

SUDAN UNIVERSITY OF SCIENCE & TECHNOLOGY
COLLEGE OF POST-GRADUATE STUDIES

**A STOCHASTIC MODEL FOR
EDUCATIONAL PLANNING OF
SUDANESE UNIVERSITIES**

BY

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إِنَّا كُلُّ شَيْءٍ خَلَقْنَاهُ بِقَدَرٍ



الآية (49) من سورة القمر

DEDICATION

Pr(To Whom I Love Forever)=1

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الخلاصة

إن تخطيط التعليم الجامعي باستخدام النماذج التصادفية يعتبر كفاءةً . وتأتي طريقة الدراسة باعتبار أن هناك خلافاً في نظام التعليم الجامعي، وتهدف من ذلك بتقديم نموذج تصادفي يعتمد على تطبيق أسلوب سلاسل ماركوف ليمد القائمين لتخطيط مدخلات ومخرجات العملية التعليمية من حيث تخطيط تدفقات الطلاب في جميع سنوات الدراسة في الجامعة ومتابعة تحركاتهم منذ قبولهم في الكلية ولحين تخرجهم منها. وهناك العديد من النماذج التي تستخدم العمليات التصادفية في مجال التعليم وجميعها تتناول سلاسل ماركوف ويمكن تقسيم هذه النماذج إلى نماذج انتشار، ونماذج متكاملة ونماذج متحركة، وقد أهتم هذا البحث بالنماذج الأخيرة باعتبارها ذات فعالية كبيرة.

تمت الدراسة عن طريق تكوين مصفوف الاحتمالات الانتقالية التي تبين تحركات الطلاب بين سنوات الدراسة الأربعة بالتطبيق على بيانات كلية التجارة والدراسات الاقتصادية والاجتماعية في جامعة النيلين من خلال السجلات والحاسب الالكتروني، حيث قام الباحث بتنظيم البيانات في شكل جداول مع استكمال النقص فيها وخصوصاً بالنسبة لقسم الدراسات الاجتماعية.

ومن خلال هذه البيانات تم بناء وتطبيق النموذج لكل قسم من أقسام الكلية الستة وهي: المحاسبة، إدارة الأعمال، الاقتصاد، التأمين، العلوم السياسية، العلوم الاجتماعية وذلك من خلال تكوين مصفوفة الاحتمالات الانتقالية لكل قسم ومن ثم حساب نسبة الطلاب الناجحين في كل مستوى دراسي ونسبة الطلاب الراسيين ونسبة الطلاب المستبعدين من الدراسة وكذلك نسبة الفاقد التربوي ونسبة التلكؤ الدراسي وكذلك نسبة الطلاب المتخرجين من الكلية دون أية سنة تأخير اعتماداً على الدرجات الأولى، الثانية الثالثة، والرابعة لمصفوفات الاحتمالات الانتقالية.

وأظهرت الدراسة أهمية النموذج المتناول من خلال اختبار كفاءته عن طريق معيار ثايل لعدم التساوي، وكذلك من خلال اختبار F حيث أظهرنا هذان المعياران كفاءة النموذج من خلال مقارنة تنبؤات النموذج مع القيم الفعلية.

ومن خلال نتائج البحث أوصى الباحث بتطبيق النموذج على بيانات التعليم الأخرى مثل عدد المدرسين في كل قسم دراسي وعدد المدرسين حسب الدرجات العلمية بنود ميزانية الجامعة وغيرها.

Abstract

Stochastic models for educational planning for Sudanese universities are designed in this thesis to analyze the efficiency of dynamic analysis of

educational parameters utilized. The methodology of this study was introduced to analyze defects in the educational system at Sudanese universities. The objectives elucidated in this study are to build and use an efficient model by using Markov chains, stochastically to give education leaders a scientific tool in order to plan the inputs and outputs of the education process.

Feasibly, there are different models that used the stochastic processes in education. Some these models deal with the Markov chains by utilizing spreadsheet, integrated and dynamic models. The latter models were used in this study to test to their efficiency.

The model is built by formulating the transition probabilities matrix (t.p.m) that shows the students enrollments among four possible academic years with an application of the data of faculty of Commerce, Economics and Social studies at Alneelain University. The data were obtained from the records and computer archives. They were organized in tables and completed for all departments, especially for Social Studies department.

From the data, a model was built and applied to each of the six departments of the faculty: Accounting, Business Administration, Economics, Insurance, Political Sciences and Social Studies. The parameters formulating the t.p.m to each department computed the students passed ratio in each level, students delay ratio, students graduates without delay according to the higher degrees of the t.p.m.

The study shows the significant of the dealing model depending on the test its efficiency by using Theil's unequal statistic and F-test which they gives a high predictive power by comparing the predictions with actual data.

Lastly, from the study results, the researcher recommend to that the model is efficient and can be applied on the other education data like: teacher's number in each department, teacher's number according to the scientific degrees, .., etc.

LIST OF CONTENTS

Subject	Page
Dedication	iii
Acknowledgments	iv
Abstract in Arabic	v
Abstract in English	vi
List of Contents	viii
List of Tables	x
List of Figures	xii
CHAPTER ONE: METHODOLOGY OF THE STUDY	1-6
1.1 Introduction	2
1.2 Research Questions	3
1.3 Goals	4
1.4 Hypotheses	5
1.5 Data Collection	5
1.6 Research Outline	6
CHAPTER TWO: STOCHASTIC MODELS IN EDUCATION	7-23
2-1 Stochastic Process	8
2-1-1 Stationary Process	9
2-1-2 Specification of Stochastic Process	11
2-2 Markov Chains	13
2-3 Review of Stochastic Models used in Education	16
CHAPTER THREE: MARKOV CHAINS	24-48
3-1 Transition Probabilities Matrix	25
3-2 Chapman-Kolmogorov Equation	27
3-3 Stationary Distribution of Markov Chain	28
Subject	Page
3-4 Classification of Markov Chains	33
3-5 Two-State Markov Chain	36
3-6 Estimation of the Markov Chain	44
3-6-1 Maximum Likelihood Estimation	44
3-6-2 Laplace Estimates	45
3-6-3 Bayesian Approach	45
CHAPTER FOUR: APPLICATION OF THE MODEL	49-89
4-1 Notation	50
4-2 The Data	50
4-3 Adjusted The Data	57
4-4 Model's Estimation	64

4-5 Graduates' Prediction	69
4-6 Model's Evaluation	86
CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS	90-94
5-1 Discussion	91
5-2 Conclusions	92
5-3 Recommendations	94
References	95-98
Appendix	99-117

LIST OF TABLES

Table No.	Title	Page
4-1	Number of passed, repeated, and withdrawn students in all departments at (96/97)	99
4-2	Number of passed, repeated, and withdrawn students in all departments at (97/98)	100
4-3	Number of passed, repeated, and withdrawn students in all departments at (98/99)	101
4-4	Number of passed, repeated, and withdrawn students in all departments at (99/2000)	102
4-5	Number of passed, repeated, and withdrawn students in all departments at (2000/2001)	103
4-6	Number of new students, which they accepted in first general level in the faculty	103
4-7	Ratios to estimate the students' number at the Social Studies department	57
4-8	Calculation of the students' numbers in the first year of the Social Studies department	58
4-9	Distribution of students' numbers in the second, third and fourth levels at (96/97) of the Social Studies department	59
4-10	Distribution of students' numbers of the Social Studies department at (96/97)	60
4-11	Number of students in each department during five years (first level)	60
4-12	Students' numbers in the Accounting department during (96/97-2000/2001)	104
4-13	Students' numbers in the Business Administration department during (96/97-2000/2001)	105
4-14	Students' numbers in the Economic department during (96/97-2000/2001)	106
4-15	Students' numbers in the Political Sciences department during (96/97-2000/2001)	107
4-16	Students' numbers in the Insurance department during (96/97-2000/2001)	108
4-17	Students' numbers in the Social Studies department during (96/97-2000/2001)	109
4-18	Number of passed, repeated, and withdrawn students in Accounting department during (96/97-2000/2001)	110

Table No.	Title	Page
4-19	Number of passed, repeated, and withdrawn students in Business Administration department during (96/97-2000/2001)	111
4-20	Number of passed, repeated, and withdrawn students in Economic department during (96/97-2000/2001)	112
4-21	Number of passed, repeated, and withdrawn students in Political Sciences department during (96/97-2000/2001)	113
4-22	Number of passed, repeated, and withdrawn students in Insurance department during (96/97-2000/2001)	114
4-23	Number of passed, repeated, and withdrawn students in Social Studies department during (96/97-2000/2001)	115
4-24	Students' numbers in the all departments during (96/97-2000/2001)	116
4-25	Students' numbers in the all departments during (96/97-2000/2001) including the students' number in the beginning year, i.e. $E_i(t)$	117
4-26	Predicted number of graduates for next years	75
4-27	Number of graduate students $G_s(t)$ and $G'_s(t)$ from the faculty	78
4-28	Number of graduate students $G'_s(t)$ and the delay ratios during (2000/2001-2003/2004)	81
4-29	Ratios of loss students from the faculty during (96/97-2000/2001)	84
4-30	Actual and predicted numbers of graduates in the year (2001/2002)	87

LIST OF Figures

Figure No.	Title	Page
4-1	Number of passed, repeated, and withdrawn students in all departments at (96/97)	52
4-2	Number of passed, repeated, and withdrawn students in all departments at (97/98)	53
4-3	Number of passed, repeated, and withdrawn students in all departments at (98/99)	54
4-4	Number of passed, repeated, and withdrawn students in all departments at (99/2000)	55
4-5	Number of passed, repeated, and withdrawn students in all departments at (2000/2001)	56
4-6	Number of students in each department during five years (first level)	62
4-7	Predicted number of graduates for next years	76
4-8	Graduates' ratios without delay during (2001/2002-2003/2004)	79
4-9	Delay ratios of graduate students during (2000/2001-2003/2004)	82
4-10	Ratios of loss students from the faculty during (1996/1997-2000/2001)	85
4-11	Actual and predicted numbers of graduates in the year (2001/2002)	89