



Future will be better than the past

বিসমিল্লাহির রাহমানির রাহিম

Motivation and Importance of Research for Teachers

Dr. Md. Abu Hashan Bhuiyan

Vice Chancellor

Professor of Physics

University of Information Technology and
Sciences

Dhaka 1212



Future will be better than thy past

Contents

Introduction:

Some Tales and Quotes to Motivate Towards Research

Items:

1. Research and Its Purpose
2. Characteristics of Research
3. Importance of Research for Teachers
4. Types of Research
5. Research Methodology
6. Research Scopes
7. Use of Library for Teaching and Research



Future will be better than thy past

“Divine Blessings, mixed with Hard-work,
backed by Good Intentions..... make
Miracles.”

Sufi Mohamed Mizanur Rahman

Chairman

Board of Trustees

UITS & PHP Family



Future will be better than the past

একেবারে পারফেক্ট! জীবনের সুন্দর একটি হিসাব দেখুন, বুঝুন এবং চিন্তা করুন।

যদি A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

= 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26

অর্থাৎ A to Z এর মান যদি এমনভাবে ধরি যেখানে : A=1, B=2, C=3, D=4, E=5, F=6, G=7, H=8, I=9, J=10, K=11, L=12, M=13, N=14, O=15, P=16, Q=17, R=18, S=19, T=20, U=21, V=22, W=23, X=24, Y=25, Z=26

তাহলে,,, তুমি যতই পরিশ্রমী হও না কেনো, তোমার পরিশ্রম তোমাকে ভালো একটা জায়গায় নিয়ে যাবে, কিন্তু শতভাগ না।

Hard Work: H+A+R+D+W+O+R+K= 8+1+18+4+23+15+18+11=98%

তুমি যতই বিজ্ঞ হও না কেনো, কখনো কখনো তা কঠোর পরিশ্রমের চেয়ে কম সফলতা আনতে পারে।



Future will be better than thy past

Knowledge: $K+N+O+W+L+E+D+G+E=$
 $11+14+15+23+12+5+4+7+5=96\%$

আর তুমি যদি ভাগ্যের ভরসায় বসে থাকো, তা কোনো কূলেই তোমায় ভেরাবে না।

অর্থাৎ এদের কোনোটাই 100% করতে পারে না, তাহলে সেটা কী যা 100% করতে পারে???

Money?? না, এটা 72%

Leadership?? না, এটা 97%

তাহলে??

সব সমস্যারই সমাধান করা সম্ভব, যদি আমাদের থাকে একটা পারফেক্ট Attitude বা দৃষ্টিভঙ্গি হ্যাঁ, একমাত্র Attitude ই আমাদের জীবনকে করতে পারে 100% সফল.....

Attitude= $A+T+T+I+T+U+D+E=$ $1+20+20+9+20+21+4+5=100\%$

সুতরাং দৃষ্টিভঙ্গি বদলান, জীবন বদলে যাবে।



Future will be better than thy past

"যেখানে দেখিবে ছাই, উড়াইয়া দেখ তাই,
পাইলেও পাইতে পার অমূল্য রতন" -কথাটি বুঝিয়ে দেবেন কি?

- এই কথাটির অর্থ হচ্ছে,
- কোনো কিছুকে অবহেলা করতে নেই। দেখা গেল, যেটা আপনি আজ অবহেলা করছেন কাল সেইটার কারণে আপনি হইতোবা ভালো পর্যায়ে যেতে পারতেন। কিন্তু অবহেলার কারণে আপনি সেই একই জায়গায় রয়ে গেলেন। তাই যে কোনো বিষয় তা যদি তুচ্ছও হয় তাকে মূল্য দিতে শিখুন। আর যদি মানুষের কথা বলি, তাহলে বলব সব মানুষকে সম্মান করতে শিখুন হতে পারে তার মর্যাদা কম।"



Future will be better than thy past

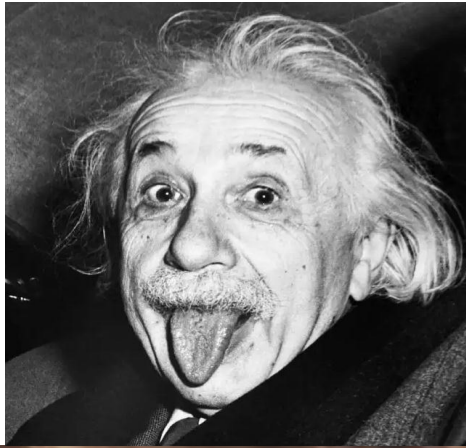
Marriage Between a **Daughter** of a **King** and a **Poor Men**

A King called persons to **marry** his daughter in one condition. One had to **pass a game**. Each one would enter to a room in the evening and would come out in the morning. Game started, every morning a dead body was taken out from the room. In one morning, a successful man came out in the morning alive. Everyone surprised seeing him alive and asked him to tell the secret behind it.

He said, it is a **ice room** with a **pillar** at the centre. He thought that there was something in that pillar, so he tried to displace it throughout night and remained alive. The King arranged wedding his daughter to the person.



Albert



Einstein

Learn from yesterday,
live for today, hope for
tomorrow. The
important thing is not
to stop questioning.

"Great spirits have always encountered violent opposition from mediocre minds."

"Anyone who has never made a mistake has never tried anything new."

"I have no special talents. I am only passionately curious."

"Genius is 1% talent and 99% percent hard work..."



Future will be better than thy past

Stephen Hawking



"I believe there are no questions that science can't answer about a physical universe."

"Intelligence is the ability to adapt to change."

"Science is increasingly answering questions that used to be the province of religion."

"Work gives you meaning and purpose, and life is empty without it."

Bill Gates



Future will be better than thy past

- “Patience is a key element of success.” ..
- “Everyone needs a coach.
- Research is what I'm doing when I don't know what I'm doing.”
- **Others**
- "Research is creating new knowledge."
- “The best research you can do is talk to people”
- “Research means that you don’t know, but are willing to find out”



Future will be better than thy past

1. Research and Its Purpose

- Systematic study to understand and predict the observed phenomenon.
- Use of existing knowledge in a new and innovative way.
- Foundation of new knowledge.
- Generation of new concepts.
- It leads to new and creative outcomes.
- A way to prove lies and to support truths.



Future will be better than the past

Purposes:

- To gather Information, investigating, discovering, exploring, and understanding.
- To prove a theory, and contribute to developing knowledge.
- To understand the arguments that need to be built around a concept.
- To contribute to the creation and development of scientific technologies.
- The **goal of scientific research** is to discover laws and postulate theories that can explain natural or social phenomena, or in other words, build **scientific** knowledge.



Future will be better than thy past

2. Characteristics of Research

These are:

- Empirical - based on observations and experimentation on theories.
- Systematic - follows orderly and sequential procedure.
- Controlled - all variables except those that are tested/experimented upon are kept constant.
- Employs hypothesis - guides the investigation process.

The Relationship Between Science and Technology



Future will be better than thy past

Science, technology and innovation each represent a successively larger category of activities which are highly interdependent but distinct.

- Science contributes to technology in at least **six** ways:
 - (1) **new knowledge** which serves as a direct source of ideas for new technological possibilities;
 - (2) **source of tools and techniques** for more efficient engineering design and a knowledge base for evaluation of feasibility of designs;



Future will be better than thy past

- (3) **research instrumentation, laboratory techniques and analytical methods** used in research that eventually find their way into design or industrial practices, often through intermediate disciplines;
- (4) **practice of research** as a source for development and assimilation of new human skills and capabilities eventually useful for technology;
- (5) **creation of a knowledge base** that becomes increasingly important in the assessment of technology in terms of its wider social and environmental impacts;
- (6) **knowledge base** that enables more efficient strategies of applied research, development, and refinement of new technologies.

Ref. : [Harvey Brooks](#), [Research Policy](#), [Volume 23, Issue 5](#), September 1994, Pages 477-486



Future will be better than thy past

3. Importance of Research for Teachers

- The objective in academic *research* is to produce new knowledge and to improve practice.
- Research methodologies facilitate teachers the tools to analyse and conclude about their findings .
- Research looks backward and there are lessons to learn.



Future will be better than the past

- Research creates a path for generating new questions.
- Research connects one to new knowledge in the field; identifies limitations of current knowledge; informs one on what needs to be studied, re-examined and researched further.
- Research is essential to update one's knowledge base.
- Research helps teachers to share with students who get involved in research who wants to build careers as researchers .



Future will be better than the past

4. Types of Research

- **Basic research:** A basic research definition is data collected to enhance knowledge. The main motivation is knowledge expansion. It is a non-commercial research that doesn't facilitate in creating or inventing anything.
- **Applied research:** Applied research focuses on analyzing and solving real-life problems. This type refers to the study that helps solve practical problems using scientific methods. Studies play an important role in solving issues that impact the overall well-being of humans.



Future will be better than thy past

- **Problem oriented research:** As the name suggests, problem-oriented research is conducted to understand the exact nature of a problem to find out relevant solutions. The term “problem” refers to multiple choices or issues when analyzing a situation.
- **Qualitative research:** It is a process that is about inquiry. It helps create in-depth understanding of problems or issues in their natural settings.
- **Quantitative research:** It is a structured way of collecting data and analyzing it to draw conclusions.

5. Research Methodology



Future will be better than thy past

Research, in general, offers a way of answering questions with evidence to support a hypothesis/observation, a reliable procedure is necessary in order to obtain the best information. That procedure is commonly called the **scientific method**.

Various steps are mentioned in the literature based on the various disciplines.



Future will be better than thy past

Of them, the following seven steps are notable:

- i) Observation /Background knowledge
- ii) Proposition/Hypothesis/Objective
- iii) Method/Experimentation
- iv) Results and discussion
- v) Conclusions

Optional:-

- vi) Reporting, and
- vii) Evaluating



Future will be better than thy past

i) Background knowledge /Observation

The first step of the scientific method is the observation of a phenomenon, which results in the second step: the question of why said phenomenon occurs. After gathering a sufficient amount of appropriate information on the subject at hand, a hypothesis (educated guess) can be formulated.



Future will be better than thy past

ii) Hypothesis/Objective

The term "hypothesis" refers to the formulation of a possible answer to a specific scientific question. The hypothesis is a prediction of the outcome. A hypothesis must be testable. Based on the hypothesis/information the objective of the research is formulated.



Future will be better than the past

iii) Method/Experimentation

The method section of the scientific method lists all of the materials used in the experiment in specific detail along with the exact procedures that were taken. The hypothesis/objective must then be tested by conducting an experiment. The experiment should be repeated several times, taking variables into account so that another researcher expect to get similar results.



Future will be better than the past

iv) Results/Discussion

Results observed in the experiments must be recorded. Researchers must interpret/discuss the results they receive, giving explanations for the data gathered. It is often useful to display results with visual aids, such as graphs or charts, to help identify trends and relationships.



Future will be better than the past

v) Conclusions/Reporting/Evaluating

Once the resulting data have been analyzed and that fulfil the objective made at the beginning of the experiment, conclusions can be drawn. Even once a conclusion is made, it should be reported, after which it will be necessary to evaluate the conclusion by looking for any potential errors in the procedure and determining a follow-up question to find out more about the phenomenon.



Future will be better than thy past

6. Research Scopes

To initiate/enhance basic and applied research collaboration/linkage programmes play vital role to stimulate innovation in science, technology and in other disciplines. Some of such programmes are mentioned below:

- Scholarships from different /
Universities Agencies
- University-University (National/International)
- University- Research Organisation
(National/International)
- University – Industry



Future will be better than the past

These kinds of collaborations/linkages help to get financial supports and research/laboratory facilities. More importantly, the relevant expertise in the field of research are available to conduct high level work in the field of choice. So, it is important to have such linkages to develop skilled higher educated teachers for a University.



Future will be better than thy past

Benefits of collaboration/Linkage

- Encourages greater creativity..
- Efficient learning.
- Ability to bring more experience to bear.
- Wider array of techniques.
- Deeper research.
- Funding.
- Increased number of publications with higher Impact factor.
- Knowledge of what others are doing on the research project.
- Better and more concrete networks built through collaborations.
- Impressing investors and funding agencies.



Use of Library for Information

Role of a Library in Teaching and Research:

- The role of library in research is pivotal and is very significant.
- Libraries have in-depth resources in the form of books, journals, magazines, articles, and bibliographies.
- Libraries offer space for teachers/students to learn and provide excellent environment for research.



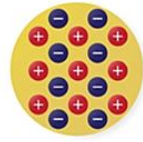
Future will be better than thy past

- Electronic and digital services are the most important services that a library can provide to the teachers and students.
- A researcher must visit local library or online library database for information collection.

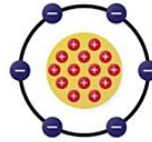
ATOMIC MODELS



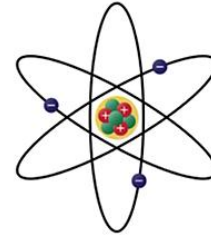
1803
JOHN DALTON



1904
J.J. THOMSON



1911
ERNEST RUTHERFORD

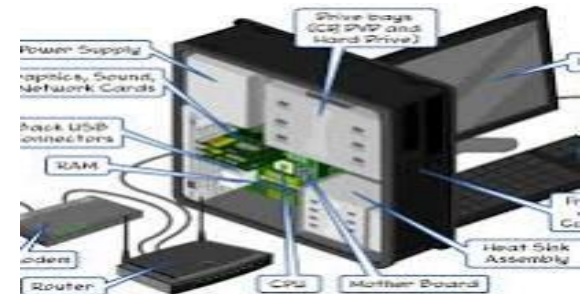
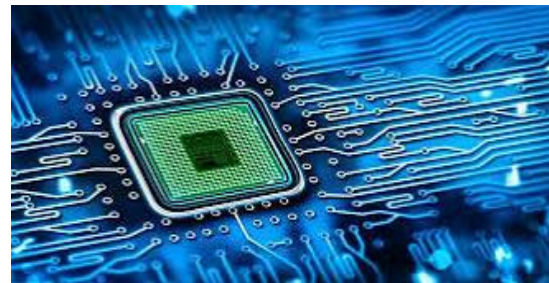


1913
NIELS BOHR



1926
ERWIN SCHRÖDINGER

Thanks and Regards



8. Concluding Remarks

In this presentation, importance of teaching and research for quality enhancement of faculty members have been discussed. An overall idea of various steps have been discussed to develop skilled faculty members. In this connection importance of library for information dissemination has also been outlined.

Advisory service can be possible if skilled persons and relevant laboratories are available. It is hoped that UITS will have acquire these very soon with dynamic leadership of our respected mentor.