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An Empirical Assessment of Transition Strategies to Universities for Special Educational Needs Students: A Proposed Predictive Paradigm Using Structural Equation Modeling

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Abstract: *Today, a growing number of students with special educational needs (SEN) are now attending universities; and empirical evidences indicate that they still face difficulties in adaptation with learning environment. Thus, universities need to make adjustments for theses students, given that the current literature suggests that the potential adjustments required may quite differ for different disabilities. The purpose of this paper is to add to literature through (a) providing deeper understanding about transition process for students with SEN, specifically in developing countries, (b) outlining a number of adaptation core strategies needed to be addressed by universities to meet the needs of these students before and during their course study, (c) empirically, examining the perceived effectiveness of these core strategies from students with SEN perspective. Based on our findings the study has made a number of important managerial and academic implications. These findings provide valuable guidance for researchers and practitioners and open areas for future research*

Keywords: *Disabilities, Learning environment, Special Educational Needs, Transition Strategies, Universities.*

1. INTRODUCTION

Worldwide higher-educational policies, over the past decade, have an increased interest in students with special educational needs (SEN), aiming to provide effective individualized support in learning environments that maximize academic and social development (Bossaert et al., 2012). Today, a growing number of students with SEN are now attending and graduating from universities, and most higher-educational institutions in western countries are developing adaptive strategies and plans addressing the needs for their students with disabilities (e.g. Annemarie and Cate, 2011; Dermody and Majekodunmi, 2011; Mauceri et al., 2011; López et al., 2013).

However, empirical evidences indicate that students with SEN still face difficulties in adaptation with learning environment and tend to achieve poorer outcomes in terms of final degree classification, despite having comparable qualifications to other students when entering the same university. Therefore, individualization in learning process is necessary and universities need to adopt adjustment or adaptive strategies for theses students, and need to ensure that such strategies are implemented effectively. Given that the current literature suggests that the potential adaptive strategies required may quite differ for different disabilities, and students with SEN should not be discriminated against or substantially disadvantaged by higher-education institutions (e.g. Taylor et al., 2010; Ghergut, 2011; López et al., 2013). Therefore there would seem to be some merit for more studies to empirically examine the perceived effectiveness of adaptation strategies for smooth transition regarding students with special educational needs at unstudied developing countries to enhance their learning outcomes. The current research is an attempt at this direction.

2. RESEARCH PROBLEM, OBJECTIVES AND PLAN

Although studies in transition strategies to universities for students with SEN are increasing in number, related models offered in the academic literature concerning its applications in universities are mainly conceptual, while little empirical research has tested it from the

perspective of these students. Nevertheless, our preliminary study which has been conducted before this current research revealed that many Egyptian universities remain unprepared for dealing with disability students. As observed by Agoliotis and Kalyva (2011) most educational systems are addressing students with SEN by pulling them out of their general classroom and teaching them in small groups or on an individual basis. Another key limitation of the existing literature to date concerns their focus exclusively on developed countries, while many higher-educational institutions in developing countries, such as Egypt, have no legal duty to develop plans for meeting special educational needs. Therefore, our research attempts to narrow this research gap in the current body of literature by identifying and examining the critical adaptation strategies for students with SEN, as well as suggesting recommendations to enhance their learning outcomes. In sum, the present investigation contributes to literature and practice through achieving the following objectives: (1) providing deeper understanding about transition process for students with SEN, specifically in developing countries, (2) outlining a number of adaptation core strategies needed to be addressed by universities to meet the needs of these students before and during their course study, (3) empirically, examining the perceived effectiveness of these core strategies from students with SEN perspective.

With these objectives in view, the current paper has been organized as follows: the literature and relevant studies were reviewed and analyzed. Then hypotheses were formulated to be tested in the study. This was followed by an explanation of the procedures used to obtain data, measurement, and validation processes, as well as the testing of the hypotheses stated. Finally, based on our findings a series of conclusions with managerial implications and final thoughts that emphasize the great interest in the topic under analysis were presented; and then certain limitations and future lines of research with regard to this issue were highlighted.

3. LITERATURE REVIEW

Relevant literature, which provided the conceptual foundation for this paper and past research were extensively reviewed and integrated sequentially, including a wide range of recently published works, in order to develop more effectively the study hypotheses. For the current study purpose, literature review is organized to address the following streams.

3.1 Theoretical Background and Related Works of SEN

In current literature students with SEN are defined as students with various (combinations of) difficulties in participating in education (Bossaert et al., 2012). More specifically when they have more difficulty than the rest of their classmates in accessing specific learning in the curriculum that corresponds to their age or require special education and related services to achieve their fullest potential, and their disabilities range from speech and language impairments to mental retardation (López et al., 2013; Vassiliki et al., 2011). Similarly, Nash and Norwich (2010) suggested that the term SEN is used officially to refer to those students who require additional or different provision for their learning difficulties and disabilities, given that some researchers prefer using the terms “inclusive education” and “barriers to learning” instead.

3.2 Academic Advisory Strategy

For students with SEN the transition process from school to a full time university course can potentially be more daunting. Ideally, students with a disability applying to university should declare their disability on their application form. This can assist academic advisors system, to make appropriate adaptive strategy or plan before teaching process starts. However, for a variety of reasons, not all students declare their disability on entry to the university (Taylor et al., 2010). Hence, it is advisable that academic advisors conduct panel interviews will all students applying to the university, and organize regular meetings with the parents of students who market as disable or need a special educational treatment to develop a plan for supporting them throughout their course.

3.3 Virtual Learning Environment Strategy

Today, virtual learning environment evolves in parallel with rapid development of informatics technology, and has been conceptualized and defined in multiple ways in literature as a distance learning environment that uses the Internet technology to interact with remote learners and deliver educational material electronically to support students and universities goals and enhance

knowledge transfer (Ahmed, 2013; Cihak, 2011; López et al, 2013). From students with SEN perspective, virtual leaning environment provides them more flexible and convenient method of delivery learning materials unrestricted by location and time, enhancing acquisition of skills and provides opportunity to engage in communication activities that are matched to their individual needs and abilities.

The range of virtual learning environments tools includes tools that permit a course to be housed "online", with access by password to a repository of course instructions, readings, lecture recordings and other resources linked by the internet. Also enable lecturers and students to initiate communication and to interact synchronously "live, in real time", and asynchronously "ready when time permits" (see Small et al., 2012; Brown and Charlier, 2013; Hassanzadeh et al., 2012; Jonas and Burns, 2010; Owens and Price, 2010; Chen and Huang, 2011; Wu et al., 2010; Chen. and Tseng, 2012; Özyurt et al., 2013).

3.4 Differentiated Teaching Strategy

In differentiated teaching strategy higher-educational lecturers accept that each student learns in a particular way and has significant needs so they adjust curriculum, promote different learning styles and try to engage all students in learning process. Under these circumstances, lecturers should take into consideration the learning profile of their students, which is based on their interests, their performance and the particular way they learn when designing each teaching hour as the needs vary from lesson to lesson, even for the same students (Vassiliki et al, 2011). These arguments are consonant with the results of other works (e.g. Mavrou, 2011) which support the effectiveness of differentiated teaching in help students with SEN cope with learning difficulties. As concluded by López et al. (2013) curriculum adaptations are contextualized educational strategies to facilitate the teaching and learning process in students with special educational needs, making modifications to the normal curriculum.

4. DEVELOPING HYPOTHESES AND RESEARCH METHODOLOGY

The hypotheses formulation process was based not only on a comprehensive review of the specialized literature, but also on the data collected from a series of qualitative studies in the preliminary stages of the current research. In the light of this process three hypotheses were formulated as follows:

H_1: implementing academic advisory system for students with special educational needs is positively associated with their perceived effectiveness of transition process.

H_2: implementing virtual learning environment for students with special educational needs is positively associated with their perceived effectiveness of transition process.

H_3: implementing differentiated teaching strategy for students with special educational needs is positively associated with their perceived effectiveness of transition process.

Then the research model was developed through the integration of the three predictor constructs mentioned in the previous hypotheses to be examined simultaneously as symbolically presented in the prediction multiple regression equation (EQ1) to predict perceived effectiveness of transition process (the criterion variable: YPTP), served as regress, given known values from a set of predictor variables, used as regressors:

$$Y_{PTP} = a + b_{ADS}\ ADS + b_{VLE}\ VLE + b_{DTS}\ DTS \quad (1)$$

Where:

ADS= Academic advisory system

VLE= Virtual learning environment

DTS= Differentiated teaching strategy

Y_{PTP}= Perceived effectiveness of transition process

A richer research methodology is used in this empirical study combining quantitative and qualitative methods to validate and empirically test the hypothesized relationships among its variables. Thus, the research process involved multi-stage procedures as follows:

4.1 Qualitative and Quantitative Studies

In the preliminary qualitative stage, a series of in-depth interviews were held and observation was also undertaken to get deeper understanding of the phenomenon under investigation, and establish the criteria and relationship constructs relevant to our empirical study. Issues arising from this stage were used as a basis for the next quantitative study. The quantitative stage in the form of personally-administrated questionnaire survey was conducted over two-month period to collect empirical data.

The target population was undergraduate students with SEN at the Egyptian universities that adopted the credit hours system, as this system gives the student the opportunity to study according to his own pace and his own abilities. Unlike the usual fixed format teaching which is followed by many Egyptian universities, the credit hour system enables the student to select a number of courses from a well planned academic program and each student is assigned an academic advisor who guides him in planning his study program, monitors his progress, and helps solve any problems that may be encountered. To increase generalizations of the results the participants were spread across four universities in Egypt during the fall academic semester of 2012. In order to gain as many representative samples as possible participants were drawn from a range of courses including business, arts, mass communication and engineering.

4.2 Instrument and Validity

To develop our instrument a number of prior relevant studies and corresponding scales were reviewed to ensure that a comprehensive list of measures was included and the major aspects of the topic were adequately covered. Multi-items measures were generated for each construct and assessed for the reliability and content validity. A 7-point multi-item Likert scales ranging from 1 as strongly disagree to 7 strongly agree was used for measuring all constructs. The questionnaire was originally developed in English, and subsequently translated into Arabic language for participants who are learning in Arabic. The questionnaire was then pre-tested among 25 respondents. This step followed by a pilot test. Based on pre-test and pilot test feedback, modifications have been made to improve readability and appropriateness. The revised questionnaire was again pre-tested and the final version was found worked well and the instrument has confirmed content validity.

4.3 Research Design and Reliability

The research design for this study involved a cross-sectional survey methodology, which was conducted between October and November, 2012. Among a total of 120 questionnaires that were randomly distributed, 56 valid responses were received and used in data analysis, after removing invalid answers, yielding a usable response rate of 46.66 percent for the overall survey. The demographic profile of the sample was mainly male (73.21 percent) and the median age was approximately 19 years.

Despite the relatively low response rate, which thought to be expected in social sciences surveys, the fact that the respondents were as representative of the population as possible, led to their contribution being regarded as providing information applicable to the larger population. The reliability of instruments was assessed using Cronbach's ά alpha coefficient test for each variable. The test showed an acceptable degree of internal consistency reflecting a strong reliability, all alpha values over 0.8 (alpha > 0.8).

5. DATA ANALYSIS AND MODEL TESTING

The empirical data collected by the survey were analyzed and tested using statistical software packages (SPSS). Multiple regression analysis with its associated statistical inference tests (F test and t-test on b), were applied for proving the significance of the variables included in the research model. To avoid violating the basic assumptions underlying the method of least squares used by the classical linear regression, a P-P plot for assessing the assumption of normality was conducted.

5.1 Multi Collinearity Test

To determine whether any multicollinearity effects existed among independent variables in the model, total correlation matrix of the research model was reviewed in-depth, and the results

showed that there was no significant evidence of multicollinearity problem among regressors. The results of testing each of the three hypotheses are given below.

5.2 The Results of Hypotheses Testing

The summary output of the multiple regression analysis, in table 1, led to accept the above mentioned hypotheses, while the statistical significance test supported this acceptance.

Table1. *Summary output of the multiple regression analysis*

Coefficients [a]	Symbols	Values
Regression Statistics		
Multiple correlation coefficient	Multiple R	0.93757282428057
Coefficient of multiple determination	R^2	0.87904280082944
Adjusted R Square	Adjusted R^2	0.87206450087724
Standard Error	SEE	0.80845071464999
Observations	N	56
ANOVA [b]		
Regression	SS_{reg}	246.995329840202
Residual	SS_{res}	33.9868130169404
Total	SS_{total}	280.982142857143
F-test overall model	F	125.96804477556*
Degrees of freedom	df_1, df_2	3, 52

[a] *Criterion variable:* Y_{INT}

b. Predictors: (constant), ADS, VLE and DTS

**Significant at (p < 0.0000 level)*

A strong significant meaningful correlation is found between perceived effectiveness of transition process and the above mentioned independent variables (Multiple correlation coefficient: Multiple R=0.93757282428057). The F statistic value (F=125.96804477556 at p < 0.000000 level) is statistically significant indicating that the results of the model could hardly have occurred by chance. Thus, the goodness-of-fit of the model is satisfactory.

The coefficient of determination, multiple R-square showed that these predictor factors explained the major proportion (87.90 %) of the variability observed among perceived effectiveness of transition process (R^2=0.87904280082944), which reinforce our confidence in the hypotheses testing results and provides support for the above mentioned association. Furthermore, the adjusted R^2 of the model, which is a more conservative estimate of variance by considering error variance, is 0.872064500877299. This reinforces our confidence that the overall explanatory power of the research model considered high and quite capable of explaining the observed variance among the sample. For easily comparison and assessing the relative impact of each predictor variable on the criterion variable standardized beta coefficients and t-test values were summarized in table 2

Table2. *Variables included in the research model equation*

Factors	Regression Coefficients		Beta Coefficients		*t-test*	
	Symbol	Value	Symbol	Value	Value	Sig.
ADS	b_{ADS}	0.635979129	B_{ADS}	0.364	5.354563	0.00000000
VLE	b_{VLE}	0.515298911	B_{VLE}	0.241	3.710234	0.00050476
DTS	b_{DTS}	0.043129006	B_{DTS}	0.132	0.349093	0.72842859
Intercept	a	0.829177107				
df	n-k-1	52				

Based on the results shown in the previous table, it can be stated that that within 3 independent variables, included in the model, only two predictors variables were found to be critical significant factors regarding the perceived effectiveness of transition process (the criterion variable Y_{PTP}), namely ADS and VLE. More specifically, academic advisor system ($Beta_{ADS}$ =0.364, p < 0.000000) had the highest effect on smoothing the transition process, followed by the virtual learning environment ($Beta_{VLE} = 0.241$ $p < 0.00050476$). Using the values of the

regression coefficients presented in table 2, the future perceived effectiveness of transition process can be predicted, in this study, by the following final equation (EQ2):

$$Y_{PTP} = 0.83 + 0.63\ ADS + 0.51 VLE + 0.04\ DTS \quad (2)$$

5.3 Normal probability analysis

As mentioned earlier, the classical regression model was used in our analysis, a P-P plot of regression standardized residual for assessing the assumption of normality was conducted. The plot, in fig. 1, showed that the quantile pairs fell nearly on a straight line. Thus, it can be stated that the data used in this research are approximately normally distributed.

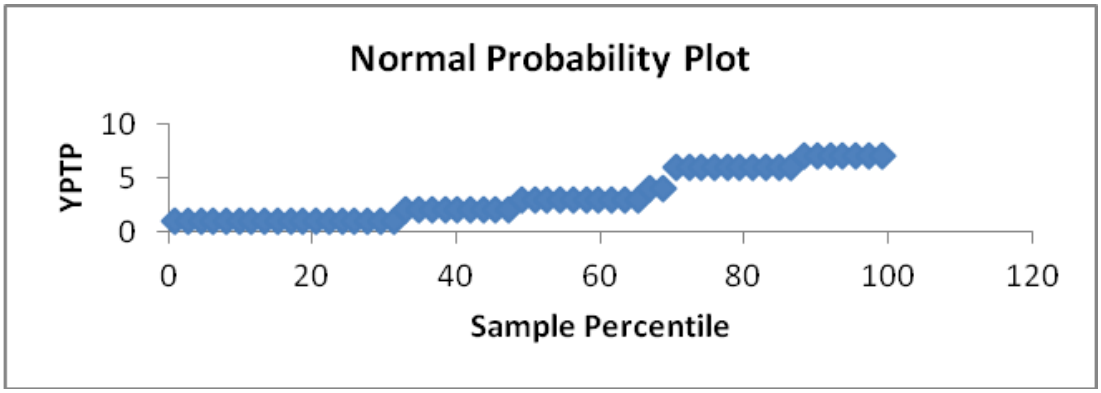

Fig1. *Normal P-P plot of regression standardized residual*

6. Conclusion and Implications

Since this work was motivated by the fact that very few empirical studies had investigated transition strategies to universities, the current research has taken a further significant step in contributing to both theory and practice of e-leaning, particularly in developing countries and to help address some gaps in the current body of literature, through expanding the research in this area by developing an empirically-based model that quantificationally assessed and predict the critical key factors that have the most significant influence on perceived effectiveness of transition process. More specifically, this study has made a number of important practical implementations and theoretical contributions. In term of practical implications, the results presented in this paper emphasized on a number of strategies that need to be addressed by universities with regard to meeting the needs of students with SEN both before and when they start their course of study. It is hoped that the topics covered in this paper may be useful to higher-education institutions in developing countries to make them aware of the potential adjustment transition strategies that may be required for such students.

From an academic and research standpoint, this study provides empirical evidences and validation for the existing specialized literature concerning disabled students. Also, the findings of the empirical study provide support for the research model and for the hypotheses regarding the directional linkage among its variables. The high overall explanatory power of our model indicated that this model is capable of explaining high proportion of variance observed in perceived effectiveness of transition process.

7. Limitations and Further Research

Although this paper is differentiated from other previous work and expanded the research scope, like all studies, there are a few limitations that should be considered when interpreting the results and implications. First, the research model was validated using empirical data gathered from Egypt and therefore the findings may be specific to the culture in this developing country. For example the differentiated teaching strategy was not found to be significant, whereas this factor was an important determinant that helped students with SEN cope with learning difficulties in other studies (e.g. Mavrou, 2011). Since the study is cross-sectional in design, a further examination of our argument using a longitudinal study is recommended in the future to investigate our model in different time periods, which may strengthen the findings and eventually achieve statistical generalization.

Apart from the above, we must point out that although the majority of the hypothesized relationships were validated, and significant, and the proposed model yielded a relatively high level of coefficient of multiple determination, multiple R-square (R2), there is still need to find additional variables, to compensate for this limitation and improve the model's ability to predict. However, there are other opportunities to build on this study in future research. Suggested areas include reexamining the proposed model in other countries with different cultures, and make comparisons, to see whether it can be applied. Also it would be valuable that future research use other theoretical bases or different methodologies and sample to derive more predictions.

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