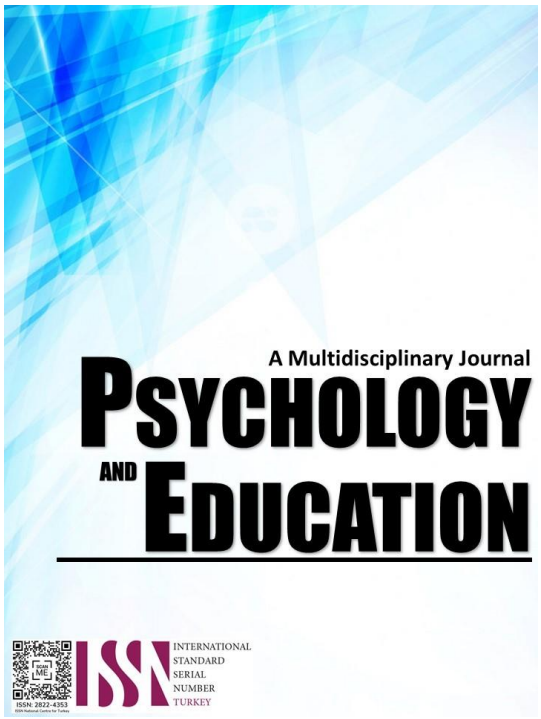
VISUALIZATION TECHNIQUES IN ENHANCING THE LEARNER'S SKILLS PERFORMANCE IN BREAD AND PASTRY PRODUCTION



PSYCHOLOGY AND EDUCATION: A MULTIDISCIPLINARY JOURNAL

2023
Volume: 10
Pages: 511-520
Document ID: 2023PEMJ877
DOI: 10.5281/zenodo.8126228
Manuscript Accepted: 2023-7-7

Psych Educ, 2023, **10**: 511-520, Document ID:2023 PEMJ877, doi:10.5281/zenodo.8126228, ISSN 2822-4353
Research Article

Visualization Techniques in Enhancing the Learner's Skills Performance in Bread and Pastry Production

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Abstract

This study entitled "Visualization Techniques in Enhancing the Learner's Skills Performance in Bread and Pastry Production" aimed to determine the relationship of visualization techniques to students' skills performance in Bread and Pastry Production among Grade 8 students. Specifically, it sought to gather the overall perception of the respondents on application of visualization techniques and its relationship in baking skills performance of the students when it comes to maintaining tools and equipment, using tools and bakery equipment; performing mensuration and calculation, and practicing occupational health and safety procedure. The researcher employed a descriptive correlational type of research.The respondents of the study were the 93 Grade 8 students in Bread and Pastry Production during the school year 2022 – 2023 at Calantas National High School. Self-made questionnaire used in gathering the necessary data and information for the study. Findings of the study reveal that there is a positive relationship between the perception of the respondents on visualization techniques and skills performance of the students in Bread and Pastry Production. There is a significant relationship between the perception of the respondents on visualization techniques and baking skills performance of students in Bread and Pastry Production as regards to the maintenance of tools and equipment. The null hypothesis posited in the study sustained as there is a significant relationship between the perception of the respondents on visualization techniques and skills performance in Bread and Pastry Production. However, the second hypothesis is sustained because there is no significant difference between the respondents and student's skill performance in Bread and Pastry Production when group according to sex.Furthermore, certain recommendations were formulated since visualization techniques and learner's baking skill's performance were found to have a significant relationship. Some of those recommendations are teachers may utilize visualtization techniques when instructing students in Bread and Pastry Production, Students may be exposed to a variety of connected ideas and let them use those ideas in hypothetical or real – world scenarios. Likewise, it is suggested that the teacher makes way to set the mood of the learners and sustain their interest in every activity performed due to his expertise in the utilization of visualization technique.

Keywords: *visualization techniques, baking skills performance, occupational safety and health, visual communication*

Introduction

The implementation of K-12 Curriculum in the Philippines proves that it is more than just adding two more years to high school. The 13 – year educational cycle has numerous beneficial practical effects on education. And one of this is the preparedness for tertiary learning, wherein the students are more equipped to deal with much higher level of learning as they enter college education. Second one is readiness to join the workforce. It helps them to make a choice of their own because they are not compelling to take college after completing Senior High School. And lastly, is skill competency in the global job market. It helps the 21st century learners to improve mathematical, scientific, and linguistic competence. DepED committed to provide higher quality education through tracks to become experts in a subject and develop their talents. K-12 graduates will eventually become globally competitive and will be able to find employment in the competitive job market. As the saying goes, investing in education is the key toward reaching national growth and development.

In Junior High School, Technology and Livelihood Education (TLE) subject has a huge role in the K-12 Curriculum. This subject is popularly known as Jack of all Trades, because of the different skills that are taught and developed in each learner. Technology and Livelihood Education is composed of four (4) components which includes Home Economics (H.E.); Industrial Arts (IA); Agri-Fishery Arts (AFA); and Information and Communication Technology (ICT). The TLE subject, gives the learners basic knowledge and skills, positive values and attitudes towards work. It also strengthens our knowledge that already comes into our society because most of our companies today prefer skilled workers.One integral part of education today is visualization, that deals with the different cognitive activities. By applying visualizations to tough topics in Bread and Pastry Production, it benefits both the students and teachers to cope with the difficult new matter. As well as leading them to profounder understanding.

Through implementing visual learning to students and providing them with the different materials, it helps to

risen their performance in their studies. Expression like "seeing is believes" or "a picture is worth a thousand words" is an example of what visualization in learning really means. The visualization makes it possible for learners to understand and accept complex concepts more simply and readily. (Kamy,2018). The mix of audio and pictures gives perceptions more vitality, which makes e- Learning interesting and successful. (Samuel, 2018). According to Harihan (2014), images, photographs, and videos leave a stronger and long – lasting effect on the brain than just words.Veřmiřovský (2010) asserts that visualization is now a fundamental component of instruction across all educational settings that are linked to cognitive tasks. Obviously, visuals cannot completely replace spoken words, but they do offer benefits to the learning process by attracting listeners, lightening the load on teachers, focusing attention on the essentials of the subject matter, and making the information easier to accept. (Veřmiřovský, 2010; Gutierrez, 2014; Kamy, 2018).By actively employing the words to conjure up images in their minds as they read, students who visualize their reading improve their comprehension of what they are reading. Visualizing text becomes automatic when learners put this ability through more purposeful exercise. Students who envision while reading not only have a richer reading experience but also have greater retention of what they have read. (Harvey & Goudvis 2000). Reading aloud or listening to a text while visualizing it helps readers and listeners form more intimate connections with it. For example, readers who can see the characters they read about could be more engaged in what they are reading. This improves the reading experience and encourages readers to keep reading. Even experienced readers can benefit from practice with this skill, although its frequently linked with educating young readers, visualizing is a talent that can be useful in many other contexts. Start with a text that uses strong verbs and descriptive language to help readers create vivid images when choosing a text for a visualizing activity. Starting with a complete book is not essential, simply one well-written sentence or brief paragraph might for visualizing a lesson. Information visualization which has its roots in study is in human-computer interaction,computer science, graphics, visual design, psychology,and quantitative data analysis, is a potent tool for making sense of this data. (Heer & Shneiderman, 2012).

Research Questions

This study aimed to determine the effect of visualization techniques in enhancing the baking skills of the students. Specifically, it sought to answer the following questions:

1. What is the profile of the Grade 8 students of Calantas National High School in terms of:
   1.1 Age;
   1.2 Sex;
   1.3 Father's Highest Educational Attainment;
   1.4 Mother's Highest Educational Attainment;
   1.5 Father's Occupation;
   1.6 Mother's Occupation; and
   1.7 Monthly Income?
2. How do the respondents perceive the application of Visualization Techniques in Teaching Bread and Pastry Production?
3. What is the level of performance of the respondents in Bread and Pastry Production as to:
   3.1 Maintaining Tools and Equipment;
   3.2 Using Tools and Bakery Equipment;
   3.3 Performing Mensuration and Calculation; and
   3.4 Practicing Occupational Health and Safety Procedure?
4. Is there a significant relationship between the perception of the respondents on the visualization techniques and skills performance in Bread and Pastry Production?
5. Is there a significant difference in the student's skills performance In Bread and Pastry Production when grouped according to sex?

Methodology

Research Design

In gathering pertinent data and information on the questions posited in the study, the researcher employed a descriptive - correlational type of research. Descriptive research is defined as research that investigates human experience through surveys and case studies. Using a correlation study design, two variables are compared. Additionally, descriptive research establishes and records how things are. Descriptive research also establishes and documents how things are. It seeks to determine the answer to what, who, where, and how questions. It determines the nature of the situation as it exists at the time of a study.

Respondents of the Study

The Grade 8 students of Calantas National High School, Macalelon, Quezon for the academic year 2022 – 2023 served as respondents of the study. Purposive sampling is used to determine the

sample size of a population that was taken for this specific study.

Research Instrument

Self-made questionnaire was used in gathering the necessary data and information needed for the study. The items in the questionnaire were based on visualization techniques which were focused on information visualization, knowledge visualization and visual communication which may influence their skills performance in Bread and Pastry Production.To ensure the validity and reliability of the questionnaires, educators who adhere to Technology and Livelihood Education were requested to participate in the validation process. Observations and recommendations made by the validators were also incorporated into the instrument's final design.Part I of the questionnaire deals with the profile of the respondents. Part II consists of varied statements to evaluate the level of application of information visualization, knowledge visualization and visual communication on the enhancement of skills performance of the students in Bread and Pastry Production.

Statistical Treatment of Data

The research applied various statistical formulae in order to analyze the findings of the study. The data gathered were tallied, tabulated and analyzed. Data were treated statistically using the following tools: For descriptive questions percent count, frequency distribution, mean and standard deviation were utilized.Pearson r was used to test the significant relationship between the perception of the respondents on the application of visualization techniques in enhancing the skills performance of students in Bread and Pastry Production, testing its significance at 0.05 level.

Results and Discussion

Table 1 presents the distribution of respondents by age and sex. This table displays that majority of the respondents are aged 13 – 15 years old which sum up to 89 or 95.7% of the respondents, three or 3.2% of the respondents belong to the age group of 10 – 12 years old and one or 1.1% of the respondents belongs to the age grouped of 16 – 17 years old. The statistical data reveal that the highest percentage of age of the respondents is 13 -15 years old.

Table 1. *Distribution of Respondents' Profile as to Age and Sex*

Age	*Frequency*	*Percent*
10 -12	3	3.2
13 - 15	89	95.7
16 -17	1	1.1
Total	93	100
Sex	*Frequency*	*Percent*
Male	51	54.8
Female	42	45.2
Total	93	100

The statistical data reveal that the age of majority of the respondents ranges from 13 – 15 years old. According to Webster Dictionary "Age is the time of life at which some particular qualification, power, or capacity arises or rests". As can be seen from this table, there are 51 male and 42 female respondents.

Table 2. *Distribution of Respondents' Parent's Educational Attainment*

Educational Attainment	*Frequency Father's*	*Percent*	*Frequency Mother's*	*Percent*
Elementary School Graduate	27	29.0	13	14.0
Elementary School Undergraduate	11	11.8	12	12.9
High School Graduate	31	33.3	39	41.9
High School Undergraduate	21	22.6	21	22.6
College Graduate	2	2.2	7	7.5
Master's Degree Graduate	1	1.1	1	1.1
Others	-	-	-	-
Total	93	100	93	100

The data presented in Table 3 shown the respondents parent's highest educational attainment. In terms of father's highest educational attainment, most of them are high school graduates with the frequency of 31 or 33.3% out of the total population of respondents. Only one of the respondents is mastered degree graduate. This further shows that they prefer to look for a job after they finished their high school than to pursue to get a college degree.

The table also shows the data of the respondents in terms of mother's highest educational attainment. It can be noted that most of them are high school graduates with the frequency of 39 or 41.9% out of 42 respondents. Furthermore, only one or 1.1% of the total population got their master's degree holder. This implies that their main goal is to look for a job after they finished their high school schooling or they cannot sustain their daily expenses with regard to their studies due to some reasons.

Table 3. *Distribution of Respondents' Parent's Occupation*

Occupation	*Frequency Father's*	*Percent*	*Frequency Mother's*	*Percent*
Employed	31	33.3	23	24.7
Self-Employed	28	30.1	25	26.9
Unemployed	34	36.6	45	48.4

Presented in Table 3 is the distribution of respondents parent's occupation. Results reveal, that most of the respondents' father's are unemployed with a frequency of 34 or 36.6% out of 93 Father's. On the other hand, self -employed got the lowest frequency of 28 or 30.1%.

According to the study, the causes for unemployment is the high population growth rate wherein there is a huge supply of graduates finding themselves unemployed. Another one is over production of labour force and inability to take on available jobs.

While the respondents mother's are mostly unemployed with the frequency of 45 or 48.4% out of the 93 Mother's. Nevertheless, employed got the lowest frequency of 23 or 24.7% of the total population of the respondents. Generally, one of the causes of unemployment for women is their domestic responsibilities which allow them to stay at home and look after the family needs.

Table 4. *Distribution of Respondents' Parent's Monthly Income*

Monthly Income	*Frequency*	*Percent*
Less than Php 10,000	82	88.2
Php 10,001 to 20,000	8	8.6
Php 20,001 to 30,000	1	1.1
Php 30,001 to 40,000	-	-
Php 40,001 to 50,000	-	-
Php 50,001 and above	2	2.2
Total	93	100

The data presented in Table 5 show the respondents' parent's monthly income. Data reveal it is obviously revealed that majority of the respondents family earned an income ranging 10,000.00 pesos and below. It has a frequency of 82 or 88.2 % out of the total percentage of 100%. However, there are only two respondents family who earn an income ranging 50,001.00 pesos and above or 2.2% of the total population of the respondents.

According to The latest "Family Income and Expenditure Survey" (FIES) of the National Statistical Coordination Board (NSCB) information about income classes in the country. The middle income class is said to earn an average of P36,934 per month while the low income segment earns an average of P7,000 per month. According to Gökhan POLAT (2011), family income is one of the important factors that determine to some extent the duration that the child participates in education.

Table 5. *Perception of the Level of Application of Visualization Techniques in Teaching Bread and Pastry Production in Terms of Knowledge Visualization*

Indicators	*Mean*	*SD*	*VI*
provide exercises that transform basic concepts into graphical or any visual presentation.	4.65	.503	Highly Manifested
allows us to explain in our own understanding the context of the lessons presented.	4.59	.576	Highly Manifested
exposed us to various interrelated concepts and allow us to apply them in a given situation.	4.34	.744	Manifested
presents topics through data/ graphics presentation and required us to explains what the data/graphs tell.	4.29	.746	Manifested
uses colorful visual materials to highlights important information of the lessons	4.47	.701	Manifested
uses charts for data presentation with clear and impressive text and label.	4.31	.766	Manifested
makes teaching –learning enjoyable through visual presentation and other visual means.	4.52	.746	Highly Manifested
integrates the use of visual communication media in the following stages of teaching-learning process namely: exploration, analysis, synthesis and presentation.	4.55	.668	Highly Manifested

uses chart or graphs to explain the step/process involved in doing laboratory activities and show details in context to ensure mastery level.	4.47	.716	Manifested
challenges us in presenting our output with utmost considerations of the given	4.40	.662	Manifested
create and employed assessment materials which contains illustrations, graphics design and others to make us more engaged in the examination	4.39	.676	Manifested
posted signs and symbols to properly guide the students on the do's and don'ts in the classroom.	4.54	.635	Highly Manifested
uses strategies that connects our conceptual knowledge to visual presentation/application.	4.35	.761	Manifested
displays classroom rules, policies, and safety regulations through charts, graphs, and other visual materials.	4.63	.547	Highly Manifested
see to it that we are inspired to learn through the use of visual communication	4.42	.697	Manifested
sets our mood to learn and sustained our engagement in every activity due to his/her expertise in the utilization of visualization techniques.	4.39	.723	Manifested
sets conducive classroom environment by posting pictures/ sceneries, words of wisdom and the likes that will makes learning easier and better.	4.35	.732	Manifested
tests our ability to comprehend the message being conveyed of the visual materials used in the lesson.	4.51	.670	Highly Manifested
includes images, graphs, videos and other forms of visual communication media in the assessment process to make the test appear easier	4.43	.728	Manifested
presents flow charts and similar visual communication media to show the proper steps to follow in doing practical tasks.	4.57	.615	Highly Manifested
Overall	4.46	.388	Manifested

Legend: 1.0-1.49 (Less Manifested); 1.50-2.49 (Rarely Manifested); 2.50-3.49 (Moderately Manifested); 3.50-4.49 (Manifested); 4.50-5.0 (Highly Manifested).

Presented in Table 6 is the perceived level of the application of Visualization Techniques in Teaching Bread and Pastry Production in terms of knowledge visualization. Statement number 1 "Provide exercises that transform basic concepts into graphical or any visual presentation got the highest mean of 4.65 and an SD 0.503 with interpretation highly manifested".

On the other hand, indicator 4 "Presents topics through data/ graphics presentation and required us to explains what the data/graphs tell got the lowest mean of 4.29 and an SD .746 with an interpretation manifested". It implies that students have some difficulties in interpreting a given data or graphic presentation that's why they cannot explain well what are those data is all about.

The table shows the results of the overall mean of 4.46 and an SD 0.388 with an interpretation "Manifested", it implies that the students recognized the application of visualization techniques in teaching Bread and Pastry Production. Consequently, students find it not unusual to do interpretation of a given data or graphs. Most of the time the data given includes information of what is all about.

The Visualization Technique module in Ken Brodlie's 1992 book Scientific Visualization is in charge of creating and modifying a graphic representation from a collection of data to enable user-interactive research. This book has previously made clear that visualization in science and engineering is much more than just graphic representation. It entails developing awareness and comprehension of the solution process. Because of this, visualization is fundamentally application-dependent, and many approaches are only useful in specific situations.

Table 6. *Level of Skills Performance of the Students In Bread And Pastry Production as to Maintaining Tools And Equipment*

Score	*Performance Descriptors*	*Frequency*	*Percent*
20 - 25	Advanced	19	20.43
15 - 19	Proficient	42	45.16
10 – 14	Approaching	29	31.18
5 - 9	Developing Proficiency	3	3.22
0 - 4	Beginning	-	-
	Total	93	100

The data presented in Table 7 show the level of skills performance of the respondents in Bread and Pastry Production as to Maintaining Tools and Equipment. It is obviously revealed that most of the respondents have proficient performance with a range of scores from 15 - 19. It has a frequency of 42 and a percentage of 45.16. However, the lowest frequency of the respondents' performance is 3 which is categorized in Developing Proficiency with a range of scores of 5 – 9. It has a percentage of 3.22 out of the total percentage of 100.

Results show, that most of the respondents has an

enough knowledge about maintaining tools and equipment which is reflected in the scores they've got. This can be the results of the used of visualization techniques that the teacher applies during the discussion of those related topics, to Bread and Pastry Production.

Table 7. *Level of Skills Performance of the Students In Bread And Pastry Production as to Using Tools and Bakery Equipment*

Score	*Performance*	*Frequency*	*Percent*
20 - 25	Advanced	93	100
15 - 19	Proficient	-	-
10 – 14	Approaching	-	-
5 - 9	Developing Proficiency	-	-
0 - 4	Beginning	-	-
	Total	93	100

The level of skills performance of the respondents in Bread and Pastry Production in terms of using tools and bakery equipment is shown in the table above. As the results reveal, all the respondents are in the advanced level with a frequency of 93 with a range of scores from 20 -25 and a percentage of 100 which comprises the total percentage of the student population.

It can be inferred that teacher and students work collaboratively, through the visualization techniques that the teacher applies in her teaching strategy. Most of our learners today are all visual learners. Of course, visuals cannot replace the spoken words, but carry advantages into the learning process by attracting listeners; reducing the burden of teachers; attending the concentration of the essence of content; and facilitating the acceptance of given information (Veřmiřovský, 2010; Gutierrez, 2014; Kamy, 2018). As a result the respondents understand very well the lessons. and it has been reflected in their skills performance which is in the advanced level.

Table 8. *Level of Skills Performance of the Students In Bread And Pastry Production as to Performing Mensuration and Calculation*

Score	*Performance*	*Frequency*	*Percent*
20 - 25	Advanced	93	100
15 - 19	Proficient	-	-
10 – 14	Approaching	-	-
5 - 9	Developing Proficiency	-	-
0 - 4	Beginning	-	-
	Total	93	100

Presented in Table 9 is the level of skills performance of the students in Bread and Pastry Production in terms of performing mensuration and calculation. The statistical data reveal that all of the respondents are in the advanced category with a frequency of 93 with a range of scores from 20 -25 and a percentage of 100.

Findings show, through implementing visual learning to students and providing them with the different materials. It helps to level up their performance in their studies. Learners can more readily understand and embrace challenging concepts when they are simplified through visualization approaches (Kamy, 2018). Furthermore, the students have evidently apply what they learn with the help of visualization techniques in performing psychomotor activity most especially in mensuration and calculation.

Table 9. *Level of Skills Performance of the Students In Bread And Pastry Production as to Practicing Occupational Health and Safety Procedure*

Score	*Performance*	*Frequency*	*Percent*
20 - 25	Advanced	93	100
15 - 19	Proficient	-	-
10 – 14	Approaching	-	-
5 - 9	Developing Proficiency	-	-
0 - 4	Beginning	-	-
	Total	93	100

The data presented in Table 9 show the level of performance of the students in Bread and Pastry Production as to Practicing Occupational Health and Safety Procedure. It is revealed that the performance of all of the students is categorized in the advanced level. They got the frequency of 93 with a range of scores from 20 -25 and a percentage of 100. The said percentage comprises the total population of the students in Grade 8 curriculum.

One integral part of education today is visualization, that deals with the different psychomotor activities. By applying visualization techniques on topics in Bread and Pastry Production, both the students and teachers are able to cope with the difficult subject matter.

Samuel (2018) claims that combining audio and pictures gives perceptions more vitality and increases the effectiveness and engagement of e-learning. And that is evidently seen in this table, when the students apply what they have learned in practicing occupational health and safety procedure.

Table 10. *Summary Table on the Level of Skills Performance of the Students In Bread And Pastry Production*

Indicators	*Score*	*Performance*	*Frequency*	*Percent*
Maintenance of Tools and Equipment	20 - 25	Advanced	19	20.43
Use of Tools and Bakery Equipment	15 - 19	Proficient	42	45.16
	10 – 14	Approaching Proficiency	29	31.18
	5 – 9	Developing	3	3.22
	20 - 25	Advanced	93	100
Performance of Mensuration and Calculation	20 – 25	Advanced	93	100
Practice of Occupational Health and Safety Procedure	20 - 25	Advanced	93	100
		Total	93	100

Presented in Table 10 is the summary table on the level of skills performance of the students in Bread and Pastry Production. It is obviously revelead that most of the respondents have advanced performance with a range of scores from 20 -25 in terms of their skill performance in use of tools and bakery equipment, performance of mensuration and calculation, and practice of occupational health and safety procedure. It has a frequency of 93 and a percentage of 100.

On the other hand, the skills performance of the respondents in terms of maintaining tools and equipment is proficient performance with a range scores from 15 – 19. It has a frequency of 42 and a percentage of 45.16.

Results show that most of the respondents learned very well about their lessons in Bread and Pastry Production which is reflected in the scores they've got. This can be the results of the use of visualization techniques that the teacher applies during the discussion of those topics related to Bread and Pastry Production which includes actual demonstration, familiarization of different tools and equipment and used of different videos and models.

Table 11. *Correlation Between The Perceived Level of Application of Visualization Techniques and Skills Performance in Bread And Pastry Production*

	Baking Skills Performance			
Visualization Techniques	*MTE*	*UTBE*	*PMC*	*POHSP*
	.446**	-	-	-

The data in Table 11 show a positive relationship between the perceived level of application of visualization techniques and that of the skills performance in Bread and Pastry Production.

According to the study's findings, there may be a substantial association between the maintenance of tools and equipment and visualization techniques in Bread and Pastry Production. The moderate correlation of 0.446 indicates that there is a positive relationship between these two variables, and that an increase in one variable are related to increases in the other. This implies that if the tools and equipment are well – maintained, it can improve the application and effectiveness of visualization techniques.

Visualization techniques play a vital role in the field of bread and pastry production as they aid in understanding complex concepts and procedures (Purlis et al., 2021). Visualization techniques involve the use of diagrams, pictures, videos, and other visual aids to convey information in a clear and concise manner. In Bread and Pastry Production, visualization techniques can help students better understand the steps involved in the process of baking and pastry making.

Through visualization techniques, students can easily grasp the different steps involved in the production of bread and pastry, including the mixing of ingredients, dough preparation, shaping, baking, and decorating (Morris, 2016). The use of visual aids such as videos and images can also help in demonstrating the tehniques used in producing different types of bread and pastry.

Furthermore, the study suggests that proper training and interventions can improve the baking skills performance of the respondents with regards to the maintenance of tools and equipment. This result suggests that there is a requirement for continuous training and development programs for students to further enhance their skills in bread and pastry production (Olakanmi et al., 2023). The use of effective visualization techniques by teaachers can also

help in facilitating skill retention among students, as it can aid in their comprehension and understanding of complex concepts and procedures.

Visualization techniques play a crucial role in analyzing, exploring, discovering, illustrating, and communicating information in a well-understandable form. Therefore, it is important for teachers and students to utilize these techniques in order to improve their skills and knowledge in bread and pastry production. The findings of this study emphasize the importance of maintaining tools and equipment, proper training and interventions, and the use of effective visualization techniques in enhancing the skills and knowledge of students in bread and pastry production.

Table 12. *Significant Difference in the Student's Skills Performance in Bread And Pastry When Grouped According to Sex*

Student's Skills Performance	*Gender*	*Mean*	*SD*	*t-test for Equality of Means*		
				t	*df*	*Sig. (2-tailed)*
Maintaining	Male	15.73	3.87	-1.777	91	.079
	Female	17.10	3.48			
Using	Male	24.12	1.93	0.4555	91	.650
	Female	23.93	2.08			
Performing	Male	24.12	1.93	0.4555	91	.650
	Female	23.93	2.08			
Practicing	Male	25.00	.000[a]			
	Female	25.00	.000[a]			
Percentage Score	Male	88.96	5.30	-0.926	91	.357
	Female	89.95	4.94			

Legend: M – Male; F - Female

The data presented in Table 12 suggests that there is no significant difference between the perception of male and female students on visualization techniques and their performance in Bread and Pastry Production. The finding implies that the use of visualization techniques can provide equal opportunities for both male and female students to succeed in their tasks.

The absence of a significant difference in the perception and performance of male and female students on visualization techniques and bread and pastry indicates that both genders are equally capable of learning and excelling in thie field. The finding has important implications for the culinary industry, which has a traditionally been a male-dominated field (Gold et al., 2018).

The lack of gender differences in the effectives of visualization techniques suggests that there may be no inherent differences in the learning abilities of males and females in this field. This finding contradicts gender stereotypes that have long persisted in the culinary industry and other fields, which often depict males as more capable in hands-on tasks and females as more skilled in tasks requiring attention to detail (Fonseca et al., 2014).

The use of visualization techniques can also contribute to breaking down gender streotypes by promoting the idea that both males and females can excel in bread and pastry production (Yashima et al., 2017). By providing equal opportunities for both genders to learn and improve their skills, the culinary industry can become more inclusive and diverse.

Moreover, gender equality in the culinary industry can have a significant economic benefits, as a more diverse workforce can lead to increaased creativity and innovation, improved customer service, and increased profitability (Katsioloudis et al.,2014). Therefore, the findings of this study emphasize the importance of promoting gender equality in the culinary industry through the use of effective teaching and learning methods such as visualization techniques.

In conclusion, the absence of a significant difference between the perception and performance of male and female students on visualization techniques and bread and pastry production suggests that both genders have an equal opportunity to excel in this field. The use of visualization techniques can help promote gender equality in the culinary industry by providing equal opportunities for both genders to learn and improve their skills.

Conclusion

From the findings of the study, the hypothesis is sustained as there is a significant relationship between the perception of the respondents on visualization techniques and skills performance in Bread and Pastry Production.
There is no significant difference in the respondents' perception on visualization techniques and that of the students' skills performance when grouped according to sex.Thus, the hypothesis posited is sustained.

The study highly recommends the following based on the findings and conclusions drawn: (1) To make teaching and learning more fun, teachers may utilize visualization teachniques when instructing students in Bread and Pastry Production. These technique includes knowledge visualization, information visualization and visual communication. Teachers may introduce a variety of connected ideas and let students use those

ideas in hypothetical or real- world scenarios. It is necessary that teacher makes way to set the mood of the learners and sustain their engagement in every activity in the utilization of visualization teachniques.Teachers may develop and use assessment materials for the learners that include images, graphics design, and other elements to keep them intersted in the examination. To guarantee that they obtain current information and skills in their field of expertise, Technology and Livelihood Education teachers may participate in skills development training on Baking and Bread and Pastry Production.(2)Likewise, it is recommended that the advanced level may be attained by students or more likely achieved a high grade by introducing new motivational strategies or utilizing the different visualization techniques. (3)Students may receive suitable coaching and training in their baking abilities from their mentors. Future researchers may conduct related studies on areas other than TLE for enhancement and improvement.

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