TECHNOLOGY AND INNOVATION IN MANAGEMENT PRACTICES

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Editor-in-Chief
Daniel James

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AN ANALYSIS ON PHYSICS CLASSROOM INITIATIVES THAT FOSTER INNOVATION AND ENTREPRENEURSHIP

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ABSTRACT

Considering the context of innovation and entrepreneurship, incorporating these subjects into physics instruction is a worthwhile educational endeavor. Physics instruction covers a wide range of topics, and the pertinent physics concepts and the physicists' innovative experiences can offer valuable resources for teaching innovation and entrepreneurship to students. The "two-stage" method of instruction is used. Students may better understand innovation and entrepreneurship techniques and develop high standards of entrepreneurship if the deep significance of physics principles and physicists' innovative experiences are made clear to them. The teaching effect of the students' innovation and entrepreneurship education can be enhanced by the approach that integrates theory and practice while directing the students' practice.

Keywords: Teaching physics; Innovation and Entrepreneurship; The quality of innovation; Strategies of Entrepreneurship

INTRODUCTION

In the twenty-first century, market competition is getting more intense. Management is concentrating on the application of technological innovation in order to take the initiative in the face of intense market competition. This will raise the degree of scientific and technological innovation of businesses through a variety of applications. There will unavoidably be certain problems when using technical advancement. To fully profit from scientific and technical innovation in business management, enterprises must take the necessary actions. Furthermore, businesses can advance society and accomplish self-development by fusing technical and scientific innovation with effective production.

The learning process or a series of activities that revitalize the teacher's professional activity in the pursuit of a predetermined objective and ensure the end result in education are propelled by innovative technology in physics education. Using cutting-edge, creative technologies in the classroom is one strategy to advance and enhance the reform of our nation's educational system. Interactive techniques, a component of cutting-edge, creative technology, are frequently employed nowadays. The English term "inter," which meaning "between" or "in between," and which denotes activity between two objects, is the root of interact. By enhancing the level of interaction between students and the teacher throughout the physics lesson, the interactive method fosters the development of personal attributes while stimulating the acquisition of theoretical and practical knowledge of the subject.

TECHNOLOGY'S PLACE IN MANAGEMENT PRACTICES

First of all, students' perceptions of physics teachers' classroom management practices were explored. It came to light that; students perceived some classroom management practices more common than others. This implies that some classroom management practices were more prevalent in senior high school physics classrooms and among physics teachers studied. This also means that the physics teachers consciously or unconsciously perceive some classroom management practices more important than others. Also, it may mean that teachers do not have the necessary resources or training to employ certain practices in their classroom. For example, the fact that computer usage was not very common in the classrooms studied may support this assertion as suggested by (Aina,2013). It was also shown that classroom management strategies had a favorable and significant association with students' enthusiasm in physics. This finding may imply that physics professors' conscious efforts to apply specific classroom management strategies could boost students' interest in physics. However, because correlation does not always imply causation, regression analysis was conducted to investigate potential drivers of students' interest in physics among the ten (10) CMPs evaluated. The regression analysis results revealed that four CMPs (task orientation, cooperation, involvement, and exploration) were excellent predictors of student interest. This finding implies that not all classroom management strategies were relevant to the students' physics interests. As a result, if teachers want to foster student engagement, they must focus on task orientation, provide chances for scientific investigations, and often include students in classroom activities while minimizing student cooperation. Although research and involvement were strong indicators, they were only occasionally seen in the physics classrooms investigated. As a result, instead of focusing on other CMPs such as cohesiveness and equity, teachers should place a greater emphasis on involvement and research, which are better predictors of students' physics interests. Based on the data, it is advised that:

- To foster engagement, physics teachers should focus on classroom management strategies such as task orientation, student interaction, and exploration.
- Physics teachers should limit the level of student cooperation in physics classrooms, assignments, and other duties.
- Teachers should include ICT resources into the teaching and learning of physics because it connects strongly with students' interest in physics but is rarely recognized.

THE IMPORTANCE OF SCIENTIFIC ENTREPRENEURSHIP

The value of scientific entrepreneurship cannot be emphasized in today's quickly changing environment. It fosters innovation, propelling advancement in a variety of industries including healthcare, technology, energy, and others. Scientific entrepreneurs are critical to furthering scientific knowledge, creating jobs, promoting economic development, and addressing significant societal issues. Scientific entrepreneurship encourages collaboration and cross-disciplinary contact. It brings together scientists, engineers, business professionals, investors, policymakers, and other stakeholders to work on groundbreaking initiatives and businesses. This collaborative method not only increases the rate of discovery, but it also improves the scalability and sustainability of scientific initiatives. Scientific entrepreneurship is a dynamic, complex process that combines scientific rigor and entrepreneurial ambition. It is critical to the full potential of scientific discoveries and research, which drives economic growth and shapes the future of companies and communities worldwide.

EXAMPLES OF SCIENTIFIC ENTREPRENEURSHIP

Biotechnology Startups: Companies such as Moderna and BioNTech demonstrate scientific entrepreneurship in the biotechnology industry. These businesses created groundbreaking mRNA vaccination technology, resulting in COVID-19 vaccines in record time.

Clean Energy Ventures: Elon Musk and his cousins developed SolarCity, a classic example of scientific entrepreneurship in the clean energy field. The company specializes in solar energy services such as solar panel installation and energy storage systems, with the goal of accelerating the transition to renewable energy.

Tech Startups: Companies such as Google and Facebook originated as startups motivated by scientific innovation. Google's search engine algorithm and Facebook's social networking platform are both examples of scientific entrepreneurship in the technology industry, using advanced algorithms and data analysis techniques to transform their respective sectors.

Agri-Tech Innovations: Indigo Agriculture is a scientific entrepreneurship success story in agricultural technology. The company creates microbial and digital solutions to boost crop yields, reduce environmental impact, and encourage sustainable farming practices.

Space Exploration Ventures: Elon Musk's SpaceX is a leading example of scientific entrepreneurship in the aerospace industry. The corporation develops and produces sophisticated rockets and spacecraft to make space travel more inexpensive and accessible.

BEN FRANKLIN

Although Ben Franklin was never president, he was an excellent scientist and businessman. As a scientist, he invented a wide range of technologies, including the lightning rod, bifocals, iron furnace burner, carriage odometer, and harmonica. His commercial accomplishments were similarly noteworthy. By the age of 24, Franklin had established himself as an entrepreneur, owning a print shop, a newspaper, and a general store. These businesses, together with the commercialization of his inventions, helped Franklin become one of the wealthiest men of his day.

THOMAS EDISON

Thomas Edison is a textbook example of a scientist who turned his innovations into profitable commercial products. Although he is credited with over 1,000 U.S. patents, his most significant inventions were arguably the phonograph and, most critically, the light bulb. Not shortly after inventing the incandescent light bulb, Edison assembled a group of wealthy investors (does J.P. Morgan come to mind?) and founded the Edison Electric Light Company. Edison had a long-term goal of making electricity accessible to the general public. His company's unofficial objective was to make electricity so inexpensive that only the wealthy would use candles. To expedite the process, Edison went so far as to patent an electrical distribution system, resulting in a ready-made power supply for his product.

GEORGE EASTMAN

George Eastman was the innovator who single-handedly introduced photography into the homes of Americans. Intrigued by photography, Eastman got fascinated with creating a convenient and hassle-free development procedure. From the start, he aimed to market the results of his research to the wider public. After getting the patent for his roll film camera in 1888, he immediately began production, marketing his product with the motto, "You press the button, we do the rest." Interestingly, Eastman's marketing acumen remained consistent throughout his career. His company name, Kodak, was created based on three creative marketing concepts: The name had to be brief, impossible to mispronounce, and completely distinctive. It must have succeeded, for Kodak went on to become the dominant force in film and photography for much of the twentieth century.

MARIE CURIE (1867-1934)

Marie Curie is yet another scientist who expressed anxiety about the commercial implications of her work. What makes Curie even more remarkable is that she lived in an era when women were not widely recognized in either the scientific or economic worlds. Despite these challenges, her discovery of the element radium paved the way for future discoveries in radiation. Curie chose not to patent the radium-isolation technique, recognizing the value of her invention. She also went out of her way to collaborate with industry by teaching industrial physicists in her own laboratory. Although her collaborative spirit may have cost her money, it resulted in two Nobel prizes, one of which was for peace.

TECHNOLOGY TRANSFER PROCESS

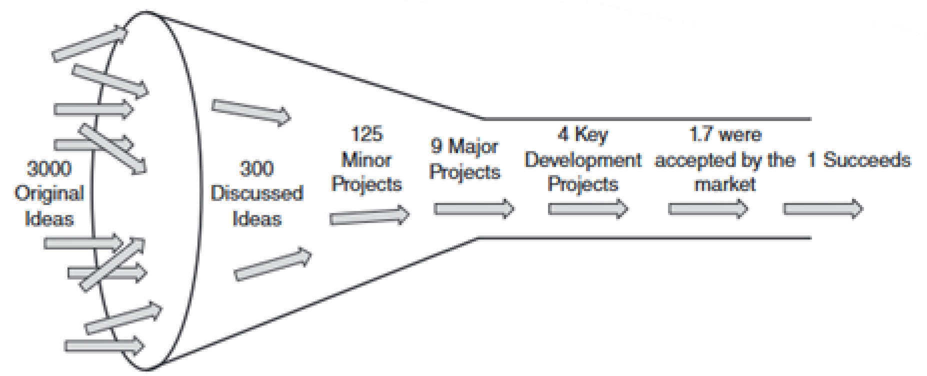
Technology transfer is the process of transmitting scientific discoveries, research findings, and technical advances from university and research institutions to the private sector for practical applications and societal benefits. It is crucial for converting scientific information into real products, services, and solutions that meet market demands and generate economic progress.

The technology transfer process typically consists of many critical steps: Discovery and Research: The process of technology transfer begins with scientific research and discovery in university institutions, research facilities, or commercial firms. This study may lead to the creation of new technologies, techniques, or intellectual property with commercial applications. Intellectual Property Protection: Once a promising invention or breakthrough has been identified, intellectual property protection is critical for ensuring its commercial worth. This may include filing patents, trademarks, or copyrights to protect the invention's novel elements and prevent unlawful use or reproduction by others.

Every year, physics-based industries, including as manufacturing, energy generation, and the automobile industry, make a larger contribution to global economies. The IOP reflects this strength. According to a recent top-level study, over half of IOP members work in business or industry, and the organization provides extensive support for them.

Since the motto "mass entrepreneurship and innovation" was introduced, hundreds of millions of people have been motivated. Many people actively practice in the era of innovation, such as big data, cloud computing, artificial intelligence, and a number of innovation hotspots and successes associated with "Internet +". Universities should make a difference in this era of widespread innovation and entrepreneurship. So, universities started In the new economic normal, society must integrate resources, promote innovation potential, increase employment possibilities, and generate new value. As a result, encouraging college students to innovate and become entrepreneurs would contribute to the overall social and economic development. Colleges and universities created a particular innovation and entrepreneurship education course to help college students develop their innovation and entrepreneurship skills. The theory and practice of innovation and entrepreneurship education at home and abroad demonstrate that innovation and entrepreneurship education should be integrated throughout the college education process, encompassing practically all teaching courses and teaching links. College physics in the College of Science and Engineering The industry's fundamental required course focuses on basic idea cognition and the application of basic physics principles in professional course teaching. As the foundation of scientific and engineering education, university physics has long been regarded by domestic and international institutions, and the reform of university physics education is continually evolving with the growth of the social economy. Based on the qualities of university physics education, innovation, and entrepreneurship. In the current educational landscape, it is both practical and long-term important to investigate and implement the integration of innovation and entrepreneurship in college physics teaching (Zhai, D.F. and Mu, Y. 2013).

To attain the teaching goal, we should do our best to diversity not only from physical knowledge points, but also from innovative and entrepreneurial deeds while introducing new courses. In terms of content organization, we should simplify the physical knowledge elements in each course. If there are too many knowledge points, we can assign some of the content to explain in the final course to allow ample time to organize new and entrepreneurial ideas. Education. We do not keep to calculation-based practice when arranging after-school work, but rather arrange various problems related to the ideological education of creativity and entrepreneurship.



Sketch map of the innovation funnel model (using new drug development as an example)

Source: Jin (2002)

Along with the administration and management of departmental education, the teacher evaluates the student's knowledge, skills, and capacities as they master the department; all of these procedures are carried out in response to changes in content and form in the curricular material. In this situation, changes in the teaching process caused by the teaching material are called content changes, whereas changes in the teaching material caused by the teacher's influence are considered form changes.

CONCLUSION

We concentrated on changes in the content and format of instructional activities when teaching physics courses.

1. The impact of the study material on the student by section; typically, in the transfer of any knowledge, the learning material affects the learner as they master the content with ease or difficulty, simple or complex. The content of the student's mastery of the material changes as a result of various changes in the student, such as the definition of the sections of the physics course, rules, interest in learning the laws, the desire to apply the knowledge gained in the course, the introduction of memory and thinking in the material, and processes such as transferring to required learning situations.

2. How the instructional materials affected the student's physics course. In this situation, there are alterations in the manner in which the physics course contents are taught, such as the comments of the textbook author or the transformation of the teacher's speech into his own. In short, when physics course topics are taught as a social phenomena, both reading and teaching activities alter in terms of content and format.

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