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TO EVALUATE THE EFFECTIVENESS OF USING PROJECT-BASED

ASSESSMENTS IN IMPROVING THE CRITICAL THINKING AND TEAM BUILDING

SKILLS OF A GRADE 11 BUSINESS EDUCATION CLASS

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Abstract

Critical thinking and team building skills are some of the sought after skills that students need to have but lack in the world of work. The purpose of this qualitative research is to understand the effectiveness of Project-based assessment on the critical thinking and team building skills of a group of grade 11 business education students. The study population for this reach was a group of 15 students along with a total of 5 teachers and administrative staff at a local high school in Jamaica. They were given a group project in three parts and observed using interviews, focus groups and comparison of current assignment with previous assignment to identify themes to answer the central research question. Data were analyzed and three themes were derived; students are not against working in groups, their critical thinking and team building skills were improved, and longer time for group would reveal more information. The findings and recommendations noted that using this form of assessment would improve the learning outcome of students by the end of the school year and produce more industry ready employees.

INTRODUCTION

The aim of assessment was to test student ability to apply concepts and practices taught in the classroom in a pragmatic situation (McAlpine, 2002). When COVD-19 occurred in 2020, many institutions were forced to find alternative means of carrying out certain function. No exceptions were made for students who were either entering examinations or who were just starting out school. This resulted in a number of terminal or summative assessments being propounded or done using a virtual method. The school in this research was not excluded by the restrictions that came as a result of the pandemic.

This dissertation research evaluated the influence Project-based Assessment would have on the critical thinking and team-building skills of students within a grade 11 students in a business education classroom. The research paper zoomed in on how two groups within the classroom were able to work together to create a research portfolio that would include the creation of a business plan, a pitch presentation to potential investors, and a critical reflection piece outlining their experience. This study looked at the development of each student in each phase and how they were able to work together to create the final project. Their final project was used to compare the quality of the previous group to evaluate how this form of assessment is changing the outcome over the years of application.

Purpose of the Study

The purpose of this study was to understand how the use of project-based assessment (PBA) influenced students' academic performance. This revealed the direction students critical thinking and collaborative skills took when this intervention plan was implemented. This study, by extension, not only benefited the business education classroom but span across all departments and also extended into the lives of each student. Most students in this classroom were accustomed to studying for an exam that required them recalling or remembering key definitions for terms, but they could not apply the concepts they had studied to a situation critically. Many students at the institution tended to shy away from critically analyzing situations, especially in teams or group settings. They may not have had the skills to look past the surface information to understand the root cause.

This topic is especially important as it formed foundation for the development of competency-based assessments. This approach is where high schools in Jamaica are looking to embark in the near future. Critical thinking and teambuilding skills are crucial to students' success in such an environment.

Context

The institution where this research was conducted is a local school in Jamaica, and they asked that their names be kept confidential. This institution currently serves approximately 1,000 students with grades ranging from grade seven to 12; each class has an average of 35 students with a male to female ratio of 2:1. The school caters to over 50 communities in and around the area and acts as an emergency center in a natural disaster. There are 60 staff members including teachers for the different

subjects, administrative and auxiliary staff, bursary staff, library, and volunteers. The school has a healthy mix of visual, auditory, and kinesthetic learners. The age range of students is from 12 to 19 years of age, and the school is divided into two levels (upper and lower school) with two shifts (morning and afternoon). The school offers studies in Business Education, Arts, Humanities, Science, Agriculture, and Food and Nutrition. They also have special education for those academically challenged, physical education, reading, and drama clubs as a major part of their offering.

Statement of the Problem

Wekesa and Ongunya (2016) found that project-based assessment strategies in countries such as Japan and the United States have improved students learning in practical subjects such as Biology and Chemistry but the opposite in Kenya. Jamaica, similar to Kenya, has seen a decrease in students' performance due to a lack of critical thinking and teambuilding (Das and Ngacho, 2017). Students lacking appropriate critical thinking skills and the ability to participate in group activities have negatively impacted their overall performance within business education. Because of this, there has been an increased concern for many parents and teachers. The problem was that students in the business education classroom were challenged with critically analyzing and rationalizing situations that they were presented with, affecting their overall performance. They had challenges working within a group setting as they were not integrated into the group dynamics, thus, not feeling the creative juices of working in a team setting. This situation resulted in a lower performance rate in relation to their counterparts in other countries.

Rationale

The purpose of this study was to understand how problem-based assessment influences the critical thinking and teambuilding skills of students in an 11th grade business education classroom. Wood (2003) defined problem-based learning as a student-centered approach that requires students to learn about a concept in a pragmatic setting using groups as the main focal for learning and developing new knowledge. Walker and Leary (2009) discussed that problem-based assessment might have different outcomes across different subject areas. If the subject area is heavy on concepts and theories with little to no practical application, instructors may have a problem implementing strategies. However, there will be a more practical use of this concept in situations such as science, technology, engineering, mathematics, and business education. Students are better ready to build on new information when they are set in circumstances that compel them to consider fresh and rely upon one another for groundbreaking thoughts. In a setting where students are challenged only to recall and remember, they will not be forced to challenge their current thinking and to help others to build on their ideas.

Project-based assessment is a new concept being explored in schools in Jamaica. Prior to this research, final assessments were in the form of summative structures with little real-world application. The questions on the assessments are localized to Barbados, where the head of the examination (Caribbean Examination Council) meets to set examinations for the Caribbean region. The issue with this is that some of the questions do not apply to the Jamaican environment. Therefore, students

are challenged with learning information not relevant to Jamaica that may not even have practical applicability to Jamaica.

Alleyne et al. (2002) explored how problem-based assessment in teaching medical sciences would have more learning value than utilizing the conventional assessment model. It was found that students were better able to apply what they had learned when they saw each other carrying out a procedure. This approach changed the way practical courses are facilitated, and the overall critical thinking and teambuilding skills gained from this exercise grew.

Research Questions

1. How does project-based assessment influence the critical thinking skills of grade 11 students in business education over six weeks?

2. How does project-based assessment influence the teambuilding skills of grade 11 students in business education over six weeks

Significance of the Study

This study is significant for teaching approaches because it adds to the existing body of knowledge in that field. Critical thinking and teambuilding skills are critical in the working world and all aspects of academia. As such, the outcome of this research can benefit stakeholders in and out of the school. The school's principal, leadership, and teachers will have a deeper insight into how project-based assessment impacts learning within the school. Students will be able to see if their efforts are improving or not and how they can change or continue on their current learning path. The overall institution will be able to see if the school, in aggregate, is performing when compared to other schools utilizing the same program. This intervention could improve critical thinking and

teambuilding skills, and therefore overall performance in academia will also change.

Students will be able to carry out root cause analysis individually or as a group. They

may be able to develop solutions to complex problems in and outside of the classroom

which will also improve their job prospects if they decide to enter the working world and

not obtain tertiary education.

LITERATURE REVIEW

This section presents a critical analysis of the existing body of knowledge with the aim of understanding what conversations have already occurred as it relates to Project-based Assessment/Learning (PBA). This review aims to understand how the Project-based Assessment/Learning approach would influence critical thinking and teambuilding in studying business education, how PBA has impacted learning overall, and how this is applicable in pedagogy and andragogy situations. This topic is relevant to the leadership of the high school in Jamaica, the government, and the various ministries that create policies that directly impact how students learn and are assessed and add to the existing body of knowledge. The literature discussed in this review will span from 2006 to 2021 and look at PBA in different disciplines.

The research will be organized using the methical approach where the different research types are reviewed, and the results for each study compared to identify similarities and differences. The study will examine topics such as project-based assessment/Learning, critical thinking, teambuilding or collaborative skills, research methods used in collecting data, and results with subsections such as similarities in findings, differences, and unanswered questions. The research will conclude with an overall summary of the literature

What is Project-based Assessment and Learning?

Baglin et al. (2013) defined assessment as the timely capturing of learning using various data collection methods to understand better how students are performing at a given task. Such tasks can vary based on the topic being discussed and the time in the students learning period. Cho and Brown (2013) further developed this definition to note

that assessment involves either theoretical, practical, or a combination of theory and practice to capture the true essence of what students have garnered throughout the course. This study utilized a subjective way to deal with comprehending how Project-based Learning (PBL) in education at a local school in the USA can be used as a device to integrate the necessities of organizations into understudies learning.

Izzah (2021), similar to Cho and Brown (2013), employed a qualitative methodological approach to exploring how teachers in TESOL classrooms feel about PBA. PBA is used as a replacement for traditional assessment in the form of a final project, a portfolio, or a series of graded work that total a final score. Izzah (2021) noted that this approach allows for assessment to be spread over a long time.

Project-based Assessment (PBA) and Project-based Learning (PBL) are used interchangeably. Danford (2006) in the exploration involving perceptions for Project-based learning and International Business Education, noticed that the PBL setting makes an immediate picture of issues that exist in reality, and the utilization of these as ways of assessing participants learning to help in fostering decisive reasoning and cooperative or group building abilities. Additionally, Nguyen (2021) defined critical thinking in line with PBL as how students assess information to understand and interpret the meaning of data, how the information is summarized based on their understanding, then applied to the problem

Critical Thinking and PBL

Sasson et al. (2018) note that critical thinking is an in-demand soft skill many companies look for in prospective candidates. The author, in this context, employed a quantitative approach to developing and promoting critical thinking and question-posing

in a PBL environment that was being taught in a co-facilitation setting by three different teachers delivering different subject areas. Sasson et al. (2018) further noted that PBL is heavily based on critical thinking. Baglin et al. (2013) noted when the statistics were tested using interviews, it was recorded that some students noted that using this simulation gave them a sense of urgency in understanding the problem they are faced with, knowing that time is a factor, seeing people in the virtual space reacting to the solutions they implemented motivated them to do the course. It captured that their critical thinking and ability to work in groups have increased since they are afforded as close to hands-on as possible. Belecina and Ocampo (2018) in their article that critical thinking is a sought after skill that everyday activity needs and students as early as now needs to learn how to develop this. This can be learned through problem solving activities that encourages students to think outside of the box. This means that situations students are presented with are not simple straight forward answers but one that requires the application of concepts, the testing of hypothesis and the drawing of conclusions from these tests. Rodzalan and Saat (2015) noted in their study of undergraduate students from core Sciences and the Social Science faculty. This research was done on 2000 students from a mixture of schools where it was found that males think more critically and are able to solve more complex problems than females and the highest number of students who were able to solve these problems critically were from the Social Sciences. The application of PBL into these setting has proven that many students are able to think about situations on a practical level and apply this to some version of their reality. Nguyen (2021) conducted his mixed research and also discovered students have a greater appreciation for PBA over traditional assessments.

Collaboration and Teambuilding Skills

Cho and Brown (2013) have captured similar results from their analysis. In a qualitative study of PBA, they discovered six factors that promoted the use of this approach in their chosen organization of the study. These factors are community partners (they are satisfied with the immersion that students are getting as a result of this hands-on approach), dedicated facilitators (having professionals who are trained in PBA teaching this course provides a deeper level of immersion into the different course areas and helps students to think outside of the box and value the role of collaboration as they teachers are displaying this), group work (students engage in more collaborative and authentic form of learning that enables critical thinking and the development of group spirit), authentic projects (assessments, activities, and projects that are given in this classroom are all based on real-world problems to stimulate creativity), school culture (this when PBA becomes the language of the school helps to motivate students), and STEM-focus (PBA is not just focused on the sciences but it incorporates all disciplines into the lesson and uses STEM principles to effectively enable learning). This methodology shows that when students are challenged in a group setting to demonstrate their understanding, they go through the group stages and become better as a group and deeper thinkers on their own (Papanikolaou and Boubouka, 2010). Izzah (2021) further developed the principle examined in Cho and Brown (2013) to affirm that PBA is a favored methodology by numerous educators in showing their classes. This review utilized a qualitative technique by interviewing four female ELT instructors and it was noted two educators said that project-based evaluation has made their homerooms more tomfoolery and energizing than if they had just done composed

tests. A teacher said that she considered several evaluation methods before settling on the one she used. In comparison, another instructor said that she often assessed pupils based on her own opinions and concerns. Despite these factors, they all acknowledged that they were thinking about their pupils, specifically how to enhance their learning.

Danford (2006) in his early research paved the way for later research. This study noted that PBL is instrumental in allowing the different learning styles to reconstruct knowledge, and to change schemas that exist. Through PBL, learners are better able to apply concepts (the cognitive learner) to an existing phenomenon and learn from the result while in the experiential learning style, the student wants to be directly involved in the process. That means the experiential learner would be the one to carry out the concepts developed by the cognitive learner. PBL is able to support both learning style. Experiential learning in a group setting is more immersive than individual learning. Students as noted Miller (1990), students are able to learn from demonstration of other students especially when they are in a collaborative setting. This in turn will build the spirit of teamwork.

Sasson et al. (2018) use a quantitative approach only to see the extent that which students rather PBL to enhance their learning and ability to be immersed in a dynamic and pragmatic learning environment. In this study, the results are divided into Question-posing skills and Critical thinking.

For Question-posing skills, the researcher applied the Anova test analysis and conclude that there is a significant difference between the innovative program and the traditional program. Given that F = 6.707 and p = 0.02, this means that students rather the innovative assessment over the other traditional assessment.

Gaps in the Literature

Though the majority of the research agreed that PBA is a great way to immerse students in understanding different situations from a real-world standpoint, some articles also reported variations in their report. Baglin et al. (2013) and Nguyen (2021), reported that although students are immersed in a rich learning experience, there are some students that whom this principle is still lost. It does not directly help these students thinking skills but is primarily based on the student's ability to synthesize the information and act on it. Students wanting to develop their thinking and teambuilding skills is not just based on the method of teaching that is applied but on the motivation of the students.

Cho and Brown (2013) and Izzah (2021) also noted in their qualitative study that factors that may adversely impact the feasibility of the method would be the facilitators involved in the process, the culture of the school, the community with which the school exists and the students in the system. If they are not aligning with the concepts of PbL/A, the concepts, and objective of the methodology will not be applicable.

In the current classroom, there exist the lack of research that was done to understand how this form of assessment is changing the learning outcome of students. There have been two groups who have used this method but none of them were evaluated to understand the impact. As such, this research will evaluate the influence PBA will have on the development of critical thinking and team-building skills within a group of grade 11 business education students.

Limitations

A limitation in this study was the small sample size of 15 participants from a high school in St. James, Jamaica. Another limitation was the inability to study the students over an extended period of time. This only allowed for data to be collected over a six weeks period of time which can be very limited to the topic at hand. The participant population for this qualitative study included teachers and students who were working in and attending the current school, which can be perceived as a limitation.

Summary

In summary, the literature noted that learning using the PbL/A methodology is ideal when students are in realistic situations that challenge their idea of the concept they are learning. Giving the student the ability to apply the concept can impact the retention of the information. The principle of students learning by doing is highlighted in a situation requiring them to work as a team to find a solution and resolve the issue; this is an integral part of students in any situation to develop their critical thinking abilities. On a broader scale, the research notes that students tend to step up and deliver with all learning within a defined space, especially when faced with real issues.

The literature discusses critical thinking, and collaborative work and covers information relating to what PbL/A is and how it has developed over the years. The articles also proved a deeper analysis of perspectives of various stakeholders in the teaching and learning process and the impact they have on students being able to apply what was learned in a pragmatic setting. However, the articles do not address competencies that the business education syllabus teaches and how these are applied in the real world. Specifically, how to develop critical thinking and teamwork through

PbA. There is no published research on high schools in Jamaica and how this mode of

assessment could impact the students. This topic needs to be explored and developed

as it can be useful in redefining assessments in Jamaica.

METHODOLOGY

Purpose of the Study

The purpose of this research, was to gain an understanding of how PBA influences the critical thinking and teambuilding skills of business education students in a grade 11 classroom. This research sought to understand if using PBA was a viable option over conventional assessment instruments.

Research Questions

1. How does project-based assessment influence the critical thinking skills of grade 11 students in business education over six weeks?

2. How does project-based assessment influence the teambuilding skills of grade 11 students in business education over six weeks?

Population

The study population comprised 15 students ranging from 16 to 17 years old, with the only 11th-grade business education class at my school, two teachers, and three administrative staff. The class contains 11 females and four males from a mix of lower and middle-class families in and around the community. The class is currently performing at an academic average of 87 percent, with the individual averages ranging from 91 percent to and lowest of 57 percent. This class is now a hybrid course with classes online 70 percent of the time and face-to-face 30 percent. Students visit the school twice per month, engaging in different practical activities. The face-to-face class is done using the conventional chalk and talk, and virtual sessions are done through Zoom using PowerPoint and YouTube videos to teach whatever topic is being discussed. Two teachers facilitate the different business education courses, and three

administrative staff help prepare all the necessary documentation for the students to sit for their external assessments. Therefore, the total population including 15 students, two teachers, and three administrative staff is 20.

Population Justification

The chosen class for this study is currently the only 11th-grade business education class active at the school. The institution offers different specializations in science, technology, engineering, and mathematics (STEM), Business, and the Arts. Since Project-based learning is predominantly used in STEM classrooms, studying it in the business class would help understand if this approach would yield similar results. The class population of 15 students with two teachers and three administrative staff is ideal for conducting a complete analysis of the class as the sample size is ideal for this type of research. The sample size is enough to observe and capture behavior without the information becoming repetitive.

Intervention

The researcher implemented a strategy that would contribute positively to the growth of the class to understand how PBA would influence critical thinking and collaboration in an 11th-grade business education classroom. A workplace portfolio was used to help students develop their business education competency. The initiative was in three parts and was completed over a six weeks period, which resulted in a complete business plan for a company of their choice. At the end of the intervention initiative, the students were able to critically reflect on different situations and work collaboratively to complete the different tasks. The portfolio comprised a business feasibility study (including the industry analysis, and competitor analysis), a simple business plan, and a

critical reflection on the development of the business idea. This initiative helped students look at the current business landscape, assessed where there was a need in the market, and then applied their knowledge of business development to create a business plan that fixed the need.

Intervention Plan

To successfully implement this intervention plan, the development of the final business plan (seven sections in the plan) will need to be carried out according to the following steps:

Section One: Portfolio Entry One – Industry and Competitor Analysis

- **Week One (Monday – Tuesday):** Each student was grouped into a smaller group of five (three groups in total), and asked to use whatever medium, technology, or resource at their disposal to examine the current business landscape in St. James, Jamaica. They were asked to identify two needs that had little to no suppliers in the marketplace. It was required that they describe the need and justify how the need, provided the opportunity for a business intervention. This aspect of the assignment tested the critical thinking skills of each group member as they collaborated on conducting the analysis.

- **Week One (Wednesday – Thursday):** Each group was challenged with completing an analysis of their chosen business need. They were asked to look at the strength, weaknesses, opportunities, and threats of the identified niche. They were also asked to complete an analysis of Political, Economic, Social, and Technological aspects of this need to understand its industry viability.

- **Week One (Friday):** Each group reported on their finding in the form of a presentation. They used a PowerPoint as the technology in their discussion. Their analyses were discussed by the class and then graded based on their flow of reasoning and how each group member relayed information. This aspect tested the collaborative and critical thinking skills of the group as they were asked questions on the spot.

Section Two: Portfolio Entry Two – Writing the Business Plan

Week Two: The groups were required to discuss and write sections one and two of their business plan. This section contained the following information:

    a. The Executive Summary

    b. Company Description

        i. Location and Facilities

        ii. Business Objectives

Week Three: The group moved to documenting the feasibility analysis conducted in week one into the business plan format based on the headings:

    c. Product/Service Description

    d. Internal and External Analysis

        i. Industry Analysis

        ii. SWOT Analysis

Week Four: The group moved on to the development of the fifth and sixth section of their business plan. The sections are:

    e. Sales and Marketing

        i. Sales Plan

    ii. Marketing Plan

        1. Target Market

        2. Advertising and Sales Promotion

  f. Human Resource Plan

    i. Organizational Chart

    ii. Roles and Responsibilities

Week Five: During that week, the group reflected on their overall plan, then determined the cost to operate such entity. They wrote the final section that spoke to the financial information of the proposed company. The seventh section contained:

  g. The Financial Plan

    i. Start-up Cost

    ii. The Income and Expenditure Statement

Section Three: Portfolio Entry Three – Presentation of Business Plan and Critical Reflection on Assignment

- **Week Six (Tuesday):** Each group was given 30 minutes to present their business plan, answer questions, and get feedback from the teachers and other business persons who were invited to the event. The event was a business day hosted at the community center in the community. Each idea was up for funding from our local member of parliament. This aspect of the assignment, was intended to test the critical thinking skills of each group member as they collaborated on conducting the analysis. The rubric used (observation) to assess critical thinking and collaboration this was based on the answer to the following questions as noted by the panel:

- *Was there group cohesion throughout the presentation?*

- *How did each group member respond to questions effectively? Did they exude confidence or did other members of the group provided them with the answer?*

- *Was there evidence of research present in the presentation? Did they cite any popular source to support their ideas?*

- *Was there any indication visible while the presentation was going on that some members did not participate satisfactorily?*

The assignment was scored at each phase, however, there were comments, instructions and guidelines that were observed along the way, to help students understand the instructions. The extent to which students and groups adhered to the guidelines, helped to determine how deep their thinking was and how it translated to their group work.

- **Week Six (Wednesday - Thursday):** Each group member wrote their individual reflection on what happened in the course and how they worked together to overcome the challenges.

- **Week Six (Friday):** Each group submitted their final project, which included the reflection for each group member in a formal folder that was graded and analyzed. This aspect of the assignment tested the critical thinking skills of each group member as they collaborated on conducting the analysis. This section showed if the skills displayed by the group over the duration of the presentation were captured in their final submission.

Sources of Data

The information from this research was taken from students' evaluation score, and observed actions at each stage in the development of the portfolio. The score was tied to performance criteria of advanced proficiency, proficient, emerging proficiency, limited proficiency, and no proficiency which then tied to different range of scores. Each performance criterion had specific behavioral outcomes that were observed, documented, and given to the group to help them in the next phase of the process. This helped the researcher to better understand how PBA influences critical thinking and collaboration in a group of grade 11 business education students. Students were interviewed over the six weeks to understand how they were progressing at each stage in the developmental stage of their business plan. Each student was interviewed for 10 minutes to understand how the group activity contributed to the development of their skills. After all interviews were complete, three focus group sessions were conducted (one per group) to garner feedback as a group. This information was then triangulated with the information coming from individual interviews. Finally, students' records (portfolios with observed comments and scoring at each phase in the developmental process) from the previous 11th grade was reviewed to see if there were any similarities.

Instrumentation

The sources used to collect the information necessary in answering the central research questions were interviews with students, teachers, and school administrators as well as the final project of the intervention plan (the Business Plan). The participants each had between five to seven open-ended questions that solicited the unfiltered view

of all stakeholders. The interview questions were used in the one-on-one sessions to get direct feedback from each. The responses from each interview were recorded on a tape recorder and the information then transcribed to be used in later analysis.

For the focus group, a maximum of five questions were asked to each group, and their responses were recorded to be used in helping to rate how their learning had improved. Information was also taken from previous assessments done by students who had gone before the current group to see if their critical thinking and collaboration skills came out in their projects. The responses from each interview were recorded on a tape recorder and the information transcribed to be used in later analysis.

Focus groups and one-one-sessions provided feedback of participants' stance individually and as a group about the topic being discussed. The collection of previous projects acted as a means of triangulation that determined the influence the current assessment system would've had on students in comparison to the previous groups.

Research Procedure

The researcher obtained permission to conduct this qualitative research with the group of grade 11 students who were a part of the make-up summer session through a written request to the principal and chairman of the school. The letter was sent to the school as a hard copy and emailed to the principal approximately two weeks before the summer session. This allowed the school enough time to grant permission in advance and sensitize the students about the research that was to be conducted over the six weeks. That procedure ensured that all necessary permissions were granted promptly (Giorgi, 1997).

Soliciting Participants

To collect the relevant information that aided in formulating an answer to the central research topic, selecting the right number of participants was essential to the research process. The sample population was determined by examining the number of stakeholders involved in the only business education class within the high school. A total of 20 participants were involved in the process of study. The population was 15 students, two teachers, and three administrative assistants who all played a critical role in preparing the students for their external assessments. The class was also selected because of the researcher's involvement in the school. Voluntary efforts were made by the researcher in the past in helping the school by facilitating different informational sessions from time to time. It was of utmost importance that the thoughts of the teachers and administrative staff on PBA was understood, so it could be determined what their preference is as it relates to assessment methods.

Informed Consent

Hardicre (2014) cited that informed consent is one of the establishing standards of examination morals. Its goal is that participants can enter research uninhibitedly (willfully) with full data about how it affects them to partake and that they give assent before they enter the examination. Once permission was received from the principal and chairman of the school, the information was communicated to the teachers and the administrative staff. The researcher issued an informed consent form to teachers and administrative staff, informing them of their rights and getting their consent for this project's success.

Once obtained, each student was given a form of consent to be signed by their parents/guardians, with details about the nature of the project. The form also contained the researcher's contact information, and parents were encouraged to reach out, if any clarification was required. The parents were asked to return all forms within fourteen days. The school was asked to reach out to parents, if there was no response within the quoted timeframe. The expectation was that all participants would've wanted take part in the research exercise. The researcher hoped to have at least 80 percent consent from the student population, so the rise research could've most accurately reflect the perspective of the greater population. For the students/administrative staff/teachers who opted not to participate, information was not be collected for analyzation. This added to the reliability and validity of the information from the study. After the return of all signed consent forms, a general meeting was held with the study population, to further sensitize and edify them on the research topic, prior to the assignment being conducted.

Data Collection Procedures

To collect the data required to answer the central research question, there was a planned six weeks initiative conducted by the researcher to gather the information.

Table 1: showing planned activities for data collection over a six weeks period.

Weeks	Planned Activities
Week 1	**Day 1: Data Collection** The researcher made arrangements with the school administration to

| | review 10 past projects for students from the previous year. The aim was to identify trends, and to use as a comparison with the results to be collected. The projects collected had grade distributions with three of the highest, lowest, and the remaining had a mix of the middle to highest and lowest scores. **Day 2: Teacher and Administrator Interviews** The two teachers and three administrators were questioned on the practice of PBA at the school and the outcomes of the projects selected in day one to see what the SWOT | |

	of the previous group were. **Day 3 – 5: Student Interviews** Students were interviewed individually to understand their take on PBA, how has this practice impacted their thinking, their interactions with previous students and how they think this would impact their learning ,critical thinking and collaborative skills.
Week 2	Day 1 – 5: Student Interviews During this week, students who were not able to participate in the interviews from the previous week were engaged.
Week 3 - 5	**Days 1, 3, and 5: Stakeholder Interviews**

	Interviews were done with teachers, students, and administrators over the weeks compare the development of their thinking in comparison to week one interviews and to measure how drastically their thinking was altered.
Week 6	**Day 3 – 5: Focus Group Interviews** Students were placed in groups of five in week one. Each group was interviewed (one per day) to understand their group dynamics, how the group contributed to the final projects, how each member complimented each other and how their activity changed their opinion of working in

	groups and their critical thinking skills.

Ethical Considerations

Academic and professional research requires the application of some level of ethical standard. The research includes using key ethical standards to explore exercises that incorporate the plan and execution of research efforts about society and others, the utilization of resources and examination yields, logical wrongdoing, and the guideline of exploration (Campbell, 2017). Ethical consideration is important in research because it allows for the protection of all participants involved, the information collected, the integrity of the methods used to collect the data, and how the data will be used (Brewis, 2014).

To ensure ethical consideration was accounted for in this research and that there is no risk or harm, the researcher employed confidentiality and anonymity throughout the session. All stakeholders involved in the process were issued consent forms that, which would allow them to express their interest or disinterest in participating in the research. All students and stakeholders who expressed a disinterest in participating in the study, were not recorded and their data not analyzed or used. All interview transcripts have been kept confidential from all other stakeholders except the school principal. Students were thoroughly informed about the research process and what would be required of them prior to giving out the consent form. This was the approach taken to ensure all participants made informed decisions. Since the intervention plan

was a part of the school's curriculum map, students were required to complete the

activity to gain the credits needed for graduation. For those students who decided not to

participate, no information was collected from them and used in the research.

Considerations during Intervention

In this research, the intervention to be implemented was creating a business plan

portfolio that outlined students' steps to launch and develop a successful business

entity. This approach to learning using the PBA methodology is noted to have an

influence on the development of the critical thinking and collaborative skills of students

in the classroom. This intervention is appropriate for the situation at the school of choice

as the Coronavirus has impacted the summative assessment format that is commonly

applied to all subject areas. Because of COVID-19 and the need for students to still be

tested for competency, many schools are now using the PBA method to achieve the

learning outcome for different subject areas. Cho and Brown (2013) cited that project-

based assessment is a critical component in helping students to tap into real-world

problems and to apply them to their current situation.

There are some risks that might arise because of the implementation of the PBA

strategy. Some students were not accustomed to working in a group, so this challenges

were anticipated. In anticipation of this, the researcher gave the class a lesson in group

formation and the stages in the process, which helped them to integrate easier into their

group setting. Another challenge was lack of confidence in-group members. Some

students expressed concern that they would be placed in groups with students who

were less academically inclined. In order to combat this, each student was chosen at

random, and a task assigned to each group. Coaching was done to ensure participation

of all group members. It was expected that some students would've become flustered and in some cases overwhelmed as they were not accustomed to the project-based setting, while some would've taken it in stride. For those who were apprehensive, the benefits of doing assignments in segments was compared to having one final assessment were impressed upon them as a way of making the idea more attractive. The concern that students might've failed was alleviated with the regular intervention of the assigned business education teachers and the researcher to ensure that students were kept on the right track and never lacked support. In this research, the intervention is a cost-effective approach to learning as students are challenged to step outside of the classroom and use resources in their surroundings to help solve a problem.

The literature reviewed for this research employed qualitative, quantitative, and mixed methodology to understand PBA, and all have denoted similar findings in the classroom. Within the context of the chosen school, as noted in Izzah (2021), PBA is effective in ensuring students are well-grounded in the ideology of owning their learning and sharing knowledge with others. This intervention will develop research skills and the ability to think critically and learn within a collaborative space, which is the aim of PBA in education. . To ensure the safety of all participants in this activity, a consent form was issued and all participants thoroughly educated about the plans and processes that would be involved in the research and how their efforts would be collected. No added risk of bodily harm to participants was anticipated, as the study was conducted in a space designated as safe by the government and their school's safety board. This intervention took place at and around the school's premises.

Considerations during Data Collection

The safety of all research stakeholders is paramount in conducting any research that will contribute to the existing body of knowledge (Guldenmund, 2007). This study was no exception to this thinking. No harm came to the participants as a result of the data that was collected. The information collected and analyzed was content required by the school's curriculum and not outside the scope of this outline. This means that all items that the students completed were pre-defined and approved by the relevant board. A prior group completed a similar portfolio and no one was harmed in the process. To avoid any bias coming from the interviews and focus group sessions, all answers were recorded as given by each participant and each question was asked within the context of the research. No external discussions or comments were made. If the researcher was unclear on a response, the participant was asked to clarify and this was recorded. This removed the likelihood of the researcher influencing the responses provided.

Considerations of Researcher Bias

A researcher's bias must be avoided, especially in qualitative research to ensure credibility. Mantzoukas (2005) noted that for research to appear unbiased, the researcher must employ a series of techniques to ensure that this is done. In this research bias was avoided by using multiple sources of data in order to triangulate and to aid in the coding process. Having the participants read the transcribed interviews for accuracy of spoken words was also used to avoid researcher bias.

Gentzkow and Shapiro (2014) noted that another way to avoid researcher bias is to use multiple ways of coding the data. If there is some consistency across analysis,

then the information appears true. In the case of this research, the information was shared with two other researchers for coding without any context, then all results collected and analyzed. This eliminated all bias from the process.

Another layer of security that was applied, was to have the stakeholders review the interpretation to ensure it aligned with their thoughts. McDonald et al. (2013) noted that when you ask individuals who gave the information whether your understandings appear to be illustrative of their convictions. They will be able to say if this aligns and then, you will be able to make changes accordingly.

The researcher has no personal relationships with any of the students who participated in the intervention. This removed the bias of familiarity with the students and their behavior. This did not come up in the interview and focus group sessions as all participants were asked to answer the questions based on their understanding and all needed clarifications were recorded. The researcher was keen not to influence any response as questions were asked directly and be recorded as evidence.

Finally, the information was triangulated with previous portfolios developed by past students from the previous year. This showed what was done, and highlighted the level of teamwork and critical thinking that was involved in the process. Kasinath and Armstrong (2007) noted that on the off chance that you can find different wellsprings of information that help your translations, then, at that point, you can have more certainty that what you've found is genuine.

In summary, bias was avoided by using multiple sources for coding, asking stakeholders to validate interpretation, and triangulating the information with

previous year's students' portfolios for confirmation. This ensured that the validity and integrity of the information was maintained.

Summary

In summary, the purpose of this research was to understand the influence of PBA on students' critical thinking and collaborative skills in a grade 11 business education classroom. The total population for this survey was 20 participants, students, teachers, and administrators at the selected school. The selected intervention plan was as a result of the development of a long-term business plan that eventually became a business set-up within the school. This intervention lasted for six weeks ending in a terminal presentation at week six. Information was collected from the portfolios, interviews, and focus group sessions.

The researcher obtained permission from the school and the other stakeholders involved in the process through the use of consent forms. Parents were required to sign consent forms to indicate that they were interested in having data collected and analyzed for their child/ward. The data collection drive will span over six weeks with each week dedicated to different activities.

Finally, anonymity and confidentiality was practiced in this research through the use of informed consent and people having the ability to not be included in the study. Bias was removed from the research using multiple coding, asking participants to review findings, the researcher not having any prior knowledge of the new grade 11 business education class, and triangulate responses with previous work done by other students. This ensured that all information collected, solely reflected the thoughts and desires of the stakeholders to see the true influence of PBA in the classroom.

DATA ANALYSIS AND RESULTS

In this section the information collected from the research participants will be presented using a thematic approach. A thematic analysis as note in Clarke et al. (2015) is the analysis of information collected qualitatively using techniques such as interviews, focus group setting to analyze patters within data. The interviews and focus group information will be combined using a tabular format to frame the different themes that that were developed from each research question. The will show the major and minor themes that were derived from each session.

Data Analysis Procedure

To ensure that credible information was garnered, the data was captured in isolated interview session with each member of the business education class as well as each teacher and administrative staff that provided assistance to each student. After each interview, the information was then analyzed individually to uncover the patters in each and later on compared as a whole to identify similarities. For the focus group session, each group was interviewed separately and each response analyzed individually and then compared for similarities. This process ensured that no student or group would be exposed to the answer of the other group which could impact their responses. The data from the previous group's course work were reviewed as a group to see the quality of the project and to identify the similarities in scoring, responses, and errors. This was also tabulated for a clearer visibility of the results and to identify the teams present in the work. The overall responses from the interview, focus group sessions, and previous work done by students were then analyzed and used to answer the central questions from this research.

Validity and Reliability

In a qualitative research, it is especially important that the information that is collected is seen as viable and reliable. To ensure that this was the case, the researcher separated all participants and did individual interviews that were recorded and transcribed. This ensured that the participant's responses were credible as they were communicated. The same was done for the focus group setting where each group was isolated and their responses captured via recording and transcribed. This allowed the researcher to capture and analyses their information in its true state and this also avoided any researcher's bias. Moreover, triangulation was used to increase credibility and to substantiate findings. For the projects that were done by the previous grade 11 class, the top, middle, and lowest assignments were collected and analyzed. The researcher in the presence of the school's leadership selected these assignments to ensure that all levels of the assignments were analyzed. With this approach, no bias was involved in the collection of the data and in the analysis to derive the findings.

Results

The responses in this research will be presented using thematic tables. Interviews, focus groups, and the analysis of previous assignments will be presented using the thematic table. Table 1 and table 2 outline the questions asked or indicators that were observed, a summary of the responses and observations, the sub-themes and main themes that were derived from each of the indicators that were observed. Each table was further developed by describing the details and conclusion on the overall themes that were developed.

Descriptive Findings

Table 2: *showing Thematic Table: Interviews of Students*

	Interview Questions	Summary of Responses	Sub-Themes	Main Theme
1	Describe how you feel about working in a group with other students in your class on a project.	*Hesitant about working with people on my final assignment. *Open to the idea but I have to be the lead. * Like the idea as I sometimes struggle with some tasks. * Okay with it. I can work by myself or with a team if they are open to it. * Don't feel comfortable with this idea. * Is there another option? I want to graduate. So, if I have to do it, let's do it.	* Some level of hesitation about group work and final assignments. * Concern about the quality of the outcome of a group assignment.	* Hesitation to work in a group.
2	Tell me about a time when you worked in a group on an assignment, how did that impact your thinking, and how you interact with your groupmates?	* Had a good group. I came out understanding better because we shared information. * Some of the group members were selfish and I only learned what I did. * Most of the group members were not active in the group chat. Don't think this made be better at thinking or group work. * My group came together at the end. This made me wanting to do more group work.	* Some level of thinking was developed but not much. * Group dynamics were missing. * Little to no impact on overall thinking.	* Little development in thinking and group dynamics.
3	What do you think you and your group members could have done to improve the interaction?	* Be willing to help others in the group. * Communicate more * Made more time for the assignments and group interaction.	* Group members needed to communicate more and being helpful	* Communication and willingness to help.
4	What do you think are some of your areas of opportunities as it relates to working in a group that you could work on?	* Need to get better internet to talk more in the group. *Need to learn how to show people what I am thinking. * Manage my emotions more.	* Confidence in speaking * Emotional intelligence	* Lack of confidence and emotions.

Table 2 outlined the questions that were asked to each student in their individual interview sessions. From the recording it shows that many students are hesitating with participating in group work activities. The major team that was unearthed as it relates to critical thinking and group dynamics shows that little to no development were observed and students did not care much for team building. It was also noted that communication was a concern that came out of a lack of confidence and emotional development.

Table 3: *showing Thematic Table: Interviews of Teachers and Administrative*

Staff

	Interview Questions	Summary of Responses	Sub-Themes	Main Theme
1	Since working with these students, how are they working in a group setting? Have you seen any improvements in critical thinking, or their ability to work as a team?	* Some students have taken a liking to group work. They are working better than the previous groups did. * Some students are still struggling because of external factors to fit in. * Some students have shown deeper thinking and the share this with their groups. * Some students find it hard to integrate into the groups and as such they struggle.	* Some level of improvement in thinking and group dynamics. * Hesitation in doing group work. * Some students still struggle with group assignments.	* Some level of development in thinking and team building skills.
2	What are some opportunities you think might come out of this assignment and how do you think this could be addressed on a team and individual level?	* More group involvement in assignments could help with group building skills. * More group assignments that involves group thinking and presentations. * Keeping groups consistent for the year and more group activities that requires more presentations.	* More group work with more presentations. * Maintain one group for the school year.	* Maintain groups for the year with more assignments and presentations.
3	Do you believe that random grouping is most effective? Why or why not?	* Random grouping does not work as students needs to be grouped based on similarities. * Random grouping is good as this is how the working world works. * Random groups are good and bad but the teacher determines this. * Random grouping is effective if properly done and groups are made aware beforehand.	Random grouping is good as it mimics the real world.	Random grouping is effective.
4	What do you hope to gain from this experience	* A deeper understanding of how I can implement group work in the classroom to make it more effective. * Better thinking students who are not afraid of team work. * Critical thinkers * Team players.	* Critical thinkers * Team players * A way to implement group work to develop students.	* Critical thinkers with people skills.

Table 3 outlines the questions that were asked to the teachers and administrative

staff who engage with the students on a daily basis. From the discussion, it was noted

that some level of critical thinking and teambuilding skill would come of the group

exercise. They believed that maintaining the groups all year would be more beneficial

than changing the groups per activities. They also noted that groups that are formed

using randomization is more effective and from the group activities they hope to develop

critical thinkers who are capable of working in a group. The theme that resonated with

from this session is that PBA is an effective way to test for competency as it creates

critical thinkers and team-players.

Table 4: *showing Thematic Table: Focus Groups Session*

	Interview Questions	Summary of Responses	Sub-Themes	Main Theme
1	Describe what working in a group means to you collectively?	* People working together on an assignment. * People working as a team to complete a task.	* Group of people working together.	* Group of people acting as one.
2	What are some of the things you hope to achieve out of this assignment in terms of skills (people, thinking, collaboration)?	* Getting the highest grade and learning to work with people. * Passing the assigment and being able to do my part properly. * Working with my classmates to complete the assignment as a group and to be able to think better. * Managing my time to complete my part and to help my classmates understand any challenges we might face.	* Passing the course. * Develop my thinking skills. * Developing my skills working with people.	* Passing the course while thinking critically and working as a team.
3	Do you have any reservations about the group that you are in and how do you plan on working together as a team?	* I am okay with the group though I would rather my friends in my group. * I would would have prefered a group I selected but I will have to work with this one. * The group is fine as long as they pull their weight. * I would rather do the assignment on my own.	* Would rather a group with friends but will have to work with this one. * More independent work would be preferred.	* Rather working with friends but will just have to make this group work.
4	How will each group member be held accountable for their assignment contribution?	* Time lines will be set. * Each group member will have to add to the final document. * Report to teacher if when a member is not participating. * Removing member from group who is not participating after two reports.	* Timelines and reporting to teacher for removal.	* Timelines and reporting to teacher for removal.
5	How will you assign roles to different group members?	* Randomization - pick your role from a bag. * Self assignment and randomization	* Randomization	* Randomization

Table 4 shows the questions that were asked to each group within the focused group session. The major themes that came out of the sessions were that group work means people acting as one. Students are hoping to pass the course and become critical thinkers who are capable of working in a team. Some rather have their friends in their groups but they have to work with the group. People will be held accountable with

timelines and reporting to teacher and responsibilities in the group will be assigned

randomly.

Table 5: showing Thematic Table: Overall Observation of the Past Group

Projects

	Performance Criteria Observed	Observation (Teacher Feedback in Portfolio)
1	Section One: Portfolio Entry One – Industry and Competitor Analysis	* Industry analysis needed more work as they lack reference to current market information. * SWOT analysis needed to reflect more of the opportunities that the current busiiness will have. The threates highlighted are opprtunities. * The Jamaican landscape was not fully developed. * All sections within this segment was written on.
2	Section Two: Portfolio Entry Two – Writing the Business Plan	* The plan was organized and showed effort make from section one. * More information needed on the sales and marketing strategy. * Location justification needed more information to show why the site would be ideal for the physical location of the business. * Assignment needed to be proofread before submitting.
3	Section Three: Portfolio Entry Three – Presentation of Business Plan and Critical Reflection on Assignment	* The group presentation shows disconnect which was further developed in the reflection. Group member noted problems with other group members and the challenges they faced while compiling and preparing for the presentation. * Participants were not able to answer some questions from the judges/investors on their proposed plan.

From the previous classes' portfolio, table 5 showed that in section one, all

groups had a challenge conducting the industry analysis. Especially the SWOT analysis

where opportunities were listed as threats and not enough opportunities were noted

based on the business plan. More development into the idea was required. In section

two, the assignments were organized but needed to be proofread before submission.

Some groups needed to justify their location more and develop on their sales and

marketing strategies. Finally, results show**s** some form of disconnection between group

members in presenting the information and answering questions. This was further

developed by group members in their reflection at the end of the presentation.

Table 6: *showing Thematic Table: Overall Experience with the Group Activity*

	Reflection Questions	Summary of Responses	Sub-Themes	Main Theme
1	How did the assignment impact your thinking skills?	* Deeper appreciation for working as a team on a complex project. * Better able to section tough assignment into simpler sections. * Better able to reflect on my experience and adding it to what I am doing.	* Deeper thinking skills * Able to see tasks as individual units of a whole.	* Deeper level of reasoning.
2	How did the assignment impact your skills working as a group?	* Better able to work with different personalities. * Group makes the tasks easier when people are willing to work. * Better able to lead people.	* Team spirit * Greater ease working in a group. * Leadership skills	* Greater acceptance of team work and team building.
3	Would you engage in another group activity for any other course?	* Yes * Only if it is necessary * Not sure * No	* Not closed off to the idea	* Not closed off to the idea
4	What lessons will you take away from this assignment?	* Understand your group members. * Each member can contribute to the whole to make the task easier. * Be prepared to do my part and help others. * Sometimes you will need to explain your contribution to the group for greater understanding. * Compromise is needed in a group work.	* Group work requires patience and understanding. * Different people understands tasks differently. * Be open to doing more work and helping.	* Each member helps each other.
5	What would you change in your future group?	* Some group members. * My initial view of the group members. * My level of participation	* The group members and initial thoughts	* Group members and prospective.
6	Comment on your overall group members and their contribution.	* Some members were hard to work with. * Some members were willing to help the struggling members. * Some members needed to pull their weight. * Some members were know it alls.	* Know it all group members * Difficult group members.	* Difficult group members makes the proces a bit harder.

Table 6 shows that students stated that they developed a deeper level of thinking and appreciation for working within a team setting. They stated that they are not closed off to the idea of another group work and they believe that each member of the group must be open to helping another. It was also noted that if given the chance to change anything in future group, they would change their group members and their way

of thinking about groups. The dominant comment that came out of the reflection is that difficult group members make the assignments harder.

Table 7: *showing Thematic Table: Overall Observation of the Present Group Projects*

	Performance Criteria Observed	Observation
1	Section One: Portfolio Entry One – Industry and Competitor Analysis	* Industry analysis was well developed and all items were connected. * The SWOT analysis was concise with minor opprtunities to refine threats and opportunities. * Needed proofreading before the submission of section.
2	Section Two: Portfolio Entry Two – Writing the Business Plan	* The plan was organized and showed effort make from section one. * The sales strategy needed more development as it relates to Social Media marketing. * The different sections of the plan flowed into each other with minor wording issues. The general flow was acceptable.
3	Section Three: Portfolio Entry Three – Presentation of Business Plan and Critical Reflection on Assignment	* The group presentations showed each member presenting a portion of the assignment. * It was evident that preparation was made for the presentation. * There were instances where some group members struggled to answer a question but the general group assisted the member.

Table 7 shows that section one of the assignment was completed properly with the exception of general proofreading that was needed before submission. Section two shows the short coming identified when the previous groups were developing their business plans.. More proofreading opportunities were identified in this section. Section three shows where the presentations were on point and all group members took part in presenting the information. The presentation also show**s** how the group assisted each other in answering questions that were asked by the potential investors.

DISCUSSION AND CONCLUSION

This section of the research will discuss the findings of the research against the central research questions. In this section the researcher will discuss the outcome or results of the analysis, the themes that were derived from the data collection initiative as well as the implications associated with this research. This will then be concluded with an overall summary of the general findings and the answers to the central research questions.

Outcome Analysis

The aim of this research was to understand how Project-based Assessment would influence the critical thinking and team-building skills of a group of grade 11 business education students at a local high school in Jamaica. The guiding questions that were used in this research were:

1. **How does project-based assessment influence the critical thinking skills of grade 11 students in business education over six weeks?**

2. **How does project-based assessment influence the teambuilding skills of grade 11 students in business education over six weeks?**

Throughout the research exercise, there were a number of instances where students voiced how they feel about working in a group as well as the outcome of their final project has produced a number of themes that allowed the researcher to understand the central research questions. The first interview sessions that were done was aimed at understanding how each student who will be participating in the assessment felt about group work, their history with group work, how they from history would improve approach to group work and what are some of the opportunities they

noticed working on a group has and how this could be improved. The themes emerged from this session showed that most students have hesitations working in a group, the feel that little improvement would happen as a result of their interaction in the group. They also noted that they are willing to work on their confidence and their ability to help their group members and also to work on their confidence and their emotions when working as a group. Analyzing the findings of the focus group session, some of the themes that came out of the questioning were that group member believe that working together means they act as one, they believe that as a group they are able to pass the course while thinking critically and building on their team spirit, some rather working with their friends but are willing to make the adjustments. They noted that they rather groups be done in a random format and if a member is not pulling their weight, they would report this and have the teacher remove them from the group in a timely manner. The researcher also captured the thoughts of the administrators and teachers who worked with the students to understand what they were hoping to achieve from this activity. They noted that they hope students will develop some level of thinking and team building spirit. They hope that groups would be maintained for more than the six weeks to get a deeper understanding of the students in their group in a classroom setting. The theme of random grouping also came out of the session similar to what was gathered in the focus group with students and that the end goal of this activity would be critical thinkers.

The focus group, interviews, and session with administrator has provided three common themes. They are, groups' needs to be done randomly, groups should be maintained for longer period and students are willing to work as a group. These themes

can cross-referenced with the final reflection from each students and to answer the central research questions. Students noted that from the group activities, they have developed a deeper level of thinking because they were able to bounce their ideas off their group members. This aligns with Sasson et al. (2018) when he noted that using PBA is an easier way to help students develop their critical thinking skills through activities that would require that they think beyond the surface to understand the problem at hand and be able to apply their reasoning to solving problems. In answering question one above, group work is a good tool that can be used to help students develop their critical thinking. This tool allows them to sound these off each other and they are analyzed to find commonalities. Students would have develop a sought after skills as noted in Baglin et al. (2013) who noted that critical thinking is a sought-after skill that modern day workplace and even problems right at home requires.

As it relates to working as groups, some of the themes that emerged from the research that the students now have a greater acceptance of working as a group. This ties in with their critical thinking skills as they were better able to resolve complicated issues as a group. They noted that they are not closed off from the idea, each member helps each other. This aligns with Cho and Brown (2013) noted that students are at first hesitant about doing group work because of trust issues and compatibility. Nguyen (2021) and Danford (2006) reported similarly that when students are challenged with completing complicated assignments in a group, once they go through the stages of grouping, they will be able to produce great information. Students have noted from a theme that as a group, each one helps the other and that going into future group, they

are willing to adjust their prospective and some of their group members as difficult group members make the learning process more challenging.

In terms of the second research question, the findings from the reflective assessment shows that group work is a great tool once the group gets to know each have help them in building their ability to work as a group. This has help the participants in the research to become better.

Finally, when a comparative analysis was done on the assignments completed in this research against the ones from the previous groups, there were some observed improvements. In section one, for the previous assessment it showed that students needed to put more work into their industry analysis and to critically reflect on the Jamaican business landscape. In the current assignment, it showed that the only improvement that was needed was proofreading and making minor adjustments to the SWOT analysis. For section two, in the previous assignment, organization, lack of information, location justification, and proofreading were opportunities identified. For the current assignment, there were no improvements needed. In section three, for the presentation and reflection, in the previous research, there were disconnects in the group presentation and participants had challenges answering questions. For the current presentation, all members participated in the presentation and where one faltered, another member was able to answer the questions.

One limitation to this study was that the assignment was only done over a six weeks period. This only provided surface information based on the activity that was given. There was not information collected over a longer period of time to see the true depth of the students learning.

In summary, students have developed their critical thinking and teambuilding skills as they were able to complete the assignments with little to no reports made to the teachers on group participation. Each group members noted in their reflection that they are open to the idea of more group activities and they would work on their prospective and approach in the next activity.

Implications

From the research, it can be noted that Project-based Assessment is a great way of testing students using complicated assignment over a short or long term period. Some recommendations that were derived as a result of the research is that more activities should be given to students as group activities. This has proven from the research that group activities with clear objectives and guidance is a great way to have students own their learning. This would make the teaching-learning exercise more inclusive of students. Students would be the one who own their learning and be able to create that student-centered learning focus. Another recommendation from the research is to have more groups that last the entire school year. This would allow students to do more tasks as a group and would develop lasting relationships with their group members. This would allow for the teachers to truly see how each group member would grow over a longer period of time. As such, more information could be gathered from the students.

Recommendation for Further Studies

Another interesting area of study would be on the impact of group work on students thinking over a longer period of time. This research would look at how students in the high school setting who are subjected to groups over a two years period would

manage the different problems that would arise. This research would be helpful for teachers at this level to train students on the different ways to resolve conflict within their groups. These skills would allow students to transfer them to the workplace, colleges, or even the home to better resolve conflicts. Studying this would have a big impact on the workplace where there are a lot of young people leaving high schools are employed as it would help them in coaching students to create a harmonious environment.

Implementation Plan

To successfully implement this assessment solution, the school of focus would need to offer this assignment over a one year time span. This strategy would allow the students to be able to do deeper assessment of the Jamaican landscape to identify underpopulated business idea and to develop a revolutionary idea that could disrupt the norm with a new way of doing this. The school will benefit from creating more team players who are at their peak of critical thinking. The groups can be defined a month after the students starts in grade 10 and then they can build on the assignment as they learn the content in and out of class.

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Conclusion

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To summarize the overall research, it was noted that PBA contributes positively to the development of critical thinking and group dynamics in a group of grade 11 business education students. It was noted in the thematic analysis that students appreciate the group building skills they have developed over the six weeks period. They also noted that their level of thinking as a result of the group activity has developed deeper. They now look pass the surface to find the underlined meaning. This

is in line with the findings of Cho and Brown (2013) and Baglin et al. (2013) that PBA is a great way to have students think about problems pragmatically. This will result in critical thinkers over a longer time period. Miller (1990) also noted that through PBA students are challenged to complete tasks through demonstration and as groups this can be done. As noted in the finding, projects are a great way to build thinking long-term. Sasson et al. (2018) and Danford (2006) concluded that group work is an essential part of the working world and teaching students this as early as possible is a good way to prepare them for the working world. This was highlighted in the research as students are not totally against group activities. This is the perfect opportunity to teach people the skills they need to work as a team.

A few gaps in this research notes that the study was done for six-weeks and students were tested using one form of assessment. Therefore, the suggestions is to look at this topic and group formation in the long term to see if the finding in the short-term remains consistent in the long-run. There is also the idea that students might have greater challenge working on different assessments as a group over a longer time. This would be a great way to further understand the topic at hand.

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APPENDIX

APPENDICES I: Interview Questions for Students

1. Describe how you feel about working in a group with other students in your class on a project.

2. Tell me about a time when you worked in a group on an assignment, how did that impact your thinking, and how you interact with your groupmates?

3. What do you think you and your group members could have done to improve the interaction?

4. What do you think are some of your areas of opportunities as it relates to working in a group that you could work on?

APPENDICES II: Focus Group Question

1. Describe what working in a group means to you collectively?

2. What are some of the things you hope to achieve out of this assignment in terms of skills (people, thinking, collaboration)?

3. Do you have any reservations about the group that you are in and how do you plan on working together as a team?

4. How will each group member be held accountable for their assignment contribution?

5. How will you assign roles to different group members?

APPENDICES III: Questions to the Teachers and Administrative Staff

1. Since working with these students, how are they working in a group setting?

   Have you seen any improvements in critical thinking, or their ability to work as a

   team?

2. What are some opportunities you think might come out of this assignment and

   how do you think this could be addressed on a team and individual level?

3. Do you believe that random grouping is most effective? Why or why not?

4. What do you hope to gain from this experience?

APPENDICES IV: PRINCIPAL CONSENT FORM

Executive Summary

The goal of this research is to comprehend how Project-based assessment will influence the critical thinking and team-building skills of students in a grade 11 business education classroom. This research expects to identify the issue of distinguishing a feasible method for assessments for students considering the novel Coronavirus and the progression of information that students have access to while taking assessments online. The research questions that will be answered are how does project-based assessment influences critical thinking in a grade 11 business education classroom and how does project-based assessment influences team-building in a grade 11 business education classroom? Understanding how this technique for evaluation means for these certifiable abilities is significant as they are abilities that are popular in the working world. This research will aid in understanding how this applied research proposition will help the students in dominating key competencies expected at the current grade level.

The population of the study will be 15 students that will be a part of the business education class for the 2022-2023 batch that will be engaging in the summer readiness program slated to start June 13, 2022, which will span six weeks. This research will also seek to solicit feedback from the two teachers who will be facilitating the session and the three administrative staff that assist with the relevant preparation for their end-of-school assessments. This will total of 20 stakeholders for this research activity. The intervention that will be used in this initiative will be the three-part Business Plan portfolio that will work for the readiness program and the information that will be collected will only be the assessments that are given at each block in the process. That

is, the results from the industry and feasibility analysis in block one, the business plan in block two, and the critical reflection in block three. We will also conduct focus groups and short interviews with group members in order to gauge the behavior and feeling each member of the team will be experiencing. We will also use information from the previous group to help with triangulating the information captured in the research for similarities and differences.

In summary, this research will seek to understand the influence of project-based assessment on the development of critical thinking and team-building skills in a grade 11 business education classroom. The proposed intervention activity will be the three-block portfolio that will be prepared by each group and the information that will be collected will be the final results at the end of each block in the process. Interviews and focus sessions will also be done to understand the behavior and feelings form each group member. The research will conclude with a final document that will answer the central questions of how does project-based assessment influences critical thinking in a grade 11 business education classroom and how does project-based assessment influences team-building in a grade 11 business education classroom.

Form: Principal's Consent for Course-based
Applied Research
Project
CIS 280 Research in Education; CIS 280 Final
Research Dissertation
Practice
Atlantic International University

This form serves as a record that the principal/building supervisor where you plan to do your applied research project has been informed of the proposed activity and has given permission for it to happen in her/his school.

Contact Information

Doctoral Student Info:

Name
:

Student ID
#:

Preferred Phone #: Country
Code:

Number:

Email
:

Applied Classroom Research Site Info:

School
Name:

High School in St.
James

Site Address (including country and zip codes): Address in St. James

Description of Proposed Applied Classroom Research (*see below for guidance*)
The Doctoral student should provide the Principal with a copy of the Executive Summary of the proposed project.

Agreement *(to be completed by the building supervisor/principal)*

I,_____, principal/building supervisor of the_____

_____ School(s) understand:

1. the nature of the planned applied classroom research project;

2. that this is a course requirement for the above-named Doctorate student;

3. that the privacy and confidentiality of every staff member and student in the building will be protected;

4. that there will be no requests for data, access to records, or other demands on personnel time other than what has been described in the Executive Summary that was provided to me;

5. that I have the right to stop the project if it goes in a direction to which I have not agreed;

6. that no identifiable student data will be included in the final written report that is submitted to the Doctoral student's Atlantic International University Research Supervisor;

● that the final written report will be the only formal written document prepared about the project and that it is not part of a dissertation requirement, will not be presented at a conference, and will not be published; and

● that I will be given a copy of the final written report.

I hereby give my permission to the above-named Doctorate student to conduct the proposed applied classroom research project in my school(s).

_____   _____
Signature of Principal/Building Supervisor   Date

APPENDICES V: Letter to Parents

March 27, 2022

Dear Parents:

In combination with studies for my Doctorate Degree in Education at the Atlantic International University, I am doing an applied classroom research project on assessing the impact of Project-based assessment and how this influences the critical thinking and team-building skills of students within a grade-eleven classroom. I am doing this to enhance my teaching practices and to explore ways to provide students with more effective and cost-effective learning experiences.

I will be focusing my project on the 15 members of the new Business Education class that will be participating in the summer program aimed at preparing students for their final evaluation at the end of grade 11 in 2023. We will be looking at the Business Plan portfolio that they will be building over the six weeks of the program and as well as taking not of their presentations.

I will be gathering data using interviews and focus sessions weekly as well as using the information from their portfolio at the end of the program to understand how this has impacted their critical thinking and team-building skills. We will also be looking at past assignments from the bath that will be graduating in June in comparison to the ones from the batch with your child. I want to assure you that no identifiable student information will be reported. All student information will be treated as anonymous.

A report on the results of my applied classroom research project will be submitted only to my Course Instructor. The results will not be published in any other manner.

If you have questions regarding this project, please feel free to contact me at 18768555981.

Sincerely,

Tiou Kimar Clarke,

Doctoral Candidate
Atlantic International University