



LITHUANIAN UNIVERSITY
OF HEALTH SCIENCES

Lecture

Becoming a Physician Researcher

Part 1

Where to get the ideas?

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Lecturer



KEY CONCEPTS



- **MEDICINE**

The science dealing with the preserving of health and with preventing and treating disease or injury.

- **RESEARCH**

A detailed study of a subject, especially in order to discover (new) information or reach a (new) understanding.

- **SCIENCE**

The careful study of the structure and behaviour of the physical world, especially by watching, measuring, and doing experiments, and the development of theories to describe the results of activities.

Ideas about Science

- **SCIENCE** is everywhere, science is logical and can be understood and applied to everyday situations.
- **SCIENCE** is about finding the causes of phenomena in the real world.
- **SCIENTIFIC EXPLANATIONS, THEORIES and MODELS** are those that best fit the evidence available at a particular time.
- **THE KNOWLEDGE** produced by science is used in engineering and technologies to create products and to serve human end.
- **THE SKILLS** you learn through science are applicable to all areas of life.
- **APPLICATIONS OF SCIENCE** often have ethical, social, economic and political implications.



No matter what you result doing as an adult,
it involves science!

Literature

1. Deehan J, MacDonald A. "What's the Big Idea?": A qualitative analysis of the big ideas of primary science teachers. *International Journal of Educational Research*. 2023;119:N.PAG. doi:10.1016/j.ijer.2023.102189.

Shared values are common between physicians and scientists

- **VISION** - clear sense of what one wants to accomplish in this world.
- **INTEGRITY** - principles of life based on honesty and consistency.
- **DEDICATION** - hard work, persistence, and determination to move ahead despite setbacks.
- **CURIOSITY** - questions of why and how.
- **CONFIDENCE** - a belief in yourself that allows one to challenge dogma and take chances.



Literature

1. Schwartz DA. Physician-scientists: the bridge between medicine and science. Am J Respir Crit Care Med. 2012 Mar 15;185(6):595-6. doi: 10.1164/rccm.201110-1806ED.

Physician-scientist the bridge between medicine and science

Table 2

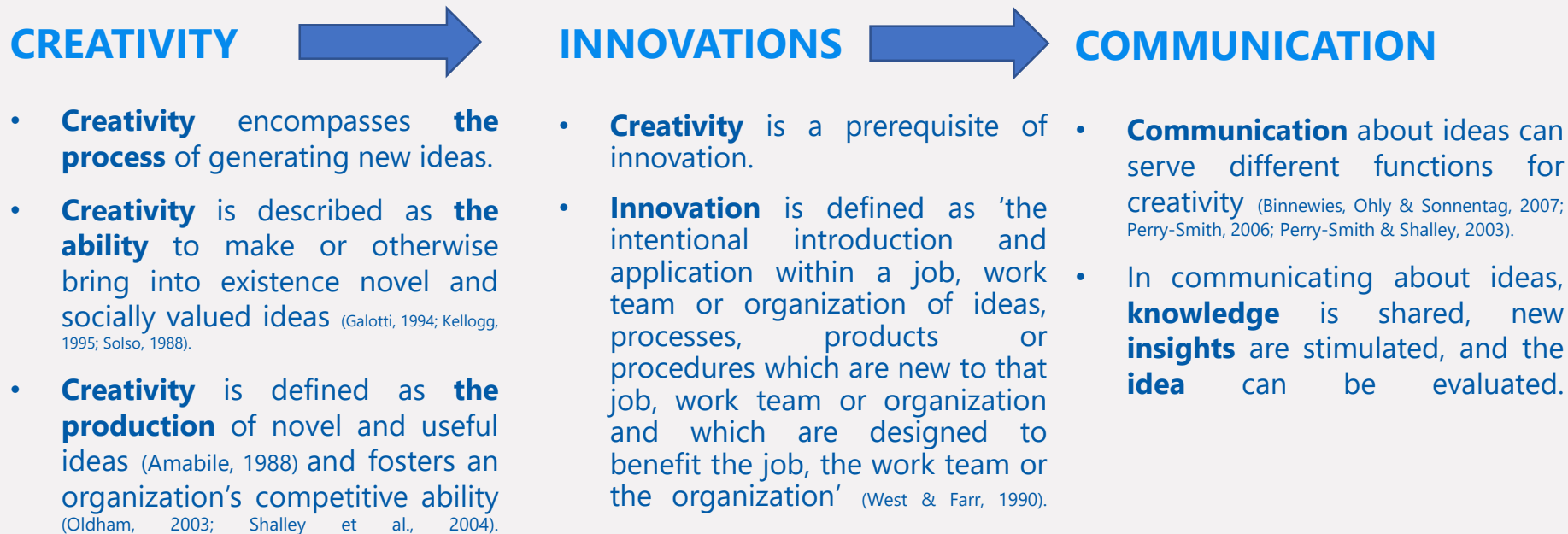
Attributes that distinguish physicians and scientists

Attributes	Physicians	Scientists
Approach to knowledge	Application	Discovery
Cognitive focus	Unique features of a patient or illness	Generalizable principles of a discovery
Decision making	Rapid	Reserved
Adherence to accepted standards of practice	Almost always	Almost never
Expert opinion	Respect authority	Question authority
Response to mistakes	Risk management review	Basis for potential breakthroughs
Basis for remuneration	Efficiency and effectiveness	Creativity and entrepreneurship

Literature

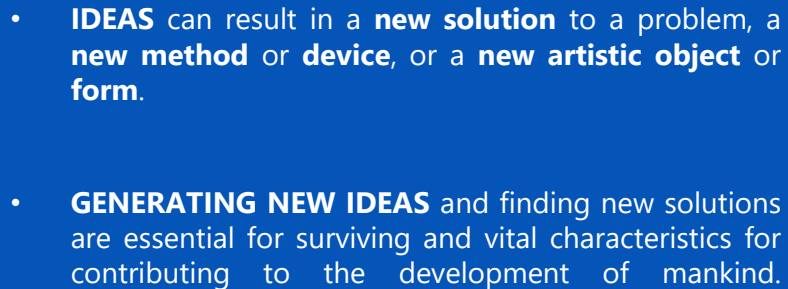
1. Schwartz DA. Physician-scientists: the bridge between medicine and science. Am J Respir Crit Care Med. 2012 Mar 15;185(6):595-6. doi: 10.1164/rccm.201110-1806ED.

ELEMENTS OF RESEARCH IDEAS MANAGEMENT



Literature

1. Tomic W, Brouwers A. Where Do Teachers Get Their Ideas From? *Creativity & Innovation Management*. 1999;8(4):262. doi:10.1111/1467-8691.00145.
2. Ohly S, Kase R, Škerlavaj M. Networks for generating and for validating ideas: The social side of creativity. *Innovation: Management, Policy & Practice*. 2010;12(1):41-52. doi:10.5172/impp.12.1.41.



Incredible medical breakthroughs changing the world

- **VACCINATION.** The first-ever successful vaccine was the smallpox vaccine, introduced in 1796 by Edward Jenner.
- **ANAESTHESIA.** The first-ever surgical procedure using anaesthesia was performed in the USA on the 16th of October 1846, to remove the tumour from a patient's neck.
- **EPIDEMIOLOGY.** John Snow (UK, 15 March 1813-16 June 1858) is widely regarded as the father of epidemiology – the study of the patterns and causes of disease in a population.
- **GERM THEORY.** In 1865, Joseph Lister, was the first to apply germ theory to surgery and introduced the antiseptic principle to surgery.
- **INSULIN** was first used as a treatment for diabetes at the Toronto General Hospital in 1922.
- **GENE THERAPY.** Gene therapy is defined as the treatment of disease by transfer of genetic material into cells. The first gene therapy trial was launched in 1990.
- **3D PRINTING.** The first 3D printer was developed in the 1980s by Chuck Hull to print solid structures for manufacturing. Today, 3D printing is already being used to create dental implants.
- **ARTIFICIAL INTELLIGENCE AND ROBOTICS.** One of the most exciting technologies changing the healthcare landscape in 2022.
- **PRECISION MEDICINE.** As medical technology advances it is becoming more and more personalised to individual patients.
- **TELEMEDICINE.** Refers specifically to remote clinical services, while telehealth encompasses remote non-clinical services.

Literature

1. <https://www.worldwidecancerresearch.org/news-opinion/2021/april/7-incredible-medical-breakthroughs-that-changed-the-world>.

SOURCES FOR THE RESEARCH IDEA



EXAMPLE

In surgery, the research idea could come from more specific topics related to the general topics:

- Preoperative assessment.
- Details of the operation and its performance.
- Modification of the surgical technique.
- Postoperative follow-up.
- Final results, including morbidity and mortality.

Literature

1. Toledo-Pereyra LH. Developing the research idea. *Journal of investigative surgery: the official journal of the Academy of Surgical Research*. 2011;24(3):101-102. doi:10.3109/08941939.2011.572797

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“To really know is science, to merely believe you know is ignorance”.

Hippocrates

Greek physician, c. 460-c. 370 BC

The lecturer contacts

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