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Paper Title: Analysis of the National Diagnostic Aptitude Test (NDAT) of Pre-Service Teachers: Basis for Program Enhancement

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Abstract — This study aimed to analyze the performance level of the Pre-Service Teachers of Urdaneta City University. This sought to answer the following problems: (1) profile of the respondents in terms of their program and area of specialization, (2) performance level of the pre-service teachers on the following subjects: English, Social Studies , Biological Science, Physics, Mathematics, Filipino, PPST, K-12 and OBE, and (3) proposed innovation to improve the Enhancement Program of the College of Teacher Education.

The instrument used was the National Diagnostic Aptitude Test administered by the Carl Balita Review Center in the Enhancement Program of the College of Teacher Education of the Urdaneta City University during the school year 2019 – 2020. It was composed of a total of 100 items: number of items in each of the different subject areas: English (10items), Social Studies (10items), Biological Science(5items), Mathematics (10items), Filipino(10items), PPST(36items), K-12 (4items) and OBE (10items).

After a systematic and in-depth analysis of the data gathered, the investigations finally come up with the following results: (1) Majority of the 4th year Pre-Service Teachers are under the Bachelor in Secondary Education Program with 99 or 60%. Most of them are under the PEHM Major with 23.6%, followed by the Social Studies Majors with 18 or 10.9% and with the least number, English Majors with only 7 or 4.2%. (2) The respondents' performance level on the National Diagnostic Aptitude Test are low when it comes to the subjects English, Social Studies, Biological Science, Physics, Mathematics, K-12 and OBE.

The following conclusions were drawn based on the salient findings: (1) The respondents of the study are BSEd Program dominated. Most of them are PEHM majors and few of them are English Majors. (2) The respondents got a low performance level on all of the subjects in the National Diagnostic Aptitude Test and are highly performing on the subjects Filipino and PPST.

The following are the recommendations drawn based on the salient findings and conclusions: (1) An intense and advanced enhancement on the following subjects must be implemented. (2) The institution should implement a joint development of initial teacher licensing tests for knowledge and skill areas they need to have. (3) The College of Teacher Education should have an annual monitoring assessment to measure learning outcomes for the department to be able to identify which topics or subjects to enhance.

Keywords — National Diagnostic Aptitude Test, Program Enhancement

I. Introduction

The goal of education has become more complex as the number of the students has increased enormously. Teachers have always been concerned in measuring and evaluating the progress of their students so they can adjust their instructional practices to meet the needs of their students.

A variety of assessment and evaluation tools like a diagnostic test are used to determine students' level of knowledge, skills and understanding of a course, subject, or lesson to test the students on what they already know. These various test allow the instructor to adjust the curriculum and pedagogy to meet the needs of the students.

Consequently, process of augmentation or improvement of learners' attributes, knowledge, ability, skills and potentials are observed by schools. Enhancement program in teacher education institutions, for example, is being undertaken to strengthen the knowledge and capabilities of pre-service BSE and BEEd students.

The success level of the enhancement program is measured not only in terms of the effectiveness of the administration of the program and the effectiveness of the instructors handling enhancement subject areas, relevance of topics and adequacy of information shared by them, but also in terms of the learning level of the students taking the enhancement subjects/courses.

Esomonu and Eleje, (2020), that diagnostic testing can help improve students' achievement. As mentioned in the study, their finding provided empirical support to earlier findings by Betts et al., (2015), Ofem et al., (2017) and Rusrus (2007) that recorded an increase in learners' achievement when diagnostic test goes together with feedback and a corrective measure remediation.

Moreover, the results of the study of Geok Shim et al., (2017), indicated that students who performed well in their diagnostic test also performed well in their mathematics final assessments. Likewise, those who did not perform well in their diagnostic test obtained poor results in their final mathematics assessment. As cited, the result of this study supported Carmody et al., (2006) which also found that there was a significant positive correlation between the students' diagnostic test and the final examination.

In the country, The Philippine Educational Placement Test (PEPT) was the principal instrument used in the Accreditation and Equivalency Program (AEP) in 1977. The PEPT Test the competencies gained through formal, informal and non - formal education which was equivalent to those developed in five subject areas, Communication Arts in English, Filipino, Science, Mathematics, and Social Studies.

Juan Miguel Luz, 2005; alleged that Filipino students are doing so badly in national achievement test and in international comparative survey tests.

Fruehling, (2004), stated that placement test are administered to assist in appropriate academic placement, to assess academic achievement, to identify individual aptitudes, to explore vocational interests, and to examine personal characteristic. Houston, (2004), told that placement test are designed to try to predict the eventual success of student in college, Allington, (2004), said that schools administer placement test in the form of standardized tests to determine which student would benefit from a remedial course. The University of Wisconsin System Placement Test, (2000), has major purpose of identifying the students who could be place into advanced appropriate course.

However, placement test according to Armstrong, do not predict grade significantly because there are too many outside variables that determine final grade. Some of these variables are sex, previous knowledge, commitment of learning the material, and instructor variation.

Thus, the National Diagnostic Aptitude Test administered by the Carl Balita Review Center during the Enhancement Program in the College of Teacher Education of the Urdaneta City University was one method assessing/evaluation adopted by the College of Teacher Education of the Urdaneta City university in identifying the weaknesses and strengths of the students. The National Diagnostic Aptitude Test was formulated to identify and implement policies and innovation in the teaching-learning process and enhance the knowledge and skills acquisition of students especially those who performed below the prescribed rating. The tests determine the level of achievement of the respondents through interpretation and analysis of their raw scores in the nine subject areas: English, Social Studies, Biological Science, Physics, Mathematics, Filipino, PPST, K-12, and OBE.

Literature Review

There were studies that would really relate the present study. This study explains further the factors and effect of the diagnostic test of the pre-service teachers on the College of Teacher education.

Diversity is increasing in our classrooms implying the need for teachers to be prepared to work effectively with students from different backgrounds, such as cultural, linguistic or national origin. Additionally, the focus on diversity education is important because of the need for students to develop, from an early age, the ability to communicate with and relate to others from diversity backgrounds. This study of Keengwe (2010) focuses on cross cultural experiences gained from cross cultural partnerships between pre-service teachers and English language learners over the course of a semester at a medium size public university. Evidence from this project suggests the need for teacher educators to model and support appropriate cultural competencies that are critical in classrooms that are fast becoming more culturally as well as linguistically diverse (Keengwe, 2010)

Moreover, Sticker, et al. (1993) appraised 2 explanations for sex differences in over and under prediction of college grades by the Scholastic Aptitude Test: sex-related differences in (1)

the nature of the grade criterion and (2) the variables associated with the academic performance. An entire freshmen class at a large state university was studied. Women's GPA was under predicted (and men's GPA was over predicted), but only by a small amount. When the GPA was adjusted for differences in grading standards for individual courses, over and under predictions were not affected, when sex differences were controlled for in individual differences variables concerned with academic preparations, studiousness, and attitudes about mathematics, over and under predictions were reduced.

In addition to the above study, Nichols (1964) mentioned that a sample of 356 National Meri Finalists attending 91 colleges was used to assess the effects of colleges on student Graduate Record Examination performance. Precollege characteristics of the students were controlled by multiple partial correlation and by modifications of this technique. Colleges tended to influence the Verbal and Quantitative scores of the students in opposite directions. Northeastern men's colleges tended to increase Verbal relative to Quantitative while technical institutes and state universities tended to increase Quantitative relative to Verbal. The student's major field of study had a similar reciprocal effect on the Verbal and Quantitative scores, but most of the differences between colleges remained when the effect of the major field of study was controlled. The size of the college effects was small relative to the variability attributable to differences between students which existed before the students entered college.

Also, Levine, et al. (1979) stated that a student may be so typical and unlike other students that his or her aptitude test score fails to be a completely appropriate measure of his or her relative ability. We consider the problem of using the student's pattern of multiple choice aptitude test to decide whether his or her score is an appropriate ability measure. Several indicators of appropriateness are formulated and evaluated with a simulation of the Scholastic Aptitude Test. Applications to investigations of alignment errors, exceptional creativity, suboptimal test taking strategies, and unauthorized access to test items are noted.

It is greatly noted that these review of literature provides further knowledge in the conduct of this present study.

II. Methodology

Research Design

The descriptive survey method was used in this study. The respondents of the study are the pre-service teachers (4th year) A.Y. 2019-2020 of the College of Teacher Education. A total of 165 students.

The instrument used was the National Diagnostic Aptitude Test administered by the Carl Balita Review Center in the Enhancement Program of the College of Teacher Education of the

Urdaneta City University during the school year 2019 – 2020. It was composed of a total of 100 items: number of items in each of the different subject areas i. e.;

a.   English (10 items)
b.   Social Studies (10 items)
c.   Biological Science (5 items)
d.   Physics (5 items)
e.   Mathematics (10 items)
f.   Filipino (10 items)
g.   PPST (36 items)
h.   K-12 (4 items)
i.   OBE (10 items)

Population and Locale of the Study

The respondents of the study are the pre-service teachers (4th year) A.Y. 2019-2020 of the College of Teacher Education. A total of 165 students.

Data Collection Instruments

The instrument used was the National Diagnostic Aptitude Test administered by the Carl Balita Review Center in the Enhancement Program of the College of Teacher Education of the Urdaneta City University during the school year 2019 – 2020. It was composed of a total of 100 items.

Table 1. Distribution of the Respondents in terms of their Program and Area of Specialization.

	Frequency	Percent
Program		
BEEd	66	40.0
BSEd	99	60.0
Area of Specialization		
PEHM	39	23.6
Social Studies	18	10.9
Filipino	15	9.1
English	7	4.2
Science	8	4.8
Mathematics	12	7.3

It is presented on the table that there are 66 or 40% BEEd pre-service teachers and 99 or 60% BSEd pre-service teachers, who took the National Diagnostic Aptitude Test administered by Carl E. Balita Review Center. 39 or 23.6% of the BSEd pre-service teachers are PEHM majors, 18 or 10.9% of them were Social studies majors, 15 or 9.1% were Filipino majors, 7 or 4.2% were English majors, and there were 8 or 4.8% and 12 or 7.3% who's major of specialization were Science and Mathematics, respectively.

Performance of the Pre-service Teachers on National Diagnostic Aptitude Test in terms of General Education Subjects, PPST, K-12 and OBE

Table 2 below shows the distribution of the frequency of upper 50% and lower 50% of BEEd, PEHM and Social Studies pre-service teachers' scores on National Diagnostic Aptitude Test in terms of General Education Subjects, namely English, Social Studies, Biological Science, Physics, Mathematics, and Filipino, PPST, K-12 and OBE.

Table 2. Performance of the Pre-Service Teachers on National Diagnostic Aptitude Test in Terms of General Education Subjects, PPST, K-12 and OBE

Subjects		Major					
		BEEd		PEHM		Soc.Stud.	
		n=66		n=39		n=18	
		<50%	>50%	<50%	>50%	<50%	>50%
English	freq.	57	9	31	8	14	4
	%	86.36	13.64	79.49	20.51	77.78	22.22
Soc. Stud.	freq.	64	2	36	3	13	5
	%	96.97	3.03	92.31	7.69	72.22	27.78
Bio Sci	freq.	60	6	35	4	17	1
	%	90.91	9.01	89.74	10.26	94.44	5.56
Physics	freq.	65	1	38	1	18	**0**
	%	98.48	1.52	97.44	2.56	100.00	**0.00**
Math	freq.	62	4	34	5	18	**0**
	%	93.94	6.06	87.18	12.82	100.00	**0.00**
Filipino	freq.	49	17	32	7	14	4
	%	74.24	25.76	82.05	17.95	77.78	22.22
PPST	freq.	28	**39**	25	14	6	**12**
	%	42.42	**57.58**	64.10	35.90	33.33	**66.67**
K-12	freq.	60	6	36	3	17	1
	%	90.91	9.09	92.31	7.69	94.44	5.56
OBE	freq.	60	6	35	4	11	7
	%	90.91	9.09	89.74	10.26	61.11	38.89

As can be gleaned from the table, BEEd pre-service teachers got lower than 50% of the number of items in all of the subjects except for PPST. There are 39 or 57.58% of the BEEd pre-service teachers and 12 or 66.67% got a passing score in PPST. This could mean that a considerable number of pre-service teachers from both programs, BEEd and BSE, particularly Social Studies majors are equipped with ample knowledge on the framework for teacher quality and teacher development as enunciated in DepEd Order No. 42, series of 2017, also known as the National Adoption and Implementation of the Philippine Professional Standards for Teachers (PPST). This only means that they are aware and functional understanding of the seven domains and 37 strands that pertain to more specific dimensions of teacher practices such as content knowledge and pedagogy, learning environment, diversity of learners, curriculum and planning, assessment and reporting, community linkages and professional engagement, and personal growth and professional development.

On the other hand, out of 39 PEHM Pre-service teachers, only 14 or 35.90% of the students got more than half of the correct answers on PPST. And there is only one or 2.56% student who got more than 50% of the correct answers on Physics. This means that PEHM majors have lower performances in PPST and Physics as against their counterparts in the BSE Social Studies. This implies the need to enrich lessons on the said subjects to enhance their background knowledge along these subject areas.

Moreover, Social Studies Pre-service teachers got higher than 50% of the number of items in PPST but none of them got higher than 50% on Physics and Mathematics. This only means that Social Studies majors are strong in terms of their knowledge on teacher quality in the Philippines but considerably weak in terms of exact sciences such as Physics and Mathematics.

Table 3. Performance of the Pre-Service Teachers on National Diagnostic Aptitude Test in Terms of General Education Subjects.

Subjects		Major Filipino n=15		English n=7		Science n=8		Math n=12		OverAll N=165	
		<50%	>50%	<50%	>50%	<50%	>50%	<50%	>50%	<50%	>50%
English	freq.	10	5	2	**5**	5	3	8	4	127	38
	%	66.67	33.33	28.57	**71.43**	62.50	37.50	66.67	33.33	76.97	23.03
Soc. Stud.	freq.	14	1	5	2	7	1	7	5	146	19
	%	93.33	6.67	71.43	28.57	87.50	12.50	58.33	41.67	88.48	11.52
Bio Sci	freq.	9	6	4	3	0	**8**	10	2	135	30
	%	60.00	40.00	57.14	42.86	0.00	**100.00**	83.33	16.67	81.82	18.18
Physics	freq.	12	3	6	1	7	1	12	**0**	158	7
	%	80.00	20.00	85.71	14.29	87.50	12.50	100.00	**0.00**	95.76	4.24
Math	freq.	15	**0**	6	1	6	2	2	**10**	143	22
	%	100.00	**0.00**	85.71	14.29	75.00	25.00	16.67	**83.33**	86.67	13.33
Filipino	freq.	3	**12**	4	3	5	3	9	3	116	49
	%	20.00	**80.00**	57.14	42.86	62.50	37.50	75.00	25.00	70.30	29.70
PPST	freq.	8	7	0	**7**	2	**6**	2	**10**	105	60
	%	53.33	46.67	0.00	**100.00**	25.00	**75.00**	16.67	**83.33**	63.64	36.36
K-12	freq.	15	**0**	7	**0**	6	2	12	**0**	153	12
	%	100.00	**0.00**	100.00	**0.00**	75.00	25.00	100.00	**0.00**	92.73	7.27
OBE	freq.	12	3	2	**5**	6	2	9	3	134	31
	%	80.00	20.00	28.57	**71.43**	75.00	25.00	75.00	25.00	81.21	18.79

It can be gleaned from the table above that out of 15 Filipino pre-service teachers, 12 or 80% of them got higher than the 50% of number of total items in Filipino. This means that most of them really is performing well and are strong in their area of specialization. On the other hand, none of the Filipino pre-service teachers got higher than the 50% number of items in the subjects Math and K-12 which could mean that these could be their waterloo subjects.

For English pre-service teachers, 5 out of 7 or 71.43% got more than the passing score on their major, English, and OBE which means they are doing well in these subjects. It can also be seen that all of the English pre-service teachers got greater than the passing score. This only means that English majors are strong in the above mentioned subject areas.

All of the General Science pre-service teachers got higher than 50% of the total number of items on Biological Science which shows their competency in their major field. Also, 6 or 75% of them got more than the passing score in PPST which is indicative of their strength along this line.

Out of 12 Mathematics pre-service teachers, 10 or 83.33 of them got higher than 50% of the number of items on their major, Mathematics, and PPST which affirms the fact that they are strong in their line of specialization and have high potential in terms of teacher quality and development.

For the overall performance of the pre-service teachers, it can be deduced from the table that they perform well on the subjects Filipino and PPST with 70.30% and 63.64%, respectively. On the other hand, out of 166 pre-service teachers, 76.96% of them got lower than the 50% of the number of items in all of the subjects except for the two: Filipino and PPST. This means that the pre-service teachers of the College Teacher Education of Urdaneta City University are strong in the subjects Filipino and PPST and relatively weak in terms of other subject-areas such as: English, Social Studies, Biological Science, Physics, Math, K-12, and OBE. This implies the need to strengthen and enrich lessons pertaining to the latter subjects to enhance the knowledge and capabilities of the pre-service teachers on the said subject-areas.

III. Results and Discussion

After a systematic and in-depth analysis of the data gathered, the investigations finally come up with the following results: (1) Majority of the 4th year Pre-Service Teachers are under the Bachelor in Secondary Education Program with 99 or 60%. Most of them are under the PEHM Major with 23.6%, followed by the Social Studies Majors with 18 or 10.9% and with the least number, English Majors with only 7 or 4.2%. (2) The respondents' performance level on the National Diagnostic Aptitude Test are low when it comes to the subjects English, Social Studies, Biological Science, Physics, Mathematics, K-12 and OBE.

IV. Conclusion

Based from the following findings, conclusions were drawn: (1) The respondents of the study are BSEd Program dominated. Most of them are PEHM majors and few of them are English Majors. (2) The respondents got a low performance level on all of the subjects in the National Diagnostic Aptitude Test and are highly performing on the subjects Filipino and PPST.

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