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Research Paper



A Comparative Study on the Application of Quality Assessment Schemes in Academic and Construction Industries

[1*]M.Balasubramanian, [2*]Senthil Selvan.S, [3*] V.R.Prasath Kumar, [4*]Mahadevan.S

[1, 3]Assistant professor, [2]Professor, [4]P.G Student

**Department of civil engineering,SRM Institute of Science and technology, Kattankulathur – 603203, Tamil Nadu, India.*

**Corresponding author E-mail: balasubramanian.m@ktr.srmuniv.ac.in*

Abstract

In this study, the development of professionalism of undergraduate students of civil engineering is essential to face the challenges in the modern world and this study describes professional internship program for each semester in the civil engineering department at SRM Institute of Science and Technology. Based upon literature reviews of the professional internship program for each semester questionnaires are prepared and given to faculties, undergraduates of SRM Institute of Science and Technology and also get from the construction contractors, to predict issues in the traditional professional internship program. For undergraduates questionnaires consider weighted percentage of before and after professional internship program are Wb and Wa. The expert groups were utilized to planning, implementation, evaluation, and execution of the professional internship program at the SRM Institute of Science and Technology. An implementation of the professional internship program for each semester of undergraduate students of the civil engineering department at SRM Institute of Science and Technology. The outcomes obtained for civil engineering undergraduates are getting from valuable resources, that professional internship program for each semester is needed undergraduates to develop the carrier and gain knowledge and should create best civil engineers.

Keywords: *Professional internship program; Civil engineering; Undergraduates.*

1. Introduction

With the help of professional internship program undergraduates easily understand the concepts and know how to solve construction problems and this program fills the gap between academic and industry so that undergraduates can easily join the theoretical knowledge with the professional knowledge gained through a professional internship program [1].

In the civil engineering curriculum is a major role to develop the professional ability of the undergraduates and this development is a breakthrough for civil engineering professors[2].

The professional internship program is needed in the curriculum of the department of civil engineering to create the professional civil engineer. It is necessary to include both theoretical and practical knowledge in the educational system [3].

The main objective of study is to implement Professional internship program per semester can create the civil engineering undergraduates of SRM Institute of Science and Technology as a professional engineer in the modern environment and this is state of Professional internship program is evaluated in the first half of this study [4][5]. Questionnaires about professional internship program finished by faculties, undergraduates of SRM Institute of Science and Technology and also construction contractors are studied. The experts are utilized to predict results. Based on the findings an improved professional internship program is proposed [6].

A module is created by Clarke (2007) with help of construction engineer for undergraduates in a civil engineering program [7]. The aim was to fill the gap between the academic and construction practice by setting a position of consulting engineers [8][9]. In the Institute of Science and Technology of Alabamaat Birmingham at USA has been processed summer experience for structural engineering undergraduate students [10].

The best outcome of civil engineering undergraduates can be achieved by industry collaboration with Institute of Science and Technology [11]. This helps undergraduates to get a field knowledge easily and get job opportunities and professional internship program per semester is easy to gain the work experience [12].

The Professional internship program is an important problem to teach undergraduate students about benefits and value of this program [13]. The investigation involved with cooperative, part-time, and summer work experiences to investigate how civil engineering students at Lamar Institute of Science and Technology improved their understanding of various subject areas required by accreditation ABET [14].

Professional practice problems are important in the undergraduate civil engineering curriculum is predicted by accreditation [15][16]. They entitled course “Civil Engineering Practice” for practical problems into the department curriculum in a creative approach [16].

Nowadays civil engineer incomes are low compared to other profession. The civil engineering curriculum can get a dramatic change in past thirty years [17]. In this study to evaluate the existing professional internship program can be implemented in every semester for undergraduate students of the civil engineering department at SRM Institute of Science and Technology to face construction issues.

A theory is studied, that the professional internship program is essential and necessary for civil engineering undergraduate students of SRM Institute of Science and Technology. To prove this theory,

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questionnaires are given to faculties, civil engineering undergraduates of SRM Institute of Science and Technology and also construction contractors, based upon a literature review of the professional internship program and use the Delphi method to prove the theory. Major outcomes are discussed and presented in this paper.

In the first half, current summer training programs of undergraduate students of the civil engineering curriculum at SRM Institute of Science and Technology are reviewed and questionnaires are prepared. In the second part of the study process of the Delphi method and study outcomes of this process. A professional internship program per semester is proposed based upon the findings for undergraduate students of the civil engineering curriculum at SRM Institute of Science and Technology.

2. Preparation of Questionnaires

Identify the issues that already in the existing practical training programs for civil engineering program in SRM Institute of Science and Technology, first identify the problems and listed them in an order of survey questionnaires, and get the data from the faculties, undergraduate students of SRM Institute of Science and Technology, construction contractors, and experts group. With the help of literature reviews, questionnaires are prepared to present situation of civil engineering curriculum with professional internship program worldwide[18]. In this study, two hundred major construction contractors are selected for questionnaire survey in various parts of Tamilnadu and only forty-five construction contractors are answered and recovery percentage of 22.5 %. It shows that construction contractors are not liked the professional internship program of undergraduate students due to decreasing level of projects; it shows the current depressed state of the economy of our country.

Thirty professors of department Civil Engineering at SRM Institute of Science and Technology are selected for questionnaire survey and only 24 professors are answered and recovery percentage of 80%. It was shown that the professors of the civil engineering department at SRM Institute of Science and Technology are very curious in the professional internship program.

For the undergraduate students prepare a before internship program questionnaires and after internship program questionnaires and distributed individually. The first set of before internship program questionnaire to ninety-five undergraduate students was done and the second set of after internship program questionnaire to eighty-nine undergraduate students was done.

The outcomes of the survey construction contractors and faculties were determined from the ratio of $P = \frac{A}{N}$ Where A=Accepted members, N= total members.

W of the accepted weighted percentage of undergraduate students is from following Eq. (1). WB be the weighted percentage of before professional internship program and WA is the weighted percentage of after professional internship program for undergraduate students is computed.

$$W = \frac{x1W1 + x2W2 + x3W3 + x4W4 + x5W5}{x1 + x2 + x3 + x4 + x5} X100 \quad (1)$$

in which W1=1, W2=0.8, W3=0.6, W4=0.4 and W5=0.2 and x1 be a no. of strongly agree undergraduates; x2 be a no. of agree on undergraduates; x3 be a no. of neither disagree nor agree undergraduates; x4 be a no. of disagree undergraduates; x5 be a no. of strongly disagree undergraduates.

3. Research Results and Discussions

For publication purpose, highly agreed questions are presented due to the space limitations. The research outcomes from faculties, civil engineering undergraduate students of SRM Institute of Science and Technology, construction contractors, and Expert groups are listed sequentially

3.1. Construction Contractors' Opinions

Table 1 shows that construction contractors realize that professional internship program per semester are needed for undergraduate students and have injury insurance. Builders realize that professional internship program of each semester is needed and essential. They didn't get any additional funds for professional internship program due to economic conditions in our country.

Table 1. Survey of Construction Contractors

Nos	Questions	Yes %
C1	Do you think that the professional internship program is helpful to the construction contractors?	46
C2	Do you think that the professional internship program for each semester is required?	90
C3	Does your company accept undergraduates to get professional internship program?	58
C4	What do you think about insurance and stipend for Undergraduates during professional internship program?	52
	• Undergraduates should have insurance.	
	• Stipend for undergraduates should be supported By the contractor.	16

3.2. Professors' Opinions

From professors point of view that professional internship program for each semester is essential for undergraduates in SRM Institute of Science and Technology. Professional internship program per semester can develop undergraduates to learn easily theory concepts to practice. Professional internship program per semester develops undergraduates in civil engineering education and help for a future profession. They thought that safety of undergraduates is risky because construction sites are dangerous.

Table 2: Survey from Professors

Nos	Questions	Yes%
P1	Do you have professional internship program at the end of each semester in your department?	8
P2	Reasons why don't you ask your students to take professional internship program Construction sites are dangerous.	68
P3	Do you think that undergraduate students at SRM Institute of Science and Technology should have to take professional internship program? Professional internship program necessary for undergraduates.	76
P4	What following effects do you think that professional internship program has on students?	
	•The Professional internship program is helpful for undergraduates to get a job.	69
	•The Professional internship program creates undergraduates' interest in civil engineering.	70
	• The professional internship program per semester can help undergraduates to understand theoretical concepts with actual engineering ideas.	80
P5	Do you think that professional internship program has to be popularized? The Professional internship program has to be popularized to all the related Civil engineering department in our country.	57

3.3. Undergraduate Students' Opinions

In table 3 shows before and after professional internship program several opinions from undergraduate students of civil engineering at SRM Institute of Science and Technology. After internship program, the of undergraduates think that professional internship program

for each semester is required for our carrier and learn actively through an internship program. They needed reasonable stipend for the professional internship program but contractors don't give stipend due to economic conditions.

Table 3. Undergraduate Students suggestion before and after professional internship program

Question item	WB%	WA%
Planning of practical training		
• The professional internship program for each semester of the department of civil engineering at SRM Institute of Science and Technology is very important.	55	75
• The professional internship program per semester is required	59	78
• Department should plan the training processes and types adequately.	66	86
• The professional training job should match the social tendency.	62	83
• The department should set up a planning committee for professional internship program per semester	63	82
Implementation of professional internship program per semester		
• Undergraduates need to understand the goals of the professional internship program before the internship.	66	84
• Undergraduates should be aware of engineering safety during professional internship program	65	86
• Undergraduates should actively learn during the professional internship program	61	80
• Undergraduates should be given a reasonable stipend.	68	88
Evaluation of practical training		
• Evaluation or grading should include moral character	62	81
• Evaluation or grading should include service attitude and respect attitude.	64	83
• Evaluation or grading should include presentation and communication skills.	60	80
• The Department should issue Undergraduates certification and credits after the training program.	62	82
Development of practical training		
• Undergraduates will be benefited while finding a job after graduation by professional internship program per semester.	62	76
• Undergraduates are glad to share the training experiences with professors and classmates.	58	78
• Undergraduates can find the advantages and disadvantages of construction during the training and create some new idea to improve problems.	58	78

4. Experts Group's Opinions

4.1 Planning of Professional internship program

Table 4 shows that expert groups suggest that the professional internship program for each semester is needed for undergraduates at SRM Institute of Science and Technology and be needed course program. were mean is $\bar{X}$ and the standard deviation is SD.

For undergraduates, expert groups certify that the professional internship program for each semester is essential for his future carrier. With help of academic and industry collaboration where undergraduate students can go for professional internship program easily in the areas of residential villas, residential apartments, dams, harbors and so on[11]. Suggesting consultant firms for professional internship program per semester to get professional knowledge. Therefore, undergraduates learn thoroughly about the theoretical concepts of academics to the actual engineering design during the professional internship program and they can separate into groups for the professional internship program in the civil engineering department at SRM Institute of Science and Technology.

Table 4. Expert Group's suggestion for Planning of professional internship program

Question E1. Do the undergraduates at SRM Institute of Science and Technology need the professional internship program for each semester?		
Answer item	$\bar{X}$	SD
• Required	4.450	0.570
Question E2. Why don't civil engineering department ask undergraduate students for a professional internship program for each semester?		
Answer item	$\bar{X}$	SD
• The construction site was dangerous.	4.085	0.665
Question E3. Should the professional internship program be required or an optional program?		
Answer item	$\bar{X}$	SD
• Required course	3.919	1.500
Question E4. How many credit hours should be for the professional internship?		
Answer item	$\bar{X}$	SD
• Two credit hours	3.165	1.588
Question E5. When do you think that students should have a professional internship program?		
Answer item	$\bar{X}$	SD
• During each semester holidays at the SRM Institute of Science and Technology.	3.333	1.677
Question E6. Where can undergraduate students go for the professional internship program?		
Answer item of department in private company	$\bar{X}$	SD
• Construction industries	4.333	1.166
• Engineering consultant company	4.000	1.478
Question E7. Which types of construction are suitable for a professional internship program for each semester?		
Answer item	$\bar{X}$	SD
• Supervision of construction	4.165	1.195
Question E8. Will the professional ability of undergraduate students be developed through the professional internship program?		
Answer item	$\bar{X}$	SD
• Undergraduates understand easily to learn theoretical Concepts with the practical engineering.	4.200	1.230
Question E9. What are the training processes and types?		
Answer item	$\bar{X}$	SD
• Undergraduates can be separated into groups for the professional internship program in the civil engineering departmentat SRM Institute of Science and Technology for better outcomes.	4.167	1.115
Significance: 0.00		

4.2 Implementation of Practical Training program

Table 5 shows that expert groups majorly recommends that the undergraduates should have injury insurance during the professional internship program. They should write internship reports each semester for testing technical skill learned from the internship. From 1998 and 1999, the government takes action on all automobile and motorcycles drivers were strongly to buy accidental insurance. So that expert groups suggests that undergraduates should have insurance for injury during the professional internship program

Table 5. Expert Group's suggestion for Implementation of professional internship program

Question E10. Are there any matters needing attention during professional internship program?		
Answer item	$\bar{X}$	SD
• The organizations for professional internship could be assigned by the civil department.	4.167	0.578
• Professors should enhance the technical knowledge for the professional internship program	4.333	1.045
• A meeting should be given to undergraduate students before the Professional internship program.	4.000	1.477
• Undergraduates should have injury insurance during the Professional internship program	4.585	1.163
• Undergraduates should be actively learning during the professional learning.	3.669	1.300
• Undergraduates should prepare reports on what they have learned in the internship program	4.165	1.110
Significance: 0.00		

4.3 Evaluation of Practical Training program

In table 6 shows that professional internship program reports should be reviewed to make interest in civil engineering course. Undergraduates develop technical and communication skills. Undergraduates should keep the internship report for future reference. The expert groups suggest that offer two credits for that professional internship program if undergraduates qualified in the internship program.

Table 6. Experts Group's suggestion for Evaluation of Professional internship program

Question E11. Does the department of civil engineering have to review and assess the outcome of the Professional internship program?		
Answer item	$\bar{X}$	SD
• Undergraduates should be given credits if they pass the professional internship program.	4.000	1.125
Question E12. What should be included in the content of the assessment?		
Answer item	$\bar{X}$	SD
• Reports on what undergraduates had learned	4.585	0.510
• Learning attitude and respectful manner	4.081	1.167
Significance: 0.00		

4.4 Execution of Practical Training program

In table 7 shows that the professional internship program for each semester should be mandatory in the civil engineering department at SRM Institute of Science and Technology. Undergraduates can easily understand the theoretical concepts with actual engineering ideas. Professional internship program for each semester will be indexed in the curriculum of civil engineering at SRM Institute of Science and Technology for developing best civil engineers tomorrow.

Table 7. Expert Group's suggestion for Execution of Professional internship program

Question E13. What should be done for a professional internship program in the future?		
Answer item	$\bar{X}$	SD
• The advantage and disadvantage of construction Industry found by undergraduates during professional internship should be discussed with faculties. The new idea should be created to improve the disadvantage of construction industry	3.333	1.555
Question E14. Do you think that professional internship program per semester will benefits students?		
Answer item	$\bar{X}$	SD
• The professional internship program per semester can help undergraduates to understand theoretical concepts with actual engineering ideas	4.000	1.127
Question E15. Do you think that professional internship should be mandatory at SRM Institute of Science and Technology?		
Answer item	$\bar{X}$	SD
• Yes, the professional internship program should be mandatory in the of civil engineering department at SRM Institute of Science and Technology	4.115	1.125
Significance: 0.00		

Note: Delphi experts scoring values for $\bar{X}$: very important (five points); important (four points); common (three points); not important (two points); and not very important (one point).

5. Conclusion

The following conclusions can be made:

1. To develop the professionalism in undergraduates should conduct Professional internship program for each semester in the civil engineering department at SRM Institute of Science and Technology. The expert groups suggest that professional internship program are essential for undergraduates to develop the carrier. For that professional internship program for each semester can help undergraduates learn easily to apply theoretical knowledge to practical knowledge.
2. Construction contractors don't give stipend during professional internship program because of poor economic status of our country
3. Professors suggested injury insurance for undergraduates should take care by respective Institute of Science and Technology and professional internship program for each semester is essential for undergraduate students to face challenge in site
4. According to undergraduates questionnaires, before taking professional internship program there must be no idea about field experience, after taking professional internship program, they realize that internship program is beneficial to our carrier so that an implementing of the professional internship program for each semester should helpful for gain field knowledge.
5. From the expert groups, suggest that professional internship program for each semester is essential for undergraduates, with the help of industrial collaboration of Institute of Science and Technology can achieve various opportunities for the internship program and they submit internship report to review the undergraduate's performance. They suggest professional internship program for each semester offer two grade points if undergraduates qualified in the internship program and maintain report for future reference, and they suggest that professional internship program for each semester is mandatory in the department of civil engineering at SRM Institute of Science and Technology.
6. A Survey conducted in the department of civil engineering at SRM Institute of Science and Technology for implementation professional internship program for each semester to fill the gap between academic and construction industry and it will helpful for future civil engineers.

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