Alumni Survey and Employer Response: Building Engineering Program of College of Architecture and Planning, King Faisal University

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Abstract

The paper outlines the purposes for alumni and employer surveys conducted for objective assessment of outcomes for the Building Engineering Program, introduced by the College of Architecture and Planning of King Faisal University. The Survey methodology, format organization, categorization and rating levels of the surveys' questionnaire are explained. Data analysis of surveys' are conducted using descriptive statistics and based on favorable response. Demographic information of the alumni employment pattern indicates imminent job opportunities and job profile characteristics. Contended and favorable alumni response is expressed for program content, training and compatibility. Alumni also reflected highly favorable professional involvements; elevated levels of confidence, professionalism, involved responsibilities and appreciable job satisfaction. Employer survey similarly confirms highly favorable response for alumni quality and professionalism, even with limited experience of most employers with building engineering alumni. A positive concurrence of both alumni and employer on graduates' professionalism, ability to shoulder responsibilities and immediate involvement and matching consistency to local private market demands are readily inferred. The paper concludes with recommendation for furthering of Building Engineering implementation with ranging spectrums of emphases and varying focusing orientations.

Keywords: Alumni survey, assessment, building engineering programs, Favorable, outcomes, employers

Introduction

Innovative and specialized Building Engineering programs are late academic discipline development, over the last few decades. Their introduction by academic institutions, at undergraduate level, was in response to challenging demands of modern market professional needs [1-4]. The expansive complexities of modern building industries and involved scopes of scientific and engineering knowledge, particularly in a rapidly

changing technical world, are primary factors in this regard. Furthermore, specialized engineering programs are currently focusing on training of work-ready engineers, i.e. from classroom to work [5]. Thus, different Building Engineering programs curricula, while primarily concerned with provision of wider and interrelated engineering and technical exposures, generally reflected varied involvement with differing emphases and specialization. In this regard, the environments in which programs developed are particularly influencing, i.e. as illustrated by curriculum development of King Faisal Building Engineering program and similar Building Engineering programs in UK and Canada [1-4]. Such programs widen the horizon for graduate's successful exploitation of potential and extended their employment opportunities and involvement in diversity of fields and activities associated with building industries.

The introduction of the Building Engineering program by the College of Architecture and Planning of King Faisal University was prompted by expanding development of modern building industries in Saudi Arabia which exasperated acute demand for highly qualified professional expertise. As a result, the program focus and scope were greatly influenced by local market professional needs, employment opportunities, as well as college environment and resources, but also taking into consideration international criteria. This led to exposition of broad, but balanced spectrum of technological skills of pertinent scientific and engineering knowledge with sufficient depth and ranging practical experiences in addressed areas of building engineering expertise [4].

Current trends for quality and accountability of educational systems demand that academic programs engage in systematic cyclic assessments and improvements. These attempts to bring quality assurance to engineering education, a key feature of newly established accreditation criteria [6-8]. However, meaningful examinations of programs' qualities and outcomes are generally recognized as most challenging tasks for those involved with the design and development of engineering programs. In this regard, alumni and employers surveys are commonly employed to provide assessments' data for the evaluations of programs' outcomes and effectiveness of achievements of objectives. These are useful in explaining alumni employment opportunities and characteristics, professional accomplishments, career development activities and satisfaction with the program and graduates' performances [9-15]. Data collected provide

feedback for development and refinement of program and support its focusing, orientation, exposition and articulation of employment professional needs. As a result, abilities to maintain academic excellence and achieve international standards and recognition are strengthened. Further more; the surveys' exercises are particularly enlightening in laying out formats for objective appraisal of program's outcomes' consistencies, meaningful evaluation of curriculum and explore initiation of accreditation requirements.

The College of Architecture and Planning of King Faisal University introduced The Building Engineering program in 1993/94 AD, 1414/15 H and was successfully operated, graduating eight patches since 1995/96 to 2002/03 AD, (1416/17–1423/24 H). This prompted the conduct of alumni and employer surveys for assessment of program market impact and evaluation of alumni quality and professional performance and employer response. Surveys' exposures of employment opportunities, professional involvement, quality and confident professionalism of program's alumni are seen as particularly enlightening. These together with employers' commendatory evaluation provide solid confirmations and justifications for program suitability and consistency with local market requirements.

Program Scope and Emphases

Building Engineering programs are generally interdisciplinary that draws on expertise of architectural and pertinent engineering disciplines. They essentially address the engineering and technical aspects of building design, construction and operation and maintenance, as well as material and components manufacturing. Programs' courses focus on detailed design of structural systems and environmental control and services systems employed in buildings, construction design and materials' specifications. They also address economical resources management considerations and impact on environment [3]. Thus, Building Engineering complements architectural design process, which is largely the merit of the architect.

Numerous factors prompted the development of the Building Engineering program of KFU College of Architecture and Planning. The general philosophy, framework and structural composition of the program were essentially modeled on renowned international programs of similar nature [1-3]. However, the environment and resources of the College and the need to express positive characteristic uniqueness while maintaining

international standards were of primary importance in determining program's focus and orientation. Also, the demands and priorities of local professional market and building industries were particularly influencing of program emphases and exposition. This led to focus on four main areas of building technological specialization, cultivating high proficiency levels and with equal exposition; with regard to building design, construction and maintenance processes; and comprising:

- Construction Technology,
- Environmental Technology and Building Services,
- Building Structures, and
- Construction Management.

The overall gains in improvement of Building Engineering skills are positively reflected in ameliorated efficiency of building industry and quality of building and built environment. Employment opportunities for program graduates are envisaged to encompass wide-ranging involvement in the building industry, as determined by market demands, which comprise:

- Supporting role for design activities, in design offices of private practice, municipal and governmental institutions, consultancy and contractual concerns.
- Construction sites management and supervision, inspection and maintenance operations.
- Legislative authorities and institutions concerned with the development and/or implementation of standards, regulations, codes and by-Laws.
- Building industry: materials and construction omponents manufacturing.

Alumni Survey

Alumni surveys are commonly employed by academic institutions to obtain data to enable objective and meaningful assessment of programs' outcomes and effectiveness of achievement of objectives and provide feedback to support programs' cyclic revision [9-14]. The purpose for the alumni survey of Building Engineering program of KFU College of Architecture and Planning was to appraise program's outcomes. It was envisaged to establish alumni employment characteristics and professional involvement determine graduate satisfaction levels with program curriculum and clarify compatibility and suitability of program to market professional requirements. The survey information supports evaluation of program's impact, achievement of objectives and to provide feed back for direction of curriculum development and revision as well as initiating accreditation requirements.

1) Survey Methodology

The alumni survey was conducted with the first six patches of Building Engineering program graduates, for the period 1996–2001 AD, (1417-1422 H) and for a total of 59 graduates. The survey questionnaire was sent to all program's alumni, who had at least one year on the job, for an alumni sample size of n = 49. The questionnaire returns were received by fax with a response rate of 71 %, (n = 35 respondents). The alumni questionnaire raised issues carefully addressed to cover most areas of significance for an objective appraisal of program's impact and outcomes. The alumni survey was composed of two parts:

i) The first part of the survey study addressed relevant demographic information with regard to alumni employment opportunities and job profile and characteristics. These were established by continuous and direct follow-up of all graduates of program and further complemented by information obtained from survey's response.

ii) The second part of the survey study focused on program's outcomes evaluation. The questionnaire used in this regard was organized into four main categories, raising issues of three questions addressing each of the following main considerations:
   - Courses content and student training and development of expertise.
   - Professional confidence, job performance and inter-disciplinary communication.
   - Job involvement and professional responsibilities.
   - Compatibility of program with professional involvement.

2) Analysis of Alumni Employment Profile and Job Characteristics

Demographic information about alumni employment opportunities, obtained from direct follow-up of alumni employment and complemented by survey data, is analyzed based on descriptive statistics. This is instrumental in clarifying alumni job profile and characteristics and supports outcomes' assessments of market and professional impact of the program. Alumni employment is initially categorized with regards to two main aspects:

i) Institution categorization, comprising:
   - Private companies
   - semi-private/public, and
   - governmental/public.

ii) Job profile characteristics, comprising following main involvement:

- Design,
- construction site supervision,
- maintenance,
- manufacturing industries,
- legislative and standard authority, and
- academic institutions.

The employment pattern for the Building Engineering alumni generally showed that the majority of graduates, of more than 63 %, favored job opportunities with private firms and semi-private institutions, accounting for about 40.8 %, (n = 20 alumni), and 22.4 % (n =11), respectively. The remaining 36.7 %, (n = 18), joined governmental institutions. The diagram of figure 1 shows break down of employment distribution for Building Engineering alumni.

It is generally recognized that a practical measure of program outcomes consistency is inferred when more than 50 % of programs' alumni conform to job market demands [15]. This is evidently illustrated by Building Engineering alumni employment pattern, as illustrated in figure 1. It is also confirmed by the highly rated confidence of local market for alumni professionalism, contributing capabilities and ability of immediate professional involvement. Private and semi private sectors are profit oriented and known to hire professionals who can achieve acceptable annual revenue returns.

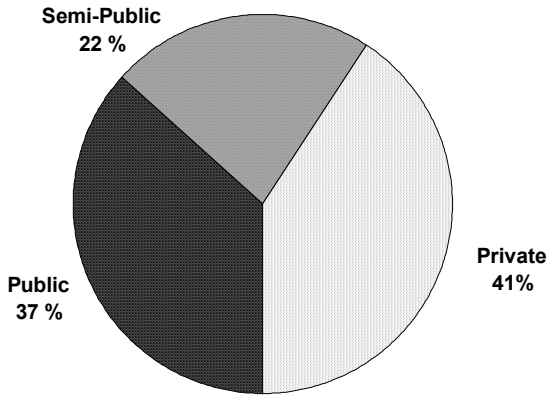

Figure 1: Employment opportunities of Building Engineering alumni

Alumni categorization of job profile and professional involvement shows a fair distribution for wide-ranging involvement, as illustrated by the diagram of Figure 2. However building sites and construction supervision are generally highly rated representing about 51 % of alumni job involvement, (n = 25 alumni). Design involvement is rated second and accounting for about 25 % of alumni job responsibilities, (n = 12). Such job distribution is particularly representative for graduates attached to private firms or semi-governmental institutions, and evidently reflects market priorities. Similarly, inspection and maintenance activities and academic employment each represents about 8 %, (n = 4). On the other hand, alumni involvements with legislative, and administrative as well as manufacturing employment are rather limited, where each accounted for about 4 %, (n = 2), of alumni job involvement.

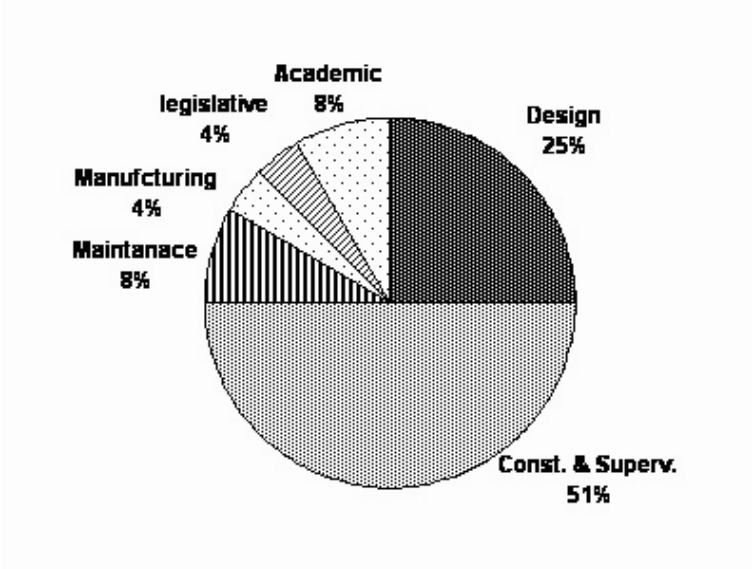

Figure 2: Alumni job profile and characteristics.

3) Analysis of Alumni Response

The second part of the alumni survey study used questionnaire to explain alumni satisfaction levels with program curriculum, clarify compatibility and suitability of program to market professional requirements and assess impact and achievement of objectives. The alumni questionnaire

allows a four levels scale for answering the questions for each of the four categories of issues raised. The scale levels ranged between very high, high, medium and low rating. The data form the survey returns, of 35 alumni, are analyzed based on descriptive statistics and expressed in percentage terms. Alumni response ratings are conveniently expressed in terms of 'favorable response' assessment, which combines the very high and high ratings. Such evaluation procedure is commonly used for convenient representative expression of respondents' satisfaction ratings in the high and above scales [15]. The diagram of figure 3 illustrates alumni response and satisfaction ratings for program outcome, impact and suitability and professional compatibility.

Questionnaire group for courses content, student training and development of expertise explores evaluation of program by graduates. These address the following main issues:

- Practical suitability of the spectrum of knowledge covered by the program,
- content and depth of information offered by the different courses, and
- the range of program emphases offered.

Appreciable satisfaction rating is indicated for this questionnaire category of program course content and student training. 86 % of alumni responded favorably for questions about suitability of program and spectrum of knowledge covered. Similar score ratings, of 86 %, are also expressed for courses' contents and depth of information offered. However, a slightly lower alumni percentage of 69% indicated favorable score rating with regard to the range of program emphases. This generally asserts high satisfaction levels with content and depth as well as diversity of knowledge and practical training offered by the program. This also further confirms suitability of program formulation and emphases, to greater extent.

Alumni professional confidence, competence and job performance is assessed by exploration of following pertinent questions:

- Ease of communication with other pertinent engineering disciplines,
- self confidence and competence as compared to other graduates of similar status, and
- role supporting architectural design.

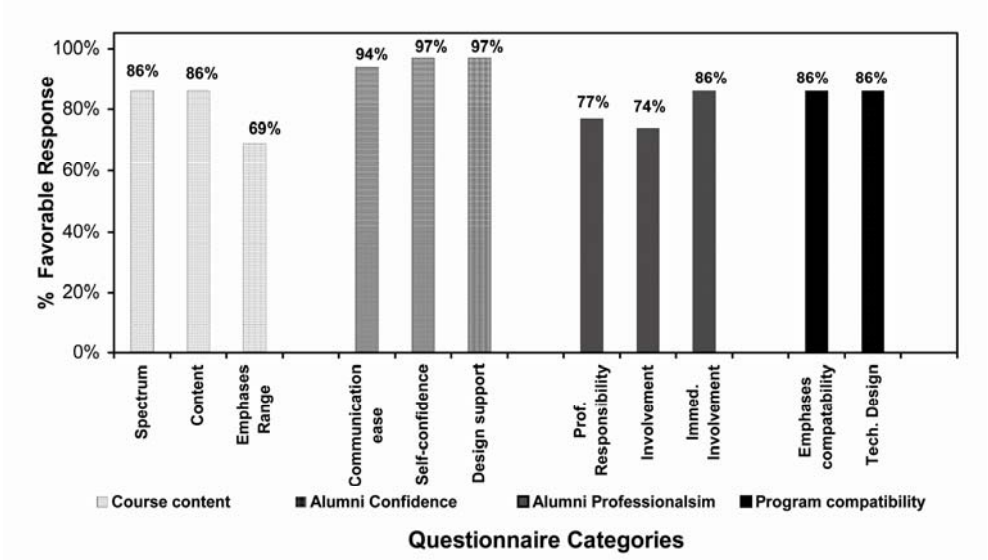

Figure 3: Alumni response and satisfaction rating for program outcome, impact and professional job involvement

Appreciable percentages of alumni generally expressed favorable judgment ratings for the questionnaire with regard to professional confidence and job performance. Alumni response to question about communication ease with other engineering disciplines comes to about 94 %. A remarkable high percentage of about 97 % of alumni also expressed favorable assessment for questions about self-confidence and competence as well as for their supporting architectural design role. Such finding confirms the confident and competent training received by alumni of KFU Building Engineering program.

Alumni professionalism, assessed in terms of his professional involvement, responsibilities and assignments entrusted, is addressed with reference to the following questions:

- Level of professional responsibilities entrusted
- project and involvement size, and
- immediate professional involvement

Favorable response of 77 % is expressed by alumni for question about level of professional responsibilities and assignment entrusted. Similarly, 74 % of alumni indicated favorable response for project involvement. For

immediate professional involvement and alumni readiness, the rating for favorable response comes to about 86 %. This confirms the high level of professionalism felt by Building Engineering alumni and their readiness and ability to assume immediate responsibilities, without the need for extensive or specialized prior training.

Compatibility of program with professional requirements is similarly explored which address such issues including:

- Suitability of emphasis addressed by the program to professional involvement,
- suitability of technical projects and studio designs training, and
- professional job conformation to student major specialization.

Like-wise, alumni response to questions about compatibility and suitability of program with professional requirements is also favorable. 86 % of alumni expressed favorable rating for the suitability of program emphases and technical design training with professional requirements.

However, a lower response is inferred from additional alumni's comments with regard to professional job conformation to student major specialization. This evidently indicates market insensitivity to alumni specific specialization. It also emphasizes current market priorities and demands for construction supervision and maintenance involvement. However, inference of program outcomes' consistency is evidently asserted with the generally favorable alumni overall response rating of greater than 50 % [15].

Employer Survey

The purpose of employer survey was to determine employer knowledge of Building Engineering program, establish their satisfaction ratings for the performance and professional skills of program's alumni and clarify impact of program outcomes and consistency with market demands. The questionnaire was sent to all employers of program's alumni, for a sample size n = 49. Employer sample is identified as those in direct management and supervision of each alumni, employed for at least one year in the job, and with alumni consent. Employer response was faxed back, with response rate for questionnaire returns of about 65 %, (n =32 respondent). The issues raised by the survey are categorized into three main groups, and with generally three questions raised by each category:

- Alumni quality,

- alumni professionalism, and
- prior knowledge of program.

Analysis of Employers Response

The employer's questionnaire is also organized into a four levels scale, ranging between very high, high, medium and low ratings, for answering questions raised by the different categories. The survey's returns data are also analyzed based on descriptive statistics and expressed in percentage terms. The analysis similarly combines the very high and high ratings as 'favorable response' for convenient presentation of response evaluation [15]. However, employers' response of program's impact and outcomes' consistency are generally highly positive, as illustrated by the diagram of figure 4.

Employers' evaluations of Building Engineering alumni's qualities are addressed by the survey with consideration of such issues:

- Alumni vitality and professional abilities,
- readiness to assume immediate job responsibilities without prior extensive job training, and
- performance compared to other graduates of similar status.

Graduates vitality and professional ability was highly rated by employers, with 88 % favorable rating. Similarly, employer response to alumni readiness to assume immediate job responsibilities upon assignment showed appreciable percentage of 97 % for favorable rating. Alumni comparative performance with other graduates is also highly rated and with 81 % of employers expressing favorable rating.

The issues addressed for employers' evaluations of alumni professionalism, performance, suitability of job assignment and involvement included:

- Level of responsibility entrusted to graduates
- job and assignments suitability, and
- professionalism and performance ability and contribution.

Employer's response ratings for this questionnaire category are also generally high. These ranged between 88 % of favorable rating for alumni responsibilities entrusted. 94 % of favorable ratings are similarly expressed for job assignment suitability as well as for professionalism and performance ability. These emphasized the particularly responsible

involvement entrusted to graduates and the high appreciation shown by employers for their professionalism. Such indications are particularly significant as program alumni are replacing experienced expatriates engineers.

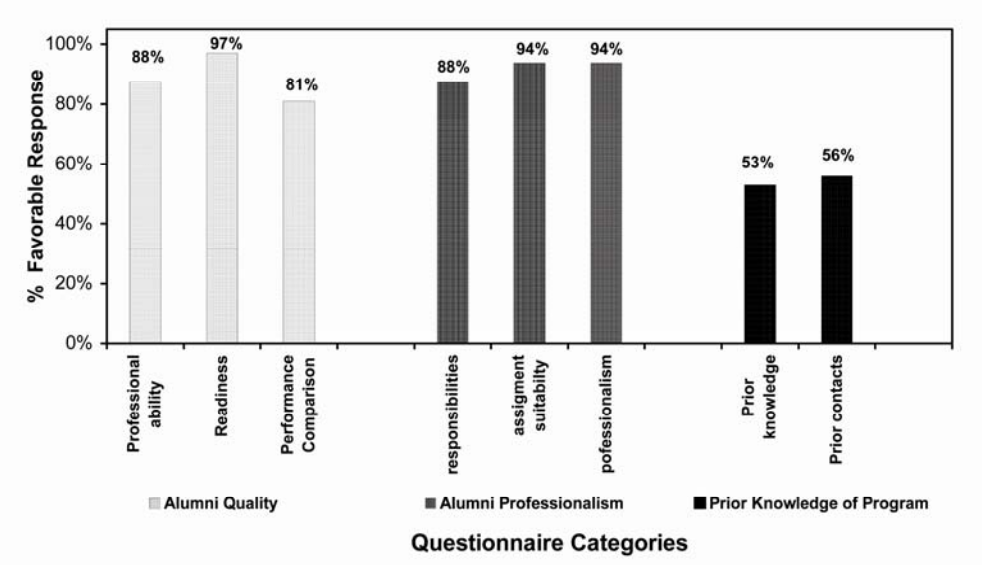

Figure 4: Employer's evaluation of Building Engineering alumni qualities and professionalism

Employer response to the level of prior knowledge of the program's content and experience with its alumni was explored with consideration of the following main aspects:

- Prior knowledge of Building Engineering, and
- prior professional experience and close contact with program's alumni.

Employer' responses in these regards are rather mixed, but with generally slightly reduced rating. Employers' lowest favorable response rating is expressed with regard to their prior knowledge of program, which comes to about 53 %. Like wise, employer favorable response to prior contact with program alumni comes to about 56 %. This evidently reflects the limited prior knowledge of employers about Building Engineering program. It should be pointed out that the program is relatively new and did not have sufficient exposure to wide spectrum of employers. It is, therefore, expected that employer response would evidently improve as the program is

more publicized. This also calls for better exposition of program and alumni potentials with local building industries. However, experiences of employers with program alumni are generally favorable with more than 50 % of response, thus, confirming the positive impact of program and high consistency of its outcomes with market demands [15].

Conclusion

Building Engineering program, evidently, expanded the outlets for students to effectively utilize their natural potentials and talents. This is confirmed by alumni and employers surveys conducted and explained by employment opportunities and professional involvements of program's graduates. The alumni and employer surveys' studies provide data for objective and meaningful appraisal of programs' outcomes and impact, and evaluation of effectiveness of achieving objectives. They also avail feedbacks to support program's cyclic revision and curriculum development, as start for initiation of accreditation requirements.

A singularly important outcome identified by the surveys studies is the high percentage of Building Engineering alumni employed in private and semi private institutions, with their particular needs and demands. This reflected matching consistency between program's education, graduates' capabilities and professionalism and local private market priorities, realities and varied professional expertise demands.

The alumni survey generally confirms the highly favorable graduates' response and appreciable satisfaction for their program preparations, which evidently infuse them with greater confidence, professional capabilities and positive impact on job performance. Employer, like wise, indicated highly favorable response for the vitality, preparedness and professional suitability of the Building Engineering alumni. The most significant concurrence illustrated by surveys' studies is the highly favorable matching confirmation by both alumni and employers with regard to the quality, professionalism and skills and performance compatibility of the Building Engineering graduates for the varied demands of the local building industry. As such, impact of program and consistency of its outcomes with market demands are vindicated.

It may be safe to conclude that program's graduates have met employers' expectations as they are in greater demand and with excellent and varied employment opportunities. The signs are that job opportunities and demands

for Building Engineering graduates will accelerate with further recognition and publicity of the program and the expansion of building industries. The nature of job profile characteristics for Building Engineers suggests the need for focusing of such programs and student training to comply with the demands of construction supervision and building maintenance involvements. Thus, further extension of such Building Engineering program experiences can be strongly recommended for national implementation. Different universities and institutions can realistically address wider focusing and differing orientations and ranging spectrums and emphases.

Further more, experiences gained with the surveys' studies are particularly advantageous in laying out formats and procedures for objective program's appraisal. The process is readily amenable for further refinement to enable extensive evaluation of pertinent program outcomes indicators for curriculum development and conduct of accreditation requirements.

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استفتاء الخريجين و أرباب العمل: برنامج هندسة البناء في كلية العمارة و التخطيط، جامعة الملك فيصل

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الدمام - المملكة العربية السعودية

الملخص :

تتطرق ورقة البحث إلى الغرض من إجراء استبيان للخريجين و أرباب العمل من اجل تقييم موضوعي لمخرجات برنامج هندسة البناء المقدم من كلية العمارة والتخطيط بجامعة الملك فيصل. توضح الورقة طرق وتنسيق وتفصيل الاستبيان. أيضا تتطرق الورقة إلى طرق و تشكيل و تفصيل الاستبيان و مستويات التقييم للبرنامج. تم تجميع ثم تحليل البيانات التي تحتوي إجابات مقياس التفضيل من قبل المستفتين وشرحها باستخدام الإحصاء الوصفي. أوضحت الدراسة الإحصائية طبيعة وتنوع وظائف الخريجين و توفر فرص العمل المميزة لهم. تشير الدراسة إلى ثقة الخريجين العالية في محتوى البرنامج و المهارات المكتسبة منه. كذلك أشاد الخريجين بمستواهم المهني العالي من خلال المسئوليات المناطة بهم و الرضا عن أداؤهم المهني. على الرغم من محدودية صلة أرباب العمل بالبرنامج إلا أن نتائج استبيانهم أكدت الرضا التام عن أداء و مهنية الخريجين. و قد أوضح الاتفاق التطابق الإيجابي بين مرئيات الخريجين و أرباب العمل في الاستفتاء المشترك حول مهنية و كفاءة و قدرة الخريجين بالاضطلاع بالمسئوليات المكلفين بها. بينت نتائج الاستفتاء توافق مخرجات البرنامج مع متطلبات سوف العمل. يوصى البحث بالتوسع في طرح برامج بتخصصات وتوجهات مختلفة في مجال هندسة البناء في المملكة العربية السعودية.