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Admissions in Allied Health Sciences Degree Programs: Factors Associated with Enrollments Perspective

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ABSTRACT

Background: Allied health sciences in Pakistan has witnessed a rapid surge in the enrollments recently with a dearth of admissions few years back. Factors involved in decision-making among prospective current students' interest in these disciplines needs to be explored. Hence, this study was conducted with the objective to explore the factors involved in increasing trends of enrollments in disciplines of Allied Health Sciences. **Subjects and Methods:** This mix methodology research design study recruited N=380 students enrolled in different degree programs of allied health sciences of private universities of Lahore, from February 2019 to June 2019, using convenience sampling. A self-designed Tool for Assessment of Behavior Control was used for data collection. Data was analyzed using SPSS Version 22. Descriptive statistics was utilized. Multivariate analysis of variance (MANOVA) was used to assess difference between subscales of TABC. **Results:** Factors involved in decision making among students were identified & all domains revealed significant association with degree program ($p<0.05$) with Attitude having highest mean scores for DPT indicating high level of personal attitude towards the degree, while it was least for DDNS, Subjective Norms having highest scores for DMLS. Different domains also revealed association with age, gender, semester and residential area. Thematic analysis revealed seven themes affecting enrollment in AHS with quality of education and demand of degree in future affecting enrollment. **Conclusion:** Students with the professional degree program of DPT possess a high level of personal attitude and education planned behavioral control & intentions, while those with DMLS have high level of educational planned behavioral control, educational attitude, educational subjective norms and intentions toward their degree program. Most important themes affecting enrollment include quality of education & professional degree program, age, gender, semester level, and residential area.

INTRODUCTION

Allied Health Profession (AHS) is an ill-defined diverse group of health professionals excluding medical and nursing/ midwifery professionals proposed as Allied Scientific and Complementary (ASC) health professionals including traditional and new service areas with an allied health focus[1], and apply their proficiency to prevent disease, diagnosis, treat and rehabilitate to restore and sustain optimal physical, sensory, and social functions of persons or people of any age group. Combined efforts are included among a variety of practical and compassionate teams for patient care [2].

Abdullah MA et al. [3] reported acute shortage of different strata of healthcare manpower in Pakistan, with expectation to worsen due to rapid growth rate, non-equitable distribution and loss of trained healthcare manpower abroad. Higher educational institutions are making advancements as regards quality of education and clinical practices of AHS professional degree programs with most advancements being made in the developed countries. In Pakistan, being a developing country, in Allied Health Professional Educational degree programs some programs have been added in the recent decade and advancement in current professions are in progress [4]. Allied health professions have begun introducing professions on demand of medical health care systems. With a large numbers of professionals required to run the health care systems, jobs are positioned worldwide from developed to developing countries. There are many new health care jobs located in Allied Health Professions

worldwide with up to 100 different job career already classified in Allied Health Professions [5]. Hence, it's a large growing field with AHS being the latest trend of medical supportive field toward different dimensions to solve the challenges being faced by Health services and the people of all over the world. AHS deal with all foremost departments like Intensive care unit (ICU), emergency, Operation Theater and laboratories. It also provides services in all associated departments in medical and allied fields like cardiology, psychiatry, rheumatology; and general surgical and allied fields like orthopedic, otolaryngology, ophthalmology etc. [6]. They are also essential part of multi-disciplinary teams with different skills [7].

Many predictions are involved as regards large number enrollments of Allied Health Professions. These professions being a source of good earning and job security as well [8]. No doubt Education in health and human services professions is the trend of the day, which is gradually become multifaceted with advancements and changes in scope of practice with time [9]. With a large number of degree programs available within AHS, various fiscal constraints are also being faced by AHS with health being in a transitional phase of education & practical training to fill the deficiency of health professionals. New clinical pathways are required to face the challenges of health with the world's suggestions of alternative reproductions of professions [10]. Hence the research question is focused on student's behavior! Do they know the value of professions, or have an attitude for the field? Behavioral approach is based on attitude, subjective norms and perceived control behavior, and originates from economic model that was dominant in 1950s [11]. In 1970s behavioral approaches obtained significant hype with social psychology of theory of Reasoned action [12]. The attitude to specific behavior and subjective norms are the cause of the behavioral intentions. Someone's intentions are motivation towards behavior. The Attitude towards behavior determines the behavioral believes about outcome of behavior and evaluation. Subjective norms are person's insight of social pressure in performing/not performing a given behavior is determined by normative belief and motivation to comply with specific references [13]. Planned Behavioral Theory (PBT) comprehensive with Theory of Reasoned Action (TRA) to more realistic framework of non-volitional behavior by encompassing individuals with required opportunities of recourses and knowledge [14]. Ajzen modified theory by descriptive factors, perceived behavioral control resulted in behavioral planned theory [15].

Few years back there was dearth of admissions in Allied Health Professional degree programs, with lot needed to be done to improve the career as well as service structure of AHP in Pakistan [7]. However, gradually there is a drift towards enrollment in AHP. Hence due to dearth of AHP in Pakistan, rapid population growth, it is essentially required to identify factors linked to decision-making among prospective current students interest to enroll in allied health education programs to cater to the needs of the population explosion in the developing countries like Pakistan [16].

Hence this study was conceived with the objective to explore the factors about gradually increasing trends of enrollments in professions of Allied Health Science.

MATERIALS AND METHODS

Current study utilized mixed methodology research (MMR) design involving both qualitative and quantitative research approaches. The qualitative methodology was employed in order to identify themes behind the satisfaction or otherwise of students with the AHS degree programs. Study was conducted over a period of 6 months from 1st February 2019 to 30th June, 2019 and recruited a sample of N=384 students of different degree programs in Allied Health Sciences of private Universities. Sample included Students from all batches registered in full time professional degree programs of AHS including Doctor of Diet Nutrition Sciences (DDNS), Doctor of Medical Lab Sciences (DMLS), Doctor of Physical Therapy (DPT), Medical Imaging Doctor (MID) & other programs, without gender and age limitation.

Students were statistically stratified in groups according to number of enrolled students using formula: $n = \frac{z^2 pq}{e^2}$

[Note: p=prevalence, q=1-p, e=margin of error]

$$n = \frac{(1.96)^2\ 0.5 * 0.5}{(0.05)^2} = 384$$

After divining population in homogeneous grouping we applied proportional allocation method to identify how many samples should be selected from each group as we have 5 groups of students.

$$n_h = n \cdot \frac{N_h}{N}$$

[Note: n_h = statrum proposed sample size, Nh = Statrum Total Size, N = Target Population Size, n = Sample Size]

$$n_1 = 384 * {}^{285}/_{1150} = 95$$

$$n_2 = 384 * {}^{170}/_{1150} = 57$$

$$n_3 = 384 * {}^{323}/_{1150} = 108$$

$$n_4 = 384 * {}^{280}/_{1150} = 94$$

$$n_5 = 384 * {}^{92}/_{1150} = 30$$

$$n_1 + n_2 + n_3 + n_4 + n_5 = 384$$

Hence a total sample of N=384 students was calculated. However, 4 students' questionnaires with incomplete data were excluded from the study.

Study was conducted following ethical approval Institutional Ethical Research Committee of DHPT, university of Lahore Reference # DHPT-04 dated 19th January, 2019 and informed consent of the participants.

Self- designed questionaire was used for data collection. The questionnaire was designed using framework of planned behavior theory of Ajzaen. Questionnaire consisted of 35 items divided in 7 sections and two descriptive questions. Every section consisted on 5 items. 1st section comprised 5 items about attitude, 2nd about subjective norms,3rd about Perceived behavioral control, 4th Educational attitude, 5th Educational subjective

norms, 6th educational perceived behavioral control and 7th on the subject of intentions. The Cronbach Alpha reliability value α = .86 revealed that all seven subscales were reliable (table 1).

Table 1

Cronbach. Alpha Reliability of Tool for Assessment of Behavior Control, & its Subscales. (N=380)

Domains	Scale Mean if Item Deleted	Cronbach's Alpha
Attitude	230.66	0.756
Subjective Norms	233.80	0.754
Perceived Behavioral Control	231.51	0.758
Educational Attitude	231.08	0.748
Educational Subjective Norms	230.94	0.756
Educational Perceived Behavioral Control	227.27	0.749
Intentions	230.41	0.765
Total Scale Score	124.28	0.865

Data was collected with self-administered questionaire (likert) type scale) 400 hundred questionnaires were distributed among Allied Health professional degree programs students, 385 returned back to researcher and of these five was incomplete hence excluded from data analysis.

SPSS Version 22 was utilized for data analysis. Descriptive statistics were used to describe the demographic characteristics of participants and treated as categorical variables. Person correlation was used to assess the relationship among the all study variables including attitude, subjective norm, perceived behavioral control, educational attitude, educational subjective norms, educational planned behavioral control and intentions. Differences on the different subscales of TABC among students were assessed by Multivariate analysis of variance (MANOVA)

RESULTS

The results derived for quantitative and qualitative analysis revealed:

Quantitative Statistics

i) Demographic Characteristics:

Descriptive statistics (table 2) revealed that majority of students 208 (54.7%) were 21-25 years old, and males 198(52.1%). Most students 94(24.7%) were from the department of Diet and Nutrition and majority 150(39.5%) in 3 to 4th semester. Most 174(45.8%) were from Lahore followed by 134(35.3%) from Central Punjab.

Table 2

Descriptive of Demographics of Students (N=380)

Variable	Category	f(%)
Age (Years)	15-20	126(33.2)
	21-25	208(54.7)
	26-30	40(10.59)
	30-35	6(1.6)
Gender	Male	198(52.1)
	Female	182(47.9)
Degree Program	Doctor of Diet and Nutrition Sciences	94(24.7)
	Doctor of Medical Lab Sciences	57(15)
	Doctor of Physical Therapy	108(28.4)
	Medical Imaging Doctor	31(8.2)
	others	90(23.7)
Semester	1 to 2	82(21.6)
	3 to 4	150(39.5)
	5 to 6	102(26.8)
	7 to 8	46(12.1)
Residence	Lahore	174(45.8)
	Central Punjab	134(35.3)
	South Punjab	38(10)
	Other	34(8.9

(Note: DDNS= Doctor of Diet and Nutrition Sciences, DMLS= Doctor of Medical Lab Sciences, DPT= Doctor of Physical Therapy, MID = Medical Imaging Doctor f = frequency, % = percentages,)

Pearson product moment correlation test revealed that there was significant (p<0.01) positive relationship among the variables (table 3).

Table 3

Pearson Product Moment Correlation to measure relationship subscales of Tool for Assessment of Behavior Control.

Domain (Mean±SD)	1	2	3	4	5	6	7
1.Attitude (17.91±4.51)	1	.354**	.440**	.631**	.471**	.510**	.407**
2.Subjective Norms (14.76±5.23)		1	.543**	.479**	.497**	.416**	.263**
3.Perceived Behavioral Control (17.06±4.66)			1	.687**	.393**	.291**	.254**
4.Educational Attitude (17.48±4.14)				1	.635**	.592**	.494**
5. Educational Subjective Norm (17.62±3.95)					1	.652**	.500**
6. Educational Planned Behavioral Control (21.30±4.59)						1	.749**
7. Intentions (18.16±3.82)							1

Note: ** P<0.01.

Table 4 showing descriptive statistics of different domains cross tabulated against student characteristics revealed significant association of Perceived Behavioral Control, Educational Attitude, Educational Planned Behavioral Control and Intentions domains with age with p=0.049, p=0.011, p=0.004 & p=0.002 respectively. While gender with higher scores for males was significantly associated with all domains (p<0.05) except domain of intentions (p=0.069).

Table 4

Student Characteristics Vs Subscales of Tool for Assessment of Behavior Control. Cross tabulation with T-test and Anova Statistics

Student Characteristics		Attitude Mean±SD	Subjective Norms Mean±SD	Perceived Behavioral Control Mean±SD	Educational Attitude Mean±SD	Educational Subjective Norms Mean±SD	Educational Planned Behavioral Control Mean±SD	Intentions Mean±SD
Age Group	15-20 (126)	17.77±5.08	15.23±4.50	16.32±4.57	16.50±4.21	17.56±3.76	21.42±3.91	17.74±3.71
	21-25 (208)	17.83±4.28	14.53±5.55	17.66±4.35	17.89±4.10	17.49±4.11	20.75±5.05	17.98±3.92
	26-30 (40)	18.48±4.10	14.65±5.90	16.28±5.99	18.18±3.86	18.75±3.59	23.38±3.61	19.95±3.30
	30-35 (6)	19.67±2.25	13.50±3.21	16.83±5.08	19.00±2.28	16.17±4.22	24.00±2.00	21.17±1.33

	Total (380)	17.91±4.51	14.76±5.23	17.06±4.66	17.48±4.14	17.62±3.95	21.30±4.59	18.16±3.82
	f/p-value	0.571, 0.634	0.59, 0.622	2.647, 0.049	3.776, 0.011	1.459, 0.225	4.582 ± 0.004	4.978±0.002
Gender	Male (198)	18.78±4.08	16.18±4.80	17.57±4.48	17.96±3.79	18.22±3.70	21.83±4.08	18.50±3.30
	Female (182)	16.96±4.78	13.21± 5.25	16.51±4.80	16.95±4.44	16.97±4.12	20.72±5.04	17.79±4.30
	t/p-value	3.994, 0.000	4.756, 0.000	2.227, 0.027	2.401, 0.017	3.13, 0.002	2.365, 0.019	1.825±0.069
Degree program	DDNS (94)	15.35±5.23	13.44±3.08	15.60±3.70	14.44±3.28	16.26±2.44	18.24±2.92	16.01±2.28
	DMLS (57)	18.63±2.60	16.00±5.40	17.74±4.34	18.70±3.53	18.44±4.42	22.49±4.02	18.74±3.53
	DPT (108)	19.55±3.37	14.79±6.33	17.16±5.15	18.42±3.92	18.36±3.82	22.54±4.59	19.43±3.82
	MID (31)	19.03±4.61	15.13±5.02	18.42±4.82	18.39±4.33	16.87±4.40	22.13±4.30	18.10±4.66
	Others (90)	17.77±4.71	15.20±5.33	17.57±4.80	18.44±4.00	17.90±4.53	21.96±5.08	18.53±4.11
	Total (380)	17.91±4.51	14.76±5.23	17.06±4.66	17.48±4.14	17.62±3.95	21.30±4.59	18.16±3.82
	f/p-value	13.544, 0.000	2.547, 0.039	3.659, 0.006	20.392, 0.006	4.958, 0.001	16.3, 0.000	16.3, 0.000
Semester	1-2 (82)	19.46±3.72	16.15±4.65	17.38±4.57	17.66±3.62	18.59±3.20	22.13±3.38	18.41±3.32
	3-4 (150)	16.33±4.78	14.29±5.27	16.59±4.32	16.68±4.26	17.12±4.01	20.41±4.67	17.47±3.67
	5-6 (102)	18.33±4.64	14.31± 5.54	17.66±4.89	18.27±4.27	17.76±4.29	21.40±5.29	18.47±4.38
	7-8 (46)	19.33±2.75	14.83± 5.07	16.67±5.26	18.00±3.99	17.22±3.94	22.48±4.09	19.26±3.53
	Total (380)	17.91± 4.51	14.76± 5.23	17.06±4.66	17.48±4.14	17.62±3.95	21.30±4.59	18.16±3.82
	f,p-value	12.12, 0.000	2.614, 0.051	1.295, 0.276	3.481, 0.016	2.674, 0.047	3.909, 0.009	3.323±0.02
Residence	Lahore (174)	18.44±4.43	15.74± 5.34	17.99±4.61	18.40±4.05	17.94±4.13	22.10±4.53	18.80±3.72
	Central Punjab (134)	17.18±4.41	14.39± 4.84	16.46±4.56	16.48±3.91	17.40±3.34	20.24±4.42	17.27±3.72
	South Punjab (38)	17.34±4.91	12.29± 5.17	14.76±4.21	16.37±4.38	17.71±4.19	21.39±4.06	18.53±3.57
	Other (34)	18.71±4.60	13.97± 5.15	17.18±4.71	17.97±4.19	16.79±4.84	21.24±5.44	17.97±4.45
	Total (380)	17.91±4.51	14.76± 5.23	17.06±4.66	17.48±4.14	17.62±3.95	21.30±4.59	18.16±3.82
	f,p-value	2.543, 0.056	5.547, 0.001	6.416, 0.000	6.839, 0.000	1.02, 0.384	44.277, 0.006	4.304±0.005

As regards degree program (table 4), all domains revealed significant association with degree program (p<0.05) with Attitude having highest mean scores for DPT indicating high level of personal attitude towards the degree, while it was least for DDNS, Subjective Norms having highest scores for DMLS, Perceived Behavioral Control having highest scores for MID, Educational Attitude &, Educational Subjective Norms having highest scores for DMLS, Educational Planned Behavioral Control and Intentions having highest scores for DPT (Figure 1, 2)

Figure 1

Graphical Representation of Means of Attitude, Subjective Norms, Perceived Behavioral Control & Educational Attitude for Different Degree Programs.

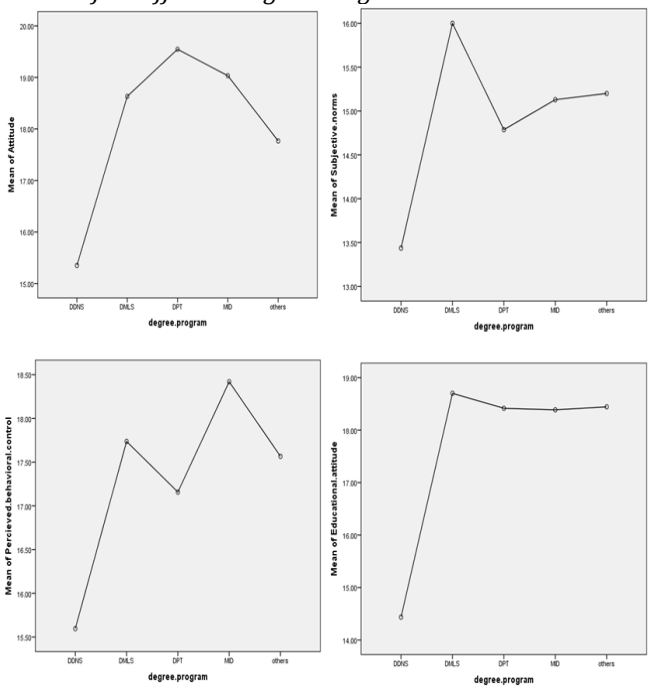
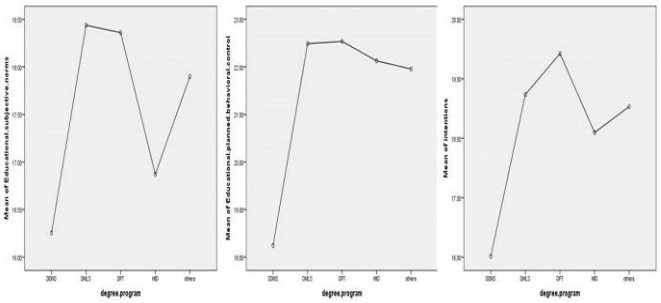


Figure 2

Graphical Representation of Means of Educational Subjective Norms, Educational Planned Behavioral Control and Intentions for Different Degree Programs.



Semester level was also significantly associated with domains including Attitude (p=0.000) with highest score in semester 1-2, Educational Attitude (p=0.016) with highest score in semester 5-6, Educational Subjective Norms (p=0.047) with highest score in semester 1-2, Educational Planned Behavioral Control (p=0.009) with highest scores in semester7-8 and Intentions (p=0.02) with highest scores in semester 7-8. Area of residence was also associated with domains of subjective Norms (p=0.001), Perceived Behavioral Control (p=0.000) with highest scores for Lahore, Educational Attitude (p=0.000) with heist scores for Lahore, Educational Planned Behavioral Control (p=0.006) and Intentions (p=0.005) with highest scores for Lahore, which is a metropolitan city (table 4).

ii) Descriptive Statistics & Factor Association:

Qualitative Analysis of the Questions

To a query "are you satisfied with your degree program or not" 55(68%) students answer the question in negative that showed they were not satisfied with their degree

program only 25(32%) students revealed satisfied with their degree program.

The thematic analysis of the answers of the students in response to the question describes the reasons of satisfied with their professional degree program or otherwise, responses of the 80 students who were interviewed revealed seven themes (table 5). Among these the themes which most affected satisfaction resulting in dissatisfaction were quality of life 26(32.5%), demand of degree in future 18(32.5%) and teacher's qualification 16(20%). While satisfaction level of students was high with practical work & selection criteria [78(97.5%) each], university policy 77(96.25%), and clinical practice 76(95%). Only 2(2.5%) students showed their concern about the student's selection criteria, 18(32.5%) students described that their degree was not fulfilling the demands of future while, 3(3.75%) students had concerns about the university policies.

DISCUSSION

The theory of planned behaviour has only been applied to a limited extent for research in area of choosing the profession. Given the large variety of decisions and behaviours that have been studied using the theory, there appear to be several possible future applications of the planned behavioural theory for selection of profession. However, this theory focuses on individual behaviour, whereas a multilevel model is required to obtain an appropriate understanding the Allied health professions [17]. Sathees S et al. reported in their study conducted in Jaffna, related to Allied Health Sciences that senior students and teachers should motivate through mentoring of that profession and provide support by providing professional guide lines. Study also focused teachers' availability and teaching language for Allied Health Professionals [18]. Dr. Barfield, s study focused on identification of factors that influenced on decision-making among students interested in allied health education programs and identified six factors that were independently linked to the decision to enrol in allied health education programs including personal Influence, Social Influence, Academic Preparation, Career Opportunity, Individual Aspiration, and Self-Efficacy [19].

Current study's focus was on Attitude toward the professional degree program, Perceived Behavioural Control and Subjective Norms towards profession. First focus was on attitude toward the profession and evaluation in current profession. In subjective norm students believe with other people in their lives, whose people think about whether or not the students should perform in current profession. 2nd is Perceived Behavioural Control that is students perceptions of whether or not they can performed specific profession and how easy it is to perform in this [19].

Ajzen's [20] Theory of Planned Behaviour distribute in three Conceptually-independent antecedents most important to behavioural intention: Attitude toward the Behaviour, Perceived Behavioural Control and Subjective Norms. Attitude toward the behaviour measures the degree a person has a negative or positive evaluation toward performance of the behaviour. Perceived Behavioural Control refers to people's perceptions of whether or not they can perform that specific behaviour and how easy it is to perform. Subjective Norms refer to what individuals believe other key people in their lives think about whether or not the individual should perform the behaviour or what these key individuals are doing themselves. The perceived opinions of these key people help determine whether a person was actually performing the behaviour. The Theory of Planned Behaviour model assumes that salient beliefs are the antecedents to Attitude toward the Act, Subjective Norms and Perceived Behavioural Control [21].

Another study published in British Journal of Educational Psychology in 2001 that focused on students study behaviour in college through planned behaviour theory. The only modification from the original model was the inclusion of a direct causal link between motivation to comply and study behaviour. Findings suggest that goal importance is the causal agent in directing all elements necessary to achieve high levels of study behaviour [22] This was also noted in current study, where all domains revealed significant association with degree program with highest personal attitude, educational planned behavioural control and intentions towards the DPT degree while it was least for DDNS. Subjective Norms had highest scores for DMLS and perceived behavioural control for MID. Educational Attitude & Educational Subjective Norms had highest scores for DMLS.

In the present study gender revealed significant association with all domains except intentions with higher scores for males, this might be due to the fact that this is a male dominated society and is in coherence with another study in which male gender was significantly associated with involvement in research in AHP [23].

In current study Attitude, educational attitude, educational subjective Norms, educational planned behavioural control and intentions revealed significant association with semester in which the student were studying, while all domains revealed significant association with residence with higher scores for those coming from Lahore which is a large metropolitan city. This could be due to the fact that students form large cities were more inclined towards education.

Current investigation revealed seven themes affecting the satisfaction level of enrolment to AHS including Poor Quality of Education, Degree not fulfilling the demand of future era being the top barriers while the remaining including Practical Work, Student selection criteria, University policy, clinical practice and teacher's qualifications in the current environment seemed to attract students for enrolment in AHS programs. Quality of education is an important factor, which prospective students are interested, similarly a common degree structure can affect enrolment [24].

Limitations:

Study sample targeted and utilized only Allied Health Sciences students and a self-developed scale, instead of some rigorous measure. However, this study utilized the framework of planned behavior theory of Ajzaen, which is strength of the study. It could have included other medical and nursing specialties and thus a good comparative assessment would have been possible. Hence representation form a wide range of specialties to further

explore the diverse factors involved in enrollment process should be planned in future.

CONCLUSIONS

Students with the professional degree program of DPT showed high level of their personal attitude and Education Planned Behavioral Control & Intentions toward their degree, while those with DMLS showed high level of Educational planned Behavioral Control, Educational Attitude, Educational subjective Norms and Intentions toward their professional degree program

The thematic analysis of the questions the students were more concerned about the quality of education in their professional degree program the quality of which affected enrollment.

In addition to the impact of degree, age, gender, semester level, and residential area are also significant factors affecting enrollment.

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