

# Lecturers' Perceptions and Expectations Towards Learning Skills and Innovations of 4C's of 21st Century Skills

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## Abstract

Educational institutions have an equally challenging task anticipating which classes and skills they should teach to help their students land well-paying jobs when they graduate. In conjunction with that, investigating teachers' perceptions of the learning environment gives insight in the extent to which the educational design has been successfully implemented and continue to succeed throughout their careers. However, a few responses from the head department depicts that the perception and expectation of learning skills and innovation is moderate level. Besides that, perception and expectation are two different things, not merely an easy thing to achieve in the 21st century era which focuses on learning skills and innovation. Thus, the research was conducted to identify the knowledge, motivation, and organizational level of the Four C's (4C's) Critical Thinking, Creative Thinking, Communication, Collaboration, and to investigate the most dominant factors contributing to perception and expectation of learning skills and innovation of 4C's. Descriptive analysis with quantitative approach was used to collect data with sample 90 lecturers among Temerloh Community College, Paya Besar Community College and Bentong Community College, whereby data was analysed using SPSS version 27. The findings indicate that knowledge (mean =3.3972) and organizational level (mean= 3.4306) were at moderate level. Therefore, it shows that the lectures need to improvise their knowledge and the awareness of the development of 4C's. In addition, the findings show the dominant factor of 4C's of perception is Collaboration (mean=3.7844 ) and expectation (mean= 4.5200) showed the respondents easy to adapt and execute for collaboration merely same compare to Other 4C's of Perception shows Critical Thinking (mean= 3.3711), Creative Thinking (mean=3.4667) and Communication (mean= 3.4933) were at moderate level. The study complies exploring the perspective of teachers. Therefore, steps should be taken drastically to successfully implement 4Cs via execute training and re-design of the curricula by adding rubric assessment of 4C's as part of the evaluation in teaching and learning towards 21st century skills.

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Keywords: Learning Skills & Innovation, 4C's, Perception and Expectation

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## INTRODUCTION

Malaysia Education Blueprint 2015-2025 for the Malaysian higher education has been developed which emphasizes structuring more holistic and integrated curricula to prepare students for the needs of 21st century employment skills. Furthermore, to meet the demands of the global economy and the nation's competitiveness in the era of the 4.0 industrial revolution is to prepare a more innovative learning system and to increase the competence of graduates in the era of 21st century skills emphasizing learning skills and innovation of 4C's mastering key soft skill competencies known as critical thinking, communication, collaboration, and creativity (Thornhill-Miller et al., 2023) (Orak & İnözü, 2021, ) 21st Century Knowledge and Skills in Educator Preparation, 2010,(OECD Future of Education and Skills 2030, 2019).

Furthermore, the OECD Future Education and Skills 2030, 2019 declared these skills as a gateway to be successful, to survive, and to thrive to put the importance on higher order cognitive skills to be achieved by learners. This shows that a focus to 4CS is essential to prepare students for the future and most demand skills and first required in world of work. This emphasizes the importance of exploring the perspective of teachers who are involved in an educational innovation. It showed that the implementation of the innovative learning environment only partly succeeded and that more cooperation between educational designers and teachers is needed to create more congruence between the educational design and the factual learning environment in the classroom.

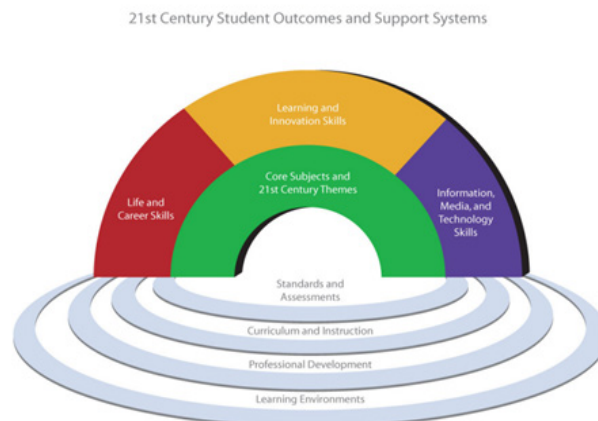


Figure 1. 1: The Rainbow/ 21st century learning framework

Source: Partnership for 21st Century Skills(P21), 2011

[www.P21.org/Framework](http://www.P21.org/Framework)

The Rainbow, known as P21 framework defines each skill set with specific key capabilities. Learning and innovation skills consist of competencies for engaging in critical thinking and problem solving, communication, collaboration, and creative thinking. Therefore, what educators need and, in the future, investigating teachers' perceptions of the learning environment give insight to the extent by which the educational design has been successfully implemented and continue to succeed to better prepare today's graduates for a world of work in which academic content mastery and skills. In conjunction with that, (Ahmar Ahmad et al., 2019) lectures adapt to be innovative in their teaching and learning approaches to enhance students' active involvement in the class lesson as well as mastery of 21st century skills of 4Cs. Thus, the study focuses on the Lecturers' Perceptions and Expectations Towards Learning Skills and Innovations of 4C's of 21 St Century Skills as community colleges and as Technical and Vocational Education and Training (TVET) providers.

## RESEARCH PROBLEM

### Learning Skills and Innovation of 4C's in Community Colleges

Community Colleges are institutions that provide training and skill needs at all levels and provide education opportunities to secondary school graduates before they enter the labor market or further education to a higher level. However, the technological enhancements have historically driven increases in the quality of and access to education globally. A few responses from Head department depict that the perception and expectation of learning skills and innovation is at moderate level. Besides this, perception and expectation are two different

things and not merely an easy thing to achieve in the 21st century where the focus is on learning skills and innovation.

*Table 1.1: Perception and Expectation*

*Source: Feedback Report from Programme Head of Department of Community Colleges of Pahang, (2023)*

<b>Bill</b>	<b>Learning Skills and Innovations (Perception Vs Expectation)</b>	<b>Level</b>
1	Temerloh Community College	Moderate
2	Paya Besar Community College	Moderate
3	Bentong Community College	Moderate

Therefore, this study focuses to the extent of the research is conducted to identify the knowledge, motivation and organization level of Four C's (4C's) Critical Thinking, Creative Thinking, Communication, Collaboration and to investigate the most dominant factors contributing to perception and expectation of learning skills and innovation of 4C's. In addition, to identify the steps should be taken successfully implementing of 4Cs' of learning skills and innovation. Besides, the feedback shows that lectures knowledge regarding adapt 4Cs' and lectures perception dan expectation of 4Cs based on students and factors that need attention to be improvised for better graduates competent with high order cognitive skills. Thus, causes lectures' perception at moderate level to expectation. Therefore, further research is needed to assist the Innovation & Research Unit (R&D) and the management of colleges and the Department of Polytechnic and Community College (JPPKK) and faculty members as educators to know and be able to develop 4CS in teaching and learning and increase the level of influential factors in studying perception and expectation to be improved as TVET providers.

### **RESEARCH OBJECTIVES**

The research objectives are:

- To identify the knowledge, motivation and organization in terms of 21<sup>st</sup> century learning skills and innovation.
- To investigate dominant factor that influence Perceptions and Expectations Towards Learning Skills and Innovations of 4c's
- To identify the steps should be taken successfully implementing of 4cs of learning skills and innovation

### **RESEARCH SCOPE**

In order to better evaluate lecturers' perceptions and expectations towards learning skills and innovations of 4C's of 21st century skills, the scope of study are as follows:

- The study was conducted at Pahang State within three community colleges which is Temerloh Community College, Paya Besar Community College, and Bentong Community College.

- The population of the study focused on lecturers within 3 community colleges who are actively involved in teaching and learning.
- The population of the study was 110 accordingly the sample was determined by Krejcie, R.V. dan Morgan, D.W (1970) based on the number attached to 86 round up to 90 as respondents.
- Items are defined as:
  - Knowledge. Knowledge is defined as lectures knowledge of 4Cs' and adapt and aware in the context of research.
  - Motivation. Motivation is defined as lecturers' interest and effort to develop 4Cs' in the context.
  - Organization. Organization is defined as specific nature of organization support in the sense of promoting 4C for lectures to develop in class in the context of research.
- Factors which can influence perception and expectation are as follows:
  - Critical Thinking and Problem Solving. Critical Thinking and Problem Solving is defined as essential a skill in effectively analysing problem solving, enable, evaluate potential solutions, and ability to think critically in the context of research.
  - Creative Thinking. Creative Thinking is defined as wide range of idea creation techniques to create new and worthwhile ideas sin this context of research.
  - Communication. Communication is defined as articulate thoughts and ideas effectively using oral and written communication skills in a variety of forms in this context of research.
  - Collaboration. Collaboration defined as demonstrate ability to work effectively and respectfully with diverse teams in this context of research.

## CONCEPTUAL DIAGRAM

In Figure 1.1, the dependent variable in this research is set to four factors which influence lecturers' tendencies of 4Cs in Teaching and Learning. Each factor is selected based on past studies of P21 Framework that have been done by several researchers. Among the four factors selected were Critical Thinking and Problem Solving, Creative Thinking, Communication and Collaboration and item of lectures of 4Cs' in term of knowledge, Motivation and Organization.

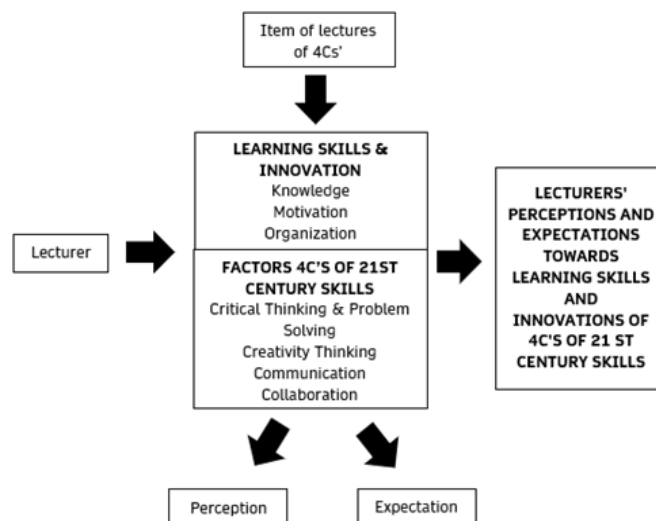


Figure 1.2: Conceptual Model for Lecturer's Perception and Expectation of 4Cs'

Source: (Thornhill-Miller et al., 2023) (Orak & İnözü, 2021)

adapted according to the sustainability of the research as a theoretical base

Furthermore, the independent variables in this study were the lectures. Overall, from the conceptual framework, it can be seen that there are four factors that play an important role as variables of this study and supported by item of lectures of 4Cs' to be evaluated. In addition, the conceptual model is widely used in research contexts as well as with several researches adapting the P21 century learning framework specially learning skills and innovation. In conjunction with that, this model for generating explanations for the factors and in terms of 21st century skills.

## SIGNIFICANCE OF THE RESEARCH

The significance of this research lies in its alignment with curriculum standards, reflecting current industry trends, and fostering the development of teaching and learning practices based on contemporary educational concepts. This alignment is crucial to meeting the demands of 21st Century Skills and addressing the needs of the labor market, especially within the context of a Community College serving as a Technical and Vocational Education and Training (TVET) provider.

Additionally, the study's outcomes can offer valuable insights to stakeholders, including the Department of Polytechnic Education and Community College (JPPKK), college administrators, the college's Research and Development (R&D) Unit, and the implementers of innovation, namely the lecturers. These insights, in turn, can positively influence the inclination of lecturers to actively engage in the development of teaching and learning strategies aligned with the 4C's (Critical thinking, Communication, Collaboration, and Creativity).

Moreover, this research aligns with a systematic approach to improvement, providing a roadmap for lecturers to enhance learning and teaching methods, thereby contributing to the cultivation of first-class human capital in an innovative and skillful manner.

In essence, the study makes a meaningful contribution to research and development (R&D) by designing strategies that enhance lecturers' perceptions and expectations related to the 4C's among students. The findings serve as a practical guide for formulating R&D strategies aimed at empowering the 4C's in the development of teaching and learning practices, aligning with the demands of 21st-century skills and addressing the challenges posed by the Fourth Industrial Revolution (IR 4.0).

## LITERATURE REVIEW

Educational institutions have an equally challenging task anticipating which classes and skills they should teach to help their students land well-paying jobs when they graduate. (Gunawan et al., n.d. 2022). In conjunction with that, investigating teachers' perceptions of the learning environment gives insight in the extent to which the educational design has been successfully implemented and continue to succeed throughout their careers. (Anagün Assoc & Osmangazi Üniversitesi, 2018b) Therefore, learning and innovation skills within the 21st century skills framework benefit students by preparing them to meet future career requirements. (Haviz et al., 2020) declared these skills studied from various perspectives and its importance. Although the demand for implementation of the skills exists, (Kim, H. J., Park, J. H., Yoo, S., & Kim, H., 2016) it is argued that there is a lack of understanding how 4C's should be implemented.

Learning and innovation skills refer to the mental processes required to adapt and improve upon a modern work environment. (Timotheou & Ioannou, 2021). Furthermore, the Institute for the Future (2019) proclaims that towards the era of the Fourth Industrial Revolution, because of the rapidly increases of technology, promoting "new industries, jobs, places of work and working patterns", students are expected mastery of the 4C's to help educators effectively implement 21st century learning skills and innovation within the classroom. (Soderlund, n.d., 2020)

In the context of this study, there are four factors of 4C's that hinder the lectures' perception and expectation which form the backbone of by several authors (Anagün Assoc & Osmangazi Üniversitesi, 2018b; Angelaki et al., 2023; Joynes, 2019; Kösterelioğlu, 2021; OECD Future of Education and Skills 2030, 2019; Orak & İnözü, 2021; Rusdin & Ali, 2019) as seen below: -

- i. Critical Skills and Problem Solving
- ii. Critical Thinking
- iii. Communication
- iv. Collaboration

Thus, the level of knowledge, motivation, and organization of the lectures' regarding this technology needs to be identified. As the same problem aroused in the different research studies, the literature documented that curriculum or programs must be integrated with the 4C's. Therefore, it is worthwhile to conduct a study to determine the extent to which factors might influence and hinder the lectures' perception and expectation of learning skills and innovation.

## METHODOLOGY

### Research Design

The design of this study is descriptive. Researchers have chosen this design because they want to know what is happening and which is the phenomenon of lecturers' perception and expectation of 4C's. In addition, researchers use survey methods to collect data because it is more appropriate and efficient to conduct descriptive studies. Research using survey methods has also been chosen because it is most popular among social scientists. The data was obtained from the respondents using the questionnaire as a research instrument. (Bihu, 2022) The researcher selected the study design as shown in table 1.2.

Table 1.2 Research Design

Research Design	Methodology	Strategies
Descriptive	Survey	Questionnaire

### Research Design

The population of the study consisted of 110 lecturers. A sample of 90 questionnaires were distributed to the students from three community colleges namely: Temerloh Community College, Paya Besar Community College, and Bentong Community College. The sampling procedure used for the study was stratified random sampling. The stratification has been done based on the list of community colleges and sample size. The sample is randomly selected lecturers who involved in teaching and learning within these three community colleges.

Table 1.3 Sample of students by list of community colleges and sample size

List of Community Colleges	Population	Sample
Temerloh Community College	29	29
Paya Besar Community College	31	31
Bentong Community College	110	30
Total	110	90

### Research Instrument

This research was conducted through a survey using online questionnaires (Google Form). In addition, the instrument was used to collect detailed data, both structured and standard. Questionnaire prepared by the researcher consisted of a five point scale based on previous studies. The scaled respondent choices were: 1-strongly disagree, 2-disagree, 3-slightly agree, 4-agree, 5-strongly agree. This survey questionnaire has two parts- Part A, Part B, Part C & Part D. The instrument was reviewed by Research and Innovation (R&I) Officer and item of questionnaires Part B and Part C were adapted from previous studies.

Part A: Demographic of Respondent

Part B: Lectures' Knowledge, Motivation And Organization Level of 4C's Skills Among Lecturers adapted from (Orak & İnözü, 2014)

Part C: Lectures' Perception And Expectations Towards Learning Skills And Innovation Of 4c's - Critical Thinking, Creative Thinking, Communicating, And Collaborating Among Students adapted from (Boonpu & Chaisuk, 2022)

Part D: Suggestion on Steps should be taken successfully implementing of 4cs of learning skills and innovation.

## Reliability

A pilot study was conducted through the questionnaire to determine if there were any problems with the questionnaire items. This is to ensure that the reliability of the questionnaire that is constructed is high and more reliable than using a small number of selected samples. A good reliability level is acceptable if the alpha value exceeds 0.6. For this study, the reliability value 0.917.

Table 1.4 Reliability Assessment of Alpha Values  
Source: George, D., & Mallery, P.;(2003)

Reliability Statistics	
Cronbach's Alpha	N of Items
<b>.914</b>	<b>52</b>

Table 1.5 Alpha Cronbach

Cronbach's Alpha, a	Reliability Assessment
1	High, Good and Effective
0.8	Very Good
0.6 - 0.7	Acceptable

## Data Analysis

According to Mohd Najib, A. G. (2003), descriptive test is used to describe the sample with frequency distribution, mean, median and mode and measures variability such as range and standard deviation. Studies conducted in decriptive and the data was analyzed using Statistical Package For Social Science (SPSS) version 27.0. The findings are presented in the tables with calculation of mean score. Interpretation of mean score shown in Table 1.6.

Table 1.6. Interpretation of Mean Value and Score  
Source: Adapted from Landell, 1997

Mean Value	Interpretation of mean score
1.00 - 2.33	Low
2.34 - 3.67	Moderate
3.68 - 5.00	High



## RESULTS AND DISCUSSION

### Quantitative Study

#### *Demographic Respondents*

Section A contains the data on the respondents' gender, age, programme, work experience and list of community colleges. The results of this demographic data have been reviewed to further strengthen the reliability of the data collected and the results presented in Tables 1.7 – 1.11. A total of 90 respondents of the study comprised men with a percentage of 20%, while female respondents with a percentage 80%. For the age, 90 respondents aged 31-40 years were at 63.3% and 41-50 years were 9 and 51-60 years were at 3%. In addition, they were 10 programmes within three community colleges. While the list of community college respondents included Bentong 30 (33.3%) and Paya Besar 31 (34.4%) and 29 (32.2%) were from Temerloh Community College comprised as respondents.

Table 1.7: Gender

Gender		
	Frequency	Percent
Male	18	20.0
Female	72	80.0
Total	90	100.0

Table 1.8: Age

Age		
	Frequency	Percent
31 - 40 Years	57	63.3
41 - 59 Years	9	10.0
51 - 60 Years	3	3.3
Total	90	100.0

Table 1.9: Programme

Programme		
	Frequency	Percent
STM	20	22.2
SRP	3	3.3
SPB	7	7.8
SFP	7	7.8
PENGAJIAN AM	4	4.4
SMP	9	10.0
SPP	6	6.7
SKE/ STE	23	25.6
STP	8	8.9
SSK	3	3.3
Total	90	100.0

Table 1.10 List of Colleges

College		
	Frequency	Percent
Kolej Komuniti Temerloh	29	32.2
Kolej Komuniti Bentong	30	33.3
Kolej Komuniti Paya Besar	31	34.4
Total	90	100.0

Table 1.11 Work Experience

Work Experience		
	Frequency	Percent
6 - 10 Years	45	50.0
11 - 20 Years	45	50.0
Total	90	100.0

#### Lecturers' Knowledge, Motivation, and Organization Level Of 4C's Skills Among Lecturers

Table 1.12 Descriptive Statistics

Descriptive Statistics			
In terms of 4C's skills level Among Lecturers level of	Mean	Std. Deviation	Interpretation Mean
Knowledge	3.3972	.46491	Moderate
Motivation	3.7074	.58876	High
Organizational	3.4306	.42239	Moderate

The mean score of motivation level of IoT among students was found to be 3.7771 which is at high level (Table 1.6). The mean score shows that many students like to expand knowledge in their field of study. Besides that, the mean score also shows that students have at least basic understanding on the importance and information about IoT. Most of the students showed expertise on how to develop IoT related projects Furthermore, students perceived that they are unable to find new technology in learning opportunities.

*Lecturers' Perception and Expectations Towards Learning Skills and Innovation Of 4C's -Critical Thinking, Creative Thinking, Communicating, And Collaborating Among Students*

Descriptive Statistics				
Lectures' Perception and Expectation		Mean	Std. Deviation	Interpretation Mean
Critical Thinking	expectation	4.1489	.45917	High
	perception	3.3711	.35292	Moderate
Creative Thinking	expectation	4.2339	.44088	High
	perception	3.4667	.34184	Moderate
Communication	expectation	4.3022	.41135	High
	perception	3.4933	.33413	Moderate
Collaboration	expectation	4.5200	.41738	High
	perception	3.7844	.55382	High
Overview of 4C's Lectures' Perception and Expectation	expectation	4.3012	.36637	High
	perception	3.5289	.90307	Moderate

Table 1.13: Lecturers' Perception and Expectation of 4C's

The lecturers' expectations, learning skills, and innovations in critical thinking overall are very high (mean= 4.1489) considering that there are many expectations in all of them with the most perception averages including being able to think, analyze, synthesize, and a reason to solve problems and obstacles. Besides that, learning skills and innovations in creative thinking, the lectures expectation overall at a very high (mean= 4.2339), while perception (mean=3.4667) is at moderate level. Furthermore, the overall expectation in learning skills and innovations in communication (mean= 4.3022) showed that there were many expectations at all levels, with the most perception averages (mean=3.4933). The findings show that students are able transfer knowledge, ideas, and understanding proper languages but still need to be improvised. Research found that students have a strong individual behaviour which is their willingness to actively a collaborate on activities while both expectation (mean= 4.5200) and perception (mean=3.7844) are at high levels.

*Suggestion on Some Steps that Should be Taken Successfully in Implementing 4C's of Learning Skills and Innovation*

Table 1.14 indicates there are eight other suggestions on steps on implementing for 4C's for improvised lecturers' perception and expectation. Steps on taking up the evaluation rubric for assessment should include elements of 4C's is the highest percentage which is 25.6% at 23 respondents. However, other steps such as Supports from institutions as well as the curriculum development (11.1%), 10), The lack of responses shows 26 respondents, 28.9% did not respond.

Table 1.14 Steps that Should be Taken to Successfully Implementing 4C's

Steps should be taken successfully implementing of 4Cs				
List of Suggestion on steps		Frequency	Percent	
		Training should be given to lecture's as valued added.	5	5.6
		Organize program that enhancing element 4C's.	4	4.4
		The Evaluvation rubric for assesment should include element of 4Cs.	23	25.6
		Colloborate industrial oriented program	1	1.1
		Initiative lesson activities with element of 4CS	2	2.2
		Supports from institutions as well as the curriculum development	10	11.1
		Adding Subject /Space for learning interpersonal skills	2	2.2
		Educator plays a crucial role in include 4CS in Teaching and Learning	1	1.1
		No Suggestion	26	28.9
		Total	90	100.0

## Discussion

As the findings indicate that the Knowledge and Organizational level of 4C's is at moderate level whereby lecturers should be aware that the development and implementing it and organizational support within the curriculum and its importance needs to be taken seriously for 4C's to be implemented (Boonpu & Chaisuk, 2022). However, the author also emphasized that the role of lectures plays important to assure the quality of teaching and learning apart from students' ability and knowledge level of 4C's. For these reasons, education systems should integrate "21st century skills" into the core curriculum. (Anagün Assoc & Osmangazi Üniversitesi, 2018) Curriculum, instruction and learning environments must be aligned to produce a support system that will lead to the 21st century outcomes for today's students. Anagün, Ş. S. (2018). Based on National Education Association (2015) emphasized on 4C's need to be fully integrated into learning and teaching to produce citizens and employees adequately prepared for the 21st century.

There are four 4C's of Learning Skills and Innovation evolving in this research is Critical Thinking, Creative Thinking, Communication, which is at moderate level based on lecturers' perception while Collaboration is at high level based on Perception and Expectation. Therefore, to increase the awareness of 4C's in examining "21st century skills", their conception, assessment, and vaporization cited by (Thornhill-Miller et al., 2023). In conjunction with that, evaluation rubric for assessment should include element of 4C's in teaching and learning as suggested by lecturers should be needs to be taken seriously by the Ministry of Education (MoHE) in designing the curriculum.

## CONCLUSION

As a conclusion, globalization and digitization have accelerated in the twenty-first century, transforming the way we live, communicate, study, and work. As a result, to succeed in the twenty-first century, graders must possess the “Four Cs” or 4C’s (Communication, Collaboration, Critical Thinking, and Creativity). Furthermore, these 4C’s should be embedded in the evaluation of rubric assessment. In higher learning such as community colleges as TVET providers emphasize as an important element taught for students and teachers to become highly exciting in the era of 21st century skills. Nevertheless, these 4C’s create an ideal environment in learning and teaching for both aspects. However, to meet the lecturers’ perception and expectation is merely not easy. This research study emphasized to test the learning skills and innovation among students and gives insight in the extent to which the educational design has been successfully implemented and continue to succeed throughout their careers.

## IMPLICATIONS FOR FUTURE RESEARCH

The implications of the study are: to give exposure to curriculum developers such as lecturers, students, curriculum developers, Department of Polytechnics and Community Colleges; to develop a rubric assessment of 4C’s; and to be evaluated in teaching and learning. Furthermore, all the stakeholders should cooperate together to take drastic steps to strengthen the learning and teaching strategies with 4C’s within the student’s intellectual capacity. Furthermore, this should be enhanced to blend in to 21st century skills as community colleges lead IR 4.0 in higher learning. Future recommendations of the research include increasing acceptance, new paradigm teaching and learning as students as generation of 4C’s and should be integrated to develop a new paradigm in teaching and learning as students.

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