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Board Examination Analytics for Pamantasan ng Cabuyao, Laguna

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ABSTRACT

This study provides a framework for determining board exam probabilistic performances of students through the identification and analysis of indicators that affect student board exam performances. The design and development of the framework are governed by the theoretical and empirical study of factors related to student profiles, academic metrics, and academic support services metrics. The formulation of factors and considerations for the framework revolves around the identification of causal items affecting board exam performance of examinees. The factors are tested for their perceived causative and relational effects as drawn from related studies and literature. Moreover, this study provides a framework that addresses the issues related to managing board examination course offerings via consideration of university policies, practices, priorities, and programs.

Keywords **—** Social Science, Board Examination, Analytics, Philippines

INTRODUCTION

The Philippine Commission on Higher Education (CHED), in coordination with the Professional Regulatory Commission (PRC), sees the critical role of state licensure board examinations in continually enforcing quality assurance administrations in the higher education institutions (HEIs). The board examinations are among the major gauges for measuring the quality of education for HEIs. The HEIs in the country generally have been noted to be delivering poorly citing their dismal performances in the board examinations. The standards and quality assurance metrics of HEIs are highly related to their performances in the board exams. Thus, an HEI's provision of due diligence on enhancing board exam performances in its program offerings could be considered among the ways through which the HEI is seriously upgrading its delivery of educational services (Acosta & Acosta, 2016).

To enhance board examination performances, school administrators need to address the myriad of issues affecting the institution and the individual students. And as such, the board exam performances are just reflective of the quality of educational and co-curricular services the HEIs are providing their students (Cresswell, 2000; Sreekanth, 2006).

The Philippines is said to have HEIs which do not perform satisfactorily in licensure examinations. Consequently, the graduates of the country's HEIs are deemed less competent as compared to graduates in the international arena (Acosta & Acosta, 2016).

The Pamantasan ng Cabuyao (PNC) was created under the Municipal Ordinance 2003-059 approved on April 16, 2003, by the then Municipality of Cabuyao Sanggunian under the leadership of Mayor Proceso "Etok" Aguillo. The Philippine Republic Act 7160 (An Act Providing for Local Government Code of 1991) provides for the empowerment and strengthening of local government units like the City of Cabuyao. With the strengthening of the local government units comes devolution of certain services which were previously centrally governed (RA 7160, 1991). The provision of public education is among the devolved services of the national government to the local government units. The devolution of education has led to the creation of local colleges and universities (LUCs). In the Philippines settings, the city or municipal LUCs are funded and operated by their respective city or municipality, while the provincial LUCs are funded and operated by their respective provincial government. Thus, it can be indicated that the state of a locally-funded HEI depends mostly on the

ability and/or willingness of the concerned local government units to fund the various operations of the LUC. Most likely, municipalities and provinces with low incomes will not be able to sufficiently fund their local HEIs. And the very poor localities do not even have LUCs to fund and operate, given the intricacies of several government and accreditation and international quality education compliances (Dayrit, 2005).

While there may have many shortcomings, public HEIs are still the choice of the majority of the citizens of the country (Dayrit, 2005) due to the equitability they provide. The government support accorded to LUCs provide for financial stability, which may translate to disengagement with commercialization. Private educational institutions need to go through the rigors of commercial viability to sustain their operations. On the other hand, LUCs get their funding from the local government, and financial costs to students are kept at very minimal levels. Currently, some LUCs also coordinate with the national government in providing free tertiary education (RA 10931).

In this manner, LUCs are provided greater opportunities to offer exception not only intuition but also in other state fees. Further, they could also offer financial assistance and scholarships according to set criteria. With being a government arm, LUCs are seen as able to access the very vast network of infrastructure and support services made available by the national government. But there are drawbacks in the LUC framework of operations. Government units are very much regulated that needed procurements need to undergo the rigors of government procurement laws. Compliance with these procurement regulations could usually take much longer and thus are seen as non-responsive enough to the current needs of the government units such as LUCs. Table 1 shows a summary of strengths, weaknesses, opportunities, and threats for public HEIs.

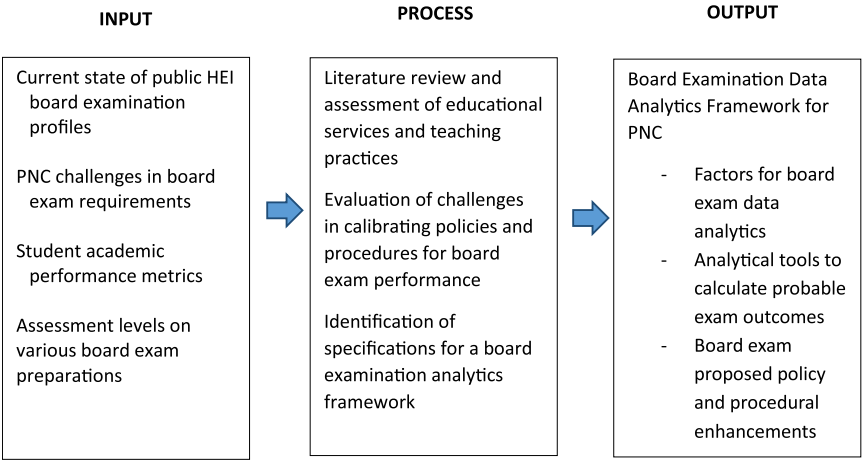
FRAMEWORK

The inputs include knowledge inputs from an interview of school key informants and personnel/officers, library and Internet research, and survey. The bulk of the knowledge inputs were on the current state of public schools in the country in general (e.g., assessing school board examination needs, requirements, and applicable technologies, especially in the public sector educational services) and assessment levels of respondents on various factors involving board examination matters.

The processes of the research include the assessment of different knowledge inputs. The library and internet research was used for the review of related literature

and studies. The data from interviews were used for identifying problems, school board examination preparation processes, and best practices.

The responses from the survey through a questionnaire were used for the identification of specific board examination needs assessment for public HEIs leading to the identification of the specifications for the board examination data analytics system design and development framework; and the output is a board examination data analytics system framework for the PNC, as well as factors to be considered in calibrating policies and procedures regarding board examination concerns within the university. Further proposed enhancements for board examination concerns are part of the output.



The study has as its scope the design and development of a data analytics system framework for determining board exam probability of success or failure of students of PNC. The system framework was designed according to the specifications set in systems development, frameworks for educational designs, and approaches in data analytics.

A lot of public HEIs need to cope with what resources are available for their schools. Oftentimes, resources are just barely enough to meet minimum requirements. There are even areas in which these minimum requirements are have not complied. It is not the intent of this study to provide a systematic framework for board examination analytics that would implement or recommend educational services that would cater to a state-of-the-art or high-end educational facilities, technologies, or learning management systems. Further, this study does

not intend to identify and promote materials, processes, tools, equipment, and management models on the mere basis of being the latest, the most popular, the most in-demand, or the most sophisticated. Rather, this study is intended to develop a system whose framework is anchored on educational services that are cost-effective but not sacrificing quality, standards, and the environment. And the foremost consideration is the perceived suitability of the system framework in the LCU environment, vis-à-vis the board examination concerns.

METHODOLOGY

Research Design

The methods used in developing the framework and the system which consists of the fusion of systems analysis and design methodologies and data analytics methodologies. Included in the chapter are the research design, the research population and sampling, the sampling technique, the respondents of the study, the data-gathering procedure, the data analysis plan, the technical study, the research instruments used, and the statistical treatment of data.

The mixed method of research was used in this study. This is considered to be appropriate in this type of study because it combines the elements of qualitative and quantitative approaches.

The researchers used this method to overcome the restrictions of a single design study. The method purports to: (1) explain and interpret, (2) explore a phenomenon, (3) develop and test a new instrument, (4) serve a theoretical perspective, and (5) address a question at different levels. (Schoonenboom & Johnson, 2017).

The researchers carefully planned the studies. One major consideration is the timing of the quantitative and qualitative components. Depending on the goals of each stage/component, the phases of data collection can be either sequential or concurrent. When sequential, the first phase of data collection can help to inform the second phase, or the second phase can be used to aid in the interpretation of data collected in the first phase (Schoonenboom & Jonson, 2017).

This research study uses purposive sampling. The purposive sampling is to be used to gather assessment levels of key informants: 1) most recent board examination based passers who had first-hand experiences on the various aspects of board examination preparations, and 2) licensed faculty members who handle board examination-based courses.

The concerned licensed university faculty members handling board-based programs and the most recent passers of their respective board examinations among the graduates of the university were asked to provide their responses through a survey questionnaire. Their evaluation and responses revolved around 1) personal and academic profiles and 2) the levels of assessment on perceived priorities, personal preparations and competencies, institutional support and preparations, and 3) the level of adherence to board course examination preparations. They were asked about their level of assessments of the different measures addressing board examination preparations. Also, the profiles of the respondents and the current state of the university related to activities prior to the conduct of the board examination were sought through the questionnaire.

The research used Internet and library resource materials to gather preliminary data to help in the determination of the requirements for educational board examination needs assessment, the factors involved in the facility management, and technology management aspects of school operations. These materials were also used in the review of literature related to the study. The literature review provides the practical and theoretical background needed in the formulation of the analytical procedures for enhancing educational services with considerations on different aspects of school management like manpower, materials, methodologies, and machines/equipment.

The stated aspects of educational management will be evaluated via a research survey questionnaire. The questionnaire consists of statements with which the respondents provided their corresponding responses reflecting their level of agreement or disagreement, their level of perception on the sufficiency of some school services & facility components, or their level of perception as to the suitability of policies, procedures, practices and/or various supports related to board examination preparations in the LCU context. Each of the statements carries a nominal rating, as well as a numerical rating.

Incorporated in the questionnaire are items that asked for ranking, identification, specification, and/or respondent selection. Items that require ranking are listed and were ranked by the respondents, with the item that must have the highest rank getting the ranking of (1) one. The succeeding items will be ranked two and so forth, respectively. The identification and specification are mostly structured in multiple-choice format, while selections are structured in single choice format. Listed in the identification and specification choices are items that were picked from various surveyed related literature. The respondent is allowed to identify or specify other items beyond those that are listed. The bulk of

the items are grouped into categories and sub-categories and are to be answered through the respondents' choice, which reflects their level of assessment on each item presented.

For scaling the responses, a 1 to 5 Likert Scale was used to indicate the level of assessment and/or agreement of respondents on each item or statement. A rating of 1 has a nominal rating, which signifies the respondent's highest agreement, while a rating of 5 has a nominal rating, which signifies the respondent's lowest agreement on a particular item being presented. Any other rating between 1 and 5 corresponds to its respective nominal rating as implied. Table 2 shows the scale of the responses.

Table 2. Scale for Responses

Numerical Rating	1	2	3	4	5
Nominal Rating	Very Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Very Strongly Disagree
	The above ratings may also be interpreted accordingly below				
	Very Sufficient	Sufficient	Moderately Sufficient	Insufficient	Very Insufficient
	Very Suitable/ Applicable	Suitable/ Applicable	Moderately Suitable	Unsuitable/ Not Applicable	Very Unsuitable/ Not Applicable
	Excellent	Very Good	Fair	Poor	Very Poor

The ordinal data obtained from the survey questionnaire will be classified and subject to analysis according to a Likert scale consisting of 5 (5) response categories, which range from a high numerical rating of one (1) to a rating of five (5). A distribution-fitting approach will be applied in order to analyze the collected data and categorize the various criteria.

For identifying multiple responses, the respondents may choose none, one or more than one response. Each of the responses will be evaluated through percentages.

For identifying priorities, the ranking will be implemented wherein respondents are presented with ten choices with which they were asked to rank the highest priority with the numerical rank of 1 (one). All the succeeding items will be provided with numerical rankings in succession until the numerical rank of 10 (ten), which is deemed as the least priority.

Population and Sample

For various assessment levels, the respondents of the study were the licensed university faculty and staff handling board-based courses and the most recent passers of board examinations of the university.

The respondents helped identify the factors, requirements, and specifications for the board exam data analytics framework and for a guide in calibrating university policies and practices related to board examination preparations.

Data Gathering Procedures

To gather information needed for the research, the researcher undertook library and internet researches that included related articles, journals, documents, and books. Also, the researcher interviewed some key personnel and students related to HEIs about school board examination preparations, operations, practices, and problems encountered.

The researcher administered survey questionnaires, which were answered by licensed faculty and board examination passers.

The data gathered included the following: 1) practices and problems encountered by school administrators and staff regarding board examinations, 2) best practices, processes, and policies that will enhance board examination preparations and analytics; 3) assessment levels of faculty members handling board-based programs; 4) assessment levels of most recent passers of their respective board examinations.

Instrumentation

The researchers used as research instruments library research, internet research, questionnaire, and interview. The said data gathering tools will help the researchers identifying the specifications for designing and developing the system.

Library research includes gathering data from books, journals, articles, forms, magazines, published and unpublished studies. Internet research includes information from documents, handbooks, related laws, journals, and articles from websites.

Interview. An interview is an official meeting in which one or more persons. The interview involves activities like asking questions, seeking consultation, or evaluation of the school processes, practices, problem areas, and challenges related to their board examinations. The persons interviewed were the Registrar, administrators (who have a keen knowledge of respective aspects of board

examination-related policies and implementations), staff and officers who are involved in school administration, as well as personnel involved or have experienced board examination administration and/or preparations. Also, the study sought the following personnel or offices as key informants in providing the needed data and statistics: 1) Office of the University Registrar, 2) Information Technology Department, 3) Office of Student Affairs and Guidance and Counselling Office, 4) respective College Dean's Offices, and 5) Human Resource Office.

Questionnaire. The questionnaire set is most frequently comprised of a concise, pre-planned set of questions designed to yield specific information regarding profiles, hospital data, assessment levels, ranking, listing, and identification of items related to board examination preparations. The questionnaire used was validated prior to actual use. Validation was be undertaken by subjecting the questionnaire to concerned personnel or client who is not part of the actual respondents. The questionnaire covers both profiles and responses, mostly in a structured format. Qualitative data is incorporated into the questionnaire through an open-ended question, which seeks additional suggestions, ideas, or comments from respondents. The qualitative data enabled the respondents to add freely other items that they deem are to be included in their responses.

The frequency distribution of each of the ranked, specified, listed, or selected items shall be computed. The item with the lowest mean is considered the highest-ranked, and the succeeding lower means are the items which second, third, and so on in the ranking. For specified, listed, or selected items, those with the highest frequency counts are considered as the answers which reflect the collective agreement of respondents towards particular items.

Statistical Treatment of Data

The data collected were evaluated and studied. The statistical tools that were needed for the data are for the determination of the frequency, ranking, mean, weighted mean, and percentages. The mean values for assessment levels were computed. The percentage was used to indicate distributions.

Table 3. The Mean Values and Verbal Interpretations for Assessment Levels

Mean Values	Verbal Interpretation	Remarks
1.0-1.5	Excellent	To be considered as factors
1.51-1.99	Very Satisfactory	
2.0-2.50	Satisfactory	
2.51-2.99	Fair	Not to be considered as factors
3.0-3.50	Unsatisfactory	
3.51-3.99	Very Unsatisfactory	
4.0-4.50	Poor	
4.51 -5.0	Very Poor	

The arithmetic mean values were computed for a whole section or for each category in a section. Descriptions and treatment would be provided onto items with both highest and lowest mean values. Items with the highest mean ranks and frequencies among listed, identified, or selected items (except for nominal data like names, locations, etc.) will likewise be considered in the system development.

Factor analysis was to be used to identify the significant factors. Items with a factor loading of 0.5 or higher were be considered as significant factors; for factors to be considered in the design and development of a proposed board examination metrics framework for public HEIs the items are tested for Spearman rank correlation. Among the factors to be tested are those items that pertain to personal preparedness (personal factors), management of school preparations for board examinations (institutional factors), and adherence to board examination best practices (adherence factors). The factors will be tested at the confidence level of 95%, where the p-value is significant at 0.05 ($p\text{-value} < \alpha < 0.05$).

Table 4. Degree of Relationship

Correlation Coefficient (r)	Degree of Relationship
0.00 – 0.20	Negligible relationship
0.21 – 0.40	Low relationship
0.41 – 0.60	Moderate relationship
0.61 – 0.80	High Relationship
0.81 – 1.0	Very High Relationship

The analysis of variance (ANOVA) will be used to determine if there are significant differences in the current board examination preparation metrics

between respondents from high board exam passing rate programs and those from low (below national passing average) passing rate programs. Also, the ANOVA will be used to test differences among the different levels of school preparations and the factors that determine current levels of student preparedness, profiles, and related metrics.

RESULTS AND DISCUSSION

The results are presented and discussed with reference to the aim of the study, which was to determine the suitable board examination analytics framework for PnC. Presented are the following: 1) challenges in calibrating policies and procedures for board examinations, 2) factors that determine the probability of success in board examinations, 3) analytical tools to calculate probable outcomes of board examinees, 4) board examination analytics framework, and 5) policies and procedures for improving board examination performances.

The presentations, altogether with narratives on statistical results, form the basis for the design and development of the board examination analytics framework for public PnC. A guideline for calibrating policies and procedures for enhancing the board examination preparations is presented as well.

Challenges in calibrating policies and procedures for board examinations

Institutional initiatives aimed at calibrating policies and procedures for board examination concerns need to be thoroughly guided so as to be more effective. The hit and miss approach to calibrating policies and procedures may not only yield unsatisfactory results. They could also be detrimental to the PNC in terms of greater costs, wasted opportunities, and undesirable conditions like worsened board examination outcomes. To date, board exam results in the university have been inconsistently going up and down despite several measures put in place. Calibrating policies and procedures in the university are aimed at the university to sustain not only above national mark passing rates but also 100% passing rates across all board courses.

The university has calibrated its policies and procedures for board examination programs over time. These calibrations include pre-determining student competencies during admission processing of prospective students, the institution of monetary rewards for highly successful examinees, competency appraisals after two years of coursework within the university, additional qualifying examinations, barring graduates from taking the examination if appraised too

unfit to pass the exam, provision of university-based in-house reviews, upgrades in prospective student admissions to board-based programs and curricular appraisals which were indirectly aimed to enhance board examination outcomes. With these calibrations came some positive yields in the passing rates of its graduates. However, directly attributing these calibrations to the positive yields is a sweeping generalization. Foremost consideration must be on determining with higher probability the factors that enhance board examination performances.

Per analysis of perceived board exam priority needs of respondents, the areas which show the need for calibration for the university may be culled from the respondents' priority of areas of concern for board examination preparations. Table XXX shows the respondents' priority areas of concern for board examination preparations. The top two areas, 1) *Personal motivation and will* and 2) *Strong family/friend support for the academic pursuit,* are outside the domain of the university services since they are well within the individual respondent's circumstances. However, the university may still be able to reach out to the students in various engagements like counseling, career guidance, and programs that nurture secondary social support such as peer groups, sports & recreation, values formation, hobbies, and advocacies. A study among secondary students reveals that the school has a very crucial role in terms of reaching to the over-arching need of students to greater motivations like in self-efficacy, achievement goals, life satisfaction, and setting of academic achievement levels (Diseth, Danielsen, & Somdrum, 2012).

Thus, the foremost challenge in calibrating policies and practices onboard examination is on how to motivate the students to achieve more in the board examinations. Other challenges include policies and practices that could improve the competency of the teaching staff and the enhancement of the curricula to reflect the needed integration of various board examination concerns. Further, the provision of policies and practices for board examination reviews and integration of review modules and mock board examinations could instill institutional emphasis on reviews and other terminal responsibilities of the university towards its prospective licensure examinees.

Table 1. Ranking of Respondents' Areas of Concern for Board Examinations

Rank	Mean Rank	Areas of Concern
1	2.87	Personal motivation and will
2	4.38	Strong family/friend support for the academic pursuit
3	4.57	Competency of teaching staff
4	4.60	Appropriate curricula for the field of study
5	5.02	Board examination reviews after graduation
6	5.30	Integration of board examination review modules and/or mock board examinations into the curriculum
7	5.75	Financial support systems (scholarships, tuition fee discounts, low costs of schooling, etc.)
8	5.85	Availability of board exam review materials
9	6.19	Appropriate facilities (library, laboratories, study halls, simulation rooms, etc.)
10	6.91	Purchase/upgrade of equipment/machines/tools needed for academic studies

Factors that determine the probability of success in board examinations

For a lot of schools, the success or failure of examinees in a board examination is mostly a guessing game wherein examinees and even school administrators struggle in finding clues regarding their would-be performance outcomes in various board examinations. However, the more successful schools have their strategic plans, practices, and policies regarding board examination concerns reviewed and reformed, if needed (Quiambao et al., 2015).

Student and Faculty Profiles

Table 1 shows the frequency counts and percentages of the respondents according to sex, category, passing rate, and frequency of taking the board examination until they have successfully passed. The majority of the respondents are females (56.6%), while males account for 43.4%. Most of the respondents (51 or 96.2%) indicated that they scored above their respective board examination batch's national passing rate. Also, most of the respondents (92.4%) indicated that they were able to pass their respective board examinations on just their first take.

Students who passed the board examination contribute to the overall passing mark of their respective academic institutions computed as the number of passers over the number of students who took the examination, dubbed as the

institutional passing rate. The institutional passing rate is weighed against the national passing rate, which is the number of students who passed the exam over the number of students who took the exam nationwide. One of the performance measures undertaken by institutions is to evaluate their institutional passing rate, whether it is above or below the national passing rate. One of the ways the Philippine Government, through the CHED, regulates the academic institutions is by requiring individual institutions to have institutional passing rates that are above the national passing rate. For instance, under the BS Nursing Program, failure to achieve an institutional passing rate which is above the national passing rate for three (3) consecutive years could mean revocation of the license of the institution to continually offer the affected academic program (CHED Memorandum Order No. 14, Series of 2009).

Table 2. Distribution of the Respondents According to Sex, Passing Rate and Order of Taking of the Board until Passing

	Frequency		Totals		Passing Rate, %	
	Male [43.4%]	Female [56.6%]		%	Above National Rate	Below National Rate
Faculty	10	15	25	47.2	23 (92%)	2 (3.77%)
Student	13	15	28	52.8	28 (100%)	0 (0.0%)
Total	23	30	53	100	51 (96.2%)	2 (3.77%)
First Take	20	29	49	92.4	49 (92.4%)	1 (1.91%)
Second Take	2	0	2	3.7	2 (3.7%)	0 (0.0%)
Third Take	1	1	2	3.7	0 (0.0%)	1 (1.91%)

Table 3 shows the distribution of the respondents according to their educational degree programs. Most of the respondents were from the BS Nursing program then followed by the Engineering Programs and BS Accountancy (both with 11 or 20.8%).

Table 3. Distribution of Respondents According to Degree Program

Program	Frequency	Percent
BEED (Elementary Education)	1	1.9
BS Accountancy	11	20.8
BS ECE (Electronics and Communications Engineering)	10	18.9
BS Nursing	16	30.2
BS Psychology	9	17.0
BSE (Education)	5	9.4
BSEE (Electrical Engineering)	1	1.9
Total	53	100

Table 3 shows the distribution of the respondents according to their general weighted average (GWA) in their respective college programs. A big bulk of the respondents (19 or 35.8%) indicated having GWA within the range of 1.75-1.99. This range falls within the satisfactory mark. Combined with respondents with outstanding and very satisfactory ratings, it can be deduced that the majority of both the student and faculty respondents belong to the high academic achievers' range. In scientific studies, grades, either at collegiate or high school levels, are said to be significant predictors for the academic achievements of students, including the board examinations. That is, those who perform better academically in high school or in college course works have a greater probability of achieving successful results in board examinations. Generally, there are too many involved competencies, traits, and attitudinal attachments towards achievements of good grades (Ong, Palompon, & Bañico, 2012; Gohara et al., 2011).

Table 4. Distribution of College GWA of the Respondents

Grade Range	Nominal Description	Frequency	Percent
1.0-1.24	Excellent	2	3.8
1.25-1.49	Outstanding	5	9.4
1.5-1.74	Very Satisfactory	7	13.2
1.75-1.99	Satisfactory	19	35.8
2.0-2.24	Good	8	15.1
2.0-2.25	Fair	1	1.9
2.25-2.49	Fair	8	15.1
2.5-2.74	Poor	2	3.8
2.75-3.0	Very Poor	1	1.9
Total		53	100

Table 4 shows the distribution of the respondents according to their high school GWA. The majority of the respondents (24 or 45.3% and 11 or 20.8%) indicated having GWA within the range of 86-90 and 91-95, respectively. Their GWAs also fall within satisfactory and very satisfactory marks.

Table 5. Distribution of High School GWA of the Respondents

Range	Frequency	Percent	Nominal Description
96-100	3	5.7	Excellent
91-95	11	20.8	Very Satisfactory
86-90	24	45.3	Satisfactory
81-85	13	24.5	Fair
76-80	2	3.8	Poor
Total	53	100	

Table 5 shows the distribution of the respondents according to the classification of their high school from where they graduated. The majority of the respondents (28 or 52.8%) came from public high schools. The majority of the faculty respondents (14 or 56%) indicated coming from private high schools, whereas the majority of the students (60.72%) indicated coming from public high schools. This indicates that the majority of the graduates of the university cater to students coming from the public high schools within the community. Further, this is also indicative that the students came mostly from low-income levels.

Table 6. Distribution of the Respondents According to HS Classification

			Frequency	Percent
	Faculty, %	Students, %		
Private	14 (56%)	11 (44%)	25	47.2
Public	11 (39.28)	17 (60.72%)	28	52.8
Total			53	100

When asked about the degree of alignment of their respective degree programs with their filed/s of interest, 25 or 47.2% indicated that they are aligned. Nineteen (19) or 35.8% indicated perfect alignment. For those who indicated perfect alignment, 18 passed the exam on the first take and 19 got scores above the national passing rate for their respective batch of examination. For those who indicated alignment, 24 passed the exam on the first take, and 23 got scores

above the national passing rate for their respective batch of examination. The data somehow indicates congruence of alignment of interest to pass on the first take and to achieving scores above the national passing rate. A study by Shellito et al. (2010) shows that one's degree of interest provides a clue as to satisfactory achievement at certain endeavors. Interest plays a key role in providing a positive attitude towards work, research activity, or even academic pursuits.

Table 6 shows the distribution of the respondents according to the perceived alignment of their degree program with their field/s of interest, the number of takes until passed, and passing rate.

Table 7. Distribution of the Respondents According to Program Alignment

	Freq.,	%	Takes Until Passed			Passing Rate	
			1st	2nd	3rd	Above Nat'l	Below Nat'l
Perfectly aligned	19	35.8	18	1	0	19	0
Aligned	25	47.2	24	1	1	23	2
Somehow aligned	8	15.1	8	0	0	7	1
Not Aligned	1	1.9	0	0	1	0	1
Totals, %	53	100	50	2	1	49 (92.5%)	4 (7.7%)

While personal motivation and strong support from family and friends rank high in the perception of respondents as the primary keys for successfully passing the board examination, it is still a common notion that the college or university from where the examinees finished their respective degrees makes for a big factor for such success. Licensure examinations are aimed at testing the individual competencies of the examinees after their degree completion towards readiness in the professional labor market (Goldhaber, & Hansen, 2010). Colleges and universities build a critical knowledge base, rudimentary skills & know-how, experiential insights, analytical thinking, and attitudinal traits on their students. Throughout the years of residency, the holistic education provided by schools matters a lot to the students since these were weighed against numerous academic and non-academic endeavors (Raymond, 2001). Thus, it could be said that the quality of educational services matters so much in the outcomes of examinees in the board examinations.

Table 8. Kendall's Tau-b Correlation between Alignment and Student Competencies

		Align Code	PSC_Ave
AlignCode	Correlation Coefficient	1.000	.085
	Sig. (2-tailed)	.	.436
PSC_Ave	Correlation Coefficient	.085	1.000
	Sig. (2-tailed)	.436	.
	N	53	

Student, faculty, and school preparations for board examination

Per review of critical literature, all circumstantial factors contribute to an individual person's performances, especially with regards to board examinations. Generally, the factors that affect or correlate with boarding examination performances can be grouped as either: 1) personal preparedness and competency factors or 2) institutional support and adherence to best practices factors.

Table 9. Level of Agreement on Personal Preparedness for Board Examination (Grand Mean = 1.94)

Logistical and Setting (Overall Mean = 1.92)		Means
PP2	I organized well my time-space to suit well for the board exam preparations.	1.74
PP3	I organized well my study space to suit well for the board exam preparations.	1.77
PP1	I have sufficient access to lecture and review materials for the board exam.	1.92
PP5	I was able to prioritize the board exam preparations over other concerns like family household chores, trips, dates, etc.	2.00
PP4	I ate healthy and brain-stimulating foods for the board exam preparations.	2.19
Emotional, Physical and Mental (Overall Mean = 1.88)		
PP8	I prepared myself to be physically, mentally and emotionally fit for the board exam.	1.51
PP10	I did not have serious medical illness/es prior to the board exam.	1.70
PP6	I practiced answering old board exams very well.	1.83
PP7	I went through the rigors of mock board exams seriously.	2.00
PP9	I went through almost over eight hours daily of serious reviews during the month prior to the board exam.	2.25
Operational (Overall Mean = 2.03)		

PP12	I prepared all the needed paper requirements for the board exam.	1.38
PP13	I stayed in a house/place wherein I could devote my whole time studying/reviewing for the board exam.	1.94
PP11	At times, I reviewed with a study group/peers.	2.15
PP15	Family and household concerns were taken care of by other members of the family so that I could concentrate on my board exam preparations.	2.26
PP14	I rid myself of most of the household chores and responsibilities at least three weeks before the exam.	2.40

The result of the respondents' perceptions regarding their level of agreement on factors that matter on board examinations reveals the major significant factors. For personal preparedness factors, the factors regarding emotional, physical, and mental fitness factors rank the highest (1.88 overall means). Physical, mental, and emotional fitness for the board examinations (1.51) ranks the highest. For operational factors, the preparation of the needed paper requirements for the board examination ranks the highest overall (1.38) among all personal preparedness factors.

Table 9 shows the level of agreement of the respondents regarding the institutional preparedness for the board examinations.

CONCLUSIONS

Based on the findings of the study, the following conclusions are drawn: (1) There is a perceived high concern on enhancing personal motivation and will (2.87 mean rank), strengthening family and/or friend support on academic pursuits (4.38 mean rank), scaling up the competency of teaching staff (4.57 mean rank)and upgrading the curriculum (4.60 mean rank). (2) There is a perceived moderate level of preparedness for board examinations at student levels (personal preparedness = 1.94, personal level of competencies = 2.29respective means) and institutional levels (institutional preparedness = 2.65, institutional support for board examinations = 2.58 and adherence to board examination preparations best practices = 2.88). (3) The tools needed for board examination data analytics include the tools for a) data-gathering, b) data-cleansing, c) data storage & retrieval, d) basic and advanced statistical tools and, e) tools for supporting artificial and business intelligence; and (4) The data analytics system framework consists of a) aggregation of structured and unstructured data, 2) generation

of significant factors via several statistical methods, 3) weighting of significant methods towards the production of the probability of board examination passing index and, 5) enhancements of all the data analytics processes through artificial and business intelligence approaches.

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