

A REVIEW ON 21ST CENTURY LEARNING MODELS

BIQICHE AABLA

***ABSTRACT_** The idea of 21st Century Skills has been the mainstream in recent educational research, curriculum development, pre-service and in-service education. Given the fact that today's world is drastically changing, our education must also undergo continual development. It is certainly true that there is no educational development without providing learners with quality education which is the key to unlock their potential. There is a growing need for action at both regional and national levels to bring about the prerequisite changes required for a global modern world based on the training and preparation of learners. This reveals the bottom-up orientation which calls first for analysing students' needs and 21st century demands before carrying any further research that targets curriculum change or educational reform. This paper aims at providing a review of prevalent models of learning in the 21st century and highlighting their importance in preparing learners to be active and contributing citizens in today's global modern world. The first model highlights basic 21st century skills and support systems as illustrated in the framework developed by the Partnership for 21st Century Learning Skills. The four keys to college and career readiness model as developed by David Conley, sheds light on the four aspects which can be used by educators to prepare learners for successful integration in college and job market. Tony Wagner's seven survival skills model spotlights the prerequisite skills that are in-demand in the world of work. This paper explores these models in depth and highlights several key elements for learning in the 21st century. It also underlines the importance of personal skills to the 21st century labour market.*

KEY WORDS: *21st century skills, 21st century learners, globalization, curriculum*

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I. INTRODUCTION

The Glossary of Education Reform defines 21st century skills as “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.” [1] Similarly, Griffinn, P., McGaw, B., and Care, E. [2] argue that “Any skills that are essential for navigating the twenty-first century can be classed as twenty-first century skills.” [2] In fact, the basic premise behind the concept of 21st century skills is that students must be taught in-demand and universally applicable skills, schools must prioritize such skills, and teachers must effectively teach them to students. Simply put, 21st century students need to learn skills that reflect the demands that placed upon them in the global modern world (complex,

competitive, knowledge-based, information-age, technology-driven economy and society.) rather than skills learned by students in the 20th century. These skills are categorized differently, by different scholars and organizations. There are three main models that best describe these skills; Framework for 21st Century Learning, Four keys to College and Career Readiness, Seven Survival Skills.

21st Century Learning Model:

This model was developed by the Partnership for 21st Century Learning initiative this model describes the competencies that students should be equipped with to successfully participate in today’s global economy. The following is the P21 Framework which illustrates the 21st century student outcomes (as indicated by the arches of the rainbow) and support systems (as indicated by the pools at the bottom).

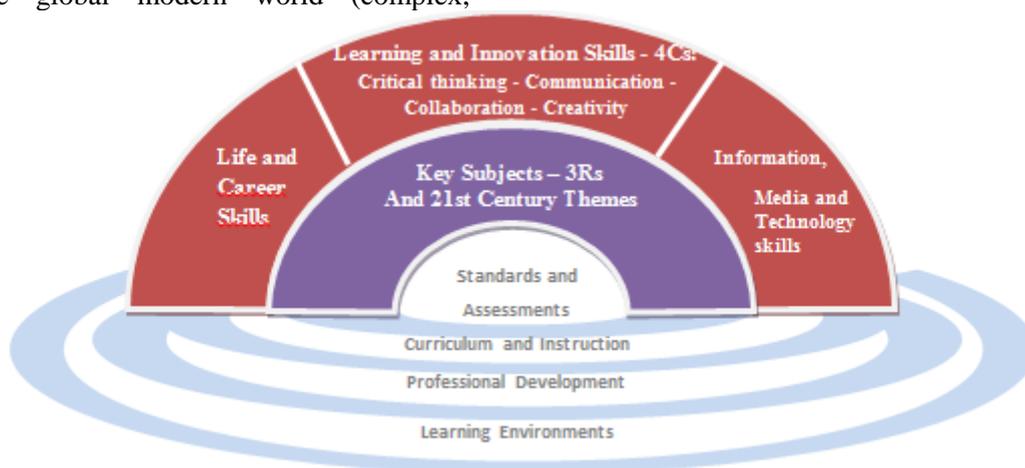


Figure 1

21st Century Student Outcomes and Support Systems [3]

In the process of 21st century learning and teaching all the components illustrated in the above figure are fully interconnected. The elements represented by the arches of the rainbow and the pools at the bottom must be aligned to produce 21st century outcomes for 21st century students.

21st Century Skills

1. Core Subjects and 21st Century Themes:

21st century learning framework regards learning as mastery of core subjects aligned with 21st century themes which are prerequisites for the success of students. School subjects include language arts, world languages, and arts, social and exact sciences. Major outcomes of 21st century learning frameworks include the learning of the aforementioned core subject and contemporary content themes in addition

to the multidisciplinary 21st century themes. The 21st century themes emphasize civic literacy, global awareness, financial literacy, health literacy, and environmental literacy. Therefore, schools are required to foster an understanding of core subjects at much higher levels by weaving the 21st century multidisciplinary themes into the academic contents.

2. Learning and Innovation Skills

Learning and innovation skills are represented as the 4Cs which refer to: Critical Thinking, Communication, Collaboration and Creativity. These skills are prerequisites for preparing students for an ever-changing life and work environments. The demands of social relations and global economy necessitate a highly distinctive set of communication and collaboration skills. Trilling and Fadel [3]

contend that 21st century students should be able to:

Think critically:

Facione [4] defined critical thinking as a judgment that is based on purpose and self regulation and that goes through systematic stages to reach that judgment. For him, the ideal critical thinker is a person of value and vision. Therefore, training good critical thinkers entails cultivating them to reach this ideal.

This suggests that critical thinking not only helps students enhance their academic performance but it also enables them to assess their learning styles, strengths and weaknesses, and allows them to take ownership of their education and become more independent [5] Similarly, the P21 initiative stresses the importance of critical thinking and focuses mainly on the learners' ability to: reason effectively, use systems thinking, make judgments and decisions, and solve problems.

According to Trilling and Fadel critical thinking refers to the student's ability to:

• Reason effectively:

- Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

• Use systems thinking:

- Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems

• Make judgments and decisions:

- Effectively analyze and evaluate evidence, arguments, claims and beliefs

- Analyze and evaluate major alternative points of view

- Synthesize and make connections between information and arguments

- Interpret information and draw conclusions based on the best analysis

- Reflect critically on learning experiences and processes

• Solve problems:

- Solve different kinds of nonfamiliar problems in both conventional and innovative ways

- Identify and ask significant questions that clarify various points of view and lead to better solutions [6]

Communicate clearly:

• Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts

• Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions

• Use communication for a range of purposes (e.g., to inform, instruct, motivate and persuade)

• Utilize multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact

• Communicate effectively in diverse environments (including multi-lingual)

Collaborate with others:

• Demonstrate ability to work effectively and respectfully with diverse teams

• Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal

• Assume shared responsibility for collaborative work, and value the individual contributions made by each team member [3]

Think creatively:

- Use a wide range of idea creation techniques (such as brainstorming)

- Create novel, new and worthwhile ideas (both incremental and radical concepts)

- Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts

Work creatively with others:

- Develop, implement and communicate new ideas to others effectively

- Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work

- Demonstrate originality and inventiveness in work and understand the real world limits to adopting new ideas

- View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes

Implement innovations:

- Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur [3]

Robinson [7] a leading thinker on creativity, has said, "We do not grow into creativity, we grow out of it—or rather, we are educated out of it." Long ago, educational systems focused on rote learning of facts and ignored creativity and novelty of thought. But, in today's global modern world creativity and innovation are increasingly becoming the essence of success in the 21st century.

It's worth noting that creativity and innovation are very high on the list of 21st century skills. Education must constantly adapt to the rapid changes in this 21st Century. This necessitates a culture of innovation guided by rigorous research and creative thinking. Creativity is often regarded as a prerequisite skill that can and should be promoted [8]. Trilling & Fadel argue, argue that creativity and innovation skills can be developed by continuous practice and nurtured by teachers and learning environments that support questioning, openness to new ideas, and learning from failures.

3. Digital Literacy Skills:

The increasing demands for digital literacy skills in the 21st century call for the mastery of of digital literacy skills namely: Information literacy, Media literacy, and Information and communication technology (ICT) literacy.

Information literacy skills:

The 21st century is marked by a flow of information and news from a wide range of sources; this calls for a successful strategy to manage the influx of foreign information. To be effective in the 21st century students should be able to:

- Access and evaluate information
 - Access information efficiently (time) and effectively (sources)
 - Evaluate information critically and competently
- Use and manage information
 - Use information accurately and creatively for the issue or problem at hand
 - Manage the flow of information from a wide variety of sources
 - Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information [3].

Media Literacy Skills

Students should be able to:

- Analyze media
 - Understand both how and why media messages are constructed, and for what purposes
 - Examine how individuals interpret messages differently, how values and points of view are included or excluded and how media can influence beliefs and behaviors
 - Apply a fundamental understanding of the ethical and legal issues surrounding the access and use of media
- Create media products
 - Understand and utilize the most appropriate media creation tools, characteristics and conventions
 - Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multicultural environments [3].

ICT Literacy Skills

Students with ICT literacy skills should be able to:

- Apply technology effectively
 - Use technology as a tool to research, organize, evaluate and communicate information
 - Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks. appropriately to access, manage, integrate, evaluate, and create information in order to successfully function in a knowledge economy.
 - Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies [3].

Notwithstanding the fact that our tech-savvy 21st century learners are often more fluent in the use of technology than their parents or educators, they will always need assistance in how to successfully exploit these powerful tools in advancing their learning.

4. Career and Life Skills

The 21st century job market requires people who are flexible, can adapt to rapid changes and develop as the workplace requires. This calls for individuals'

ability to learn new skills and advance current skills on a constant basis.

Flexibility and Adaptability Skills

Students should be able to:

- Adapt to change
 - Adapt to varied roles, job responsibilities, schedules, and contexts
 - Work effectively in a climate of ambiguity and changing priorities
- Be flexible
 - Incorporate feedback effectively
 - Deal positively with praise, setbacks and criticism
 - Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments [3]

Initiative and Self-Direction Skills

Students should be able to:

- Manage goals and time
 - Set goals with tangible and intangible success criteria
 - Balance tactical (short-term) and strategic (long-term) goals
 - Utilize time and manage workload efficiently
- Work independently
 - Monitor, define, prioritize and complete tasks without direct oversight
- Be self-directed learners
 - Go beyond basic mastery of skills and/or curriculum to explore and expand one's own learning and opportunities to gain expertise
 - Demonstrate initiative to advance skill levels toward a professional level
 - Demonstrate commitment to learning as a lifelong process
 - Reflect critically on past experiences in order to inform future progress [3]

Social and Cross-Cultural Interaction Skills

Students should be able to:

- Interact effectively with others
 - Know when it's appropriate to listen and when to speak
 - Conduct themselves in a respectable, professional manner
- Work effectively in diverse teams
 - Respect cultural differences and work effectively with people from a range of social and cultural backgrounds
 - Respond open-mindedly to different ideas and values
 - Leverage social and cultural differences to create new ideas and increase innovation and quality of work [3]

Productivity and Accountability Skills

Students should be able to:

- Manage projects
 - Set and meet goals, even in the face of obstacles and competing pressures
 - Prioritize, plan and manage work to achieve the

intended result

- Produce results
- Demonstrate additional attributes associated with producing high-quality products including:
 - Work positively and ethically
 - Manage time and projects effectively
 - Multitask
 - Participate actively, as well as be reliable and punctual
 - Present oneself professionally and with proper etiquette
 - Collaborate and cooperate effectively with teams
 - Respect and appreciate team diversity
 - Be accountable for results [3]

Leadership and Responsibility

Students should be able to:

- Guide and lead others
- Use interpersonal and problem-solving skills to influence and guide others toward a goal
- Leverage strengths of others to accomplish a common goal
- Inspire others to reach their very best via example and selflessness
- Demonstrate integrity and ethical behavior in using influence and power
- Be responsible to others
- Act responsibly with the interests of the larger community in mind [3]

21st Century Support Systems

Devising an inclusive framework for 21st century learning necessitates more than formulating specific skills for 21st centuries to master. Indeed, a functional support system is required to enable learners master the 21st century skills they're required to assimilate. The 21st Century Partnership has identified five critical support systems to ensure student mastery of 21st century skills:

1. 21st Century Standards

21st century standards focus on identifying what students should be able to do with the content knowledge and defining the skills students can utilize when bringing the content knowledge to practice in each school subject. These 21st century standards also specify levels of mastery for a given standard, from beginning level to professional level.

2. Assessments of 21st Century Skills

Assessment is necessary in guiding students' learning, providing feedback on the effectiveness of the teaching and learning operations and in informing learners and teachers on how well they are all doing in attaining 21st century learning goals. Trilling and Fadel [3] argue that refined summative tests and formative evaluations are required to measure a combination of content knowledge, acquired skills, and the application of such knowledge and skills. Accordingly, the measurement of 21st century skills should aim at ensuring balanced assessments, taking into consideration quality assurance in standardized

tests as well as in classroom formative and summative assessments.

3. 21st Century Curriculum and Instruction

To meet the demands of the 21st century education, the partnership for 21st century education stresses the importance of adopting a 21st century curriculum that blends thinking and innovation skills; information, media, and ICT literacy; and life and career skills in context of core academic subjects and through interdisciplinary themes, and implementing methods of 21st century instruction that integrate innovative teaching strategies, modern learning technologies, and real life resources and contexts.

Partnership for 21st century skills [9] considers curriculum and instruction as being at the heart of any educational endeavour, as they determine what is taught, and how it is taught. A 21st century education depends on an integrative approach to curriculum – one that unites core academic subjects, interdisciplinary themes, and prerequisite skills aligned with a unique approach to instruction in which modern pedagogies, technologies, resources, and contexts are integrated to prepare and enable students for successful integration in a global modern life.

4. 21st Century Professional Development

21st century skills professional development is support system which aims at preparing teachers and principals to implement 21st century skills into their classrooms and schools. The 21st century professional development should be a part of a comprehensive emphasis on 21st century skills that includes updates to teaching standards and assessments. All professional development efforts should form a part of an aligned system of teaching and learning that includes 21st century skills standards, curriculum, instruction and assessments.

The partnership for 21st century skills [6] stated that effective professional development initiatives that support 21st century skills, like most successful professional development efforts, include fundamental characteristics that are widely accepted, such as:

- Ensuring educators understand the importance of 21st century skills and how to best integrate them into daily instruction.
- Enabling collaboration among all participants.
- Allowing teachers and principals to construct their own learning communities.
- Tapping the expertise within a school or school district through coaching, mentoring, and team teaching.
- Supporting educators in their role of facilitators of learning.
- Using 21st century technology tools.

Trilling and Fadel argue that the success of the 21st century skills initiative depends on revamping what goes on each day in the world's classrooms and

schools. Teachers are the front line in this change, and they must have the knowledge, skills, and support to be effective 21st century teachers [3].

Teacher professional development programs, in this regard, should provide teachers with the learning experiences necessary to prepare them to effectively incorporate the 21st century skills in their teaching practices.

5. 21st Century Learning Environments

21st century learning environments is one of the four support systems in the partnership for 21st century skills framework. Its aim is to provide a descriptive view of the places, tools, people, and policies that make up 21st century learning environments.

Traditional learning environments have focused primarily on places and spaces associating the effectiveness of learning with the quality of the learning environment. As a matter of fact, effective learning environments are not only limited to time or space, but rather incorporate a wide range of support systems that take into account the methods in which

we learn best as well as the individual learning needs of each learner.

Four keys to College and Career Readiness Model:

Four keys to College and Career Readiness Model was the fruit of an extensive research carried out by David T. Conley and the Educational Policy Improvement Center (EPIC). College and Career Readiness designates that the student's preparation is paralleled with the full set of content and skills required to successfully integrate in the 21st century global job market. A college and career ready student possesses the knowledge, skills, and techniques necessary to be successful in a competing job market. College and Career Readiness does not mean that every student is required to master exactly the same content knowledge and skills to be college and career ready. A student's college and career needs help identify the exact content knowledge and skills the student is interested in.

The Four Keys to College and Career Readiness model implies students are ready for college and careers to the degree to which they have mastered elements in all four keys: Think, Know, Act, and Go.

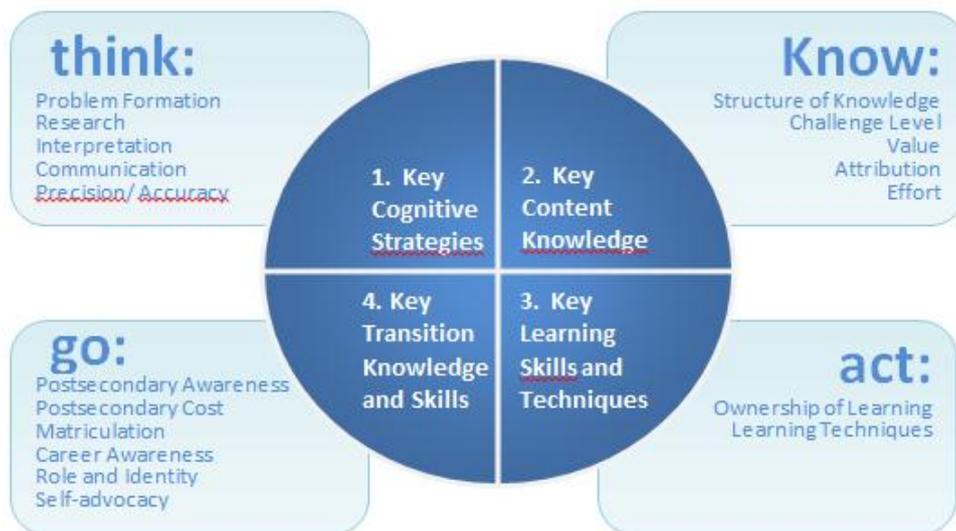


Figure 2
Four keys to College and Career Readiness Model [10]

The Conley Model describes 41 actionable aspects or outcomes on which educators and learners can focus to ameliorate preparedness and get ready for college and career success. These aspects are organized into the “Four Keys to College and Career Readiness”

(Think, Know, Act, Go) that has been used by national organizations such as The College Board and the International Baccalaureate, and by numerous states and school districts. They consist of the following:

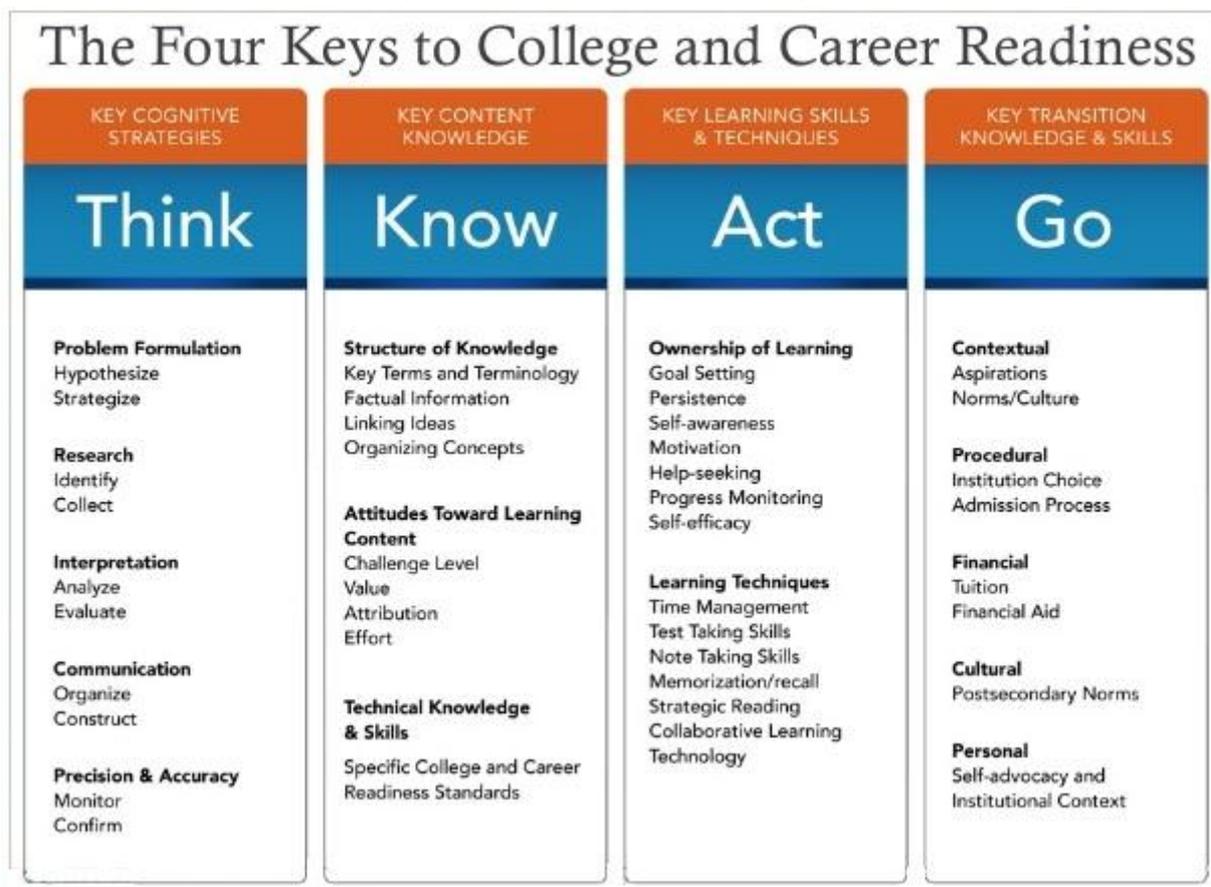


Figure 3

Four Keys to College and Career Readiness Outcomes [10]

1. THINK (Key Cognitive Strategies): Key Cognitive Strategies are the ways of thinking that are prerequisite for college-level work. They include:

- Problem formulation: Hypothesize, strategize
- Research: Identify, collect
- Interpretation: Analyze, evaluate
- Communication: Organize, construct
- Precision & accuracy: Monitor, confirm

2. KNOW (Key Content Knowledge): Key Content Knowledge refers to key foundational content and “big ideas” from core subjects that all students must know well. Also included in this Key:

- Structure of knowledge: Key terms and terminology, factual information, linking ideas, organizing concepts
- Technical knowledge & skills: Challenge level, value, attribution, effort

3. ACT (Key Learning Skills and Techniques): Key Learning Skills and Techniques consist of two broad categories:

- Ownership of learning: Goal setting, persistence, self-awareness, motivation, help-seeking, progress monitoring, self-efficacy
- Learning techniques: Time management, test-taking skills, note-taking skills, memorization/recall, strategic reading, collaborative learning, technology

4. GO (Key Transition Knowledge and Skills): Key Transition Knowledge and Skills are necessary to effectively guide the passage to real life beyond

college. This knowledge is often favoured knowledge that is not equally accessible to all learners. Students from families and communities historically under-represented in higher education or certain career pathways are less likely to have this knowledge. This key considers the following factors:

- Contextual: Aspirations, norms/culture
- Procedural: Institution choice, admission process
- Financial: Tuition, financial aid
- Cultural: Postsecondary norms
- Personal: Self-advocacy in an institutional context

Conley’s readiness model was regarded very useful in a sense that it can enhance students’ retention by helping them better understand how they spend their time and what modifications are required to meet their aspirations. Besides, this model was devised to improve the students’ performance by encouraging autonomous learning, sense of loyalty, and belonging; achievement/persistence; identification of strengths/weaknesses and reflective learning. Subsequently, it yields a meta-cognitive data set to correlate with other institutions’ data for a better targeted curricular planning and a well informed, personalized instructional design.

Seven Survival Skills Model:

Seven Survival Skills model was developed by Tony Wagner [11] in collaboration with the Change Leadership Group at the Harvard Graduate School of Education. They conducted a needs analysis research

that aimed at identifying learning standards that can ensure successful preparation and integration of young citizens in the 21st century global job market.

The following diagram illustrates Wagner's 7 survival skills:



Figure 4
Seven Survival Skills Model [11]

Tony Wagner, co-director of the Change Leadership Group (CLG) at Harvard University, uncovered the 7 survival skills that people will need to survive and thrive in the 21st century. In his 2008 book, *The Global Achievement Gap*, Tony Wagner identifies a myriad of ways to promote the educational system in the United States. The focus of his book was paid to the need for all educational institutions to teach what he calls the "Seven Survival Skills. The Seven Survival Skills are:

1. Critical Thinking and Problem Solving

The new global economy requires a workforce that is flexible and innovative. Today's companies need their workers to think about how to continuously improve their products and services and adapt to the increasing changes in the markets. Wagner quotes an interviewee who argues that schools should help learners develop critical thinking skills as soon as they are capable of abstract thinking. Therefore, educators need to provide opportunities for students to develop their thinking skills in order to effectively apply them in work and real life situations.

2. Collaboration across Networks and Leading by Influence:

In today's world of work people collaborate and work in teams either in face to face environments or often in virtual teams that work together through video conferencing and emailing. So again, educational institutions are required to teach modern skills to prepare students for successful integration in

the global job market. Educators in the 21st century are required to provide learners with situations where they delegate roles, work in teams, listen and synthesize different points of view, compromise and reach a group agreement.

Mark Chandler, Senior Vice President and General Counsel at Cisco noted that "The biggest problem we have in the company as a whole is finding people capable of exerting leadership across the board...Our mantra is that you lead by influence, rather than authority.

The ability to lead others boasts workers ability to progress and become more successful in their chosen career. To help students enhance their leadership skills, they should be encouraged to take on different roles within their group for each task within the project; as they can switch roles from a 'manager' to an 'organizer' or a 'graphic designer'. Assuming different responsibilities within the same group will provide students with opportunities to guide, teach others, use problem solving skills to influence others in a positive way. Subsequently, these will promote students' leadership skills.

3. Agility and adaptability

Tony Wagner argues 'Our system of schooling promotes the idea that there are right answers, and that you get rewarded if you get the right answer.' [11] However, in real life, the right answers aren't there because things change rapidly and people are required to adapt to the changes and be able to deal with disruption. Schools need to promote

students' ability to adapt to the changing situations. Agility and adaptability are life skills that require students to be able to think outside the box, be flexible, show willingness to accommodate to and implement changes.

4. Initiative and Entrepreneurialism

Today's world of work needs proactive workers who are able to take initiative and contribute to the world. Schools should promote these skills and help students in shaping their experience in the classroom. Students should be encouraged to take initiative, try new things and never be afraid of failure. Instructors need to inform that even if an idea may fail, they can learn from it by identifying what went wrong and thinking about how to amend it.

5. Effective Oral and Written Communication

Wagner indicates that 'The ability to express one's views clearly in a democracy and to communicate effectively across cultures is an important citizenship skill as well.' (2008: 34) Oral and written communication skills never decrease in importance. Schools need to teach students how to speak confidently and clearly. As for written communication, schools need to continue to focus on the rules of formal and informal writings and guide students' attention to use the technology available to them to help check their writing.

6. Accessing and analyzing information

21st century workers should be able to handle effectively the galactic amount of information. Mike Summers, the vice president for Global Talent Management at Dell Computers said that "There is so much information available that it is almost too much, and if people aren't prepared to process the information effectively it almost freezes them in their steps." Schools need to equip learners with information literacy skills. These skills involve knowing how to:

- Access information effectively
- Evaluate information critically
- Use information successfully and
- Understand legal-ethical issues for using and accessing such as plagiarism and copy-right.

7. Curiosity and Imagination

Michael Jung, Senior Consultant at McKinsey and Company contended that 'Our old idea is that work is defined by employers and that employees have to do whatever the employer wants...but actually, you would like him to come up with an interpretation that you like—he's adding something personal—a creative element.' [12] Today's job market calls for workers who demonstrate the desire to learn new things and the ability to deal with situation in a creative way by designing and applying new ideas. To prepare students for the new world of work, schools need to promote learners' curiosity and creativity as they are in-demand work skills.

II. CONCLUSION

This paper has been an attempt to introduce and review prevailing models that illustrate what 21st century learning should be like; namely, the Partnership for 21st Century Learning Skills Model, the Four Keys to College and Career Readiness Model and the Seven Survival Skills Model. It has also considered the extent to which these models can be used to foster students' achievement. It has been noticed that these models have gained immense popularity among researchers, curriculum designers and educators; thus, the imperative need to explore and implement these models at educational institutions. To operate effectively and successfully in the global labour market, it is important and even prerequisite to develop content knowledge and skills, which will help students to face a multitude of challenges.

The power of any educational system resides in offering quality education to learners and ensuring that this education will enable them to integrate successfully in the global job market and be active citizens. Any educational system that does not originate from the needs of students and the demands of the given period of time is proven to be futile. The impact of the forces of globalization on education is obvious. Today's citizens are simultaneously becoming oriented to the global world. Therefore, what we recommend is a new vision of educational development that considers the implementation of 21st century skills in school curriculum. In the same vein, we recommend that educators, decision makers and curriculum designers should consider teaching and learning in the light of the needs of students and requirements of the era. The 21st century skills models not only enable learners to be successful in the job market but they prepare them to be contributing citizens in a global modern world and that is the essential foundation of 21st century education. However, the challenge is now to identify specific students' needs in the light of what is required by the global job market. The challenge is also to implement the new vision: to revamp the educational curriculum, refine evaluation and assessment systems; to extend pathways to continuing professional development; and to link education to labour market. Finally, in order to ensure the successful incorporation of the new curriculum and to promote positive learning outcomes, greater attention will need to be paid to ameliorating the educational institutions' infrastructure, and more importantly to the pre-service and in-service trainings of the teaching staff. The latter will be a key element to success in incorporating the new curriculum and the improved evaluation and assessment systems.

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