



## Review Paper

# Integrating Entrepreneurship into the Teaching of IT

Abdul Basit Shaikh, Muhammad Sarim, Sheikh Kashif Raffat, Muhammad Siddiq, Adnan Nadeem and Kamran Ahsan  
Department of Computer Science, Federal Urdu University of Arts, Sciences and Technology, Karachi, PAKISTAN

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## Abstract

Teaching methods have been subject to increasing scrutiny over the past years, specially from the perspective measurable tangible outcomes. Whilst the focus has been on ensuring the students learn what is being taught, there has been a refocus on entrepreneurship education. This has been reinforced by the global economic turndown and the need to increase economic growth. Hence, traditional teaching methods can be redefined by inverting the paradigm. Instead of developing a course outline based on the discipline being taught, develop the course based on the required entrepreneurial activity, which can then be de-constructed to define the salient course outline. The purpose of this paper is to suggest great benefits in this process, with Pakistan being used as a specific example, the IT discipline as the subject and the freelancing market as the specific target.

**Keywords:** Entrepreneurship, education, teaching pedagogy, IT, innovation, economic growth.

## Introduction

The issues of innovation is now more closely linked to entrepreneurship than ever before, driven primarily by the global economic recession. The inability of state driven bailout packages has resulted in the need to promote entrepreneurial activity, which in turn has put the spotlight on entrepreneurship education. Klaus Schwab<sup>1</sup> stated in the executive summary of the World Economic Forum (WEF) report that: Entrepreneurship and education are two such extraordinary opportunities that need to be leveraged and interconnected, if we are to develop the human capital required for building the societies of the future. Entrepreneurship is the engine fuelling innovation, employment generation and economic growth. The problem with entrepreneurship education is the term itself; for how do you teach a subject which itself is dependent on dynamic judgements based on time specific realities. Whilst this is difficult, some good original work has been undertaken, with<sup>2</sup> being one of the first in developing and offering a BA (Hons) in Entrepreneurship. Whilst this is possible in structured societies like the United Kingdom, this is more difficult in countries like Pakistan where political instabilities drive other instabilities.

## IT Entrepreneurship in Pakistan

Recent articles have shown that despite all its problems, Pakistan has managed to play a substantial role in the software freelancing market<sup>3,4</sup>. The freelancing website, Freelancer.com reported that Pakistan had the third largest registered freelancers of the website, amounting to a significant 39%. Similarly odesk.com reported that of the 35 million hours of freelancing work, Pakistan contributed to 2.6 million hours, amounting to about 7.5%. Of the 4 million registered contractors, 2.14 million are from Pakistan.

Yet a cursory look at the educational system of Pakistan suggests that this relatively high participation and contribution is not because of, but in spite of the educational structures.

For such a large number of individuals to be registered and contributing to the freelancing market is an achievement of any educational system, let alone that from a developing country like Pakistan. First, this indicates the great potential that exists within the young population. Secondly, and more importantly, this suggests that these percentages can be increased significantly if the educational process was modified to support the students in developing and increasing their entrepreneurial potential. In addition, it does not require a major departure from the traditional curricula, just a change in perspective which in turn drives the curriculum. NGO's are also play a vital role for development of science and entrepreneurship especially for women in rural areas<sup>5</sup>.

## Traditional Teaching Techniques

The science of teaching has developed over years, and primarily it has a compartmentalised approach whereby the science/discipline is taught with its applications as part of the science. Hence languages, networks, multimedia sciences are taught as pure sciences and the students are left to apply them to practical issues, and to practical market requirements. Whilst the same problem exists in terms of the teaching of other sciences, the fact that IT trends change rapidly, it is very difficult to keep up with applications of these technologies when each year, the IT trends outpace the speed with which the curriculum is revised. Although the statistics showed that publication of research papers in Asian countries have exponentially grow in last five years<sup>6</sup>.

## Entrepreneurship Driving Innovation

The salient point to be made here is that innovation is driven by being in the entrepreneurship environment. Report the Study on Creative and Innovation in Education in EU Member States<sup>7</sup> reported quite appropriately that to be IT literate does not at all indicate the ability to innovate, nor be entrepreneurial. It takes a few more skills to innovate and then to turn an innovation into a business. Using the term creativity as synonymous to innovation<sup>8</sup> discusses an interesting dichotomy in creativity. Here, we are not talking about the creativity (first type of creativity) of the likes of Einstein, Mozart or Picasso, but rather the creativity (second type of creativity) borne out of the application of ones skills to new problems. There has been an extensive study on the definitions of innovation, with<sup>9</sup> providing a multidisciplinary perspective. In its most simplest, and contextless form, innovation is the initiation of something new. Entrepreneurship places a specific context on innovation,

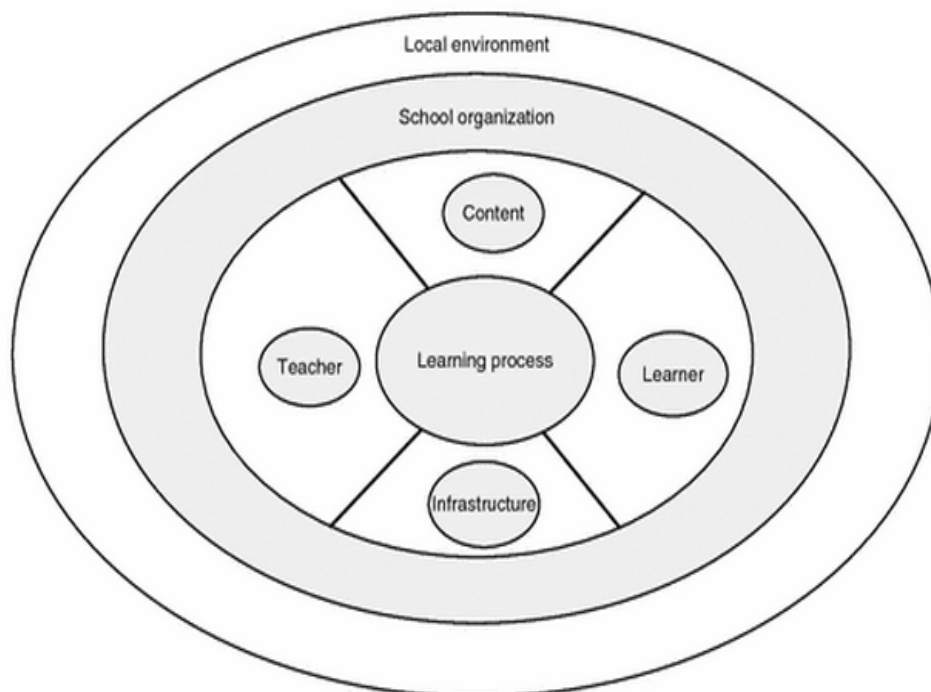
that is, the manner by which the innovation satisfies the need of people sufficiently to make it an economic benefit, or in more general terms, the pursuance of economic opportunities. Given that solution to these new problems can provide remuneration, then the entrepreneur is born. Hence, it is the environment of entrepreneurship that will drive innovation. It seems therefore, very natural to include as many aspects of the entrepreneurship environment into the IT course structure.

## ICT and Entrepreneurship Teaching

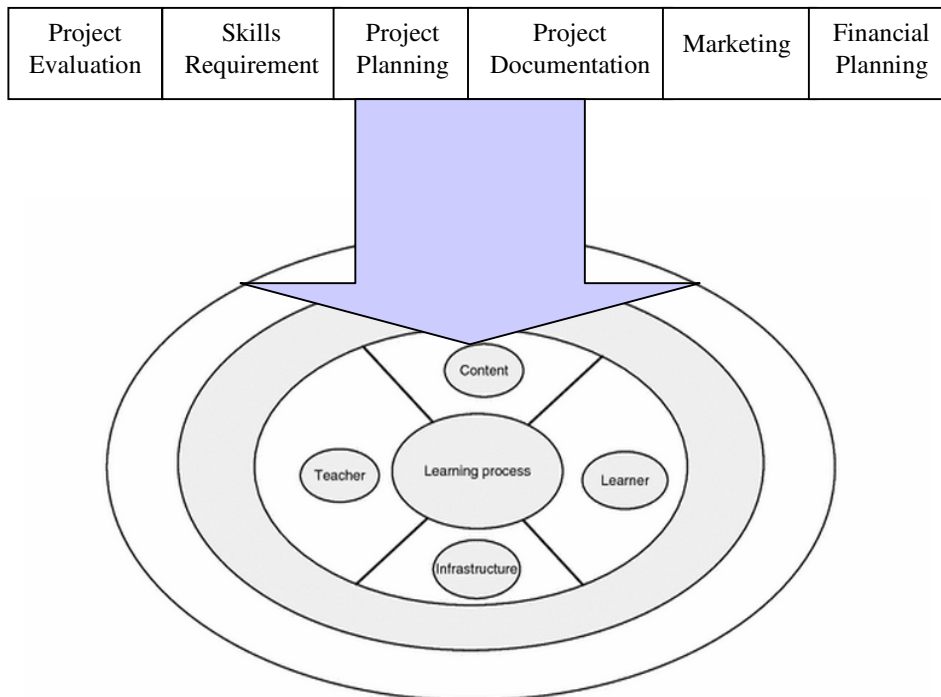
The most fundamental problem is one of mentality, of both student and teacher. The graph below, taken from<sup>3</sup>, shows a graphical depiction of the student/teacher process in a wider context.

Note that the content and local environments are not necessarily dovetailed. Entrepreneurship as a skill sits in the outer shell, in the local environment. Hence, all the dynamic skills required to undertake the enterprising activity are excluded in the skills and processes taught within the educational environment. As a solution, the chart below shows the proposed approach, with a view to developing greater integration between market needs, trends, entrepreneurship skills and the graduating student.

The novelty is not in the contents, but the manner in which the contents are delivered. Taking from the case based approach; the requirement is to define the case studies as projects where the students are required to deliver the project on time to the clients. The students would then be required to scope a project, market it, financially plan it, design and deliver it with a view to customer satisfaction. Finally the students are to be marked based on their delivery of the project on time. The integration of skills and learning achieved this way will develop the student much quicker and better than the traditional teaching pedagogy. In addition, it would be more efficient in delivering to the students the skills required



**Figure-1**  
**Schematic of Traditional Teaching Processes**



**Figure-2**  
**Schematic of Traditional Modified Teaching Processes**

## Opportunities

Whilst the above structure solves part of a problem, it fails to address one key aspect, which is how to integrate the motivation to succeed. In environments like Pakistan, the need to succeed is very high, and the consequences of failure are dire. Coupled together, they can be a potent force for ensuring success, for they will make the entrepreneurship element very prominent. The opportunity is to successfully import these as part of the course pedagogy. Some institutions in Pakistan have addressed this by providing the students with start up capital for a business venture as part of the course requirement. In the event of success, the students will be allowed to keep the profits, and if they fail the students have to pay back the venture capital. Whilst the thinking is commendable and has merits, not all institutions have the financial comfort of providing such venture capital. In addition, the institutions that provide this type of course structure will be dealing with a very select, exclusive part of society. Whereas the objective with the proposed pedagogy is to make it part of the mainstream education of IT. Hence, it would by definition, address the wider student population, and hence, have a greater impact.

## Conclusion

The change in teaching pedagogy can be described as redefining the students environment where he/she sits in the office of his imaginary job, where a project has been designated and the

student has to plan the project to deliver fully functional code, on time, in budget to the satisfaction of all. Keeping this perspective in mind, the course curricula need to be designed to simulate this process.

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