



**UNIVERSITY OF GUAM
UNIBETSEDAT GUAHAN
BOARD OF REGENTS**

RESOLUTION NO. 18-18

**RELATIVE TO APPROVING THE PROCESS FOR ESTABLISHING
THE CAREER PRIORITY LISTING FOR THE
JESUS U. TORRES PROFESSIONAL/TECHNICAL AWARD**

WHEREAS, the governance and control of the University of Guam is vested in the Board of Regents of the University of Guam; and,

WHEREAS, the provisions of Title 17 of the Guam Code Annotated, Chapter 28, governing the Student Financial Assistance Program and the Student Financial Assistance Fund, state that the Program and Fund shall be administered and granted by the Board of Regents; and

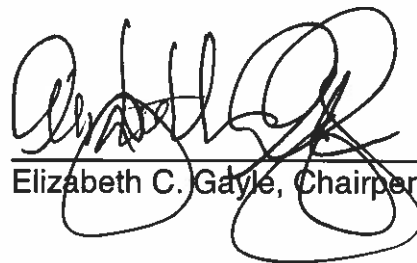
WHEREAS, in accordance with applicable provisions, the Student Affairs, Scholarship, Alumni Relations & Honorary Degree Committee held a public hearing on April 16, 2018 to address the proposed process for establishing the Career Priority Listing for the Jesus U. Torres Professional/Technical Award; and,

WHEREAS, the Senior Vice President for Academic and Student Affairs, the Dean of Enrollment Management and Student Success, and the Director of Financial Aid have all certified that the proposed process for establishing the Career Priority Listing for the Jesus U. Torres Professional/Technical Award, complies with appropriate Public Laws and the Board of Regents' Rules and Regulations; and,

WHEREAS, the Student Affairs, Scholarship, Alumni Relations, & Honorary Degree Committee recommends to the Board, approval of the proposed process for establishing the Career Priority Listing for the Jesus U. Torres Professional/Technical Award.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Regents hereby approves the proposed process for establishing the Career Priority Listing for the Jesus U. Torres Professional/Technical Award.

Adopted this 26th day of April 2018.



Elizabeth C. Gayle, Chairperson

ATTESTED:



Dr. Robert A. Underwood, Executive Secretary

Student Financial Aid
Rationalizing the basis for professional technical awards
PA501 University of Guam class project, Fall 2017
Applied Research Methods

Background & Introduction

The University of Guam administers a variety of student financial assistance that are either authorized and funded by law (Section 28102, 17 GCA) or institutionally established by the Board of Regents, University of Guam. The focus of this class project, however, addresses the Jesus U. Torres Professional and Technical awards for graduate studies and the manner in which qualified applicants are selected to receive these awards.

Goal & Objectives

The goal of this study is to create an impartial, non-partisan, and even handed administration of the program by using objective, appropriate, and market sensitive criteria reflective of equitable policy intentions.

Key Objectives of this study are:

1. Ascertaining emerging factors that impact future supply and demand for human talent;
2. Identifying Guam's future need for critical positions that impact Guam's quality of life, health, safety, education, and infrastructure; and
3. Establishing an impartial and market sensitive approach in administering the Jesus U. Torres Professional Technical financial assistance program consistent with the prioritization of awards as required by law (Section 28111, 17 GCA).

Methodology

In setting up an objective and systematic process of selecting scholarship recipients, it was helpful to:

1. Review the global landscape to understand emerging trends in an increasingly disruptive business model environment;
2. Ascertain Guam's (USA) positioning with respect to future trends in the world supply and demand for talent;
3. Conduct employer surveys; and
4. Focus on post graduate studies

The study offers a macro perspective of the talent landscape confronting the island's need for post graduate degrees and (or) professionally certified job occupations. Findings and observations relied heavily on descriptive analysis and secondary data obtained and acknowledged in the literature cited. The extent, definition, and level of aggregated data were not uniform so that the information presented in the study were driven by time and resource convenience. The employer survey taken (Appendix 1), and an interview with the student financial aid director, were the only sources of primary (but limited) data.

In reviewing the talent landscape, the study took into account current and future occupations in demand, focused on post graduate studies, and adjusted the scope to a scale more realistic for Guam and the \$520,000 annual budget allocation for the program. Essentially, there are about 20 or so new recipients each year added to the program, net of attrition and the availability of lapsed funds.

The scoring matrix proposed takes into account difficult to fill positions, global demand, and impact to the community using Maslow's hierarchy as a differentiating factor in setting funding priority.

Island Profile

Guam is an American community in East Asia. The island's \$5.7 billion economy is service sector driven, heavily impacted by tourism and substantial federal spending for defense and social programs. The private sector accounts for 76% of the island's 63,250 jobs, the government of Guam 18%, and the U.S. government 6% (Guam BLS 2017). At 37%, the island's ethnic composition is predominately Chamorro, followed by 26% Filipino, 7%

Caucasian (Guam Wikipedia), and the rest an eclectic mix from countries in Asia, Europe, and the Americas.

Guam’s current talent landscape was sampled using the targeted sectors of:

1. SHRM annual meeting in October 2017
2. Private employment agencies
3. Selected employers from the top 50 companies listed in the Deloitte & Touche ASC Trust Corporation 2016 top companies in Micronesia. (Guam Business Magazine);
4. Government departments (U.S. and Guam)

A Total of 31 survey respondents representing 8,408 employees provided information on various jobs, hiring difficulties by occupation, and reasons for difficulty, etc. Of the respondents, 78% work in the private sector, 19% government of Guam, and 3% U.S. government (Appendix 1).

Across all industries and employers surveyed, the most difficult occupations to fill were:

Accounting	49.4%
Information Technology	27.8%
Engineering	27.8%
Medical	16.7%

Positions of specific relevance to the Jesus U. Torres Professional Technical Scholarship program were those in the “professional” category. The majority of employers surveyed reported vacancies to fill.

For all job vacancies, 65% of respondents claimed the same level of difficulty in hiring as last year, but 23% reported having more difficulty than last year. Reasons given for hiring difficulty ranged from lack of education (31%) or certification and training to lack of experience (24%) and technical skills (21%). Other reasons include not accepting job offer, criminal record, and failed drug test. A complete summary of survey results is appended to this report (Appendix B).

The Emerging Talent Landscape

Competition for critically needed professional and technical talent is a reality that will continue to confront Guam because the island is not immune to the impact of global socioeconomic dislocations, disruptive technologies, and the ongoing transformation of the world's labor supply and demand. Clearly, the changing nature of jobs and the workplace is a phenomenon that has been experienced throughout modern human history.

The industrial revolution was a process that changed the economy from an agrarian, handcrafting, labor intensive work environment to one dominated by industry and machine manufacturing. The term "Industrial revolution" was used to describe Britain's economic development in the mid 18th – 19th centuries, and was largely driven by technological innovation in steel, coal energy, the steam engine, electricity, internal combustion engine, textile power looms and factory mass productions (Encyclopedia Britannica 2017).

The industrial revolution essentially economized use of human labor, increased productivity, and generated the demand for new products and services throughout the 19th and 20th centuries. This resulted in higher incomes and employment for displaced workers. In Britain, real incomes barely doubled on the eve of this revolution between the country's common era (CE) and 1570 (Economist 2014). However incomes tripled from 1570 to 1875, and then tripled yet again from 1875 to 1975. In essence, industrialization did not end up in eliminating human labor. It created employment opportunities that absorbed the 20th century's exploding population (Ibid).

In a more recent report (World Economic Forum 2016), drivers of change in the work environment were elaborated and a case made for the "Fourth Industrial Revolution." Dunne (2016) alluded to this rapid pace of change in the job market. By 2020, office and administrative functions, along with manufacturing and production roles are projected to decline dramatically. Conversely, business and other operational roles associated with computers and mathematical functions are expected to rise steeply. Technological, demographic, and socioeconomic drivers of this changing landscape are summarized in Table 1.

**Table 1:
Technological, Demographic, & Socioeconomic Drivers Times frame Impacting
Industries and Business Models (WORLD ECONOMIC FORUM 2016)**

Impact Already Felt	2015-2017	2018-2020
Computing Power & Big Data Advances	The internet of things	Advanced Robotics & Autonomous Transport
Mobile internet & Cloud Technology	Advanced manufacturing & 3D printing	Artificial Intelligence & Mechanical Learning
Crowd sourcing & Peer to Peer Platforms	New energy supplies & technologies	Advanced Material, Biotechnology & Genomics
Increasing Geopolitical Validity		
Young Demographics & Expanding middle class in emerging markets		
Rapid Urbanization		
Changing and flexible work arrangements		

Globally, only China, Argentina, and Mexico show trends in their labor supply and demand to be in balance by 2021. Talent shortage is generally worse in the industrialized world with the U.S. (includes Guam) clustered with other countries like South Korea, Canada, and the UK in a scale showing the strongest deficit trend (Cooper 2012).

Occupational Trends

The preponderance of job occupations in the foreseeable future center around STEM (science, technology, engineering, and mathematics), health care, and a sundry of business related specialties. In 2015, nearly 8.6 million or 6.2% of the U.S. employment were STEM related (Table 2). About 45% of these jobs represent computer occupations and 19% engineers (Fayer, Lacey, and Watson 2017). STEM occupations grew by 10.5% between May 2009 and May 2015, compared to the 5.2% net growth of non-STEM occupations (Ibid). The U.S. Bureau of Labor and Statistics project occupational growth rates for mathematical and computer sciences at 28.2% and 12.5%, respectively, by 2024.

Table 2:

Stem Occupations (Listed in order of Job Numbers)

Computer Occupations

Engineers

Drafters & Engineering or Mapping Technicians

Stem Related Management

Stem Related Sales

Life and Physical Science Technicians

Life Scientists

Physical Scientists

Stem Related Post-Secondary Teachers

Architects, Surveyors, Cartographers

Mathematical Science Occupations

Despite these optimistic trends, however, it is important to balance these popular perceptions with actual realities in the employment market today. Harvard professor Michael Teitelbaum (2014) writes that the United States produces far more science and engineering graduates each year than there are jobs opening for them. His research found that concerns over widespread shortages of scientists and engineers were not supported by all available evidence. Similar claims in the past, he writes, were politically successful, but resulted in a series of booms and busts that made careers in these fields increasingly unattractive. Finally, he makes the point that signs of severe shortages in the U.S. workforce are structural in origin not simply cured by additional funding (an issue not lost in this study for financial aid).

Strong business and educational groups tend to lobby for nice sounding STEM supporting policies of benefit to them and paid for by public funding and unfortunate individuals who pay for credentials apt to become unmarketable. Indeed, there are some reports suggesting that there are more STEM workers than there are suitable jobs for them (Charette 2013.). Of the 7.6 million STEM workers today (U.S. Commerce Dept. Figure), only 3.3 million have STEM degrees, suggesting that the U.S. Labor force is more flexible than alarmists would have the public believe. Not only do many STEM educated workers have jobs that do not call for their degrees, but many work in STEM jobs who do not have the “right” degrees for them (Ibid).

Future Occupational Demand

By nature, forecasting is not an exact science because it is an attempt to quantify specific data in an environment of uncertainty. Given the study’s time and resource limitations, the estimated number of post graduate occupations is, at best, an educated guess based on :

1. Population extrapolations (figure 1);
2. Information gleaned from employer interviews of the largest companies on island and;
3. Public source data (Table 3).

Table 3 lists 20 occupations requiring post graduate degrees that the U.S. Bureau of Labor Statistics has identified will have the most jobs openings by 2026. In reviewing these 20 fields of study, it is instinctive to note that the University of Guam is producing graduates in these same career fields at the baccalaureate level, and is providing an enriched pool of graduates eligible to apply for post graduate studies.

Table 3.

Most New Jobs with Graduate Degrees Projected by 2026 (Source: U.S. BLS Oct 17)

	Occupation	Additional Jobs	Median Wages
1.	Lawyers	74,800	\$118,160
2.	Health Specialties, Post-Secondary Teachers	60,500	\$99,360
3.	Physical Therapists	60,000	\$85,400
4.	Nurse Practitioners	56,000	\$100,910
5.	Physicians & Surgeons	49,600	\$206,920
6.	Physician Assistants	39,700	\$101,480
7.	Education Counselors (Vocational Guidance)	33,000	\$54,560
8.	Health Care Social Workers	32,700	\$53,760
9.	Mental Health Counselors	31,200	\$42,840
10.	Occupational Therapists	27,700	\$81,910
11.	Speech – Language Pathologists	25,400	\$74,680
12.	Dentists	23,200	\$153,900
13.	Family & General Practitioners	22,200	\$190,490
14.	Mental & Substance Abuse Social Workers	22,200	\$42,700
15.	Post-Secondary Teachers	22,200	\$64,400

16.	Clinical & School Psychologists	20,900	\$73,270
17.	Education Administrators Elementary & Secondary	19,700	\$92,510
18.	Business Teachers, Post-Secondary	18,900	\$77,490
19.	Education Administrators, Post-Secondary	18,000	\$90,760
20.	Pharmacists	17,600	\$122,230

The U.S. and Guam populations continue to grow unabated. Another factor which may increase Guam’s population is the anticipated military build-up. As the population continues to grow, so does the need for qualified health care givers. The need to educate, train, and retain qualified health care professionals has never been so imperative. The expansion of healthcare accessibility coupled with advancements in technology and pharmaceuticals due to increased research, has contributed to not just an increase in the elderly population, but to those patients who would’ve been considered to have a permanent disability or a terminal diagnosis.

According to Robert Alemian’s online article for MD Magazine, “By 2025, the U.S. will be short 90,000 physicians and 500,000 nurses. The Bureau of Labor Statistics projects that between 2014 and 2022 there will be over one million job openings for nurses because of growth and the need for replacements.’ Additionally, a report released by Shumaker Clinical Partners stated the shortage of nurses is multi-faceted which includes the following factors: “55%” of the nursing workforce is over “50-years-old”; shortage of nursing faculty (due to age and low salaries) has contributed to turning away potential nursing school candidates; and due to imbalance of health care costs and hospital cost saving measures – nurses have increased workloads contributing to long hours and eventually fatigue.

Furthermore, the demand for not only routine health care but also specialized health care is increased. An article released by The Balance (2017) identified multiple occupations which require graduate degrees: industrial-organizational psychologists; genetic counselor; physician assistant; postsecondary health specialties teacher (laboratory technicians, dentistry & veterinary services); marriage and family therapists; orthotist and prosthetist; postsecondary nursing instructors; nurse

practitioners; physical therapists; and audiologists. These occupations strengthen the need to develop a workforce which will provide for the physical and mental health well-being for of Guam's growing population.

Hiring physicians and post graduates in health care and social work are likely to be a continuing challenge, although perhaps more acutely in the case of medical specialties. When combined with retirement age attrition, Guam's aging and growing population are likely to exacerbate this challenge.

Counter balancing this projected need, however, are certain trends that are likely to impact the future of certain healthcare and medical occupations on the island. These include three strategic trends worth nothing:

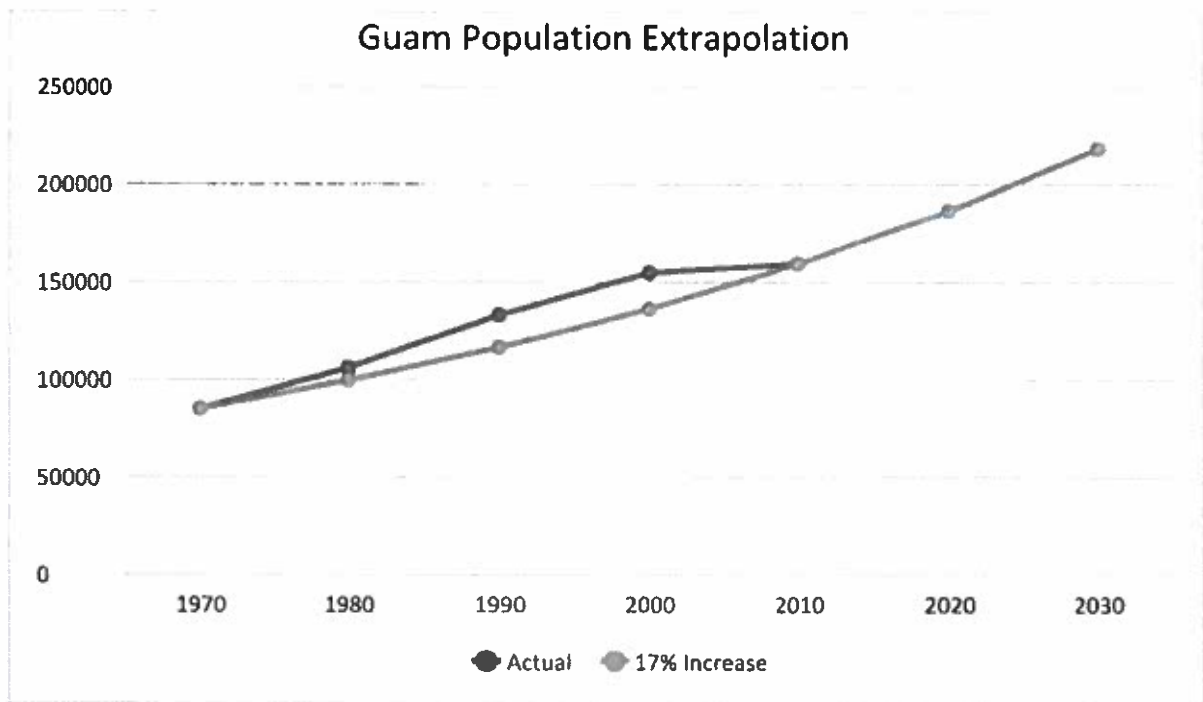
1. The disruptive technologies of robotics, artificial intelligence (AI) and genomics will eliminate certain healthcare and medical occupations. However, the good news is that these same technologies will be creating new jobs yet to be defund.
2. There will be a great demand for data scientists and deep learning experts in medicine, healthcare, and other fields. AI and other based algorithms will be needed to assist with medical decisions, how healthcare can be better organized, and how health insurance is actuarially determined.
3. Surgical robots, already in use today, will change even more on how surgeons operate. According to the medical futurist institute (2017), sales of surgical robotics will nearly double to \$6.4 billion by 2020, and there will be high demand for surgical robotics and telesurgical specialists.

By 2020, chronic conditions such as cancer and diabetes will be diagnosed quickly, using cognitive systems and real time 3D images (Das, 2016). AI systems are expected to provide physicians clinically relevant, real time, quality information. This means that specific skills and qualifications for technology centric careers in medicine and healthcare are likely to grow in the future, diversify in line with expanding cognitive developments such as non-invasive liquid biopsy, immunotherapy, and health data analytics. Indeed, the AI market for healthcare applications is expected to grow at a 42% compounded annual growth rate until 2021 with AI

systems being implemented in 90% of U.S. and 60% of global hospitals and insurance companies by 2025 (Ibid).

Social workers are an important part of the island’s wellbeing. The benefit of having a social worker with a master’s degree is their practice in clinical settings and the ability to diagnose and treat behavioral, mental, emotional, and substance abuse issues.

The 2015 health center data for Guam revealed 5.15 physicians (full-time employees) had 15,961 clinical visits. Nurse practitioners, midwives, and physician assistants showed 2.6 (FTE’s) conducting 9,503 clinic visits.



An emerging need gaining traction is the certification and training of Project Management Professionals (PMP’s). The increasingly global economy has become more “project oriented” than had been the case within industries that have not traditionally required this specialty, such as in health care, publishing, and professional services (Project Management Institute 2017). Implementing strategic initiatives, driving change, and delivering innovation are among the growing need for PMP’s. Uptick in demand for this practice will only intensify as the economies of India, China, and the emerging markets of ASEAN and BRIC countries expand.

According to the Project Management Institute (2017), there will be 2.1 million fewer PMP's in the U.S. by 2027 than there are today.

The legal profession is an entirely different matter and filled with mixed signals. In 2015, for instance, only 60% of law school graduates 10 months after graduation had found employment requiring the bar examination (Harper 2015). An ABA study looked at three for-profit law schools funded by an equity consortium (Infilaw) and found that 39.9% of Arizona summit, 34.5% of Florida Coastal, and 34.1% of Charlotte law school graduates did not find jobs requiring their degrees. Interestingly, despite languishing demand for lawyers between 2011 and 2014, graduating classes almost doubled from these three schools combined (Ibid). The ratio of law graduates to jobs in 2015 in the U.S. indicated an average 2.5 surplus

On the other hand, the 266 lawyers on Guam (ABA 2017) is far below the U.S. per capital average. The island's 16.3 lawyers per 10,000 residents is 60% below the national average of 40.3 (Leichter 2017), but comes closest to South Carolina's 20.6 for a state population (4.9 million) more than 30 times that of Guam.

The future outlook for lawyers also bears reason for pause in the context of AI. The legal profession is basically labor intensive and tradition bound in the review of litigation, contracts, and due diligence issues, as well as identifying potential frauds and misconduct. Much of these tasks are currently performed by people who are likely to be replaced by AI and how legal work gets done. The quickening pace of technology, shifts in workforce demographics and the need to offer clients more value for money are transforming this employment sector in a way that will automate 39% of jobs by 2020 (Deloitte, 2016). On the other hand, AI advocates believe that this technology will drive down costs and make legal services more affordable to greater numbers of people (Mangan, 2017).

The law firm Bakerhostetler, a large New York law firm with almost a thousand lawyers in more than a dozen cities coast to coast, hired its first "AI lawyer" for the firm's bankruptcy practice last year (Liberatore, 2016). Ross, the world's first AI attorney is built on Watson, IBM's cognitive computer. The Ross platform is asked questions in natural lawyer language and answers back with relevant, evidence based material after reading through the law, gathers evidence, draws inferences and cross checks relevant cases. It also keeps track of developments

in the legal system, especially if pertinent to attorney's specific case. Ross is capable of reading through an entire body of law, returning cited answers and relevant legislature history, case law, and secondary sources very quickly. It also monitors the law 24/7 and provides notification on new court decisions that can affect the firm's cases.

In reviewing the future occupations to be financially supported by J. U. Torres Protech Scholarships, three key assumptions were made:

1. Degree field will be needed in the future
2. Degree field is needed on Guam
3. Degree field sought is either a master's or PhD degree.

Top occupations were then identified from the eight sources listed below to classify categories that are applicable to the island's needs, and qualify for the J. U. Torres Scholarship.

- | | |
|-----------------|-------------------------------------|
| 1. SHRM | Top 10 Job Occupations 2016 |
| 2. Career Cast | Top 9 Job Occupations 2017 |
| 3. Fast Company | Top 10 Jobs 2015 |
| 4. Forbes | Top 10 Jobs 2016 |
| 5. Forbes | Top 10 Hardest Jobs to Fill 2017 |
| 6. J. B. Solis | Top 10 Jobs in the Philippines 2017 |
| 7. Fast Company | Future Jobs by 2030 |
| 8. U.S. BLS | Top 30 Jobs by 2020 |

Major fields dominating these sources were:

1. Medical – Physician assistants, nurse practitioners, physical therapists, health specialists
2. STEM – Information security analyst, software engineer, computer systems analyst, engineering
3. Business – Operations research, project management, financial analysts/accountants

Jobs anticipated, but not yet in existence, were reviewed. These included body part maker, nano-medic (subatomic treatments), memory augmentation surgeons, space pilots, and climate change specialists, to name a few. Only genetically modified agriculture and aquaculture (perhaps also vertical agriculture) would seem to have some potential for Guam post graduate studies.

By 2027, Guam will need 438 post graduates in varying fields (Table 4). These numbers were based on a very simplistic and proportional extrapolation based on population between the U.S. and Guam populations. Although different in scale and occupational diversity, this crude comparison was made only to illustrate the relative magnitude of Guam’s needs in varying professions.

Table 4.

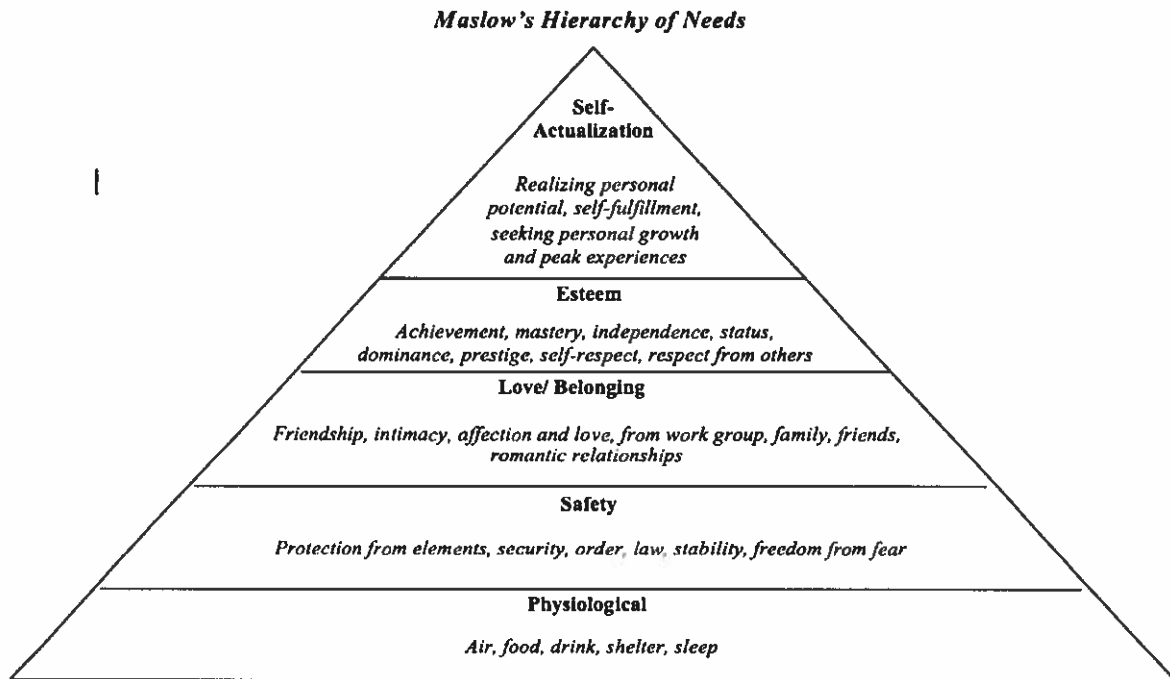
Estimated Post Graduates Needed in Selected Fields

Occupation		USA 326 Million pop.	Guam 163,000 pop.
1.	STEM Shortage (1% of Econ) Adjusted	8.6 million	4,303 43
2.	Project Management Shortage (1% of Econ) Adjusted	2.1 million	1,059 10
3.	Physicians shortage (population driven)	90,000	48
4.	Social Worker Shortage (population driven)	195,000	98
5.	Lawyers (per 100,00 population) Additional need (BLS +9%)	40.3	16.3 24

Jesus U. Torres Professional/Technical Award Criteria for Selection

The following criterion is created to evaluate participants for selection for the Jesus U. Torres Professional/ Technical Award. The rubric conditions focus on three categories: difficulty to fill position, local/global demand, and impact on community. The positions can be ranked based on a scale from one to four, where four is recognized as highest priority and one being lowest priority, for each category. Occupations of interest are categorized based on Maslow’s Hierarchy of Needs. Each level of need is given a particular set of points, such as occupations which are classified under the need of self-actualization earn a 1 and occupations in the need of physiological receive a 3. The level of priority score will then be multiplied to the rubric score.

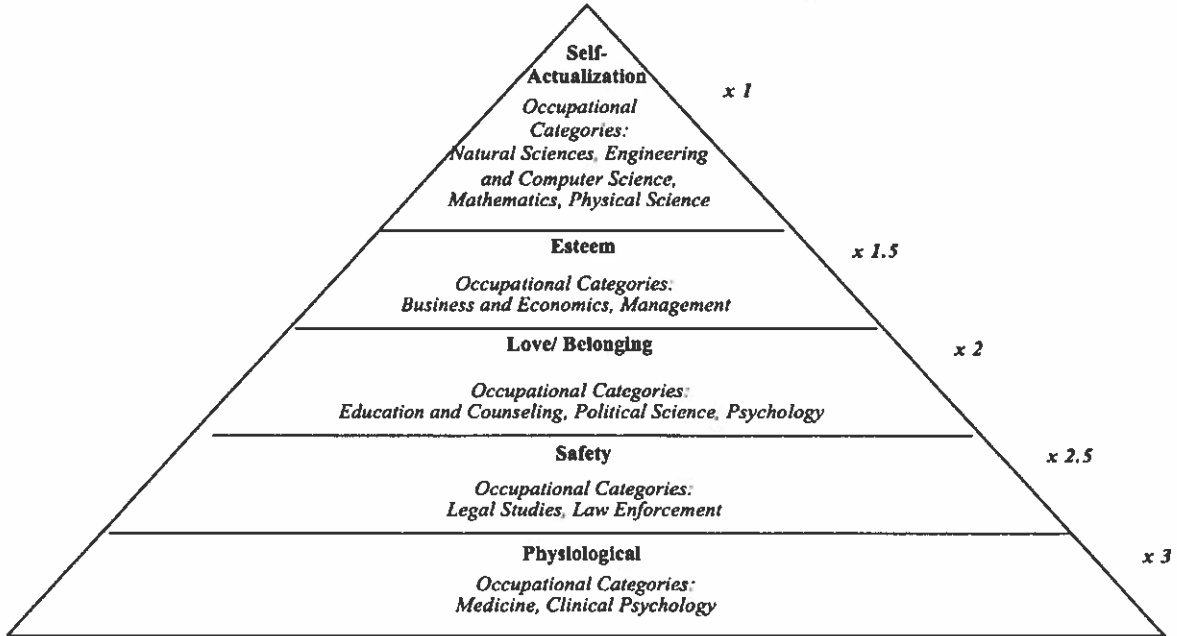
The highest possible score an applicant can achieve is a 36, given the occupational categories is classified under Maslow's Hierarchy of Physiological Need and is recognized as highly qualified on the rubric.



The rubric and hierarchy of needs matrix may be utilized as followed. In the case of three different occupations: Cardiologist, Civil Engineer and Social Worker. A Cardiologist may receive a 4 in each category, which totals to a score of 12 points. The Civil Engineer will receive 1 point in Difficulty to Fill Position, 1 point in Local/Global Demand and 2 points for Impact on Community, which results in a score of 4. In addition, the Social Worker received 1 point in Difficulty to Fulfill, 2 points in Local/Global Demand and 1 point for Impact in Community, which concludes to a score of 4 points. In the case of a tie, for instance between civil engineer and social worker, the Maslow's Hierarchy of Needs matrix will be multiplied to the rubric score and determine the occupation of higher priority. The hierarchy of need as well as the rubric will identify significant and needed occupations for the island of Guam.

**Jesus U. Torres Professional/ Technical Award
Criteria for Selection**

Maslow's Hierarchy of Needs



Category	Highest Priority - 4	High Priority - 3	Low Priority - 2	Lowest Priority - 1	Score
Difficulty to Fill Position	The position has been vacant for more than five years and less than five people hold this position.	The position has been vacant for five years and less than ten people hold this position.	The position has been vacant for three or more years and less than fifteen people hold this position.	The position has been vacant for a year and less than 20 people hold this position.	
Local/ Global Demand	The position takes on multiple responsibilities and is highly recommended to meet the needs and wants of the community.	The position is up and coming and supports new innovations.	The position focuses on meeting the needs of a specific group of people.	The position benefits the local and global demand, but is not high needs for employment.	
Impact on Community	The position provides a cumulative effect on the community. Viewed in the context of the total effect of other past, present, and reasonable foreseeable future actions.	The position provides a direct effect on the community, focusing on the present and future.	The position provides an indirect effect. These effects change land use patterns, population density or growth rate.	The position only affects a particular group of individuals and not as a whole.	
				Total x Need	

Appendix I

Survey of Critical Professional Positions for Guam
School of Business and Public Administration
University of Guam, Mangilao, GU 96923

Dear Participant,

You are invited to participate in a voluntary survey to determine critical professional positions needed for Guam in the next 5-10 years with the expectation of a growing and aging population. We are defining critical position as those that are vital to the quality of life and health, safety, education and infrastructure of our island. This survey is part of a graduate class practicum collaboration with the UOG Public Policy Center and Guam Public Law 31-237. BY completing this survey, you have read and understood the purpose of the survey and have agreed to participate voluntarily.

1. What type of industry are you working for right now?
 - Private Sector (Job nature: _____)
 - Government of Guam
 - U.S. Government

2. How many employees (part time and full time) are in your organization? _____

3. Do you have professional vacancies for any positions in your organization at this time? Yes/No

4. How many different professional positions are you hiring? Please list the most difficult positions to fill (top 5).

5. How many job openings are there for each of these difficult positions?

6. Approximately how many professional positions has your organization tried to fill in the last 12 months?

7. Has your organization had difficulty filling any positions in the past 12 months? Yes / No
If yes, please specify what occupation or job title.

8. What is your experience filling positions this year?
 - More difficult than last year
 - About the same as last year
 - Easier than last year

N/A

9. On a scale of 1-5, 1 being least important and 5 being extremely important, how important is it to fill the positions listed above (question 4).

10. Why were these positions difficult to fill?

- Applicants lacked necessary education level, certification, or training.
- Applicants lacked technical or occupational-based skills.
- Applicants lacked soft skills such as communication, teamwork, critical thinking.
- Applicants lacked relevant work experience.
- Applicants had criminal records.
- Applicants failed drug screenings.
- Applicants were unwilling to accept offered pay/compensation.

11. Do you think there are other job opportunities not currently listed that the company may need in the future? Yes / No If yes, please specify by occupational or job title?

12. Currently, what job opportunity should be made available in your organization?

13. In the next five years, what jobs should be made available in your organization?

14. In the next ten years, what jobs should be made available in your organization?

15. Please list the job titles that you find the most critical (job title and specialty if applicable) in your organization?

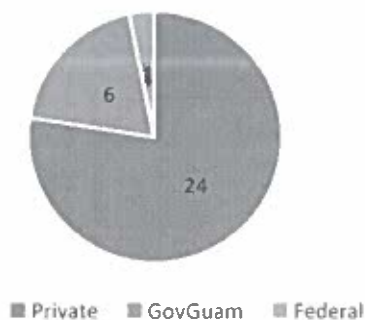
16. What, do you suppose, are other emerging career opportunities currently not on Guam?

Name: _____

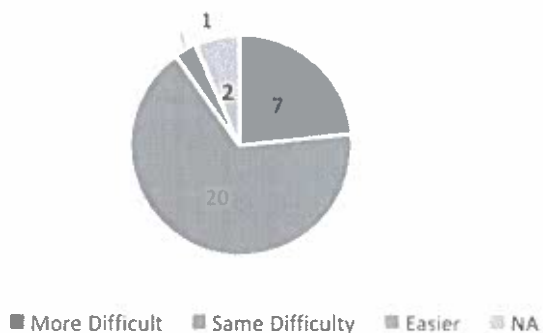
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Appendix 2

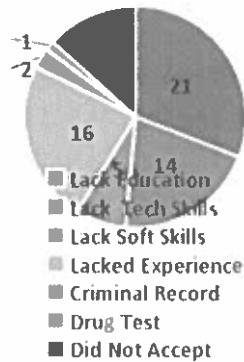
1. Total of 31 Survey Participants employing 8,408 staff. Of the 31 agencies surveyed, Private sector accounted for 24 participants with 6,914 employees, Government of Guam with 6 participants with 1,463 employees and 1 federal agency with 31 employees.



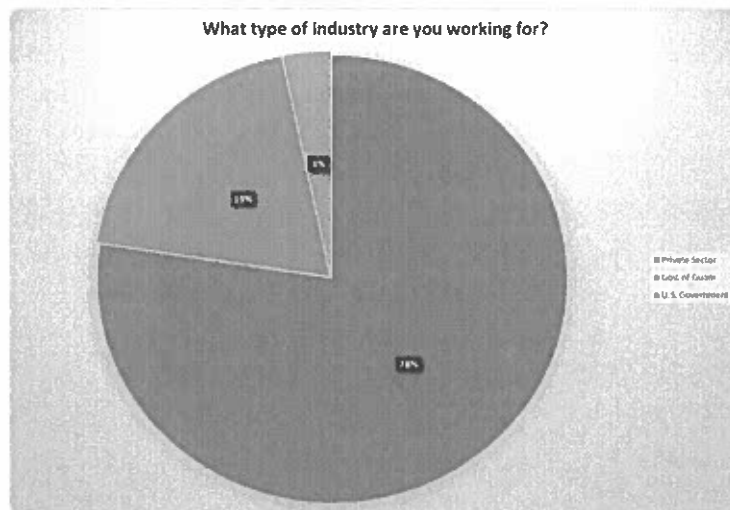
2. Difficulty in filling positions this year?
20 (65%) out of 31 participants claimed that difficulty was about the same as last year while 7 (23%) claimed it was more difficult. 1 claimed it was easier and 1 did not answer



3. Why were these positions difficult to fill?
Out of 68 answers, 21 (31%) was highest, which was lack of education, certification or training. 16 (24%) claimed lacked relevant work experience). 14 (21%) claimed lacked technical skills. The remaining reasons had 10 or less made up the remaining fourth or 25%.



4. Out of a scale of 1 – 5, 100% listed either a 4 or 5 on the importance of filling the positions
5. Based on the survey of 31 company's, 78% of those surveyed work in the private sector, 19% work for the Government of Guam and 3% work for the US Government.

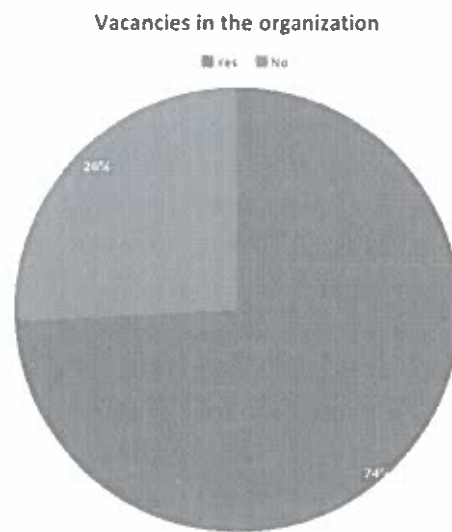


6. In reviewing the number of employees per industry, the private sector holds more employees than the Government of Guam and US Government. However, there were more private sector companies surveyed, total of 24 out 31.

7. Majority of the private and Government of Guam company's noted that they have professional vacancies to fill. For the private sector, 18 out of 24 company's surveyed responded that they do

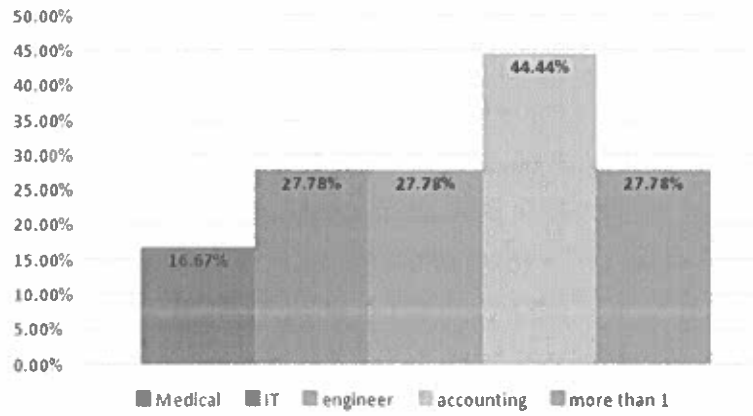


have vacancies, and 6 responded that they do not. For Government of Guam 5 out of 6, responded yes, that they do have vacancies, with only 1 responding that they don't. And for the Federal Government, the 1 company surveyed indicated that they do not have any vacancies to fill.



8. Across the board between all of the industries and companies surveyed, the positions that are considered the most difficult to fill are accounting (44.4%), Information Technology (27.78%), Engineering (27.78%) and Medical (16.67%).

Prioritized Professional Positions



References:

- Alemian, R. (2016). The nurse and physician shortage. MD Magazine. Retrieved on November 9, 2017 from www.mdmag.com/physicians-money-digest/contributor/david-alemain-2016/08/the-nurse-and-physician-shortage. August 9, 2016
- Allegis Group. 2017. Correcting the talent supply and demand equation in the United States. Global workforce trends report. <https://www.allegisgroup.com/>
- American Bar Association. 2017. Lawyer population survey by state. <http://www.americanbar.org>
- Boston.com 2013. 30 fastest-growing jobs by 2020. <https://www.boston.com/>
- Campus explorer. 2017. Top 25 in demand jobs and fastest growing occupations. www.campusexplorer.com/
- Chapter 28, 17 GCA.
- Charette, R. 2013. The STEM crisis is a myth. IEEE spectrum. Aug 30, 2013.
- Cooper, A. 2012. Global talent 2021: The transformation of labor supply and demand in world markets. Oxford economics. 48 p.
- Cooper, R. 2012. Physicians to population ratios. Staff Care. <https://222.staffcare.com>
- Das, R. 2016. Five technologies that will disrupt healthcare by 2020. Forbes, march 30, 2016. 5p/ <https://www.forbes.com>
- Debellis, J. 2016. Employer Needs Survey. North Carolina Dept. of Commerce (LEAD) Raleigh, 16. P.
- Deloitte. (2016). Deloitte insight: over 100,00 legal roles to be automated. In legal IT insider, March 16, 2016.
- Dunn, N. 2016. How technology will change the future of work. Feb 24,2016. <https://www.weforum.org>
- Economist. 2014. The future of jobs, the onrushing wave. Jan 18, 2014 issue.
- Encyclopedia Britannica. 2017. The first industrial revolution. <https://www.britannica.com>
- Fastcompany. 2015. The new rules of work. What work will look like in 2025. <https://www.fastcompany.com>
- Fayer, S.; Lacey, S.; and Watson, A. 2017. STEM occupations: Past, present, and future. U.S. Bureau of Labor and Statistics Report. 35p.
- Frick, W. 2014. The hardest roles to hire for. Harvard Business Review. 7/2/14
- Government of Guam. 2017. Bureau of Labor Statistics employment indicators. <http://bls.guam.gov>
- Guam Code Annotated. 2012. Student Financial Assistance Program for Higher Education.

- Guam Population. (2017). Retrieved on November 11, 2017 from <http://worldpopulationreview.com/countries/guam-population/>.
- Harper, S. 2015. Too many law students, too few legal jobs. New York Times. Aug 25, 2015. <https://www.nyt.ms>
- Kiersz, A. 2015. The 21 best jobs of the future. Business Insider. <https://www.businessinsider.com/>
- Lee, T. 2016. The 10 Toughest Jobs to Fill in 2016. SHRM 3 page report. <https://www.shrm.org>
- Leef, G. 2014. True or false: America desperately needs more STEM workers. Forbes. June 6, 2014.
- Leichter, M. 2017. Lawyers per capita by state, the last gen x American. <https://lawschooltuitionbubble.wordpress.com>
- Leonard, B. 2012. Higher Education Needed for most Future Jobs: SHRM study <https://www.shrm.org>
- Liberatore, S. (2016). Your AI lawyer will see you now: IBM's Ross becomes world's first artificially intelligent attorney. Retrieved from: <https://www.dailymail.com>
- Luckwaldt, J. N. 2016. These 12 jobs will grow 30% by 2024. <https://time.com/money/4169373/fast-growing-jobs-2024/>
- Macquaire University. 2017. What will the hottest jobs be in 2020? <https://www.topuniversities.com>.
- Mangan, D. (2017). Lawyers could be the next profession to be replaced by computers. CNBE report, February 17, 2017. Retrieved from <https://www.cnbc.com/>
- Manpower group. 2013. Talent shortage survey. Milwaukee, WI. 48 p.
- Manpowergroup. 2016. Talent shortage survey results. <https://insights.manpowergroupsolutions.com>
- Manpowergroup. 2016/2017. Talent shortage survey US results. <https://www.manpowergroup.com/>
- Mckinsey global institute. Technology, jobs, and the future of work. Briefing note, fortune Vatican forum, Dec 2016. 5 p
- Medical Futurist Institute. (2017). Ten new jobs in the future of healthcare and medicine. Part 1. Retrieved from: <https://medicalfuturist.com/new-jobs>
- Moran, G. 2017. Career evolution: Do these 5 times right now to still the employable in a decade. <https://www.fastcompany.com/>
- Morgan, G. 2016. These will be the top jobs in 2025 (and the skills you will need to get them). The future of work. <https://www.fastcompany.com/>
- Project Management Institute. 2017. Project management job growth and talent gap 2017-2027. 10p. <https://www.pmi.org>

- Reliant Plant. 2017. The most in-demand and fast-growing jobs of 2017. <https://www.careercast.com/>
- Shumaker Clinical Partners. (1/12/2016). *Nursing shortage effect on the health care industry: Current trends, future growth*. Retrieved 9/16/2017 from <https://www.schumacherclinical.com/providers/blog/nursing-shortage-effect-on-the-health-care-industry-current-trends-future-growth>
- Society for Human Resource management. 2016. The new talent landscape: recruiting difficulty and skill shortages. SHRM research report. 80 p.
- Strauss, K. 2017. Toughest jobs to fill in 2017. Forbes 2/8/ 2017. www.forbes.com
- Strauss, K. Fastest and Slowest growing jobs. 2016. Forbes 9/16/2016. www.forbes.com
- Targus. 2016. The future of work, technology, and people. Au.targus.com/ebook 25 p.
- Teitelbaum, M. 2014. Falling behind? Boom, bust, and the global race for scientific talent. Princeton University Press. 288p.
- The Balance. (9/10/2017). *Career Planning. Fastest Growing Careers That Require a Graduate Degree*. Retrieved 9/23/2017 from <https://www.thebalance.com/fastest-growing-careers-that-require-a-graduate-degree-525685>
- The Best Schools. (2017). MSW Programs: the 25 best master of social work programs. Retrieved from: <https://thebestschools.org/rankings/best-master-social-work-degree-programs/>
- U.S. Bureau of labor and statistics. 2017. Fastest growing occupations, 2014 and projected 2024.
- U.S. Bureau of Labor Statistics. 2017. Projections of occupational employment, 2016-2026. <https://www.bls.gov/careeroutlook/2017>
- UK commission for employment and skills. 2014. The future of work: jobs and skills in 2030. Evidence report 84. Executive summary. 29 p.
- United States Census Bureau. Retrieved on November 9, 2017 from <https://www.census.gov/newsroom/press-releases/2017/cb17-tps43.html>
- Wilson, K. 2017. Emerging artificial intelligence discipline. China daily (asia weekly). July 24, 2017, p. 32.
- World economic forum. 2016. The future of jobs. Executive summary. Employment, skills, and workforce strategy for the forum industrial revolution. 10 p.

Student Financial Aid | Jesus U. Torres Professional and Technical (ProTECH) Awards
17 GCA § 28111

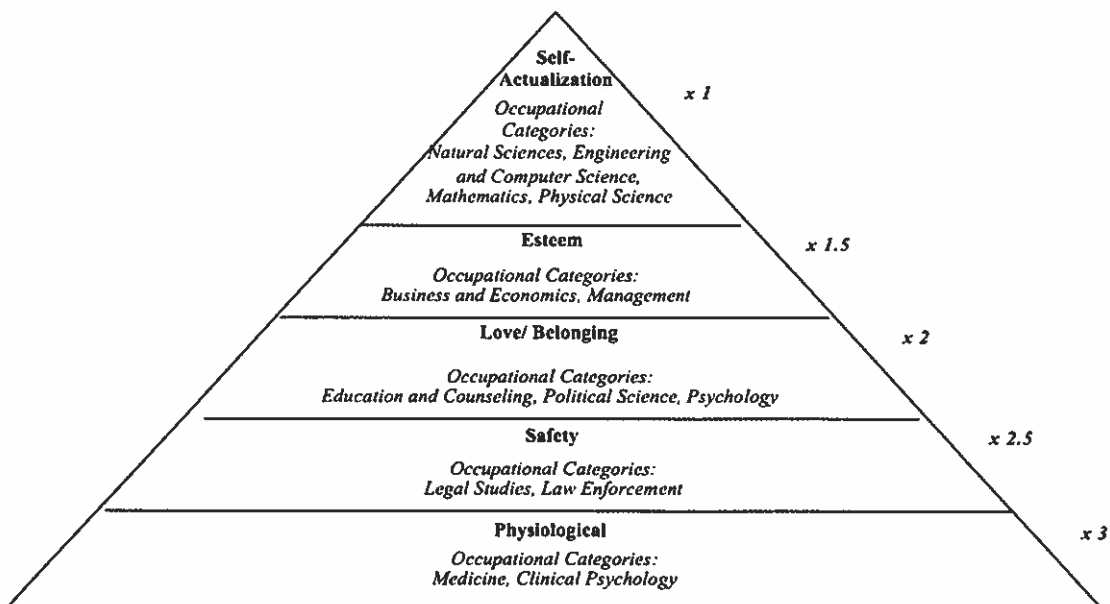
A Government of Guam sponsored scholarship for graduate and professional studies. The program receives an annual appropriation through the Student Financial Assistance Program

Student Financial Aid Program (SFAP) Scoring Matrix

Step 1: Rank positions against established rubric. Rubric focuses on three categories Future Difficult to Fill Positions | Local / Global Demand | Impact to Community. Positions are ranks from one to four (1-4), *four* (4) being **highest** priority and *one* (1) being the **lowest** priority.

Category	Highest Priority - 4	High Priority - 3	Low Priority - 2	Lowest Priority - 1	Score
Difficulty to Fill Position	The position has been vacant for more than five years and less than five people hold this position.	The position has been vacant for five years and less than ten people hold this position.	The position has been vacant for three or more years and less than fifteen people hold this position.	The position has been vacant for a year and less than 20 people hold this position.	
Local/ Global Demand	The position takes on multiple responsibilities and is highly recommended to meet the needs and wants of the community.	The position is up and coming and supports new innovations.	The position focuses on meeting the needs of a specific group of people.	The position benefits the local and global demand, but is not high needs for employment.	
Impact on Community	The position provides a cumulative effect on the community. Viewed in the context of the total effect of other past, present, and reasonable foreseeable future actions.	The position provides a direct effect on the community, focusing on the present and future.	The position provides an indirect effect. These effects change land use patterns, population density or growth rate.	The position only affects a particular group of individuals and not as a whole.	
<i>Total x Need</i>					

Step 2: Occupations of interest are categorized based on Maslow’s Hierarchy of Needs, organized by a five-tiered pyramid seen below that establishes the level of priority score. The level of priority score is multiplied by the rubric score.



Example Evaluation in the Event of a Tie

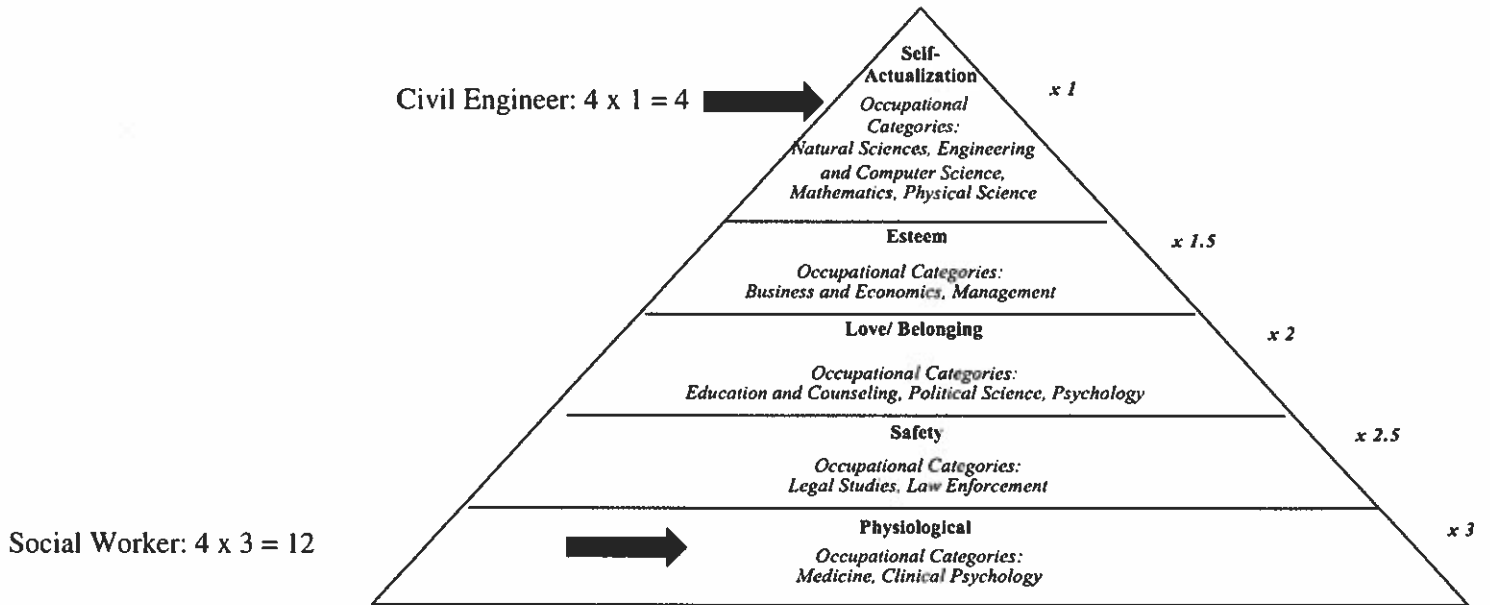
Civil Engineer = 4

Category	Score
Difficulty to Fill Position	1
Local/ Global Demand	1
Impact on Community	2

Social Worker = 4

Category	Score
Difficulty to Fill Position	1
Local/ Global Demand	2
Impact on Community	1

The scores are categorized below and multiplied by the corresponding score.



***Social worker has the higher priority score at twelve (12) over Civil Engineer at four (4).**

Survey of Critical Professional Positions for Guam
School of Business and Public Administration
University of Guam, Mangilao, GU 96923

Dear Participant,

You are invited to participate in a voluntary survey to determine critical professional positions needed for Guam in the next 5-10 years with the expectation of a growing and aging population. We are defining critical position as those that are vital to the quality of life and health, safety, education and infrastructure of our island. The outcome of the survey will be used to establish the Career Priority Listing for the awarding of the Jesus U. Torres Professional / Technical Award authorized under Guam Public Law 31-237.

BY completing this survey, you have read and understood the purpose of the survey and have agreed to participate voluntarily.

1. What type of industry are you working for right now?
Private Sector (Job nature: _____)
Government of Guam
U.S. Government
2. How many employees (part time and full time) are in your organization? _____
3. Do you have professional vacancies for any positions in your organization at this time?
Yes/No
4. How many different professional positions are you hiring? Please list the most difficult positions to fill (top 5).
5. How many job openings are there for each of these difficult positions?
6. Approximately how many professional positions has your organization tried to fill in the last 12 months?
7. Has your organization had difficulty filling any positions in the past 12 months? Yes / No
If yes, please specify what occupation or job title.

8. What is your experience filling positions this year?
More difficult than last year
About the same as last year
Easier than last year
N/A
9. On a scale of 1-5, 1 being least important and 5 being extremely important, how important is it to fill the positions listed above (question 4).
10. Why were these positions difficult to fill?
Applicants lacked necessary education level, certification, or training.
Applicants lacked technical or occupational-based skills.
Applicants lacked soft skills such as communication, teamwork, critical thinking.
Applicants lacked relevant work experience.
Applicants had criminal records.
Applicants failed drug screenings.
Applicants were unwilling to accept offered pay/compensation.
11. Do you think there are other job opportunities not currently listed that the company may need in the future? Yes / No If yes, please specify by occupational or job title?
12. Currently, what job opportunity should be made available in your organization?
13. In the next five years, what jobs should be made available in your organization?
14. In the next ten years, what jobs should be made available in your organization?
15. Please list the job titles that you find the most critical (job title and specialty if applicable) in your organization?
16. What, do you suppose, are other emerging career opportunities currently not on Guam?

Name: _____

Signature: _____