

A Theory of Personality that Focuses on Computer Engineering Course Among Students in National University

Dasmariñas

Jonerizza L. Gaunia*, Rolan B. Cagadas**, Kierven R. De Mesa***, Rylvie Joy G. Cagadas**

*(College of Education Arts and Sciences, National University, Philippines
Email: jlgaunia@gmail.com)

** (College of Engineering, National University, Philippines
Email : cagadas.scs@gmail.com)

*** (College of Engineering, National University, Philippines
Email :officialkiervendemesa@gmail.com)

**** (Career Specialist – SYSGEN RPO, Legazpi Village, Makati, Metro Manila, Philippines
Email : rylviejoy@gmail.com)

Abstract:

Deciding for a college course to take is quiet challenging for a student due to the many influencing factors or reasons in the environment that may affect his own preference. Holland code is an approach used in psychometrics to see human personality through traits that are arranged in six personality domains which are formed using factor analysis. These include the Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C) domains, collectively known as “RIASEC”. This study aims to test the reliability and construct validity of the RIASEC Holland instrument, which will later be applied to 42 second year college students of Computer Engineering in National University-Dasmariñas. The method used is confirmatory factor analysis. The results of this study indicate that the prediction of the reliability of the six personality domains using 42 second year college students of Computer Engineering in National University-Dasmariñas shows that code **CRA** (Conventional, Realistic, Artistic) are the top three interest’s areas in which 16 (38.10%) were female adolescents and 26 (61.90%) were male adolescents. This shows that the conformity of the empirical data with the code **CRA** (Conventional, Realistic, Artistic) are in the field of computer engineering, technology, arts, design, and good communication skills which is used as a theoretical concept is at a valid level. The Realistic and Conventional categories are the areas from their study of baccalaureate level colleges and universities, while Artistic work are most likely associated with college level employment or the highest level of cognitive ability.

Keywords —Computer Engineering, Personality Interest, Career Theory, RIASEC, Holland Codes.

I. INTRODUCTION

The Holland’s typological theory (Holland, 1997) specifies a theoretical connection between personality and environment that makes it possible to use the same RIASEC classification system for both. Many inventories and career assessment tools

use the typology to enable individuals to categorize their interests and personal characteristics in terms of combinations of the six types: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), or Conventional (C). According to Holland’s Theory of Career Choice, choosing work or an education program environment that matches,

or is similar to your personality, will most likely lead to success and satisfaction. These six types are briefly defined in relation to educational options in Table 1.

**Table 1:
 Holland Types Related to Educational Fields**

Types	Fields	Typical Traits
Realistic	computer engineering, forestry, surveying, poultry science, mining technology, computer installation, heating/AC technician, animal training, pharmacy technician, massage, meatcutter, carpentry, turf management, furniture design	mechanical and athletic abilities, likes to work outdoors and with tools and machines; might be described as conforming, frank, hardheaded, honest, humble, materialistic, natural, normal, persistent, practical, shy, thrifty
Investigative	biology, chemistry, physics, geology, anthropology, laboratory assistant, medical technician, social psychology, computer science, pharmacy, criminology, geography, general studies, liberal arts, psychology	math and science abilities, likes to work alone and to solve problems; might be described as analytical, complex, critical, curious, independent, intellectual, introverted, pessimistic, precise, rational
Artistic	composer,	artistic skills,

	music, stage director, dance, interior decoration, acting, writing, drawing, languages, painting, speech, philosophy, comparative literature, industrial design, art, landscape architecture, historic preservation, housing studies, journalism	enjoys creating original work, has a good imagination; may be described as complicated, disorderly, emotional, idealistic, imaginative, impulsive, independent, introspective, nonconforming, original
Social	education, speech therapy, counseling, clinical psychology, nursing, dental hygiene, sports medicine, ministry/theology, music therapy, special education, home health, food, and nutrition	likes to help, teach, and counsel people; may be described as cooperative, friendly, generous, helpful, idealistic, kind, responsible, sympathetic, tactful, understanding, warm
Enterprising	marketing, television production, business, sales, hospitality management, sports administration, urban planning, acting/directing, advertising, entrepreneurship	leadership and public speaking abilities, is interested in money and politics, likes to influence people; described as acquisitive, agreeable,

	p, educational administration, financial planning, pre- law, insurance, political science, real estate	ambitious, attention getting, domineering, energetic, extroverted, impulsive, optimistic, self-confident, sociable
Conventional	bookkeeping, accounting, office management, court reporting, desktop publishing, medical laboratory assisting, computer operator, hematology technology, business communications, industrial and engineering technology	clerical and math abilities, likes to work indoors and to organize things; described as conforming, careful, efficient, obedient, orderly, persistent, practical, thrifty, unimaginative

The number of options for education and training is very large. There is a lot of schools, colleges and universities offering associate, bachelors, and professional (postgraduate) degrees in the Philippines including school types, (e.g., public, private) with community affiliations and partnership of industries and organizations. According to RIASEC theory, if a person and an environment have the same or similar codes, e.g., an Investigative person in an Investigative environment, then the person will likely be satisfied and persist in that environment. Given extended discussion of these ideas in other literature, we will not focus on them here but concentrate our attention on the environmental aspects of RIASEC theory in education.

Holland's RIASEC theory provides a relatively simple, effective scheme for thinking of the computer engineering students in National University-Dasmariñas about the personalities, traits, interests, values, behaviors, attitudes, and their options choosing the educational program like computer engineering in National University-Dasmariñas. Conceptualizing and options in these six areas can improve personal and career decision making.

II. METHODOLOGY

Descriptive quantitative research was used to illustrate existing conditions so that these could be manipulated later as an outcome of the study since it inspects the connection among variables about developing the best strategic model in using the six personality types of RIASEC to assess educational program like computer engineering. The total population of the selected computer engineering students in National University-Dasmariñas were came from 42 samples.

Specifically, cluster and stratified random sampling was used in selecting the respondents by designations. Forty-two (42) samples of the total population were randomly selected, which composed 16 were female adolescents and 26 male adolescents, and school sector of private were 30 and in public were 12 respondents. Construct validity test obtained a fit model where the code **CRA** (Conventional, Realistic, Artistic) are in the field of computer engineering, technology, arts, design, and good communication skills which is used as a theoretical concept is at a valid level. Validity is the second most important element when testing and making a decision to use an assessment tool. Reliability concentrates on the consistency of evaluation results, while validity assesses usefulness. Reliability concentrates on the consistency of evaluation results, while validity assesses usefulness. All the evidence is capable of establishing the level of usefulness of the test with a particular individual and situation. Usually, cases of different types of validity are examined in detail, it is better to consider these as sources of evidence assessing the overall validity of the test.

The research instrument uses the Holland personality instrument which has been modified linguistically so that it is easily understood by the computer engineering students in National University-Dasmariñas, the number of questions on the instrument is 48 questions, each question requires a dislikes, slightly dislikes, neutral, slightly enjoy or enjoy, the details of the number of questions for each personality type which includes - Realistic (R), Investigative (I), Artistic (A), Social (S), and Enterprising (E). The respondents were asked to answer each item of career interest choice questions.

III. RESULTS AND DISCUSSIONS

This section includes the gathered data for the results of **IIP RIASEC Markers**. It shows the area of interest for each of the six (6) scales.

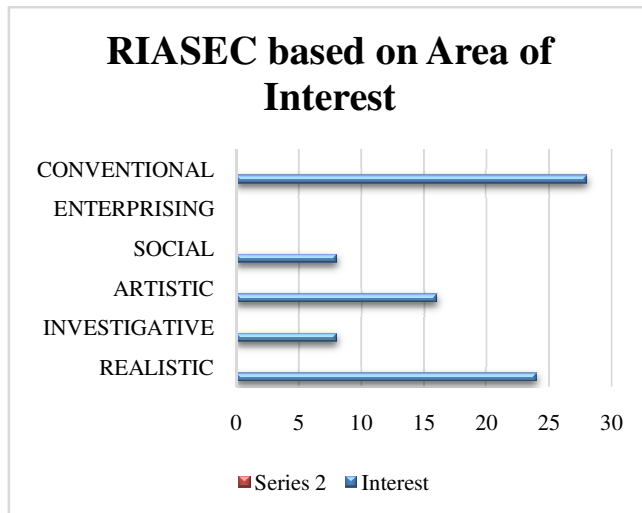


Figure 1: RIASEC results

Figure 1 shows a top three interest’s areas coming from 42 respondents are sometimes called their "Holland Code". This would make your code **CRA** (Conventional, Realistic, Artistic). The United States Department of Labor Employment and Training Administration maintains a database of occupations sorted by Holland Code. The list of occupations for the CRA are as follows:

C = Conventional

These people are very detail oriented, organized and like to work with data. Good college majors for Conventional people are Accounting, Court Reporting, Insurance, Administration, Medical Records, Banking and Data Processing. Also, their related pathways are the Health services, Business and Industrial and **Engineering Technology**. Organizing jobs involve managing data, information, and processes. Organizers like to work in structured environments to complete tasks with precision and accuracy.

R = Realistic

These people are often good at mechanical or athletic jobs. Good college majors for Realistic people are Agriculture, Health Assistant, **Computers**, Construction, Mechanic/Mechanist, **Engineering** and Food and Hospitality. Also, their related pathways are the Natural Resources, Health Services, Industrial and Engineering Technology and Arts and Communication. Building jobs involve the use of tools, machines, or physical skill. Builders like working with their hands and bodies, working with plants and animals, and working outdoors.

A = Artistic

These people like to work in unstructured situations where they can use their creativity. Good college majors for Artistic people are Communications, Cosmetology, Fine and Performing Arts, Photography, Radio and Television, Interior Design and Architecture. Also, their related pathways are the Public and Human Services and Arts and Communication. Creating jobs involve art, design, language, and self-expression. Creators like working in unstructured environments and producing something unique.

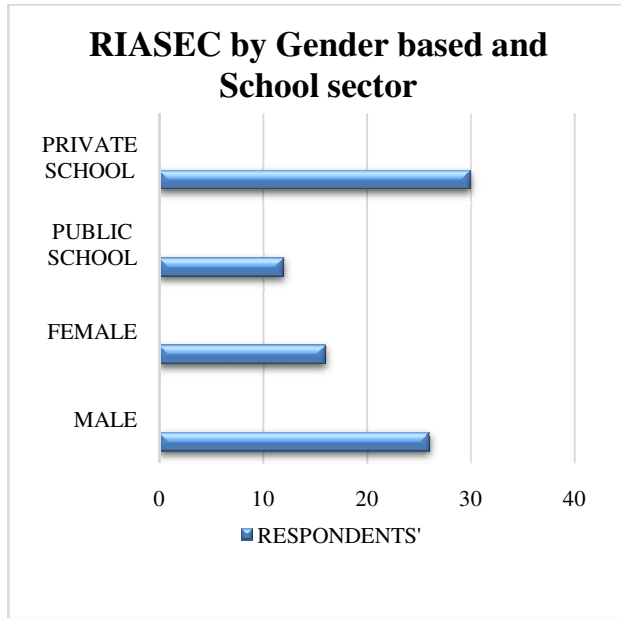


Figure 2: Gender based, and School Sector

Figure 2 shows the study focused on the effect of assessment methods on estimates of gender differences and school sector. As shown in the figure 2, the participants from National University-Dasmariñas were 42 college students, out of which 16 (38.10%) were female adolescents and male adolescents outnumbered to 26 (61.90%) as rated their interests in Holland-based activities and occupations using Likert-type scales, and they also completed a card sorting assessment of Holland interests using occupation-based items. While for school sector of private were 30 (71.43%) and in public were 12 (28.57%), therefore the data shows that there are more students from private school than the public school who is now studying at National University-Dasmariñas.

The choice of interest measure used in RIASEC may influence the extent to which gender affects the career decision-making process, which may be particularly important when exploring non traditional career choices for male and female.

Table 2:
 RIASEC by Gender based into six scales

RIASEC	MALE	PERCENTAGE (%)
REALISTIC	8	30.77
INVESTIGATIVE	2	7.69
ARTISTIC	4	15.38
SOCIAL	4	15.38
ENTERPRISING	0	0.00
CONVENTIONAL	8	30.77
TOTAL	26	61.90

RIASEC	FEMALE	PERCENTAGE (%)
REALISTIC	4	25.00
INVESTIGATIVE	2	12.50
ARTISTIC	4	25.00
SOCIAL	0	0.00
ENTERPRISING	0	0.00
CONVENTIONAL	6	37.50
TOTAL	16	38.10

RIASEC	TOTAL	PERCENTAGE (%)
REALISTIC	12	28.57
INVESTIGATIVE	4	9.52
ARTISTIC	8	19.05
SOCIAL	4	9.52
ENTERPRISING	0	0.00
CONVENTIONAL	14	33.33
TOTAL	42.00	100.00

Based on the above results, Table 2 shows we sought to identify which of the six scales were highly preferred by the respondents. With limited time constraints and resources, we looked into the top six scales in RIASEC. Our results depicted that out of 42 students, 28.57% (12) for REALISTIC which is 30.77% (8) male and 25% (4) female, 9.52% (4) for INVESTIGATIVE which is 7.69% (2) male and 12.5% (2) female, 19.05% (12) for ARTISTIC which is 15.38% (4) male and 25% (4) female, 9.52% (4) for SOCIAL which is 15.38% (4) male and 0.00% (0) female, 0.00% for ENTERPRISING which is 0.00% on both male and female, 33.33% (14) for

CONVENTIONAL which is 30.77% (8) male and 37.5% (6) female.

When we analyzed interest preferences gender wise, results depicted that higher percentage of female adolescents in six scales of RIASEC is the Conventional, and their least was both Social & Enterprising, for male adolescents' higher percentage in six scales of RIASEC are both Realistic & Conventional, and their least was the Enterprising. The most preferred of female in six scales is the Conventional and for male are both Realistic & Conventional.

IV. CONCLUSIONS AND RECOMMENDATIONS

Holland's study on career preferences is a helpful tool to assist the student in choosing career choices by exploring on their personality, interest, skills, and values. Based on the result, there is a congruence between the student's personality and career choices. Students who chose Computer Engineering as their course indicated that it matches their personality and environment complementary to their abilities. This indicates that person-fit environment and better self-concept is more likely to be successful in their career path.

For the future researchers, it is recommended that there should be career intervention for those who are still undecided with their course. This is in collaboration with the school's Guidance Counselor and the school administration to further provide information to the students. As for the future researchers, it is recommended to also conduct an interview with the respondents to gather more information and supporting details that could help the research more helpful to the academic community.

REFERENCES

[1] Ahmed, Samiah; Ahmed, Alia; Salahuddin, Taseer (2019) : How RIASEC personality traits crystallizes occupational preferences among adolescents: Match or mismatch, Pakistan Journal of Commerce and Social Sciences (PJCSS), ISSN 2309-8619, Johar Education Society, Pakistan (JESPK), Lahore, Vol. 13, Iss. 4, pp. 976-996, from <https://www.econstor.eu/bitstream/10419/214261/1/4371.pdf>.
[2] ElfiTasrif (2022). RIASEC Holland's reliability and validity on personality of informatics engineering education students in higher education. *JPP1 (Jurnal Penelitian Pendidikan Indonesia)* ISSN: 2502-

8103, from https://pdfs.semanticscholar.org/e794/4c06d1cf7549e80152f7c8c69c6a02f690a5.pdf?_gl=1*9wpzd1*_ga*NzAwMzc0MTk3LjE2ODU2MTgwMDc.*_ga_H7P4ZT52H5*MTY4NTYxODAwNy4xLjAuMTY4NTYxODAwOC41OS4wLjA.
[3] Rocconi, Louis M. ; Liu, Xiqian; Pike, Gary (2020).The impact of person-environment fit on grades, perceived gains, and satisfaction: an application of Holland's theory. *Springer Higher Education* (Vol. 80, Issue 5) <http://dx.doi.org.dlsu.idm.oclc.org/10.1007/s10734-020-00519-0>.
[4] Einarsdottir, S., & Rounk, J. (2020). A Quantitative Review of Gender Differences in Vocational Interests in Iceland: Pervasive and Persistent. *Nordic Journal of Transitions, Careers and Guidance*, 1(1), pp. 10–26. DOI: <https://doi.org/10.16993/njtcg.29>.
[5] Ludwikowski, W.M.A., Schechinger H.A., Armstrong, P.I. (2019), Are Interest Assessments Propagating Gender Differences in Occupations?, Vol. 28, Issue 1, [Online]. doi: <https://doi.org/10.1177/1069072718821600>.
[6] Batista, J.S., Gondim, S.M.G. (2022), Personality and Person-Work Environment Fit: A Study Based on the RIASEC Model, *Int. J. Environ. Res. Public Health* 2023, 20(1), 719: <https://doi.org/10.3390/ijerph20010719>.
[7] Laura G. Maldonado, Kyungin Kim, Mark D. Threeton (2020), An Application of Holland's Theory to Career Interests and Selected Careers of Automotive Technology Students, *Journal of Career and Technical Education* 2020, Vol. 35, No. 1. from <https://files.eric.ed.gov/fulltext/EJ1327135.pdf>.
[8] Bernhard Ertl, Florian G. Hartmann (2019), The Interest Profiles and Interest Congruence of Male and Female Students in STEM and Non-STEM Fields, *Front Psychol, Sec. Educational Psychology*, vol. 10 – 2019, from <https://doi.org/10.3389/fpsyg.2019.00897>.
[9] Cangayao, L., Caballes, D. (2023), Perception and Propensities of Senior High School (SHS) students towards teaching profession, Basis for recommendations in promoting education Majorship for all SHS Strands, from <http://dx.doi.org/10.30574/wjarr.2023.17.2.0179>.
[10] YuliaAyriza, AgusTriyanto, Farida AgusSetiawati, Nanang Erma Gunawan (2020), Exploring Children's Career Interests and Knowledge Based on Holland's Theory, *International Journal of Instruction*, e-ISSN: 1308-1470, vol.13, no.4, p-ISSN: 1694-609X pp. 643-662, from https://www.e-iji.net/dosyalar/iji_2020_4_40.pdf.
[11] Magdadaro, L. R. P. (2020). Passion- based vs. Practical- based Preference of Strand in Senior High School. *International Journal of Academic Research in Business and Social Sciences*, 10(3), 144–159 from <http://dx.doi.org/10.6007/IJARBS/v10-i3/7031>.
[12] Usslepp, N., Hubner, N., Stoll, G., Spengler, M., Trautwein, U., Nagengast, B. (2020), RIASEC interests and the Big Five personality traits matter for life success—But do they already matter for educational track choices?. *Journal of Personality published by Wiley Periodicals LLC.*, 2020;88:1007–1024, from <https://onlinelibrary.wiley.com/doi/pdf/10.1111/jopy.12547>
[13] Ja-Hwung Su, Yi-Wen Liao, Jia-Zhen Xu, Yu-Wei Zhao (2021), A Personality-Driven Recommender System for Cross-Domain Learning Based on Holland Code Assessments, from <https://doi.org/10.3390/su13073936>.
[14] Pabitra Kumar Das, Jayant Kumar Panigrahi, Iswar Chandra Naik, Biswajit Das (2019), Impact Of ICT On Career Aspiration Of Students Belonging To Indigenous Communities And Most Backward Sections Of India: An Empirical Study Of Tribal Development Board Schools Of Odisha, from <http://www.ijstr.org/final-print/dec2019/Impact-Of-Ict-On-Career-Aspiration-Of-Students-Belonging-To-Indigenous-Communities-And-Most-Backward-Sections-Of-India-An-Empirical-Study-Of-Tribal-Development-Board-Schools-Of-Odisha.pdf>.
[15] McKenzie, S., Bennett, D. (2022), Understanding the career interests of Information Technology (IT) students: a focus on choice of major and career aspirations, *EduInfTechnol* 27, 12839–12853 (2022). <https://doi.org/10.1007/s10639-022-11141-1>