

Unit 1: Introduction to 21st CS / BICTE / 3rd SEMESTER

UNIT 1: INTRODUCTION To 21 st CS(Century Skill)

1.1 Definition of 21st Century Skills

21st century skills refer to the knowledge, life skills, career skills, habits, and traits that are critically important to student success in today's world, particularly as students move on to college, the workforce, and adult life.

The term **21st century skills** refers to a broad set of knowledge, skills, work habits, and character traits that are believed—by educators, school reformers, college professors, employers, and others—to be critically important to success in today's world, particularly in collegiate programs and contemporary careers and workplaces.

Generally speaking, 21st century skills can be applied in all academic subject areas, and in all educational, career, and civic settings throughout a student's life.

What is 21st Century Skills

- ✓ A set of **skills** that students need to develop in order to succeed in the 21 st **century**.
- ✓ **Skills** which are highly advanced and sophisticated. The **skills** revolve around technology and scientific world and also critical thinking, advanced learning, and decision-making **skills**.
- ✓ Fundamental abilities that empower one to succeed in today's world.
- ✓ **Skills** that have been newly recognized as pertinent to navigation of and communication within the **21st century**, such as communication, collaboration, critical thinking, and creativity.
- ✓ It refer to the knowledge, life **skills**, career **skills**, habits, and traits that are critically important to student success in today's world, particularly as students move on to college, the workforce, and adult life.
- ✓ The **skills** that enable students to keep up with the changes and transformations in response to global developments.
- ✓ **Skills** that are critically important to student success in today's global society; **21st century** learning **skills** include communication, creativity, collaboration, and critical thinking.
- ✓ **Skills** that are necessary for people to succeed in the 21 st **century**, including (1) critical thinking and problem solving **skills**, (2) creativity and innovation **skills**, (3) communication **skills**, (4) collaboration **skills**, and (5) information and media literacy.
- ✓ Several **skills** which are thought to be important to be acquired for people in 21 st **century**.
- ✓ **Skills** essential for 21 **century** learners, such as collaboration, creativity, problem solving, research, technology, and community engagement.

21st Century skills

- ✓ 21st Century skills are 12 abilities that today's students need to succeed in their careers during the Information Age.

- ✓ **The twelve 21st Century skills**

1. Critical thinking
2. Creativity
3. Collaboration
4. Communication
5. Information literacy
6. Media literacy
7. Technology literacy
8. Flexibility
9. Leadership
10. Initiative
11. Productivity
12. Social skills

The Three 21st Century Skill Categories

- ✓ Each 21st Century skill is broken into one of three categories:

1. Learning skills
 2. Literacy skills
 3. Life skills
- **Learning skills (the four C's)** teaches students about the mental processes required to adapt and improve upon a modern work environment.
 - **Literacy skills (IMT)** focuses on how students can discern facts, publishing outlets, and the technology behind them. There's a strong focus on determining trustworthy sources and factual information to separate it from the misinformation that floods the Internet.
 - **Life skills (FLIPS)** take a look at intangible elements of a student's everyday life. These intangibles focus on both personal and professional qualities.

Category 1. Learning Skills (The Four C's)

(Component of 21st CS: 4C)

- ✓ The four C's are by far the most popular 21st Century skills. These skills are also called **learning skills**.
- ✓ More educators know about these skills because they're universal needs for any career. They also vary in terms of importance, depending on an individual's career aspirations.
- ✓ **The 4 C's of 21st Century Skills are:**
 - **Critical thinking:** Finding solutions to problems.

- **Creativity:** Thinking outside the box
- **Collaboration:** Working with others
- **Communication:** Talking to others

Component of 21st CS

4C:

1. Communication: sharing thoughts, ideas, and questions.

- ✓ Teaching children that communication can come in many ways is important.
- ✓ It is not just speaking verbally with someone to communicate but can also be non-verbal cues such as hand gestures and facial expressions.
- ✓ Now that we live in such a digital world, it is also important to teach children how to navigate digital spaces with responsibility.

2.Creativity: trying new approaches to solve problems.

- ✓ Being creative is often thought of when students are artistic or musical, but it is so much more than that.
- ✓ Creativity simply just means to think outside the box and that can be in any area.
- ✓ Creativity can be taught and fostered by encouraging children to try new things and by creating a safe space for them to express themselves.

3. Collaboration: working together to reach a common goal.

- ✓ Most career paths require people to work together in some capacity.
- ✓ It is important for kids to start learning how to problem solve and tackle issues in which the bigger picture involves more than just themselves.
- ✓ It can be difficult for younger children to see the side or stance from someone else's point of view. This is a skill that takes lots of time practicing.

4. Critical Thinking: looking at problems in a new way.

- ✓ Part of critical thinking is problem solving, working through things like puzzles that challenge the brain, and simply asking "Why?".
- ✓ But in today's world where we can get information at the click of a button, a large part of critical thinking is being able to look at information and decide if it is credible or not.

Category 2. Literacy Skills (IMT) **(Component of 21st CS: IMT)**

✓ **The three 21st Century literacy skills are:**

- **Information literacy:** Understanding facts, figures, statistics, and data
- **Media literacy:** Understanding the methods and outlets in which information is published
- **Technology literacy:** Understanding the machines that make the Information Age possible

✓ **Information literacy is a foundational skill. It helps students understand facts, especially data points, that they'll encounter online.** More importantly, it teaches them how to separate fact from fiction.

✓ **Media literacy is the practice of identifying publishing methods, outlets, and sources while distinguishing between the ones that are credible and the ones that aren't.** Just like the previous skill, media literacy is helpful for finding truth in a world that's saturated with information. This is how students find trustworthy sources of information in their lives. Without it, anything that *looks* credible *becomes* credible. But with it, they can learn which media outlets or formats to ignore. They also learn which ones to embrace, which is equally important.

✓ **Technology literacy goes another step further to teach students about the machines involved in the Information Age.**

- Technology literacy gives students the basic information they need to understand what gadgets perform what tasks and why. This understanding removes the intimidating feeling that technology tends to have. After all, if you don't understand how the technology works, it might as well be magic. But technology literacy unmasks the high-powered tools that run today's world. As a result, students can adapt to the world more effectively. They can play an important role in its evolution.

Category 3. Life Skills (FLIPS)
(Component of 21st CS: FLIPS)

✓ **Life skills is the final category.** Also called FLIPS, these skills all pertain to someone's personal life, but they also bleed into professional settings.

✓ **The five 21st Century life skills are:**

- **Flexibility:** Deviating from plans as needed
- **Leadership:** Motivating a team to accomplish a goal
- **Initiative:** Starting projects, strategies, and plans on one's own
- **Productivity:** Maintaining efficiency in an age of distractions
- **Social skills:** Meeting and networking with others for mutual benefit

✓ **Flexibility** is the expression of someone's ability to adapt to changing circumstances. Flexibility is crucial to a student's long-term success in a career. Knowing when to change, how to change, and how to react to change is a skill that'll pay dividends for someone's entire life.

- ✓ **Leadership** is someone's penchant for setting goals, walking a team through the steps required, and achieving those goals collaboratively.
- ✓ **True success also requires initiative, requiring students to be self-starters.** Initiative only comes naturally to a handful of people. As a result, students need to learn it to fully succeed. This is one of the hardest skills to learn and practice. Initiative often means working on projects outside of regular working hours.
- ✓ Along with initiative, 21st Century skills require students to learn about **productivity**. That's a student's ability to complete work in an appropriate amount of time. By understanding productivity strategies at every level, students discover the ways in which they work best while gaining an appreciation for how *others* work as well. That equips them with the practical means to carry out the ideas they determine through flexibility, leadership, and initiative.
- Still, there's one last skill that ties all other 21st Century skills together.
- ✓ **Social skills** are crucial to the ongoing success of a professional. Business is frequently done through the connections one person makes with others around them.
- This concept of networking is more active in some industries than others, but proper social skills are excellent tools for forging long-lasting relationships. While these may have been implied in past generations, the rise of social media and instant communications have changed the nature of human interaction. As a result, today's students possess a wide range of social skills

1.3 National Curriculum Framework and 21st CS

- ✓ The National Curriculum Framework (NCF) of Nepal is a comprehensive document that provides guidance for the development of curriculum and instructional materials in the country. The framework is based on the principles of competency-based education and aims to equip students with the knowledge, skills, and attitudes they need to succeed in the 21st century.

The NCF of Nepal recognizes the importance of the 21st-century skills in the development of the students. These skills include creativity, critical thinking, problem-solving, communication, collaboration, and digital literacy. The framework emphasizes the integration of these skills into the curriculum and instructional practices to ensure that students are prepared for the demands of the 21st century.

The NCF of Nepal also highlights the importance of providing students with a well-rounded education that includes the development of social and emotional competencies. The framework recognizes that students need to develop self-awareness, self-regulation, social awareness, and relationship skills to succeed in the 21st century.

Overall, the NCF of Nepal is aligned with the goal of equipping students with the skills they need to succeed in the 21st century. The framework emphasizes the importance of 21st-century skills, social and emotional competencies, and the integration of these skills into the curriculum and instructional practices. By following the guidance of the NCF, Nepal can develop a strong and relevant education system that prepares its students for the challenges and opportunities of the 21st century.

1.4 ATC21S 21st Century Skills (Assessment and Teaching of 21st Century Skills)

- ✓ ATC21S is a system enabling formative assessment of Collaborative Problem Solving.
- ✓ ATC21S™ has been designed to support the development of social and cognitive skills needed to become a good collaborative problem solver.
- ✓ The system consists of four main components:
 1. Empirical progressions representing a typical pathway for Collaborative Problem Solving (CPS) skill acquisition;
 2. An online assessment platform containing prototype assessment tasks. Tasks require students to work in pairs and collaborate in real time. Students responses are recorded in a log file and rated automatically;
 3. A survey completed individually by each student;
 4. Individual and whole-class reports.

Benefits:

- ✓ The system adopts a developmental learning approach to assessment and instruction.
- ✓ It guides a student's learning forward along a path of increasingly complex knowledge, skills, and abilities.
- ✓ Reports provide data on the emergence of skills mapped against empirical progressions that allow teachers to identify patterns and gaps at individual and/or class level and tailor instruction accordingly to challenge their students to move forward on a developmental continuum.
- ✓ The Project website provides open access to five professional development modules for teachers.
- ✓ **Challenges:** None of the designed tasks could sample all the elements of the CPS construct comprehensively. The capacity to capture cognitive skills is greater than the capacity to capture the social skills. The empirical progression needs further investigation. Some other challenges relate to the limitations of online administration and complexity. Potentially a similar approach could be scaled up and adopted to assess application of skills in real-world contexts without compromising the ability to measure them.
- ✓ **Relevance for entrepreneurial teaching:** ATC21S conceptualisation of Collaborative Problem Solving as a combination of cognitive and social processes displays a good number of features defining the

entrepreneurial key competence (e.g.: goal setting, resource management, tolerance for ambiguity, audience awareness, negotiation, to name a few). The rigorous approach to build an empirical progression and the elaboration of a set of IT-based prototype assessment tasks represents an inspiring example for the design of entrepreneurial teaching and learning activities and assessment tasks.

Applied assessment methods:

- ✓ Formative Assessment, IT-based Assessment, Performance Assessment.
- ✓ Examples from practice: During 2009-2012, the prototype tasks were trialled by schools in Australia, Singapore, the United States, the Netherlands, Finland and Costa Rica.
- ✓ In 2011, each participating country assessed a minimum of 660 secondary school students.

1.5 Broad Outcomes of 21st Century Skills

21st Century Learning Outcomes

- ✓ It is very important that students are prepared for this globally expanding and competitive world. To be successful, students must possess and be able to demonstrate 21 st century skills.
- ✓ These 21 st century skills include:
 - Information and Communication Technology Literacy
 - Critical Thinking/ Problem Solving
 - Communication
 - Collaboration
 - Global Awareness
 - Citizenship
 - Self Management

1. Information and Communication Technology Literacy:

Computer skills, technical knowledge, ability to learn and adapt to new technologies and application of those technologies while gaining and utilizing 21 st century skills.

2. Critical Thinking/Problem Solving:

Arguably some of the most important skills for which we advocate, critical thinking and problem solving skills require the ability to:

Exercise sound reasoning in understanding
Make complex choices
Understand the interconnections among systems
Frame, analyze and solve problems

3. Communication:

Students need to be proficient in written, oral, and technological communication. This includes masterful writing, effective oral communication skills, and the ability to utilize many different forms of media to collect, manage, evaluate and disseminate information.

4. Collaboration:

Students need to possess the necessary skill(s) that allows for optimum team performance. Mastering collaboration skills requires the ability to:
Work effectively with diverse teams
Be helpful and make necessary compromises to accomplish a common goal

5. Global Awareness:

Global Awareness means that students are able to:
Use 21 st century skills to understand and address global issues to
Learn from and work collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community context.

Utilize non-English languages as a tool for understanding other nations and cultures

6. Citizenship:

Students are able to:

- Know how to make appropriate personal economic choices
- Being an informed citizen in order to participate effectively in government
- Exercising the rights and obligations of citizenship at local, state, national and global levels
- Acting responsibly with the interests of the larger community in mind; demonstrating ethical behavior in personal, workplace and community contexts.

7. Self Management:

Maintaining a healthy lifestyle that is free of stress is an issue of utmost importance. If health and stress is managed properly, one may lead long, healthy, and happy lives. Self Management is a very important piece to focus on as students will be involved in many activities and a rigorous academic course load. Self Management will help students to:

- Access health information and services, navigate health institutions and act as an effective advocate to improve health for self, family and/or community.
- Understand preventive physical and mental health measures, including proper diet, nutrition, exercise, risk avoidance and stress reduction.

- Demonstrate understanding of national and international health and safety concerns.
- Manage a rigorous academic schedule with the addition of college courses and internship, and develop a strong work ethic.
- Self Direction: Monitoring one's own understanding and learning needs, locating appropriate resources, transferring learning from one domain to another.
- Accountability and Adaptability: Exercising personal responsibility and flexibility in personal, workplace and community contexts; setting and meeting high standards and goals for one's self and others; tolerating ambiguity.

Broad Outcomes of 21st Century Skills

21st Century Learning Outcomes

- ✓ It is very important that students are prepared for this globally expanding and competitive world. To be successful, students must possess and be able to demonstrate 21 st century skills.
- ✓ These 21 st century skills include:
 - Information and Communication Technology Literacy
 - Critical Thinking/ Problem Solving
 - Communication
 - Collaboration
 - Global Awareness
 - Citizenship
 - Self Management

1. Information and Communication Technology Literacy:

Computer skills, technical knowledge, ability to learn and adapt to new technologies and application of those technologies while gaining and utilizing 21 st century skills.

2. Critical Thinking/Problem Solving:

Arguably some of the most important skills for which we advocate, critical thinking and problem solving skills require the ability to:

Exercise sound reasoning in understanding

Make complex choices

Understand the interconnections among systems

Frame, analyze and solve problems

3. Communication:

Students need to be proficient in written, oral, and technological communication. This includes masterful writing, effective oral communication skills, and the ability to utilize many different forms of media to collect, manage, evaluate and disseminate information.

4. Collaboration:

Students need to possess the necessary skill(s) that allows for optimum team performance. Mastering collaboration skills requires the ability to:

Work effectively with diverse teams

Be helpful and make necessary compromises to accomplish a common goal

5. Global Awareness:

Global Awareness means that students are able to:

Use 21 st century skills to understand and address global issues to

Learn from and work collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community context.

Utilize non-English languages as a tool for understanding other nations and cultures

6. Citizenship:

Students are able to:

- Know how to make appropriate personal economic choices
- Being an informed citizen in order to participate effectively in government
- Exercising the rights and obligations of citizenship at local, state, national and global levels
- Acting responsibly with the interests of the larger community in mind; demonstrating ethical behavior in personal, workplace and community contexts.

7. Self Management:

Maintaining a healthy lifestyle that is free of stress is an issue of utmost importance. If health and stress is managed properly, one may lead long, healthy, and happy lives. Self Management is a very important piece to focus on as students will be involved in many activities and a rigorous academic course load. Self Management will help students to:

- Access health information and services, navigate health institutions and act as an effective advocate to improve health for self, family and/or community.
- Understand preventive physical and mental health measures, including proper diet, nutrition, exercise, risk avoidance and stress reduction.
- Demonstrate understanding of national and international health and safety concerns.
- Manage a rigorous academic schedule with the addition of college courses and internship, and develop a strong work ethic.

- Self Direction: Monitoring one's own understanding and learning needs, locating appropriate resources, transferring learning from one domain to another.
- Accountability and Adaptability: Exercising personal responsibility and flexibility in personal, workplace and community contexts; setting and meeting high standards and goals for one's self and others; tolerating ambiguity.