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Influence of 21st Century Learning Skills on Students' Academic Performance:

Evidence from University Context

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Abstract



21st century learning skills including creativity, communication, critical thinking and collaboration (4Cs) enable the students to face the realities of actual life and becomes responsible for fulfilment the demands of 21st century. This study attempted to find out the influence of 21st century learning skills (4Cs) on students' academic performance in university context, and also to analyse the difference between 4C skills with respect to natural sciences and social sciences departments, gender, and public/private university sector. Quantitative research approach was applied and 400 students from 5 public and 5 private sector universities were selected conveniently. Tool of research was structured adapted questionnaire and data was collected by online Google forms. Collected data was analysed by using Multiple Regression analysis and independent sample t-test. Results of the study indicate that no significant relationship is found between students' academic achievement and 4Cs (communication, collaboration, creativity, Critical thinking). Collaboration, critical thinking and communication have positive influence on students' academic performance but it is statistically insignificant. Creativity has negative influence but it is also insignificant statistically. Difference between the 21st century learning skills (4Cs) with respect to natural sciences/social sciences and with reference to public/private sector universities is not statistically significant. However, difference between the 21st century learning skills (4Cs) with respect to gender (male and female) is statistically significant. Females students have significantly better 4C skills than males. It is concluded that these skills need to be incorporated in students so that they can face the challenges of global society.

Keywords: Collaboration, Communication, Creativity, Critical thinking, Academic Achievement.

Introduction

To address new issues within new environment, individuals in the 21st century require high-level thinking skills recognized as twenty first century learning skills. They may able to successfully utilize expertise and exposure. As entire planet reaches the 21st century, a tremendous transition is occurring, resulting in a worldwide radical shift. It is transforming people's attitudes toward performing their routine life activities. The expertise require to perform a task or objective are referred to as skills. Ability enables the individuals that they feel comfortable and autonomous in everyday life and it is essential for excellence. Almost any ability can indeed be learned or improved with great patience and practice (Rotherham & Willingham, 2009).

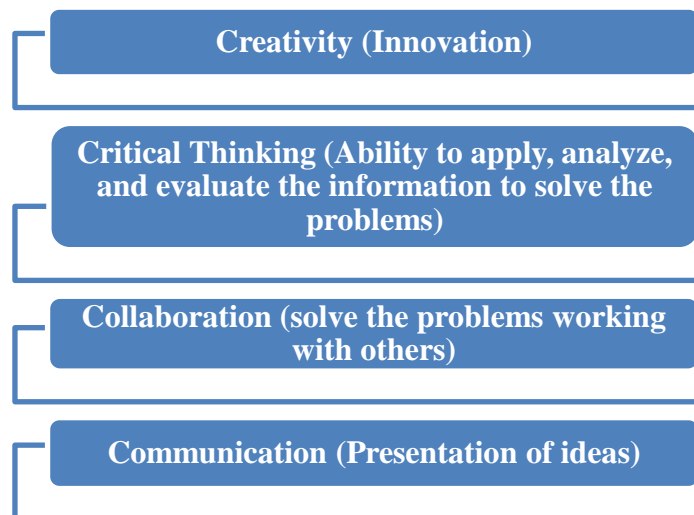
The partnership for twenty first century abilities (P21) has created a comprehensive framework for examining the various types of assistance needed in education. Innovation and inventiveness, analytical and analyzation, and cooperation and synchronization are examples of understanding and imaginative remedies. Knowledge, information and technological expertise include digital skills, multimedia technology and analytical literacy. Ultimately, flexible talents, invention, and consciousness, ethnic and financial output, and accountability, administration, and devotion are the roles of life and professional skills (Partnership for 21st Century Skills, 2009).

Because of world's rapid development and evolution, geographic barriers have shrunk and a global competitive environment has formed. Only educating students with 21st century competencies will allow societies to have a voice in this changing world. Only education can provide them with the

necessary qualifications. This change in the globe of the twenty-first century has also broadened and the credentials truly need these skills (Dede, 2010). Hood (1999) says, "We know a lot more about how things functioning, or don't, according to the principles of 21st era." Every society, parent, workplace, and student is distinct but the problems are the same. The guidelines or the responses must be unique (Hood, 1999).

As a result of global expansions and revolutions, substantial changes took place in society. Today's modern advances, especially in the field of technology, have a social influence. To assist with the world's changes and transitions, people with specific qualifications are required. The skills or competencies regarded as twenty first century skills include critical thinking and deductive reasoning, communication skill and interpersonal skills, expert knowledge, web and comprehension important part skills, civic moral compass, sociocultural and ubiquitous thought, life goals and valued function, command structure and moral code skills, economic growth and conscience skills and transformation leadership (Redecker, et al., 2011).

Learning is concerned about 3rs but writing, linguistics, and numeracy aren't the only competencies today's students require. Students need to be able to demonstrate their ability to cooperate, interact, create, and think logically in today's society. These skills are known as the 4Cs of 21st-century learning skills (Lippl, 2013). According to Kay and Greenhill (2011), the 4Cs skills are known as the core element of P21 model. Individuals in post-secondary education and work contexts are more likely to possess these skills. The Learning and Innovative Capabilities domain has four aspects. As each of the 4 competencies (components) starts with the English Alphabet C, these abilities are also known as 4Cs.



Creativity is important in 21st century as education is important. This skill enables the individuals to apply new ideas and thoughts to solve the existing problems. Collaboration is an important skill to obtain the results in an effective way. In collaborative environment, each member of the group participates, discusses and contributes to solve the problem. With the passage of time, collaboration is becoming more important skills of 21st century (Chiruguru, 2020). Critical thinking abilities are innate and cannot be taught organically. It is a learned trait that must be passed on to pupils as part of the educational learning process. This capability is not learned by the majority of students. The capacity to think critically is not passed down to students by their classmates or by the majority of their families. Teachers that are well-equipped and competent are essential in instilling critical reasoning skills in learners Critical thinking skill enables the individuals to solve the problems by using learning of other subjects (Chiruguru, 2020). Critical thinking is defined by Trilling & Fadel (2009) as an individual's personal ability to process, understand and assess data. The National Council for Excellence in Critical Thinking (California) describes analytical reasoning as an innovative process of conceptualizing, examining, analyzing, and synthesizing knowledge collected by the researcher, argumentation, practice, and contemplation (NCECT, 2014). Chiruguru (2020) describes critical thinking in such a way:

1. It uses both inductive and deductive methods to solve the problems.
2. It analyzes the problem into different parts so that solution may be made possible.
3. It solves the problems by using of traditional methods and new methods and knowledge.

“Expressing thoughts clearly, crisply articulating opinions, communicating coherent instructions, motivating others through powerful speech- these skilled have always been valued in the workplace and in public life. But in the 21st Century, these skills have been transformed and are even more important today (Roekel, n.d).” Interaction is a super ability in the world. According to Gerald (2015), it allows people to convey their opinions, problems, and solutions. Interaction is the exchange of thoughts, concerns and answers. It is expected from the students that they can convey their ideas in a fluent way and in correct language that is understandable to others. But it is identified in a report that 72% faculty is not good in English writing and 81% lacks the communication gap. So communication skill is very important to face the challenges of 21st century (Chiruguru, 2020). These skills shift the teaching paradigm from teaching technology to involvement of students in bringing new innovations in the field of learning. Learning of these skills effect on students' achievement and this research contributes in indentifying the relationship between 21st century learning skills and students' academic achievement.

Research Questions of the Study

1. What is the influence of 21st century learning skills (4Cs) on students' academic achievement at University Level?
2. What is the difference between the 21st century learning skills (4Cs) with respect to natural sciences and social sciences departments?
3. What is the difference between the 21st century learning skills (4Cs) with respect to gender (male and female)?
4. What is the difference between 21st century learning skills (4Cs) with respect to Public and Private sector Universities?

Research Hypothesis of the Study

1. There is no significant difference between the 21st century learning skills (4Cs) with respect to natural sciences and social sciences departments.
2. There is no significant difference between the 21st century learning skills (4Cs) with respect to gender (male and female).
3. There is no significant difference between 21st century learning skills (4Cs) with respect to Public and Private sector Universities.

Research Methodology

Positivist paradigm of research was employed in this study because this paradigm used the scientific method for testing of hypothesis and provides conclusions on the basis of objective facts (Kivunja & Kuyini, 2017). Research approach was quantitative because nature of research objectives demanded to use such type of research approach. In quantitative research approach, collected data was in the form of numeric and analyzed by using numerical methods (Apuke, 2017). All the public and private sector universities of Lahore district and their students were considered as population of the study. 5 public sector universities and 5 private sector universities were selected conveniently as sample and 400 students in which 202 from Public sector and 198 from Private sector universities of Lahore District were also selected by using convenient method of sampling. Detail is as:

Public Sector Universities	No. of Students	Public Sector Universities	No. of Students
University 1	54	University 1	33
University 2	31	University 2	37
University 3	40	University 3	36
University 4	42	University 4	57
University 5	35	University 5	35

Tool of research was survey questionnaire and adapted questionnaire from Todd R. Kelley, J. Geoff Knowles, Jung Han, and Euisuk Sung's questionnaire (2019) as used in the study “Creating a 21st Century Skills Survey Instrument for High School Students.” Survey questionnaire was comprised of 33 statements including the aspects of collaboration, critical thinking, creativity, and communication. Section related to collaboration was comprised of 11 statements, critical thinking section was based on 7 statements, creativity section was based on 6 statements and communication section was comprised of 9 statements. Scale range was consisted of strongly agree to strongly disagree. Data was collected online by using Google forms due to covid-19. Collected data was analyzed by using regression analysis and independent sample t-test. Relationship between 21st century learning skills (4Cs) and students' academic achievement was computed by multiple

regression analysis. Significance of difference in aspect of departments, gender basis and public private university comparison was found by using independent sample t-test.

Results of the Study

This section presents data into tabular form and data interpretations are described at the end of each table:

Table 1

Influence of 21st Century Learning Skills (4Cs) on Students' Academic Achievement

	Adjusted R square	F-Test Statistics	
		F	Sig.
Communication	0.01	1.978	0.097
Collaboration			
Creativity			
Critical thinking			
	Beta (β)	t- Test Statistics	
		T	Sig.
Collaboration	0.056	0.737	0.461
Creativity	-0.035	-0.533	0.594
Critical thinking	0.028	0.358	0.721
Communication	0.097	1.377	0.169

Results of table no.1 show that communication, collaboration, creativity and critical thinking demonstrate 1% variance in the students' academic achievement (adjusted R square 0.01). F-test statistic value of adjusted R square is 1.978 and significance value is 0.097. It indicates that p-value is greater than level of significance (0.05). So no significant relationship is found between students' academic achievement and 4Cs (communication, collaboration, creativity, Critical thinking).

Beta (β) values of above table show that 4Cs are considered as independent variables and these are computed relatively rather than independently. Beta value ($\beta = 0.056$) indicates that collaboration has significant impact on students' academic achievement. But t-value (0.737) and p-value (0.461) is higher from level of significance (0.05). This indicates that collaboration skill has not significant impact on students' academic achievement. Beta value ($\beta = -0.035$) shows that creativity has not positive impact on students' academic achievement. But t-value (-0.533) and p-value (0.594) of this beta component show that it is not important statistically because both have higher values from level of significance. Beta value ($\beta = 0.028$) of critical thinking skill shows that it impacts on students' academic achievement. But it is not found significant statistically because t-value (0.358) and p-value (0.721) indicate the higher significance level (0.05). Beta value ($\beta = 0.097$) of communication skill shows that it effects on students' academic achievement. But t-value (1.377) and p-value (0.169) indicate that it is not statistically significant because these are higher from level of significance (0.05).

Table 2

Difference between the 21st century learning skills (4Cs) with respect to natural sciences and social sciences

Departments	N	Mean	SD	t-value	Df	P
Natural sciences	234	126.14	16.88	-1.159	.398	.247
Social sciences	166	128.13	16.91			

Results of above table 2 indicate that p-value (.247) is greater than the 0.05 significance level. As a result, the null hypothesis that 'there is no significant mean difference between the 21st century learning skills (4Cs) with respect to natural sciences and social sciences departments' is accepted.

Table 3

Difference between the 21st century learning skills (4Cs) with respect to gender (male and female)

Gender	N	Mean	SD	t-value	df	p- value
Male	142	123.8451	19.72625	-2.766	398	.006
Female	258	128.6899	14.89251			

The output of t-test in this table 3 indicates that the p-value (0.006) is less than significance level (0.05), so the null hypothesis 'there is no significant difference in 4C skills with respect to

gender (male and female) of university students is rejected. Females have significantly more 4C skills than males.

Table 4

Difference between 21st century learning skills (4Cs) with respect to Public and Private sector Universities

Institute	N	Mean	Std. Deviation	t- value	Df	p-value
Public	202	127.78	18.640	.971	398	.332
Private	198	126.14	14.928			

Results of the above table show that the p-value (.332) is greater than significance level (0.05). As a result, the null hypothesis that 'there is no significant mean difference between 4C skills with respect to public and private sector university students' is accepted.

Discussion

The results of the present study revealed that 4Cs (communication, collaboration, creativity and critical thinking) have insignificant relationship with the academic achievement of the students. Findings of the study showed that the independent variable communication is effected on students' academic achievement but critical thinking is less affected on students' academic achievement. According to the recent research which reveals that students in BS programs have developed the communication skills and also curriculum is compatible with the development of this skill (Khan, Jumani & Gul, 2019). Critical thinking skills are equally important as all the other four skills and according to another study, critical thinking encourages students to be broad-minded, to ask questions and to think and justify things rationally about situations (Kompf, 2001). According to Trilling and Fadel (2009), critical reasoning curriculum permits learners to think more efficiently, engage in organizational learning, increase their capacity to develop competent judgments and conclusions, and improve their general problem-solving skills. The "new pillars of 21st century learning" are often regarded as logical and conceptual thinking.

Conclusion

Present research concluded that relationship between 21st century learning skills (4Cs) and students' academic achievement at university level was found. Difference between the 21st century learning skills (4Cs) and students' academic achievement with respect to departments and public and private sector comparison of universities was not prevalent but existed on the gender basis.

Recommendations of the Study

1. These skills are highly recommended for this generation and for the better future. Since this concept of twenty first century skills is relatively new, particularly in developing nations such as Pakistan. As a result, it is critical for officials to raise awareness among people and organizations about the need of gaining certain skills and knowledge.
2. The concerned ministry (minister of education) at the state scale may take up the issue of articulating 21st century capabilities in education. With the rapidly changing goals in the global world, educational institutions must establish a policy for the deployment of 21st century skills.
3. Teachers need to update their pedagogy to teach 21st-century abilities so that the next population may be prepared for upcoming challenges.
4. Instructors must use project-based instruction to integrate the learning of 21st century skills into their methodology. As students are the center of this study, youngsters must be interested in learning these critical abilities in order to be prepared and to be valuable and productive global leaders.

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