

Role of thesis in the Education of architecture and the related fields

Case study at the Faculty of Architecture and Urban Planning of Shahid Beheshti University, Tehran (formerly Iranian National University) during the years 1961-1982

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Abstract

The current article attempts to evaluate the situation with the assessment of the knowledge of graduates from the Faculty of Architecture and Urban Planning of Shahid Beheshti University, Tehran. It is based on a body of statistical data accumulated during the years 1961-1982 and meticulously processed by this researcher. Throughout the multiple pages of his case study, this researcher tries to answer the acute questions he himself puts at the beginning of his article. i.e, what are the principles used in evaluating the professional knowledge of the graduates of colleges of architecture, what are the factors interfering with the objective assessment of the professional knowledge and skills of the graduates, and how do these factors influence the final grades. The first part of the article embraces descriptive data, while the second part comprises the analytic portion of the study.

Introduction

Colleges of Architecture in Iran were founded based on the models of France's Buzar and Italy's Florentine architecture schools. Because in these schools, theoretical disciplines were given the same importance as practical architectural subjects, theoretical disciplines were added to the curriculum of the Faculty of Architecture and Urban Planning of Shahid Beheshti University. However, there is a troublesome breach between classrooms and training workshops, causing a disquieting situation in which there is a lack of an efficient, methodical, and well-organized educational system for the successful production of qualified specialists ready to go to work. This problem, not unknown in most of the world's architectural educational establishments, has been a constant source of worry for academic personnel and educational planning experts in Iran, particularly during recent years. Efforts to improve the existing situation have been tried repeatedly, and with varied results. In Vaughan's opinion¹, the detachment of theory from practice that we observe in modern educational establishments is akin to the separation of form from content, and leads to inevitable failure in strengthening the bond between knowledge and its practical results. On the other hand, teaching theoretical disciplines during the academic courses in architecture leads to an improvement of the students' general educational level, and consequently raises the standards for producing and assessing practical design tasks. In the formation of students of architecture, another problem that exists in the educational process is the absence of well-defined criteria for the assessment of professional knowledge and acquired skills. Presented below in great detail is a comprehensive analysis of educational reports covering the graduates of the Faculty of Architecture and Urban Planning of Shahid Beheshti University from the time of its establishment up to the Cultural Revolution of 1982. This analysis reveals the dramatic need for altering of the existing situation. In order to devise appropriate methods of evaluating the professional knowledge and skills of architecture students and graduates of the

¹ - Vaughan, T.W., "towards an architecture of conynuity". J.A.E. , jubilee Issue , 82-84, 1987.

architecture department, the following questions must be answered: What are the factors interfering with the objective assessment of the professional knowledge and skills of the graduates of colleges of architecture and how do these factors influence the final grades? - What is the role of grades in the educational process?

- What are the principles for evaluating the professional knowledge and skills of the graduates of colleges of architecture?

The collected data was first processed in Microsoft Excel and then imported to the SPSS environment for retrieving statistical results. During the first stage, the data was classified according to specific parameters.² The results of this classification have proved the correctness of the initial hypothesis and the normal distribution of statistical data in the area under survey.³ The conclusions achieved in the course of processing the collected data are presented in two separate sections of the report. The first section embraces descriptive data consisting of the information on the number of students during each study year; the length of a study course; the number of projects overseen by a particular thesis supervisor; subjects of course papers and theses; average grades during the five years of study and grades for the final theses. This data set is presented both in output tables and graphic charts.⁴ The second part comprises the analytic portion of the study. It is based on a variety of responsible and methodologically appropriate statistical procedures performed on the data set. Among the applied tests is T. Student Statistic, which allows the measuring of the difference between two sample means – in our case, for instance, between the average performance grades of the students during the entire educational course, and their final gradepoint average, or between their marks for the regular course papers and those for the final theses.⁵ To discover the pattern of relationship among those variables that do not have an obvious relationship, factor analysis has been employed.⁶ During the second stage, because the ranks of the data were not grouped or classified in any particular way, a number of non-parametric group comparisons were performed. Among the tests applied were the Mann-Whitney Test and the Kruskal-Wallis Test. Instead of Pearson's correlation coefficient, Spearman's correlation coefficient was used. The congruity of the results obtained during both stages certifies the reliability and quality of the research.

1. Statistical survey

Graduates, thesis supervisors and thesis subjects

The statistical population of the survey consisted of 1,002 students of the Faculty of Architecture and Urban Planning of Shahid Beheshti (formerly Iranian National) University; these students graduated either before the Cultural Revolution of 1982 or immediately after it during the years 1982-1983. Information regarding them has been meticulously and methodically processed. All the students constituting the statistical population of this report graduated from the Faculty during the years 1968-1981. The collected and processed data on this statistical population was comprised of: enrollment year; graduation year; subject of graduation thesis; grade of graduation thesis; rank of a diploma project; average grades for practical assignments during the educational course; average grades for theoretical disciplines; general average grades; and thesis supervisor. (See also Graphics 1/1, 1/2, 1/3, 1/4).

1.1. A brief on statistics and figures

After processing the collected data and correlating its individual criteria, this researcher has noticed that there is a troublesome discrepancy between the students' average performance during the study years and their graduation

2-To decide on sample distribution, the Kolmogorov-Smirnov Test was applied in addition to the analysis of the data processing curve.

3-After assuming the normality of the distribution of the collected data, two or more variables were compared in different ways using the T. Student Statistic (T) and Fisher Statistic (F) tests.

4-Test F was applied for the comparison of more than two variables (one-way analysis of variance), e.g. the comparison between the length of the study course of a student and his/her average yearly performances. Test F was also used to compare two independent groups of sampled data, such as the final grades of the students writing theses under the guidance of a single teacher, and those of the students whose theses were supervised by more than one teacher.

5-Pearson's correlation coefficient and data distribution graphics were used for computing the relation between such variables as "grade" and "rank" of the student's final thesis. Duncan's Test was further applied to exhibit the pronounced difference between the ranks of the data after they were measured by the variance and plotted as a scatter diagram.

6-Factor analysis is a means by which those variables that at first sight may seem unrelated are resolved into distinctive patterns under a hypothetical model. This statistical technique may be used to untangle the linear relationships into their separate patterns, with each pattern appearing as a factor delineating a distinct cluster of interrelated data.

ranks. Although the marks for the practical tasks during the study years are generally consistent with the average performance rates of the students, these marks differ greatly from the marks for the final diploma project. Examination of the charts mentioned above exhibits among the groups of the students' grades strong fluctuations which cannot be accepted as evidence of the sudden rise or fall of their academic performance. Rather, these can be explained by the involvement of some unrelated issues in the process of assessing the students' work. Interestingly, the grades between 16 and 19 (of Iranian 20-grade rating system) generally prevail, as shown in Graphics 1/5. This survey demonstrates a worrisome **disparity between the students' average performance grades during the study years and their final graduation ranks**. This researcher even came across cases of artificial leveling of the students' final grades with a strong departure from the truthful evaluation of their professional knowledge and skills. For example, in one case, a student whose average grades did not exceed a 13-15 level suddenly got an 18-20 grade for his final project. Can anyone actually believe that there is demonstrated here an incredible progress in knowledge and skills, all the more astonishing because it was achieved during a very short (six months to one year) period of time? This researcher finds it more reasonable to doubt the truthfulness and objectivity of this student's final grades. On continuing a careful inspection of the retrieved statistical data, one will notice that there are many other factors influencing the objective evaluation of the students' professional skills and knowledge.

1.2. Investigation of the grades for the final projects

Graphic 1/5 exhibits the grades for the final projects of those students who graduated from the Faculty during the first thirteen years after its establishment. Based on this data set, as well as on personal observations and recollections, the timespan may be divided into four periods:

- 1 - The first period embraces the years 1968-1972;
- 2 - The second period – the years 1972-1975;
- 3 - The third period – the years 1975-1977; and
- 4 - The fourth period – the years 1977-1981.

During each of these four periods, there exists a great inconsistency between the students' average performance during the study years and the grades for their final projects. During the first period, the maximum and minimum grades for the final projects are 19.8 and 10.39 respectively. During the second period, these grades are as follows: 19.5 and 13. During the third period, they are 19.26 and 13, and finally, during the fourth period they reach an elevation of 20 and 13. As is obvious from Table 4, during the third period students' average performance during the course of study and their grades for the final project are at the lowest, and during the fourth period at the highest level. The third period also reveals the greatest equilibrium between the students' average grades during the study years and their marks for the graduation project. The examination of Graphics 1/5 and 1/6 reveals that **students' average general grades are congruent with their average grades in architecture, the major study course at the Faculty, and for the most part fall into the same category**. These charts exhibit the results of two separate evaluation methods, both arriving at roughly similar answers. The grades observed here are largely limited to 14-16, and may reveal the actual level of professional knowledge and skills acquired by the students during this period. **The concord between the students' average general grades and their average grades in architecture may be a reliable indicator of an objective and truthful evaluation of their knowledge and skills**. The separate analysis of the students' grades for every particular study course, and their grades during each term of study reduced the probability of error, and if indeed there existed a biased and subjective mark among the student's grades, it was absorbed in the average indicators.⁷ The situation is quite different with graduation marks. Generally, the students'

7-Further verification of this claim may be seen in the list of grades for the final-year students during the scholastic year 1978-1979; of these students, 90% were given the grades of 19 and 20 under the impact of turbulent political and social events in the country, as well as other similar influences.

marks for the annual course projects are out of line with their marks for the final project. In most cases, their final project is ranked much higher than their course projects during the study years. This is a significant tendency, and its further aggravation over the years is also significant if viewed against the backdrop of the country's political and social events. Thus, a study of the year 1978 (the year before the Islamic Revolution in Iran) reveals the highest grades for the students' finals, and this is closely followed by the years of 1977 and 1976. (See Graphic 1/5).

1.3. Analysis of the indicators of graduates' general education level

Graphics 1/1, 1/2, 1/3 and 1/4 exhibit the indicators of the graduates' general education level and are comprised of the following data: average grades for all studies; average grades in architecture; mark for final project; and rank of diploma project. The maximum average grades for all studies are limited to 14-16 points, with a minimum of 13.5 and 17.6 points referring to the educational capabilities of particular students. (See rows 138, 234, 237, and 951 of Graphic 1/5.). The average grades in architecture are generally close to the grades shown above, and range between 13.25 and 17.45 points. Because of the favorable study conditions during particular time periods, this range is expanded up to 18 points (as seen in rows 234, 237, and 951 of Graphic 1/6). The marks for the final projects, however, are totally out of line with the average grades, and are shamelessly inflated. This may be because during the assessment of final projects, the members of the evaluation committee tend to overlook the shortcomings, or improve the image of the students' final achievements, or committee members become influenced by someone's subjective opinion or generally exalted mood. This personal observation seems to be confirmed by an observation of the statistical data introduced in Graphics 1/1, 1/2, 1/3 and 1/4. Rows 1, 31, 39, and 989 reveal the unjustifiable disparity between the students' final marks and their average performances during the course of their education. Rows 35, 79, 80, and 97 give additional evidence of "sudden improvement" in the achievements of students, who despite their low average grades have "succeeded" in passing their finals with reasonably high grades. Rows 422, 998, and 999 (Graphic 1/6) also show heavily inflated final results of 19-20 for students whose average was 13-14 points. Such sudden improvement over a short six-month or maximum one-year-long period seems highly unlikely. Row 951, however, points to a student who had exceptional abilities and diligence, and managed to complete his studies with the highest result. Based on the results of the current research, he was one of the best students at the Faculty before the Revolution. The fourth parameter of our survey (rank of a diploma project) deals with project evaluation according to its own categories of *exceptional*, *excellent*, *very good*, *good*, and *average*. In most of the cases studied, the rank of diploma projects ranges between good and excellent. Here again, however, we observe the disparity between the mark for the final project rank and the rank of the diploma. For example, students in Rows 589 and 590 of Graphic 1/3 were given 18 points for their final project and an exceptional rank for their diplomas, while students in Rows 824, 825, and 1000, although given 20 points for their final projects, received only "excellent" diplomas. The rank of the diploma also lacks congruence with the students' average general rates. As analysis of the collected data reveals, there is a troublesome disparity between the students' average performance and their graduation ranks, although there is a weak interrelation between the abovementioned four parameters. Discrepancy is also observable between the average general grades and the marks for the course projects during each term of study.

2. Factors interfering with the objective evaluation of students' work

The current study is carried out in the form of an evaluation survey. Its principal objective is to analyze the ample body of information so as to establish a scientific basis for the reasonable assessment of the educational process, as well as to devise adequate theoretical standards and to provide the best practical conditions for enhancing the

effectiveness of this process.⁸ A fundamental, objective analysis of the current situation at the Faculty can be conducted only after the meticulous processing of the entire collected body of data, and the rigorous scanning of the previous research and worked-out regulations. The following shows the results of this analysis, illustrated by tables of comparison tables and graphic charts. These results imply a failure in the objective assessment of the professional knowledge and skills of graduates of colleges of architecture due to the influence of the following factors: thesis supervisor; mark for the final thesis and the rank of the diploma; subject of the thesis; evaluation committee staff; and the length of the study process.

2.1. The role of the thesis supervisor

The social or academic importance of the thesis supervisor may so impress the members of the evaluation committee as to make them concentrate on the supervisor's merits as a teacher, rather than on assessing the professional knowledge of the student whose work the teacher has supervised. Analysis of statistical data related to the subjects of the theses reveals that sometimes these subjects are chosen with regard to the experience and field of research of the thesis supervisor rather than to students' interests and potential, or to the needs of society. Another problem is that often a thesis supervisor guides those working on projects in the widest range of subjects. There were cases where a single teacher supervised projects in such diverse fields of design as service centers, medical facilities, sports and cultural centers, educational establishments, residential quarters, and complex urban patterns. Unquestionably, each field of design has, in addition to some common features belonging to the area of architecture in general, many distinctive features and nuances known and understood only by a specialist in this particular field. Naturally, when one is acquainted with the fine points of the subject he can achieve better results. A real expert in a particular field can provide a student under his guidance with much more than someone who has only a superficial knowledge of the subject. Furthermore, and obviously, this work did not free them from their usual duties in classrooms and architectural ateliers. It is not surprising that under the pressure of such challenging schedules, many teachers tended to neglect the quality of the projects they supervised. (See Graphics 2/1 and 3/1) This may explain the relatively low grades of 14-16 points for students' work. In some instances, however, a student's project had more than one supervisor. When these cooperating thesis teachers had relatively equal proficiency and experience, the projects they supervised were of high quality, and grades of 17-19 points are the best evidence of this. The statistical data shows that projects completed under the guidance of one thesis supervisor were the most common, and only a few projects were accomplished under the supervision of more than one teacher. The same statistics, however, reveal that the best results were achieved under the guidance of three thesis supervisors. As proven by the analysis of the statistical data sets and applied non-parametric tests, there exists a direct relation between the thesis supervisor and the quality of the students' work. The quality of teachers' work as supervisors of students' graduation projects can cause a sudden increase or decrease of students' marks for these projects.

2.2 Marks for the graduation project and ranks of the diploma

In different years and at different stages of the educational project, a disquieting inconsistency between the mark for the graduation project and the rank of the students' diploma is observed. (See Tables 5 and 6) It appears that the assessment of the students' professional knowledge and skills as well as their ranking were often determined with disregard to the actual quality of their final theses, and were in most cases subjective rather than fair and unbiased. Accounts of the evaluation committee sessions provide further evidence of this fact. With this in mind, average

8-Sharifi, Taleqani. *Methods of research in educational and behavioral sciences*, Tehran, Roshd, 1992, p. 137.

grades for the students' performance during their entire course of education (this includes 362 study hours and 62 lecture types), though not free from fluctuation, seem better indicators of the students' proficiency. This becomes all the more evident upon observing that in some cases the mark for the final project, if compared to the student's average performance during the study years, may dramatically change the whole picture. The following is an analysis of how the mark for the graduation project was given the decisive role in defining the level of the graduates' professional knowledge and skills.

2.3. Subject of the thesis

Analysis of the statistical data discloses the following approaches to the selection of the topic for the students' graduation projects. In most cases, particularly because their theses must be completed during a limited time period, students try to choose simple subjects, often limited to a narrow field of study; subjects that have extensive bibliographical sources; and subjects that these students feel would meet with the approval of the evaluation committee. A closer inspection of Graphic 7/1, illustrating the plethora of subjects addressed in students' graduation theses, reveals that in certain years some subjects have been given a greater priority; this was often explained by nothing more than the personal tastes and general inclinations of members of the evaluation committee. Graphic 2/1 dedicated to thesis supervisors shows that the great diversity of subjects made certain teachers undertake the supervision of as many as sixty students' projects in one year. The reasons for this may be traced both to students' interests and to the evaluation committee's directives. It is interesting to note that during the selection of a subject and a thesis supervisor, students were influenced not only by personal judgments but also by the general atmosphere prevalent in the Faculty, and especially among the members of the evaluation committee. On the other hand, thesis supervisors often imposed a certain subject on a student without regard for his personal interests and abilities. Returning to the reasons that impel students to choose a particular subject for their theses, one can mention the following: easy access to the special literature on the subject; palpability of the subject and the possibility of this subject's reasonably simple treatment; general attitude towards this subject at the Faculty; and finally, the needs of society. These reasons call for deeper consideration. As seen at Graphics 2/1, 3/1, and 7/1, the subjects of the students' theses during the years 1968-1981 can be divided into nine groups, which, in order of preference, are as follows: 1) office and service structures; 2) residential quarters; 3) cultural and educational establishments; 4) recreational and sports centers; 5) building materials and techniques; 6) theoretical analysis; 7) urban and regional patterns; 8) reconstruction and rehabilitation; 9) village structures. As obvious from Graphic 7/1, the largest group of students' theses deals with the design of office and service structures. During the thirteen years under the current survey, 267 projects were presented on this subject, and it was not neglected in any year. The reasons for this may be the accessibility of all necessary materials and documentation, as well as society's needs.

2.4 Staff of the evaluation committee

Unfortunately, instead of adhering to an established standard, each succeeding staff of the evaluation committee created its own rules and regulations and influenced, often in a subjective way, the grades for the students' final projects and ranks of their diplomas. Such an unscientific, biased approach makes it impossible to compare the results of the students graduated in different years, all the more because the graduation projects of most students were ranked with regard to the students' social and political preferences or their personal qualities, rather than according to their professional knowledge and skills. To solve this problem, it is essential to work out standard rules and regulations and require the staff of every evaluation committee to adhere to these rules. It is important to keep the balance between the students' average performance rates throughout the educational course, and their marks for

the graduation projects, to ensure the possibility of a more objective evaluation of the students' professionalism and an unbiased comparison of students graduated in different years.

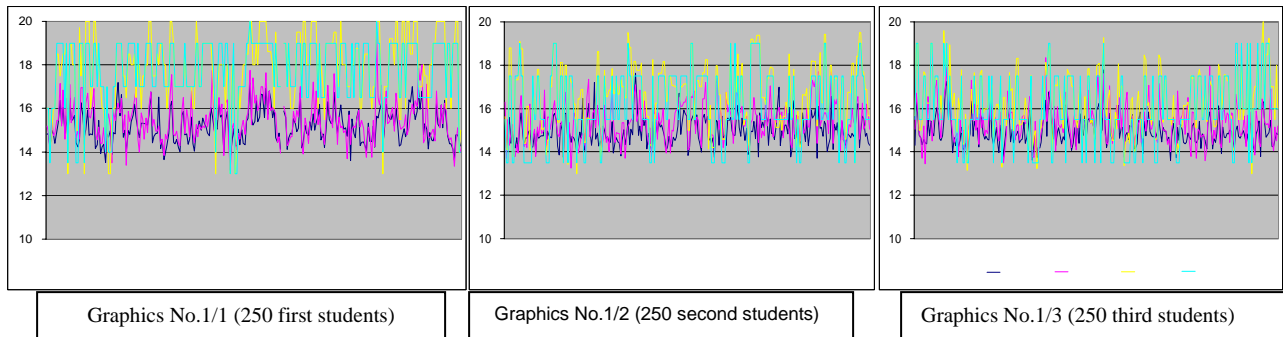
2.5. Length of a study process

According to the general educational plan, the length of a study process is six years, after which a student acquires a masters degree in Architecture and Urban Development. However, in reality this period has varied between 5.5 years (11 terms) and 14 years (28 terms). The students who graduated earlier generally exhibited better abilities and received better grades. In contrast, the more time it took the students to graduate, the worse results they showed. As shown by the statistical research, the highest results were achieved by those students who graduated from the Faculty after 5, 6, or 7 years of study, while the lowest results were achieved by those who needed more than 10 years to graduate. Keeping this in mind, it is necessary to work out special study programs whose length would depend on the abilities and intellectual potentials of the students involved.

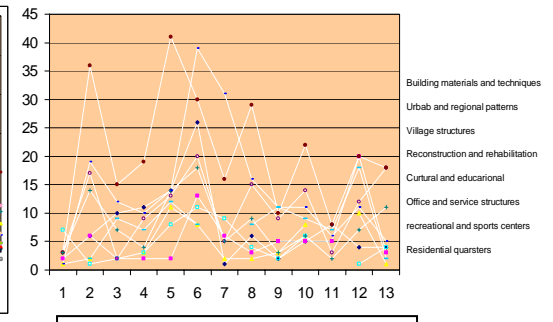
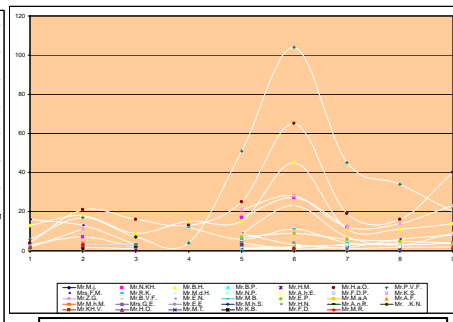
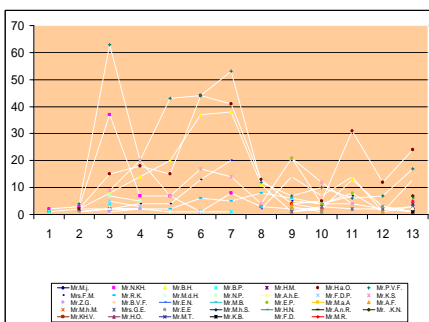
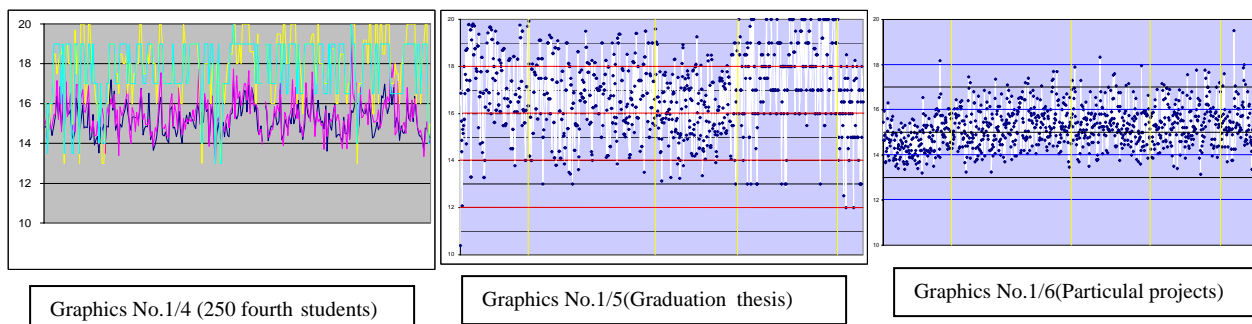
Conclusions

An analysis of the situation at the Faculty of Architecture and Urban Planning of Shahid Beheshti University, Tehran (formerly Iranian National University) during the years 1961-1981 was undertaken so as to compare it with the situation at the Faculty during the ensuing years. In the selection of the statistical population, this researcher attempted to cover the widest range of students who studied the same course. During the survey, the entire body of information available on the students and covering their educational backgrounds was meticulously and methodically processed. The shortage of necessary resources has obliged the author to limit his study to the students who graduated before the Cultural Revolution, and to exclude those students who came after it. Based on the research and examination of Graphics presented here, we can conclude that during the years under survey the students were motivated in their study and presentation of the final project by the following factors: the possibility of employment in engineering-consulting firms; society's economic growth and use of its fruit; state encouragement of certain fields of study; and participation in state building projects. These incentives may be called decisive in intensifying the importance of such fields as the design of office and service structures, and residential quarters. In this researcher's opinion, the quality of most of the projects carried out during this period can be deserving of criticism. It seems that true professionalism was not a major requirement, all the more so because thesis supervisors were seldom experts in the field of the project they supervised. Such an approach constitutes a severe blow not only to the students' final projects but to the entire educational process, and must be seriously investigated. As to the evaluation of the students' final work, this was seldom objective; consequently, must be sought to solve the existing problems. Reform in this field seems all the more imperative because there have been many changes in the educational process since that period, among them the introduction of separate programs for the bachelors and masters degrees; still, no standard criteria for the evaluation of the students' graduation projects have been established. It seems essential to establish norms for the evaluation of the students' graduation projects; thus, members of the evaluation committee may be guided by these norms rather than by their own subjective considerations. It is important to work out special regulations for every academic level, currently ranging from bachelors to doctoral degree. Finally, what is now mentioned in the students' graduation papers are his mark for the final project and the rank of the diploma (and there are cases of troublesome disparity between these two, as observed during this investigation). It seems that the students' final papers would be more objective if we include with them the students' average performance grades during the entire educational process. Because, as our survey has shown, the average performance grades usually

correlate with the marks for the course projects during the study years, these projects may be the best reflection of the professional knowledge and skills of students of architecture, and these grades may be the best indications of the students' real professionalism. The inclusion of the average performance grades in the students' graduation papers will help to create a truthful, unbiased, and objective picture of the students' abilities, thus demonstrating their real achievements during the educational process and showing how successful they were in acquiring professional knowledge and skills.



General average Peractical average Graduation thesis Grade of thesis



Position	Grade of Thesis	Graduation Thesis	Practical Average	General Average	Graduation Year	Graduation Ages
Max.	19	19.8	18.17	17.6	1968-72	1st. Age
Ave.	16.55	17.1	14.69	14.77		
Min.	13	10.39	13.2	13.54		
Max.	19	19.5	18.33	17.62	1972-75	2nd. Age
Ave.	16.19	16.61	15.33	14.96		
Min.	13.5	13	13.25	13.71		
Max.	19	19.26	17.95	17.78	1975-77	3rd. Age
Ave.	15.91	16.2	15.36	14.95		
Min.	13.5	13	13.6	13.59		
Max.	20	20	19.5	17.19	1977-81	4th. Age
Ave.	17.7	17.78	15.4	15.13		
Min.	13	13	13.15	13.52		
Max.	20	20	19.5	17.78	1968-81	All Ages
Ave.	16.64	16.97	15.24	14.97		
Min.	13	10.39	13.15	13.52		

Table No.4 (1968-1981)

Grade	Accept	Good	Very good	Grand	Excellent
Graduation year	E	D	C	B	A
1968-----69		13	14-15		
1969-----70			14-15	16-17-18	
1970-----71		13-14	15-16	17-18	19
1971-----72		13-14	15-16	17-18	19
1972-----73		13-14	15-16	17-18	19
1973-----74		13-14	15-16	17-18	19
1974-----75		13-14	15-16	17-18	19
1975-----76		13-14	15-16	17-18	18
1976-----77		13-14	15-16	17-18	19
1977-----78		13-14	15-16-17	18-19-20	
1978-----79		13-14-15	16-17-18	18-19-20	
1979-----80		13	16-17-18	18-19-20	20
1980-----81		13-14-15	16-17	18-19-20	20
1993-----94	12.5-13	14-15-16	16.5	17-18	

Table No.5 (Grade of thesis)

Grade	Accept	Good	Very good	Grand	Excellent	Sum
Graduation year	E	D	C	B	A	
1968-----69		2	5		7	
1969-----70			5	7		12
1970-----71		9	29	42	23	103
1971-----72		6	29	18	6	59
1972-----73		6	26	25	11	68
1973-----74		21	49	52	7	129
1974-----75		19	83	53	18	173
1975-----76		16	33	24	2	75
1976-----77		19	44	28	1	92
1977-----78		7	22	27		56
1978-----79		5	42	39		86
1979-----80		3	14	21	1	39
1980-----81		3	38	61	1	103
1993-----94	6	34	2	24		66
Sum	6	150	421	421	70	1068

Table No.6 (Graduates and degree)