while the range 91 to 94 has 37.17%, 84 and below has 15.78% and the range 95 and above has the least frequency of 133 or 7.55%.

Sex. The data on the sex of the student respondents shows that out of 1,762 students, 59.48% were females with a frequency of 1048 while 40.52% were males with a frequency of 714.

Table 7. Functions at Group Centroids

ISSN 2599-462X (Print) www.psurj.org/jetc ISSN 2599-4638 (Online)

Functions at Group Centroids

STRANDS	Function		
	1	2	3
STEM	0.753	0.038	0.124
HUMSS	-0.367	0.172	-0.039
GAS	-0.815	-0.905	0.539
ABM	0.257	-0.644	-0.520

The functions at group centroids represent the cut points for classification. For the first discriminant function, values near to -0.815 will be classified as GAS, values near to -0.367 will be classified as HUMSS, values near 0.257 will be deemed as part of ABM, and values near to 0.753 will be grouped into STEM. For the second discriminant function, values near to -0.905 will be classified as GAS, values near to 0.172 will be classified as HUMSS, values near -0.644 will be deemed as part of ABM, and values near to 0.038 will be grouped into STEM. For the third discriminant function, values near to 0.539 will be classified as GAS, values near to -0.039 will be classified as HUMSS, values near -0.52 will be deemed as part of ABM, and values near to 0.124 will be grouped into STEM.

Table 8. Usefulness of the Functions

Usefulness of the Functions

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 3	0.675	689.288	24	0
2 through 3	0.87	244.025	14	0
3	0.956	78.126	6	0

The Wilks' Lambda test is to test which variable contributes significance in discriminant function. The closer Wilks' lambda is to 0, the more the variable contributes to the discriminant function. The table also provided a Chi-Square statistic to test the significance of Wilk's Lambda. If the p-value is less than 0.05, we can conclude that the corresponding function explains the group membership well.

In determining the usefulness of the functions, the Wilks' Lambda's shows that all of the discriminant functions are quite useful in our classification procedure.

Table 9. Eigenvalues

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.289[a]	66.6	66.6	0.473
2	.099[a]	22.9	89.5	0.300
3	.046[a]	10.5	100	0.209

a. First 3 canonical discriminant functions were used in the analysis.

An eigenvalue indicates the proportion of variance explained. A large eigenvalue is associated with a strong function. The eigenvalue measures the discriminating ability of the discriminant function to classify the Senior High School students.

As seen in the table, the first discriminant function can explain 66.6% of the variance of the groups and has the highest eigenvalue of .289, the second discriminant function accounts for 22.9% of the groups' variance with an eigenvalue of .099, and 10.5% of the variation can be explained by the last discriminant function with least eigenvalue of .046. This table also shows that if we want to explain 90% of the variance, it is sufficient to use the first and second discriminant functions.

The canonical relation is a correlation between the discriminant scores and the levels of the dependent variable. A high correlation indicates a function that discriminates well. Canonical correlation shows that .473 for the first discriminant function is higher than the second and third discriminant function which have .300 and .209 canonical correlation.

Table 10. Standardized Canonical Discriminant Function Coefficients

Standardized Canonical Discriminant Function Coefficients

SUBJECTS	Function		
	1	2	3
FILIPINO	-0.048	**1.31**	**-0.861**
ENGLISH	**0.343**	-0.214	**0.782**
MATH	**0.432**	0.16	-0.471
SCIENCE	**0.412**	-0.159	-0.32
AP	0.206	**0.659**	-0.242
GEN. AVE	-0.186	**-1.398**	**0.961**

In determining the importance of each independent variable to every discriminant function. For the first discriminant function, the top three most important variables are Grade in Mathematics, Grade in Science, and Grade in English. For the second discriminant function, the top three most important variables are the Average Grade, Grade in Filipino, and Grade in Araling Panlipunan. For the last discriminant function, the most

important variables to consider are the Average Grade, Grade in Filipino, and Grade in English.

Table 11. Canonical Discriminant Function Coefficients

Canonical Discriminant Function Coefficients

	Function		
	1	2	3
AGE	0.007	0.185	0.279
GENDER	0.517	0.786	1.157
FILIPINO	-0.011	0.301	-0.198
ENGLISH	0.074	-0.046	0.169
MATH	0.092	0.034	-0.101
SCIENCE	0.087	-0.034	-0.067
AP	0.048	0.152	-0.056
Ave	-0.049	-0.368	0.253
(Constant)	-21.491	-7.017	-5.233

Unstandardized coefficients

As for the actual discriminant functions, they are given as:

f_1=-21.491+0.007Age+0.517Gender-0.011Fil+0.074Eng+0.092Math+0.087Sci+0.048Ap-0.049Ave

f_2=-7.017+0.185Age+0.786Gender+0.301Fil-0.046Eng+0.034Math-0.034Sci+0.152Ap-0.368Ave

f_3=-5.233+0.279Age+1.157Gender-0.198Fil+0.169Eng-0.101Math-0.067Sci-0.056Ap+0.253Ave

Table 12. Classification Results of the Senior High School Students

Classification Results

STRANDS			Predicted Group Membership				Total
			STEM	HUMSS	GAS	ABM	
Original	Count	STEM	324	69	47	90	530
		HUMSS	217	405	203	154	979
		GAS	16	13	57	12	98
		ABM	25	19	28	83	155
	%	STEM	61.1	13	8.9	17	100
		HUMSS	22.2	41.4	20.7	15.7	100
		GAS	16.3	13.3	58.2	12.2	100
		ABM	16.1	12.3	18.1	53.5	100

b. 49.3% of original grouped cases correctly classified.

The classification results revealed that 49.3% of the total cases were correctly satisfied. However, it can be noted that more than half of all cases for STEM, GAS, and ABM are correctly classified. This indicates that the Linear Discriminant Model is quite useful in determining persons for the aforementioned strands. However, the model can only classify roughly 41.4% of HUMSS cases, an indication that the model may not be quite useful in classifying persons for the HUMSS strand.

System Development using Rapid Application Development Methodology

The developers came up with a developed system entitled Academic Track Recommendation Preparation for Senior High School Using Discriminant Analysis. Rapid Application Development (RAD) methodology was used in developing the system by running through its various phases.

Requirements Planning

The researchers gathered data that was needed in the development of the proposed system, the researchers of the system brainstormed, planned, and analyzed the gathered information to develop the system.

User Design

The researchers used diagrams such as Entity Relationship Diagram (ERD) and flowcharts to represent all the processes and requirements of the system. The developers used ERD in creating a database design for the system.

Rapid Construction

The developers started programming, coding, unit integration, and system testing using prototyping. The developers used PHP as the programming language and MySQL as the open-source relational database management system.

Cutover

The researchers developed the system and tested its usability by conducting a survey with the use of the WAMMI questionnaire.

Usability of Academic Track Recommendation System

Usability Testing is defined as a type of software testing where a small set of target end-users of a software system "use" it to expose usability defects. This testing mainly focuses on the user's ease to use of the application, flexibility in handling controls, and the ability of the system to meet its objectives. The usability of the developed system was evaluated in terms of (a) attractiveness, (b) control, (c) efficiency, (d) helpfulness, and (e) learnability.

Table 13. Usability Evaluation Summary

ISSN 2599-462X (Print) www.psurj.org/jetc ISSN 2599-4638 (Online)

USABILITY	MEAN
Attractiveness	3.71
Control	3.75
Efficiency	3.69
Helpfulness	3.95
Learnability	3.85
OVERALL MEAN	**3.79**

Table 13 shows that in terms of the system's usability, the respondents reflected that the developed system was usable in attractiveness, control, efficiency, helpfulness, and learnability based on the result with the overall mean of 3.79 with corresponding interpretation as usable.

Table 14. Usability testing evaluation in terms of Attractiveness

Attractiveness	Mean	Descriptive Evaluation Rating	Descriptive Interpretation
1. This website has much that is of interest to me.	3.62	Strongly Agree	Usable
2. This website seems logical to me.	3.6	Strongly Agree	Usable
3. The pages on this website are very attractive.	3.7	Strongly Agree	Usable
4. I feel efficient when I'm using this website.	3.6	Strongly Agree	Usable
5. This website has great features.	4.03	Strongly Agree	Usable
Weighted Mean	**3.71**	**Strongly Agree**	**Usable**

Table 14 shows the results in evaluating the usability of the developed system in terms of attractiveness. The weighted mean is 3.71, with the descriptive evaluation rating of "Strongly Agree" and interpreted as "Usable".

Table 15. Usability testing evaluation in terms of Control

Control	Mean	Descriptive Evaluation Rating	Descriptive Interpretation
1. I get what I expect when I click on things on this website.	3.7	**Strongly Agree**	Usable
2. I feel in control when I'm using this website.	3.75	Strongly Agree	Usable
3. It is easy to move around in this website.	3.79	Strongly Agree	Usable
Weighted Mean	**3.75**	**Strongly Agree**	**Usable**

Table 15 shows the results in evaluating the usability of the developed system in terms of control. The weighted mean is 3.75, with the descriptive evaluation rating of "Strongly Agree" and interpreted as "Usable".

Table 16. Usability testing evaluation in terms of Efficiency

Efficiency	Mean	Descriptive Evaluation Rating	Descriptive Interpretation
1. This website is moderately fast.	3.93	Strongly Agree	Usable
2. I feel efficient when I'm using this website.	3.62	Strongly Agree	Usable
3. Using this website for the first time is easy.	3.67	Strongly Agree	Usable
4. I like using this website.	3.66	Strongly Agree	Usable
5. Using this website is worth of my time.	3.58	Strongly Agree	Usable
Weighted Mean	**3.69**	**Strongly Agree**	**Usable**

Table 16 shows the results in evaluating the usability of the developed system in terms of efficiency. The weighted mean is 3.69, with the descriptive evaluation rating of "Strongly Agree" and interpreted as "Usable".

Table 17. Usability testing evaluation in terms of Helpfulness

Helpfulness	Mean	Descriptive Evaluation Rating	Descriptive Interpretation
1. I can quickly find what I want on this website.	3.89	Strongly Agree	Usable
2. This website contained introductory explanations.	3.91	Strongly Agree	Usable
3. This website helps me find what I am looking for.	4.06	Strongly Agree	Usable
Weighted Mean	**3.95**	**Strongly Agree**	**Usable**

Table 17 shows the results in evaluating the usability of the developed system in terms of helpfulness. The weighted mean is 3.95, with the descriptive evaluation rating of "Strongly Agree" and interpreted as "Usable".

Table 18. Usability testing evaluation in terms of Learnability

Learnability	Mean	Descriptive Evaluation Rating	Descriptive Interpretation
1. Learning to find my way around this website is not a problem.	3.84	Strongly Agree	Usable
2. Everything on this website is easy to understand.	3.96	Strongly Agree	Usable
3. It is easy to tell if this website has what I want.	3.95	Strongly Agree	Usable
4. Remembering where I am on this website is easy.	3.65	Strongly Agree	Usable
Weighted Mean	**3.85**	**Strongly Agree**	**Usable**

Table 18 shows the results in evaluating the usability of the developed system in terms of learnability. The weighted mean is 3.85, with the descriptive evaluation rating of "Strongly Agree" and interpreted as "Usable".

CONCLUSION AND RECOMMENDATION

Conclusion

Based on the findings of the study, the following conclusions were drawn:

1. Based on the findings, it is sufficient to use the first and second discriminant functions.
2. The use of the RAD methodology is a great help in developing the system.
3. The model can only classify roughly 41.4% of HUMSS cases, an indication that the model may not be quite useful in classifying persons for the HUMSS strand.
4. WAMMI usability questionnaire is helpful in determining the usability of the developed system.
5. More data you have yields higher classification results.

Recommendation

Based on the findings and conclusions drawn, the researchers recommend the following for the enhancement of the system:

1. Adding more factors can be considered to have a better model.
2. Gather more data for a higher classification result.
3. Use the internet as a platform for deployment.
4. Add strand recommendation scope.

REFERENCES

[1] Ramey, K. (2013). What is Technology-Meaning of Technology and its Use. Retrieved April 3, 2019 from https://www.useoftechnology.com/what-is-technology/

[2] Hornbeck, D. (2017). "Federal role in education has a long history | The Conversation. Retrieved February 4, 2019 from http://theconversation.com/federal-role-in-education-has-a-long-history-74807

[3] PeggyBlair (2019). Abstract This study was conducted to know the similarities and differences of the Philippines and Australia's educational system. Retrieved February 4, 2019 from https://peggyblair.com/abstract-this-study-was-conducted-to-know-the-similarities-and-differences-of-the-philippines-and-australias-educational-system/

[4] Teach for the Philippines, Inc. (2013). President Aquino Signs K+12 Program Into Law. Retrieved February 4, 2019 from http://teachforthephilippines.org/our_press/president-aquino-signs-k12-into-law/

[5] Lucidchart Content Team (2018). 4 Phases of Rapid Application Development Methodology. Retrieved April 5, 2019 from https://www.lucidchart.com/blog/rapid-application-development-methodology