

Analysis of the Aptitude Test as Indicator of the Timely Graduation of the Students of the College of Architecture and Fine Arts – Polytechnic University of the Philippines

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Abstract: Gunnar Myrdal's statement in 1971, "It becomes expensive if we cannot afford it," has consistently proved to be truer more than ever. As PUP faces the challenge of maintaining and improving the quality of education to as many deserving but financially challenged students with very scarce resources there is a need to establish a protocol to assess the students other than the PUPCET examination and their high school ratings in Math, Science and English. The assessment is necessary in order to complement and supplement the required skills they need to finish the BS Architecture and BS Interior Design programs within the prescribed period to ensure the sustainability of the programs in the College of Architecture and Fine Arts. The primary objective of the admission officer is to focus on admitting students who possess the potential to succeed academically in the institution. It benefits neither the institution nor the students to admit an applicant that is not likely to persist. (Evans, 2011) The aptitude examination is designed to be able to quantify the result of the exam and provides measures on the aspect of ability needed in the program. The aptitude exam will demonstrate potential talent through sense of scale, a sense of space, accuracy of observation, and attention to details

Keywords: entrance exam, assessment tool, architecture education, aptitude test, attrition rate

1. Introduction

In the Report entitled: "Higher Education Across Asia: An Overview of Issues and Strategies from the Asian Development Bank, 2011," states the four challenges Asian countries are facing, namely:

- maintaining and improving quality of education, even in the face of serious financial constraints;
- increasing the relevance of curriculum and instruction at a time of rapid change in labor market needs;
- increasing and better utilizing the financial resources available to higher education; and
- balancing the continued expansion of access to higher education with greater attention to equity and the need to raise quality.

The Polytechnic University of the Philippines is not spared from the financial burdens. Most, if not all, government-run higher educational institutions are experiencing it. PUP holds the record in having the lowest tuition fee rate in the country of Php 12.00 per unit. It takes pride in continuously producing highly competent, passion-driven professionals. However, the university can only accept a very limited number. PUP which is one of the country's biggest state universities is offering 62 programs through its 17 colleges and 22 branches nationwide.

The College of Architecture and Fine Arts, one of the 13 colleges in the Manila campus, has produced architects, designers and artists in the past 13 years as a college and 26 years as a department since its conception in 1987. The college is constantly ranked as one of the top 5 schools in the Philippines based on the result of examinations given by the Professional Regulation Commission in both programs. The allotment for freshmen for the program of BS Architecture is 3 sections. The number of students would vary from 45-50 students per section while the BS Interior Design program has 1 section also with the same class size as that of the BS Architecture Program.

In spite of the fact that the contribution of the college in producing licensed professional architects and interior designers it has not grown in terms of student population. The relatively small population of the college is due to the fact that the university has very limited resources in terms of budget for operational activities and for infrastructure development. This is the very reason why the admission to the College of Architecture and Fine Arts is highly selective.

The enrolment of the colleges in the university always meet the required quota. In most cases it would even exceed in numbers to accommodate the financially challenged sector of the society in dire need of a good

education. It cannot be over stressed that education liberates man from the bondage of poverty mired in an abyss without a definite end. In the classical book of Gunnar Myrdal (1971) “Asian Drama – An Inquiry into the Poverty of Nations,” he states: “the major fault of enrolment statistics is that a child who is counted as enrolled does not necessarily go to school for the whole year, or regularly, or not at all.” The responsibility of the school is to provide the requirements for the students to finish their courses in the prescribed period. There is a battery of requirements which the applicants need to fulfil before they are accepted in the university and to the college/department.

2. Entrance Examination – PUPCET

PUPCET (Polytechnic University of the Philippines College of Entrance Test) is an annual entrance examination given to an applicant who is eligible to take the test. The qualifications of PUPCET applicants are the following:

- Graduating high school students of the current year with a General Average of at least 82% or higher in the first three (3) years in high school.
- High school graduate with General Weighted Average of 82% or higher in fourth year and have not enrolled in any diploma/degree program immediately after high school.
- Philippine Educational Placement Test (PEPT) passer with the average of 82% or higher in five subjects: Mathematics, Science, Communication Arts (English and Filipino), and Araling Panlipunan (Social Studies).

Those in the Alternative Learning System Accreditation and Equivalency (ALSA & E) program, who have passed the secondary level are eligible for admission to college and have 100 or higher Standard Score (SS) and an essay writing proficiency level of 2 or higher.

PUPCET exam is a form of control for the university in terms of quality of students to be accepted in the different colleges as well as the quantity. Quota system is practiced in the university because of limited budget and facilities. For academic year 2013-2014 the university scheduled 2 examination dates January 27 and February 17, 2013 the results of which were based on the report given by Admission and Registration Office is shown, to wit:

Table 1. List of PUPCET Applicants for Academic year 2013-2014

	Number
Total Number of PUPCET Passers	10,968
Total Number of Actual Examinees	46, 458
Total Number of Examinees	48, 338
Total Number of PUP CET Applicants	48, 624

The requirement for each course is determined by the Office of the Vice President for Academic Affairs in consultation with the Deans and Chairpersons. The requirements are comprised of the PUPCET rating and grades in Math, Science and English which may vary depending on the course. For the academic year 2013-2014, the requirement in the BS Architecture program is a PUPCET grade not lower than 118 and a High School average of 85 with score aggregates of not lower than 85 on subjects in Math, Science. In the Interior Design Program the PUPCET requirement is a rating of 115 and a High School Average of 83 with no grades lower the 83 in the subjects- Math, Science and English. Those with high ratings in PUPCET and graduates of the PUP Laboratory High School are given priority to be interviewed and there are academic programs that may also require an additional examination before they are accepted. In the case of the programs in the College of Architecture and Fine Arts both its programs require that the student should take and pass the aptitude exam given by the respective departments.

3. College Requirements

The limited slots available for incoming freshmen and shifters from other colleges demand the college to develop a protocol in accepting enrollees. As early as 2002, both departments started administering an aptitude exam for incoming freshmen. From academic years 2006-2007 up to 2012-2013, the aptitude exam varied for the applicants being required to draw their dream house or their current residence, exterior for the applicants of BS Architecture and on the interiors for candidates of BS Interior Design.

The Department of Architecture and Interior Design devised a new Aptitude Examination which drew inspiration from the aptitude exam given in school year 2003-2004. The objective in innovating the aptitude

examination is to be able to quantify the result of the exam and to provide a measure on the aspect of ability needed in the program. The aptitude exam will demonstrate potential talent through sense of scale, a sense of space, accuracy of observation, and attention to details.

The aptitude test involves 3 parts:

- In the technical drawing, the students were given a figure in isometric presentation and from there they were asked to provide the front view, left and right side view and top view. The knowledge and skills in technical drawing are needed in Graphics subjects which the students take for two consecutive semesters in their First year level.
- In the proportion test, and figure of an adult woman was made as reference and were asked to draw the front view of a door, window, dining table and a chair. The knowledge and skills in sense of scale and space, and accuracy of observation are assessed in this part of the aptitude test which would be very useful in the Design subjects given from 1st year until they graduate on the 4th year for BS Interior Design and 5years for BS Architecture.
- In the sketching exam, 3-dimensional shapes were used (cube, 2 cones, and cylinder) placed on top a table covered with crumpled black cloth with a spot light angled to create shades and shadows. Part 3 of the examination on Pencil Sketching and Monochromatic Rendering shows their talent in accuracy of observation, attention to details and skills in drawing on the basis of what they can see.

In order to minimize subjectivity a rubric was used in assessing the aptitude test. A rating of 1-excellent; 2-Very Good; 3-Good; 4-Fair and 5-Poor.

Table 2. Rubrics for the drawing examinations

Area of Drawing Test	Rating				
	1- Excellent	2- Very Good	3 -Good	4- Fair	5- Poor
Technical Drawings (Orthographic)	Examinee has to provide the correct projections to create the entire view and understands how each view relates to the other view in all 4 angles	Examinee has to provide the correct projections to create the three (3) views and understands how each view relates to each other	Examinee has to provide the correct projections to create the two (2) views but show some difficulty in understanding how each view relates to the other.	Examinee has to provide the correct projections to create the one (1) view but shows some difficulty in understanding how each view relates to the other.	Examinee did not use the projections and does not seem to understand how each view relates to the other
Proportion Drawing	The work shows that the student applied the guidelines of proportion in a successful manner. *Paying close attention to the position of the figure and details.	The work shows that the student applied the guidelines of proportion. *Some of the figures proportions were not realistically accurate	The student drew the figure and considered overlapping, but little consideration was put on the accurate proportions	The student barely attempted to use proportion or they did not complete the assignment.	The student did not attempt to use proportion. *Angles were not considered in their figure drawing

<p>Pencil Sketching and Monochromatic Rendering</p>	<p>Drawing has excellent amount of detail and shows great attention to detail. Layout and proportion are properly sketched. Figures looks natural, without distortions. Drawing has strong shading. Shading is well done with defined attention to detail. Object looks realistic and three-dimensional.</p>	<p>Drawing contains many strong elements of detail but needs further refinement and fine-tuning to have correct amount of detail. Majority of the figure is properly laid-out, but drawing has a few areas that need further refinement in order for the face to look proportional/natural. The student barely attempted to use proportion or they did not complete the assignment.</p>	<p>Drawing contains several strong element but needs to be improved on accuracy on the shading in reference to the direction of light</p>	<p>Drawing is relatively fine but needs improvement on details</p>	<p>Drawing is lacking detail. Detail included is improvised and looks incomplete. Elements of figures are out of place and/or are out of proportion. The student barely attempted to use proportion or they did not complete the assignment</p>
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The rating for each exam are then added for the final student rating. The summation of the 3 part exam is given the following equivalence. Those with the sum of 1-3 a rating of Excellent is given; 4-6 - Very Good; 7-10 - Good; 11-14 – Fair; 15 - Poor. Only entrants with the rating of Excellent to Good are accepted in the college.

4. Materials and methods

Descriptive statistics was employed in determining the initial viability of the aptitude examination given to incoming freshmen for academic year 2013-2014. The grades of the three (3) major subjects of the BS Architecture and the BS Interior Design students for academic year 2011-2012 and 2012-2013 were compared to freshmen of 2013-2014.

The students under academic year 2011-2012 and 2012-2013 were given an aptitude test through drawing either their dream house or the house which they currently live in. The drawing of the exterior for students wanting to take up BS Architecture and interiors for students contemplating to enroll in BS Interior Design.

Incoming freshmen for academic year 2013-2015 were given a structured aptitude test through 3 major areas: 1) Technical Drawing –Orthographic 2) Proportion Drawings; and 3) Pencil Sketching and Monochromatic Rendering. Rubrics for checking was also provided for faculty members of the college in evaluating and assessing the incoming freshmen’s examination.

The grades in the 3 major subjects of Freshmen (from academic years 2011-2012, 2012-2013 and 2013-2014) namely Design (Architecture and Interior), Graphics and Visual Techniques were compared to determine the attrition rate of each group.

5. Results and discussion

The drawings of the freshmen under the academic year 2011-2012 and 2012-2013 are still intact with their respective credentials in the office of the department of Architecture and Interior Design but they are not graded and to grade them at this period is not appropriate.

For academic year 2013-2014, there were 409 freshmen qualified to enter the BS Architecture and BS Interior Design programs the breakdown of which is shown in Table 3 Distribution of Qualified Freshmen for BS

Architecture and BS Interior Design. Students applying for the PUPCET examination are required to declare the three (3) courses where they intend to enroll in the university. Despite the fact that there were 342 students who logged in BS Architecture as their first choice there are only 91 students who enrolled in the architecture program and 67 registered BS Interior Design as their first choice only 9 of them enrolled in the interior design program.

Table 3. Distribution of Qualified Freshmen for BS Architecture and BS Interior Design.

Course	1 st choice	2 nd choice	Actual Enrollees (in program of their 1 st choice)
BS Architecture	342	12	91
BS Interior Design	67	59	9

The population of the college is derived from the list of students enrolled in the design courses for both programs BS Architecture and BS Interior Design. BS Architecture program has 3 sections with an average of 52 students for each section while the BS Interior Design with 1 section has 53 freshmen students, 45 are regular students while 8 are repeaters in Interior Design 1.

Table 4 . The total population of freshmen from academic year 2013-2014.

Course	Section 1			Section 2			Section 3		
	T otal	Re gular	Irre gular	Tot al	Re gular	Irre gular	Tot al	Reg ular	Irregu lar
BS Arch	51	48	3	51	48	3	54	49	5
BS Interior Design	53	45	8						

Table 5 shows the part of the aptitude exam where the students received a highest mark. In the technical drawing, 70 or 49% of the students achieved a rating of 1-excellent compared to proportion where 9 or 6% and 7 or 4% obtained an excellent rating for the proportion drawing and pencil sketching and monochromatic rendering, respectively.

Table 5. Result of the Aptitude test per area of examination of freshmen from academic year 2013-2014 accepted in the BS Architecture and BS Interior Design Program.

Rating	Technical Drawing – Orthographic		Proportion Drawings		Pencil Sketching and Monochromatic Rendering	
	No.	%	No.	%	No.	%
1- Excellent	70	49%	9	6%	7	5%
2- Very Good	49	34%	37	26%	69	48%
3- Good	7	5%	63	44%	6	4%
4- Fair	14	10%	33	23%	4	3%
5- Poor	2	1%	0	0	2	1%
Total	142		142		142	

Shown in the table below is a favorable rating from the incoming freshmen where 37 or 26% received a rating of excellent and 96 or 67% obtained a rating of very good.

Table 5.A Cumulative Result of the Aptitude Test freshmen from academic year 2013-2014.

Numerical Rating	Descriptive Rating	BS Architecture	BS Interior Design	Total
1-3	Excellent	36	1	37
4-6	Very Good	84	12	96
7-10	Good	8	2	10
11-14	Fair			
15	Poor			
TOTAL				142

Table 6 A-C shows the attrition rating of BS Architecture Freshmen enrolled in Graphics from 3 academic years (2011-2012; 2012-2013 and 2013-2014). There are 12 students in the 1st semester of AY 2011-2012 or 7% who did not complete Graphics. In the 1st semester of AY 2012-2013 there were 8 or 5% failed to complete the subject. For AY 2013-2014, only 2 students or 1% withdrew from the subject –Graphics. For the period of 2nd semester AY 2011-2012 there were 12 students or 8% from a population of 150 who did not complete the graphics course and for AY 2012-2013 4 or 2% failed to finish the subject. For AY 2013-2014, only 1 or .06% received an incomplete rating.

Table 6.A. Comparative matrix of the Attrition Rate of Freshmen of BS Architecture in Graphic subject per academic year.

ARCH 1-1 Academic Year	No. of Students	Regular Students	Irregular Students	No. of Students who Passed the Subject	No. of Students who Failed the Subject	No. of Students who with Incomplete Grade in the Subject	No. of Students who Withdrew the Subject
2011-2012							
1 st sem	161	149	12	147	4	1	7
2 nd sem	150	136	14	138	0	6	6
2012-2013							
1 st sem	146	142	4	138	6	0	2
2 nd sem	134	131	3	127	0	0	4
2013-2014							
1 st sem	157	142	15	155	0	0	2
2 nd sem	160	149	11	159	0	1	0

In the area of Design for AY 2011-2012 1st semester, 10 or 6.5%, and for AY 2012-2013 12 or 10% did not complete the subject. With respect to AY 2013-2014 7 or 4.4% failed to finish the subject. During the 2nd semester, AY 2011-2012 21 or 13 % and for AY 2012-2013 6 or 5.4% did not complete the design subject. For AY 2013-2014 16 or 10% failed to complete the subject.

Table 6.B Comparative matrix of the Attrition Rate of Freshmen of BS Architecture in Design subject per academic year and section.

ARCH 1-1 Academic Year	No. of Students	Regular Students	Irregular Students	No. of Students who Passed the Subject	No. of Students who Failed the Subject	No. of Students who with Incomplete Grade in the Subject	No. of Students who Withdrew the Subject
2011-2012							
1 st sem	154	149	7	144	9	0	1
2 nd sem	157	138	19	136	16	0	5
2012-2013							
1 st sem	123	121	2	109	0	6	6
2 nd sem	110	98	2	92	2	0	4
2013-2014							
1 st sem	156	143	13	136	0	6	1
2 nd sem	164	154	13	48	8	5	3

For the subject Visual Techniques, only 2 students or 1.3% and 3 or 2% withdrew from the course and during the 1st semester of AY 2011-2012 and 2012-2013, respectively. For AY 2013-2014 2 or 1 % withdrew from the subject. During the 2nd semester AY 2011-2012, 5 or 3% did not complete the course and 4 or 3% from AY 2012-2013. For AY 2013-2014 2 or 1% received a grade of incomplete and withdrew from Visual Technique class.

Table 6.C Comparative matrix of the Attrition Rate of Freshmen of BS Architecture in Visual Techniques subject.

ARCH 1-1 Academic Year	No. of Students	Regular Students	Irregular Students	No. of Students who Passed the Subject	No. of Students who Failed the Subject	No. of Students who with Incomplete Grade in the Subject	No. of Students who Withdrew the Subject
2011-2012							
1 st sem	152	147	5	150	0	0	2
2 nd sem	148	144	4	139	1	0	4
2012-2013							
1 st sem	142	141	1	139	0	0	3
2 nd sem	138	136	2	136	2	0	2
2013-2014							
1 st sem	156	142	14	154	0	0	2
2 nd sem	155	141	14	153	0	1	1

For the BS Interior Design in Graphics, for the 1st semester of 2011-2012 and 2012-2013, 6 or 13% withdrew and 1 or 2% failed from the subject respectively. For AY 2013-2014, there are no available data. During the 2nd semester of AY 2011-2012 2 or 5% was not able to complete the Graphic course. For AY 2012-2013 the entire class completed the Graphics course. AY 2013-2014 there were 5 or 9% students failed in the subject.

Table 7.A Comparative matrix of the Attrition Rate of Freshmen of BS Interior Design in Graphics subject per academic year.

ARCH 1-1 Academic Year	No. of Students	Regular Students	Irregular Students	No. of Students who Passed the Subject	No. of Students who Failed the Subject	No. of Students who with Incomplete Grade in the Subject	No. of Students who Withdrew the Subject
2011-2012							
1 st sem	47	41	6	41	0	0	6
2 nd sem	43	32	11	42	1	0	1
2012-2013							
1 st sem	50	49	1	48	1	0	0
2 nd sem	45	25	20	45	0	0	0
2013-2014							
1 st sem	DATA NOT AVAILABLE						
2 nd sem	56	45	11	51	0	2	3

In the Design subject, for the 1st semester 5 or 11% and 8 or 23% did not complete the course for AY 2011-2012 and AY 2012-2013 respectively. There are no available data for the 1st semester of AY 2013-2014. During the 2nd semester for Ay 2011-2012, 11 or 23 % failed the design subject, while 8 or 17 % for AY 2012-2013 did not complete the course. In AY 2013-2014 2nd semester 8 or 13% failed to complete the subject.

Table 7.B. Comparative matrix of the Attrition Rate of Freshmen of BS Interior Design in Design subject per academic year and section.

ARCH 1-1 Academic Year	No. of Students	Regular Students	Irregular Students	No. of Students who Passed the Subject	No. of Students who Failed the Subject	No. of Students who with Incomplete Grade in the Subject	No. of Students who Withdrew the Subject
2011-2012							
1 st sem	45	40	5	40	0	0	5
2 nd sem	48	36		37	11	0	0
2012-2013							
1 st sem	50	47	3	42	7	0	1
2 nd sem	46	35	11	38	7	0	1
2013-2014							
1 st sem	DATA NOT AVAILABLE						
2 nd sem	62	45	17	54	7	0	1

For the Visual Technique, 1st semester of AY 2011-2012, 6 or 13.3% failed to complete the course and for AY 2012-2013 all passed the course. For AY 2013-2014 all students passed the course also. During the 2nd semester of AY 2011-2012 9 or 23% failed to complete the course and for AY 2012-2013, 19 or 34% did not finish the subject. 4 or 6.5% received a grade of “withdrew”.

Table 7.C Comparative matrix of the Attrition Rate of Freshmen of BS Interior Design in Visual Techniques subject.

ARCH 1-1 Academic Year	No. of Students	Regular Students	Irregular Students	No. of Students who Passed the	No. of Students who Failed	No. of Students who with Incomplete Grade	No. of Students who Withdrew the
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				Subject	the Subject	in the Subject	Subject
2011-2012							
1 st sem	45	40	5	39	4	0	2
2 nd sem	39	34	5	30	8	0	1
2012-2013							
1 st sem	48	47	1	48	0	0	0
2 nd sem	56	47	9	37	18	0	1
2013-2014							
1 st sem	48	45	3	48	0	0	0
2 nd sem	61	45	16	57	0	0	4

Table 8. Number of Students who graduated in 2018 for Architecture and 2017 in BS Interior Design

Student Number	BS Architecture (2018)	BS Interior Design (2017)
2004	1	-
2008	-	2
2009	3	1
2010	6	7
2011	11	2
2012	19	12
2013	40	7
Total		

Table 8.A Comparative Matrix of 2013 Freshmen and Number of Students who graduated on time

Program	Freshmen	Graduates	Percentage
BS Architecture	150	40	27%
BS Interior Design	45	7	15%

6. Discussion

The enrollment for the BS Architecture program reached the quota within the first 3 days of the enrollment while the BS Interior Design would fill up the class within 10 days from the start of the enrollment. Most students not accepted in the architecture program take up BS Interior Design. The 342 PUPCET passers' 1st choice is architecture however only 91 or 26% have actually enrolled in the program. If the basis is the 342 PUPCET

passers it can cover more than 100% because the quota requirement is from 45-50 only with 3 sections or a total of 150 students for BS Architecture. For the program BS Interior Design there were 67 PUPCET passers who chose the program however, there were only 9 students who enrolled.

There were 209 freshmen students for academic year 2013-2014, however, the result of the aptitude exam only shows a total number of 142. The discrepancy of the total enrolled freshmen can be attributed to the irregular freshmen who failed the subject and the handling of data since students do not take the aptitude exam at the same time.

The attrition rate of BS Interior Design is higher as compared to that of the BS Architecture. The manifestation of this phenomenon can be attributed to the relatively low number who chose and enrolled in the BS Interior Design as their 1st choice. Those who took the structured aptitude test performed better with respect to the 2 batches who were asked to draw their dream house or their current homes. Even with the access to computer and internet data, exposure to architecture plays a significant force on how the student drew their dream houses. On the aptitude exam where students were asked to draw the house they lived in, most of the time it would bring discomfort and apprehension because they would not want to be judged on their actual living condition. In fact, during the course of inquiry to students from 2011-2012 and 2012-2013 they have admitted that they drew their relative's or neighbor's house which they feel is more presentable in the standard that the society has set.

The research is premised on "*centris paribus*"- all things being equal, in terms of how the faculty is giving the number of assignments and how they are grading the students. However, to substantiate the study there is a need to provide a deeper study, i.e. both on the horizontal and vertical depth that would consider the faculty and their grading system. The attrition rate from 1st year students to the time they are expected to graduate is 27% for architecture 40 out of 150 students and 15% for interior design or 7 out of 45.

7. Conclusions

The PUPCET, the required high school rating and the aptitude examination given by the department provide a healthy evaluation and assessment for the incoming freshmen of the college. The initial result of the attrition relative to their first year grades shows a relatively low rating comparing it to the two previous batches. The structured aptitude examination provides a clearer and more holistic predictor in the students' success in relation to their graduation. However, a series of assessments on the intervention given every year level should be assessed to determine the critical points where the attrition rate increases. The series of exams provide a more holistic evaluation of the incoming freshmen which is primordial in developing future architects and interior designers since the professions are both a science and an art. There is a need to institutionalize the aptitude examination and the development of the aptitude exam should be participated in by a multi-disciplinary group that would include architects both from the academe and industry. It is recommended that the psychologist from the guidance office should administer the test at the same time to all students intending to enroll in the BS Architecture and BS Interior Design. The result of the aptitude test would be more reliable and the program sustainable.

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