

Journey to Innovation and Entrepreneurship Through Moulage

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Abstract

The COVID-19 pandemic has affected every sector of life. The number of patients visiting health facilities has decreased, resulting in limited opportunities for student learning. Health professionals and educators are exploring authentic alternative ways to fulfill the desired learning outcomes for students. In this article, a business model for moulage is being planned as one authentic simulated learning solution. It is outlined within the framework of a business plan for institutional adoption, replication, and implementation.

Introduction

The world has faced the Corona-Virus pandemic of 2019 (COVID-19), which affected millions of people around the globe. It has affected every individual, their lifestyle, and its end is not certain. While different countries are in different stages of COVID-19 infection rates, millions of students worldwide are being affected by universities' facilities closures, leading to unprecedented disruption to the medical education process and to healthcare systems worldwide (Woolliscroft 2020). As people are at risk of developing life-threatening conditions due to COVID-19 pandemic, there are substantial challenges in medical education, including the safe delivery of lectures by instructors (Alsoufi A). Medical education, requiring regular/continuous exchange of knowledge along with proper exposure, has been severely affected with increased risk of the corona virus spreading during traditional/conventional classroom teaching learning

process. Medical students have been deprived of learning, especially the psychomotor and affective domains (Dubrowski A 2021). Medical educators are worried about ensuring an appropriate and authentic learning environment for medical students as the numbers of patients in health settings have reduced drastically resulting in a reduced number of 'must know' cases in the outpatient departments and hospital wards. The Global Quality Assurance mandate by the World Federation of Medical Education requires global standards to be met in basic medical education through competency based medical curriculum (CBME). CBME is perceived as the best solution for improved accountability to the public, rapid expansions in scientific knowledge, and changes in medical practice (Tackett 2016, Hawkins 2015).

Medical educators have been searching new ways to ensure students are still able to achieve desired learning outcomes. Simulation-based Education (SE) has become the answer to many issues. SE is an integral part of medical education and is used as a primer for clinical education. It has evolved due to shortcomings of the traditional apprenticeship model of training and improves learners' knowledge, skills, and behavior like confidence, communication skills, team building skills, continuing professional development, interpersonal skills, ultimately leading to better patient outcomes (Dubrowski A 2021, Crowe 2018, Cook 2017). SE has also been used as an assessment tool in early clinical years for students to qualify to initiate patient care. In fact, it is an ethical imperative (Cook DA 2018).

COVID-19 pandemic has brought about a paradigm shift in the way learning is processed. With fewer patients in the wards and outpatient clinics, students' learning is compromised (Dubrowski 2021). As said by Hippocrates, "Desperate times call for desperate measures"; it is time for action in education innovation. It's a call for universities to invest in simulation-based practices in order to fulfill the desired competencies within the program. There is also a trend of non-patient-based training through simulation-based practices (Maran 2003). The SE devices may include low to high fidelity ranging from part task trainers, computer-based systems, virtual reality, haptic systems, simulated patients, simulated environment and integrated simulators (Maran 2003).

Health professions education (HPE) institutions have been facing challenges in terms of cost of health care, restriction in residents' duty hours, increasing specialty sub-specialization, public concerns about medical errors, lack of trained teachers, decreasing staff, physical space, and learners' time, increasing the cost of educational resources like simulators. Academic leaders are exploring ways for sustainable, cost-effective ways of ensuring learning. Moulage may be considered as one of the high-fidelity low-cost simulators (Maran 2003, Pywell 2016).

Innovative Solution

Moulage, a form of art used as a simulation tool, is derived from the French word meaning 'molding or casting'. It is a simulation of illness or physical signs either in a standardized patient or a manikin. Moulage has a long history in HPE and anatomical teaching and is an inter-professional endeavor where students of art, technology, and health come together as a team. Moulage is also considered as a method for enhancing fidelity and improve learner engagement

(Makkink 2019, Stokes-Parish JB 2018).

BP Koirala Institute of Health Sciences (BPKIHS) is an autonomous Health Science University in Eastern Nepal. The university is known for its excellence in academics and research. The entire staff and students of the institute live within university premises and devote their time to academics, patient service, and research. The COVID-19 pandemic has led health professions educators to explore ways to develop skills in order to engage the learners in an authentic manner. Several brainstorming sessions have led to possible solutions like direct observation of procedural skills, creating moulages, developing checklists for basic procedures, simulated patients, case-based discussions, etc. One innovative solution is to create moulages for the most common lesions. A group of likeminded educators brainstormed on the idea and planned the moulage project. An artist, anatomist, forensic expert, social innovator, and entrepreneur have come together to design this health innovation. The plan is to create various moulage models. Through a series of workshops, the moulage models will be created either on standardized patients or manikins. The moulages will be pilot tested with different stakeholders (teachers and students of different levels) and their feedback will be incorporated to improvise these models. Once the quality of the moulage is assured, a business pitch will be prepared.

The target consumers will be health professions education institutions, universities, regulatory authorities like Nepal Medical Council who conduct licensing examinations for medical professionals, Medical Education Commission who selects undergraduate and postgraduate students into health professional courses, non-governmental organizations working towards capacity building of health care providers, professional societies, film industry, etc. The target consumers will need moulage models for ensuring authenticity in a simulated learning environment, training, drills, etc. Presently, moulage is rarely used in health education in Nepal. When in need, professional make-up artists are being mobilized for creating it; however, there are limited health professional education organizations creating or using moulage.

Business Model

Revenue sources for this project may come from philanthropists, sale of moulage models, leasing or renting simulation laboratories facilities to other institutions or societies, training teams in other health professions institutions or universities to create moulage models, etc. The financial modeling appropriate for this project is of 'Beneficiary Builder'. This nonprofit funding model is used by non-profit organizations that are reimbursed for services provided to specific individuals, but relies on people who have benefited in the past from the services. The stakeholders develop long-lasting relationships with former clients who are extremely appreciative of the quality of services provided (Christiansen 2009). Financial plans will be worked out in detail and the potential investors will also be approached.

Start-up capital to launch moulage would need to be from an institution and related partners (i.e., government, institutional investors, foundations). Once launched, moulage could scale through replication, defined as the provision of a certification with training services, and serving as a center of excellence for moulage creation. The financial need to initiate the project in the first

year is approximately USD 9650. This budget is divided under administrative, operation, training, sales, market development costs. The revenue assumptions have also been planned as philanthropy, institutional fund, sale of moulage models. The expected profit in year 1, 2, 3 are USD 3850, USD 8150, and USD 12100 respectively. This would not only sustain the project, but also provide the much-needed simulation-based capacity within the country. Three-year financial projections have been estimated as shown in Table 1.

Table 1: Financial Projection for Moulage Project

Details	Year 1	Year 2	Year 3
REVENUE ASSUMPTIONS			
Philanthropy	\$10000	\$10000	\$10000
Institutional Fund	\$3000	\$3000	\$3000
Sale of moulage models	\$500	\$3000	\$5000
Leasing simulation facilities to others	\$0	\$ 1000	\$2000
Training teams in other institutions to create moulage models	\$0	\$500	\$1500
License to other	\$0	\$500	\$1000
Total Revenues	\$13500	\$18000	\$22500
Expense Assumption			
Administrative staff			
Clerical staff	\$1000	\$1000	\$1200
Helper level staff	\$850	\$850	\$1000
Total	\$1850	\$1850	\$2200
Operations			
Moulage materials	\$500	\$1000	\$1000
Workshops	\$2000	\$1000	\$1000
Audits/documentation	\$500	\$500	\$700
Rent/utilities	\$500	\$500	\$500

Total	\$3500	\$3000	\$3200
Program/service/sales details			
Trainers	\$2000	\$1000	\$1000
Team leader	\$500	\$500	\$500
Part time staff	\$500	\$500	\$500
Total	\$3000	\$2000	\$2000
Marketing/Market Development Costs			
Development Costs	\$1000	\$2000	\$2000
Marketing costs	\$300	\$1000	\$1000
Total	\$1300	\$3000	\$3000
Total Expenses	\$9650	\$9850	\$10400
Total Profit/loss	\$3850	\$8150	\$12100

The moulage model is first being launched in Nepal by the BP Koirala Institute of Health Sciences in 2022. BP Koirala Institute of Health Sciences is an autonomic academic center of excellence in Nepal. It is a not-for-profit institute partially funded by the Government of Nepal. The human resources and facilities of the institute will be utilized to execute the project.

Table 2: Project Milestones and Metrics

	Milestone	Date
	Finalizing the plan of moulage module	January 2022
	Creating moulages through series of workshop	February - March 2022
	Pilot testing (faculty, students, patients) and feedback	March 2022
	Improvising the models based on feedback	April 2022
	Planning a Pitch to potential investors	December 2021 - May 2022
	Marketing campaign (departments, institutions, societies, councils, and other potential consumers)	May 2022 - November 2022

	Lobbying for innovation center for Moulage creation	November 2022 - January 2023
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Conclusion

The most important metric for understanding the success of the project is incorporation of moulage in curriculum as one of the learning methodologies. Success of the project may be gauged by its utility by departments of BPKIHS and other institutions. BPKIHS being a center of excellence in Nepal has a lot of potential for contextual innovation in academics and research. The institute is under the Ministry of Health of Government of Nepal and is a not-for-profit organization. Because of its autonomic structure, social innovation endeavors are encouraged and replication model of this business plan is best suited model for moulage project. The team is excited to work on this new venture.

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