Digital Skills and ICT as a Teaching and Learning Tool for STEM in Rwanda.

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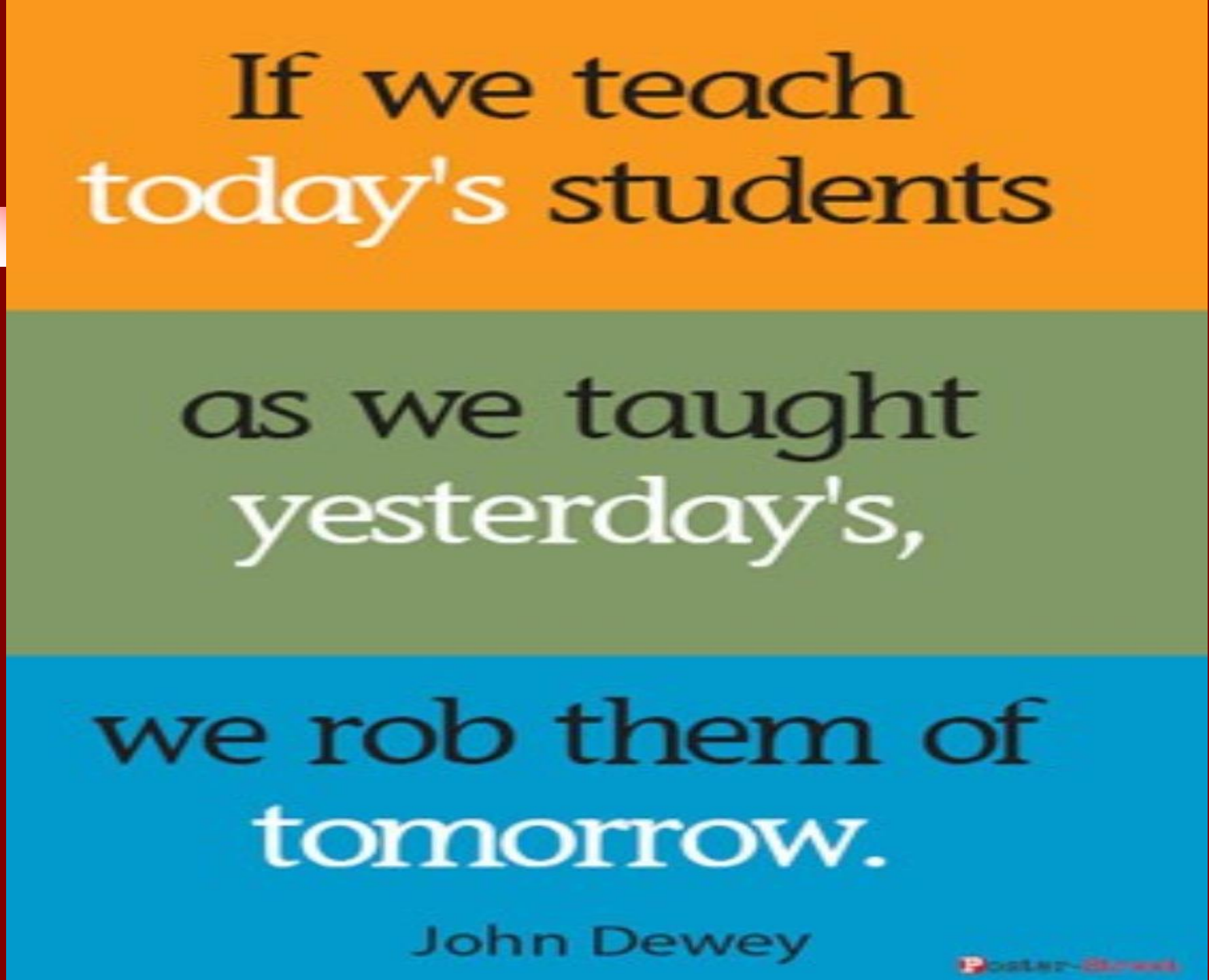
TECH MOTIVATION

- Technology is not an event, it is a just a part of every day learning.
- We need technology in every classroom and in every student and teacher's hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world." – David Warlick
- The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn." – Alvin Toffler
- The great aim of education is not knowledge, but action." – Herbert Spencer
- "Tech gives the quietest student a voice." – Jerry Blumengarten


If we teach
today's students
as we taught
yesterday's,
we rob them of
tomorrow.
John Dewey

Learn from the situation

ICT Integration in Education

Before Pandemic

During Pandemic

CONCERN OF ICT

- ✓ ICT: Ability to work with the latest information and communication technologies in any field.
- ✓ It is considered as key to excel and success in such field

CONT'D

Concerning ICT, 2 important roles are assigned to Schools:

- ✓ Fulfillment of Society expectations for demanding ICT skills.
- ✓ Raising the quality of education through ICT integration in TL processes

ROLES OF TEACHERS

- ✓ Guide
- ✓ Motivate
- ✓ Partner
- ✓ Inovate

ICT IN STEM EDUCATIO

Q1: Does the use of ICT facilitate and support a good practice of STEM subject?

Q2: Does the use of ICT inlined with lesson objectives and practices

Q3:Does ICT allow the teacher and/or Student to achieve the learning objectives that could not be achieved without it?

ICT SUPPORT FOR EFFECTIVE TL

- ✓ Simulation and modelling:Understanding lesson phenomena and deep research.
- ✓ Data Logging:Collection, storing, analysis, evaluation, presentation and dissemination of data by use of different sources(Sensor, satellites,social Media)
- ✓ DataBase and Spreadsheets:Organize and search information related to the taught lesson
- ✓ Publishing and presentation software:Word processing and desktop packages and multimedia software to enable them understanding the curren findings
- ✓ Information resources:Use of internet, CD-ROOM and data files enable them to understand sciences

Obstacles to Using ICT Effectively

The use of ICT as an effective tool for student learning inspired a growing debate among educators and policy makers.

Teachers, students, parents and many others with an interest in technology integration frequently are ~~overwhelmed~~ by providing and assessing quality technological instruction.

Although this outcry created many obstacles to the effective integration of technology into educational programs, there are two major culprits:

1. Implementation failure
2. Lack of teacher support

IMPLEMENTATION FAILURE:
Absence of a Shared Vision

The set National Technology Initiative and Framework that force the educational technology.

If this vision is not adequately communicated to the teacher, the success of this technological initiative will be in jeopardy.

Implementation of technology into educational programs fail when the initiatives do not originate or are not shared with the teachers.

IMPLEMENTATION BARRIERS: -Variances in Objectives

"… Technology is integrated when it is used in a seamless manner to support and extend curriculum objectives and to engage students in meaningful learning. It is not something one does separately; it is part of the daily activities taking place in the classroom."

Dias, L. (2001). Technology Integration. Learning and Leading with Technology, 27 (3).

IMPLEMENTATION FAILURE: Variances in Objectives

The initiative to incorporate technology effectively into classroom instruction must begin with the curriculum objectives.

This ensures a consistent goal.

A mismatch between values of the teacher and the technology initiative will cause an incorporation failure.

IMPLEMENTATION FAILURE: Planning and Leadership

School divisions require tech planning and leadership in order to ensure the success of integrating technological initiatives. This involves the provision of clear goals and a collaborative effort between the policy makers and all educational stakeholders

- Failure to provide sufficient in-servicing or modeling of effective technology usage will lead to unsuccessful implementation.

1. numerous professional development opportunities,
2. a shared vision, and
3. time for professional interaction and planning.

IMPLEMENTATION FAILURE: Lack of Access and Resources

Successful tech programs and initiatives hinge on:

1. a clear vision and
2. the availability of the required technology.

Immense frustration and eventual abandonment of initiatives occur if teacher are unable to access adequate technology.

This resource-intensive endeavor is a continual process as technology continues to evolve. Technology must be continually upgraded, support is readily available, and there is a low student/computer ratio.

Implementation Failure: Solutions

1. As teachers, administrators, and policy makers develop a unifying set of goals that links technology initiatives to curricular goals, teachers are provided the sufficient time, resources and opportunities to implement the use of technology in the classroom.

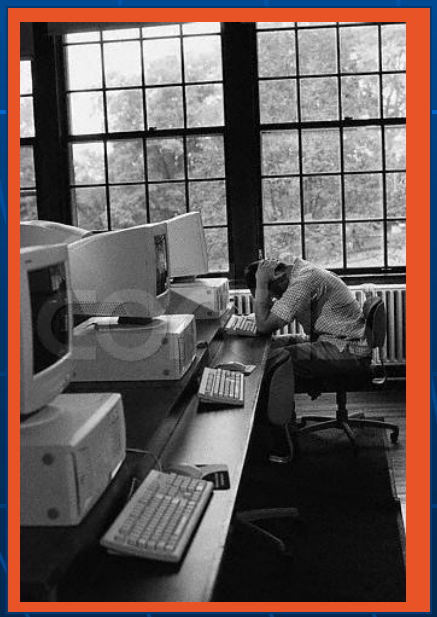
1. During teachers' investigation of their values and instructional practices in regards to technology integration, support is readily available. This includes professional development opportunities and provision for professional discourse.

1. Fostering a positive climate allows teachers to engage in risk-taking and modify their beliefs of how students learn in a technology advanced environment.

Lack of Teacher Support

Computer access and to other forms of technology have dramatically increased.

However, the level of classroom utilization does not correlate with this significant rise.



Despite improved access, several factors prevent the effective integration of technology into instruction. These barriers stem from a lack of teacher support.

Lack of Teacher Support: Teaching Conditions

- Technology initiatives can only be successful if they are compatible with the conditions of teaching.
- If inadequate computer access or if there is a high pupil/computer ratio, teachers will be reluctant to employ technology as an instructional tool.
- The technology that is available must be reliable. Computers that are outdated or frequently requiring repair will cause frustration rather than a strong commitment to change.
- The training of a teacher as a technical specialist is instrumental to successful integration. As the specialist provides suggestions for integration technology into the curriculum and instructional activities, teachers understand how technology can be used as an instructional tool across all disciplines.

Lack of Teacher Support: Technological Skill of Teachers

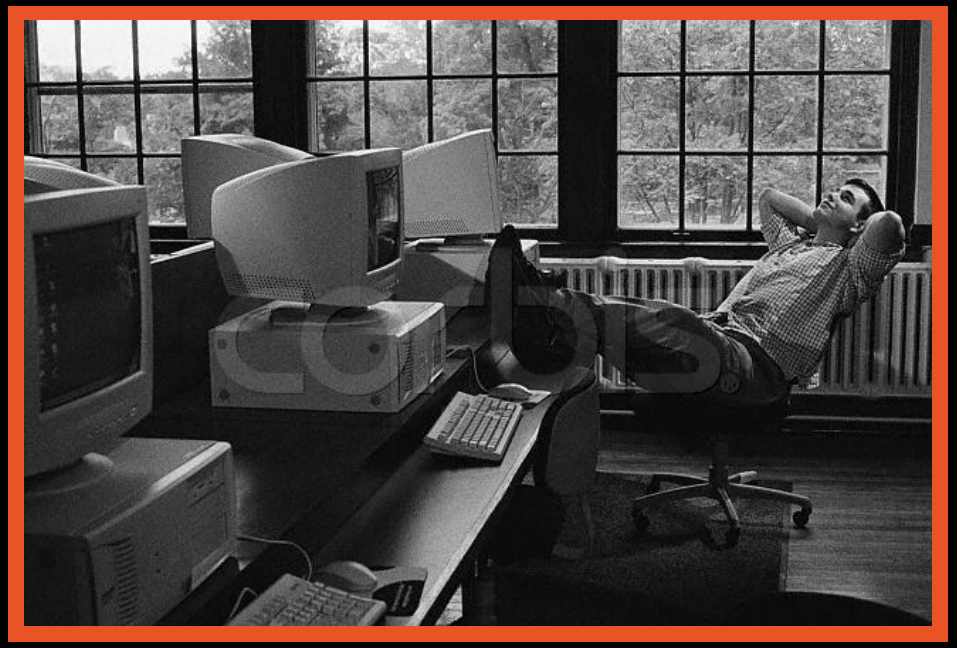
- Teachers require continuous support and training to effectively integrate technology initiatives.
- Successful technology integration involves the allocation of time for teachers to experiment with new technologies, collaborate with peers, and the provision of professional development opportunities.
- As teachers collaborate and plan lessons that integrate technology, they reframe their perceptions towards innovative technology implementation and, ultimately, student achievement.

Lack of Teacher Support: Accountability

- If teachers are held immediately responsible for changes that take time to show results, the process will undoubtedly fail.
  - Significant changes to perspective and pedagogy require time and support.
- Exemplary technology use requires more than access and training; it also involves the support and mentorship to make the vision clear and attainable.

5 Questions to Ponder & Discuss

1. What have you experienced in your own work with regards to the use of ICT? If you have noted changes in your own philosophy or practice, please describe them with reference to the articles you/we have read.



5 Questions to Ponder & Discuss

2. If implementation is successful and there is adequate teacher support, does teacher disposition and style of teaching play a role in the success of ICT initiatives?

5 Questions to Ponder & Discuss

3. If a true partnership between education and technology is inevitable, how do we, as educational leaders, envision our teaching environment in 5, 10, or 20 years from now?

Coffin, Walter, and Brisebois

5 Questions to Ponder & Discuss

4. What Do Teachers Believe to be Their Role in the Future ICT in STEM Education?
5. How ICT must enhance the quality education for special needs and eliminate the gender stereotypes in STEM education

PRACTICE

Use of Microsoft tools/Google Apps

1. Creation of info files
2. Long term save (Locally/Online) the created file
3. Publicly disseminate the info files..
4. Take home