

Bread and Pastry Production Laboratory Resources of Selected HEIs in Camarines Sur, Philippines

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Abstract –This study assessed the status of available Bread and Pastry Production (BPP) laboratory facilities in select Higher Education Institutions (HEI's) in the province, based on the BPP Training Regulation requirements of the office of Technical Education and Skills Development Authority (TESDA), evaluated the laboratory environment most preferred in the acquisition of learning by BPP students, and analyzed the relationship between the availability of laboratory resources and the National Certificate-II result of Bread and Pastry Production. Adopting the descriptive method, questionnaires were administered to randomly selected respondents. Results showed that most of the training centers were able to meet and satisfactorily complied with TESDA's regulations and were able to achieve a 100% passing result during its national assessment. The results further proved that both traditional learning and the availability of laboratory resources are integral components vis-à-vis competencies required in the National Certification standards. On this basis, it is recommended that online delivery of learning may also be adopted by institutions to acquaint and allow students to appreciate the off-campus experience especially in this time of global pandemic. It is further recommended that training centers of higher education institutions must initiate these changes of strengthening and supporting TESDA's program by encouraging its beneficiaries to take online technical-vocational courses so as to develop self-sustaining and self-sufficient individuals in the 'new normal'.

Keywords –Bread and Pastry Production, Laboratory Resources, Learning Environment, National Certificate

INTRODUCTION

Bread and Pastry Production is the fourth most in-demand technical-vocational course preferred by students, based on the 2017 survey done by TESDA on the Top 10 Most Aailed Courses by Sex: 2014-2016. This course is popular among those who plans to take short courses or those who wants to work immediately. [1]. Bread and Pastry Production-National Certificate II (BPP-NCII) is a Technical Education and Skills Development Authority (TESDA)-regulated technical-vocational program that aims to develop the skills of students in the production of baked breads and other pastry products and help them acquire competencies which will increase employability chances in the future. [2].

For a successful BPP assessment, it is imperative that the basic concepts of bread and pastry production be meticulously taught and laboratory venues be adequately equipped with the required facilities and equipment. In the case of TESDA-Region 7 with their limited funds for the improvement of their training facilities and for the purchase of new tools and equipment [3], it is highly

suggested that the necessary resources should be provided to ensure success during the training and assessment phase as it is always believed that constant laboratory practice leads to increased proficiency in what the learners acquire during classroom interaction [4]. Researchers found a positive correlation between quality of laboratory facilities and student performance [5], positive relationships between school facilities and school effectiveness [6]-[8]; and also highlighted the presence of facilities as a major influence in the performance of schools as a training and assessment center [9]. However, it was also noted that school administrators oftentimes fail to admit these inadequacies in their laboratory resources and overlook the impact that these resources have in improving its outcomes for their students. In addition, it was found that the lack of instructional materials and equipment in school has been used to account for the poor performance of students [10]. Through all these, the need to provide learning resources to meet the students' needs remain as one of the institution's primary concerns.

In the context of this research, laboratory resources

include the list of tools, equipment and training materials as stipulated in the training regulations of the bread and pastry production program of TESDA in the conduct of its training and assessment for bread and pastry production. Any training and assessment center must primarily secure its resources prior to accommodation and formal training of students and other interested individuals. A certificate of competency will only be issued to those who have satisfactorily demonstrated competence in BPP.

Based on the research findings however of the Department of Education (1999), public schools struggle when it comes to the availability, usefulness, and quality of school resources and facilities [11]. This inadequacy of teaching resources has been of serious concern to educators. Hence, the shift in strategy for educational delivery has been driven by external forces beyond the influence of any institution. Institutions are in “a state of crisis and many of the challenges include budget cuts, diminishing quality, the downsizing of faculty, and the revamping of the curriculum to fit the needs of the market.” Thus, to reduce the cost of acquiring and providing for these needs, it is even proposed that institutions “go online” and adopt technological innovations to accommodate the needs of our students [12]. Given this context, this study intended to evaluate the availability of the resources in the different training institutions, and the environments of learning found to be most preferred by our bread-and-pastry trainees and students.

Findings in this study aims to provide some future research direction to improve educational environment and performance by continuously upgrading its resources to meet the demands of its skills courses.

OBJECTIVES OF THE STUDY

This study was conducted to evaluate the laboratory resources along Bread and Pastry production, in the four selected training-Higher Education Institutions (HEIs) in Camarines Sur. Specifically, it aimed to identify the status of availability of laboratory resources in the four selected HEIs based on the Bread and Pastry Production (BPP) Training Regulation requirements of TESDA; evaluate the laboratory environment most preferred in the acquisition of learning by BPP students; and analyze the relationship between the availability of laboratory resources and the National Certificate-II result of Bread and Pastry Production.

METHODS

Research Design

The study employed the correlational research design

to analyze the relationship between the availability of laboratory resources in four (4) selected Higher Education Institutions (HEIs) in Camarines Sur to the NC-II result for Bread and Pastry Production. These identified HEIs, labeled as HE1-HE4, served as the Bread and Pastry Production (BPP) training and assessment centers in the province.

Participants

Face-to-face interview was done with 40 randomly selected BPP students and trainees (2 males and 38 females aged 20-35 years) using a survey instrument.

Instrument

The survey instrument is composed of four parts. The first and second parts contained the profile of the respondents and their status of competency; the third part included the checklist on the availability of laboratory resources such as the kitchen tools, equipment and training materials found in their respective training centers. This part also required the respondents to classify the resources based on the availability and functional use of the said tools in the laboratory; while the last part is a response to the laboratory environment found most preferred in the acquisition of learning by BPP students. The laboratory resources included in the checklist were those recommended by and adopted in TESDA’s Training Regulation requirements.

Procedure

Questionnaires sent to the respondents of the study were personally distributed by the researcher. To ensure comprehension of the form, the researchers likewise carefully explained the purpose of the survey. Face-to-face interview was conducted to vague items on the survey form and to questions on some parts of the survey form which cannot be understood by the respondents. Personal experiences on the use and handling of the laboratory resources were also shared by some of the trainees during the meeting. The filled-out questionnaires collected were tabulated to a statistical analysis.

Data Analysis

Simple statistical test was done to analyze the data generated. Further, the Pearson correlation test was used to analyze the relationship of the laboratory resources to its result in the assessment of bread and pastry production.

RESULTS AND DISCUSSION

Identify the status of availability of laboratory resources

Laboratory resources, in this research, include *kitchen tools, equipment and training materials* which are made available to all the users of the laboratory. **Tools** include measuring cups and spoons, rolling pins, sheet pans, rubber scraper, sauce pans, baking pans, ladle, grater, wooden spoons, mixing bowls and all other small tools most commonly used in cooking and baking. **Equipment** includes commercial mixers, mechanical dough roller, decker oven, compressor, dough cutter, gas range, upright freezer and refrigerator, while **training materials** include decorating magazines, videos and baking books used by both trainees and trainers [13].

The interview revealed that of the four-training center in Camarines Sur, only HEI-4 complied with the required laboratory resources for the effective implementation of the BPP-training following TESDA’s training regulations and assessment. Table 1 reveals that 82.5% of the respondents agreed that the tools and equipment found in the training center were available and functional. However, the other 12.5% noted that while there are available and functional tools and equipment in the training center, half of them were lacking.

With regards the availability of training materials, only 47.5% of the respondents observed that training materials available and functional with 50% responding that more than half of the required materials were not available. The interview further revealed respondents of both HEIs 2 and 3 observed that more than half of their training materials are not available and functional, as opposed to the responses from HEI-1 where 90% observed that their school have available and functional training materials. Respondents from HEI -1 also indicated that their tools and equipment complied with the institution’s laboratory requirements.

Table 1. Availability of Laboratory Resources in the Four HEIs

Status	Tools		Equipment		Training materials	
	NR	%	NR	%	NR	%
A	33	82.5	33	82.5	19	47.5
B	6	15	5	12.5	1	2.5
C	1	2.5	1	2.5	0	0
D	0	0	1	2.5	20	50

Legend: A – Available & functional (ALL resources are complied); B – Available & functional, yet, half of the lab resources are lacking; C – Available but not functional; D – More than half are not available and functional

From these data it may be concluded that the required laboratory tools and equipment were available,

sufficiently provided and are functional in the four training centers. However, it was also noted that training materials were found lacking in HEI 2 and HEI 3. While any training center may have any other sources of training materials such as cookbooks or recipe books, magazines and similar print-outs and publications from the internet, HEI 2 and HEI 3 did not strictly adhere to the training guidelines set by TESDA that all training centers must be equipped with tools, equipment and training materials as prescribed by their program.

Evaluate the laboratory environment most preferred by BPP students

Every student/trainee have their own ways to learn new skills, concepts and theories in and outside of the classroom. For any educator and trainer, it is equally important to provide the learning environment preferred by trainee so to which they can adapt and utilize the best possible means of providing information to them.

In learning and being trained in BPP, the students are given the option to either learn the program the traditional way, through the use of a computer and internet at home, or through blended learning. In any way, though, the student will be given an assessment at the end of the training period and a certification will still be the final measure that the student passed the requirements of the program.

The traditional way observes and practices the old style of teaching where students and teachers come face-to-face every day and primarily uses chalk and board as instruments of instruction. There is also a fixed time and day for the lectures and skills demonstrations provided by the trainers to their students. The students have an actual hands-on to all the competencies required by the BPP program and are given hand-outs and activities related to the course.

On the other hand, to answer the need to make learning accessible anytime and anywhere, TESDA, through its TESDA Online Program (TOP), launched in 2012 (TESDA, 2020) was created in order to formulate plans to deliver technical-education skills in the country in a more effective, efficient and immediate way. It is an open educational resource that aims to make technical education more accessible to Filipino citizens through the use of information and communication technologies[14]. Any student enrolled in this online program need not go to any formal classroom, rather, needs only to register himself online to proceed with the program. As soon as he or she completes the coursework, the student can request for an assessment, or National Certificate in BPP, in any accredited institution.

Finally, the blended mode, in this research, is a style of training in which students learn via electronic and online media combined with the traditional face-to-face teaching. In this learning environment, the students will be given the preliminary recipes and instructions by the training institution and baking activities will either be done in the institution or at the student’s own homes. The trainee is still required to attend the institutional assessment and pass the formal assessment as the program requires.

Table 2 presents the laboratory environment found to be most preferred in the acquisition of learning of bread and pastry production, by the different respondents of the selected HEIs in Camarines Sur.

Table 2. Laboratory Environment Preferred by BPP students in the Acquisition of Learning

	f	%
A. Online Learning (Train-from-home-scheme)	3	7.5%
B. Traditional Classroom (or face-to-face training)	32	80%
C. Blended Mode (Both online learning & traditional training)	5	12.5%

Although there is a steady increase in the use of a variety of technology over the years, in particular, the proliferation of online learning at home, it can be seen from the result in Table 2 that majority of the BPP trainees still prefer to learn and be trained in a traditional classroom than to learn the skills in an online program. Thirty-two (32) out of the forty (40) respondents, or eighty percent (80%), still preferred the face-to-face training between the trainers and trainees where the latter can interact freely with his teacher anytime, than to learn the program at the comfort of their homes and their laptops. Only five (5) or 12.5% of the total respondents

picked the blended mode for their acquisition of learning, while only three (3) respondents or 7.5% of the population chose online learning as the most useful laboratory environment in learning bread and pastry production. While it may seem appropriate that as educators, we have also to adapt our teaching and learning style to keep up with the technology that is available to us, the response of the trainees on their preference to traditional classroom gave enough reasons for anyone to believe that online classes are not nearly beneficial to many of us as traditional style classroom learning. As what has always been believed by many, online learning is not always a seamless experience for them. Respondents indicated that they encountered a host of problems from lack of course instruction and/or organization to unreliable internet connection, thus, their obvious preference for traditional classroom [15].

The discussions about the advantages and disadvantages of online learning versus traditional mode of education have been based on a variety of parameters. It is indicated that face-to-face education is time and place dependent, while the online mode represents an augmented environment that allows individual users to exercise control over time, pace, place, and the interaction with instructors as well as other participants [16]. Such that, additional research is needed to fully understand why these differences exist and whether the differences can be attributed to course design, course content, faculty engagement or other factors. More research is probably needed to determine which problems such as the lack of instructional materials, poor organization, limited access to faculty or poor technological infrastructure have the greatest effect on students and how these issues affect their perceptions of online courses and any other environments introduced to them.

Table 3. Summary of Responses on the most preferred learning environment by BPP-Students

Survey Questions Used	Traditional Classroom as a Useful Tool in Learning		Online Learning as a Useful Tool in Learning		Blended Mode as a Useful Tool in Learning	
	WM	A	WM	A	WM	A
1.Helps to understand the subject matter.	4.02	SA	2.3	NAD	3.98	Ag
2.Easier completion of task.	4.67	SA	1.85	D	2.45	NAD
3.Motivated to explore new activities.	4.85	SA	3.42	Ag	4.75	SA
4.Allows collaboration with others more easily	4.95	SA	3.3	Ag	3.87	Ag
5.Enhances more active involvement in the group’s work	4.87	SA	2.05	NAD	2.6	NAD
6.Enhances ability and creativity in products presented	4.85	SA	2.1	NAD	3.95	Ag

Legend: WM - weighted mean; A – Attribute; NAD – Neither Agree or Disagree; SA – Strongly Agree; Dis – Disagree; Ag - Agree; SD – Strongly disagree

Based on the responses, it appears that traditional education provides trainees of BPP with competencies and skills that extend beyond the fundamental content that is embedded in the courses and programs of BPP study.

In any academic environment as presented in Table 3, the presentation and organization of topics are key factors that will attract or distract a student to his teacher. Students will always look for reasons to make any given topic significant and relevant to them. As in the case of majority of the respondents, as seen in Table 3, who favored the traditional environment over the convenience of an online education in learning BPP.

Table 4. Learning environment and ease of understanding subject matter

Helps to understand the subject matter more quickly & properly	Mean Scores	Response
Traditional Classroom	4.02	Strongly Agree
Online Learning	2.3	Neither Agree or Disagree
Blended Mode	3.98	Agree

Information contained in Table 4 clearly showed that trainees strongly agree that the subject matter is easily understood more quickly and properly in a traditional classroom than in other environments of learning. Such response may be expected as the presence of a teacher can easily guide the students in case confusions will arise from an unclear procedure or a missing ingredient is requiring a replacement.

Further, most of the respondents agreed that the blended mode can also help them learn the topics and activities provided since they can still enjoy the face-to-face contact after the online coursework. On the other hand, the trainees neither agreed nor disagreed that online environment is helpful in their BPP training.

Table 5. Learning environment and completion of task

Makes Completion of task easier	Mean Scores	Response
Traditional Classroom	4.067	Strongly Agree
Online Learning	1.85	Disagree
Blended Mode	2.45	Neither Agree or Disagree

It has been strongly agreed upon in Table 5 by most of the respondents that completion of baking tasks like mise-en-place, measurement and substitution of ingredients, frosting and icing and other baking activities

are made easier in a traditional classroom than if tasks are delivered online.

This may also be such since errors in baking and cooking may be immediately recognized and rectified by the Trainers. The free exchange of dialogues and ideas in a traditional classroom give convenience and assurance to any trainee to complete and improve his/her baked product any time within the training period. There are however some respondents who neither agreed or disagreed if the blended mode of learning can help them finish the assigned task or not.

Table 6. Learning environment and self-motivation

Motivates to explore new activities	Mean Scores	Response
Traditional Classroom	4.85	Strongly Agree
Online Learning	3.42	Disagree
Blended Mode	4.5	Strongly Agree

Table 6 clearly implies that there is no way for an online learning environment to motivate any trainee to explore new activities in BPP, such as trying out a new recipe of any bread, pastries and cakes, using a different procedure to modify an old one, cutting petit-fours to different shapes, and many other enjoyable activities in baking. Such response may be due to an individual's lack of confidence in discovering things alone, with the belief that he or she can do better when in the company of classmates and teachers. Contrary to this, the direct contact and interaction between the students and teachers is more than enough motivation for the students to explore new activities on their own.

Table 7. Learning environment and collaboration with other students

Allows collaboration with others more easily	Mean Scores	Response
Traditional Classroom	4.95	Strongly Agree
Online Learning	3.3	Agree
Blended Mode	3.87	Agree

As it is apparently correct that partnerships and team works are normally done in baking activities to get the work done quicker and earlier, the 'strongly agree' response of the trainees on traditional classroom clearly indicates that there is so much ease in working and getting things done when one have someone whom he/she can work and collaborate with than if it is completed otherwise. Alternatively, the advent of video chats and online conferencing allowed the respondents to agree that they can still work collaboratively and cooperatively with others provided they are familiar and given strong access to internet. Such communication

limitations imposed by the lack of good real-time interaction support tools, was another notable difference between face-to-face and asynchronous online interactions [17].

Table 8. Learning environment and active involvement of learners

More actively involved in group's work	Mean Scores	Response
Traditional Classroom	4.87	Strongly Agree
Online Learning	2.05	Neither Agree or Disagree
Blended Mode	2.6	Neither Agree or Disagree

It is relatively uncomfortable for any one in any group to simply stay and stand idle in their work station while everyone else is doing their assigned task in baking. Thus, to encourage every student and trainee to explore activities and discover both basic and intricate skills in baking baked products, he/she has to be more actively involved with his group's work, hence; the response of "strongly agree" is obtained for the delivery of experiences in a traditional classroom. Meanwhile, the students/trainees neither agreed nor disagreed that both online learning and blended mode will make them more involved in any group work in as much as they are, most of the time, performing the baking activities alone.

Table 9. Learning environment and skills development

Enhances ability and creativity in products presented	Mean Scores	Response
Traditional Classroom	4.85	Strongly Agree
Online Learning	2.1	Neither Agree or Disagree
Blended Mode	3.95	Agree

It is evident from Table 9 that student preferred the traditional mode of learning. Such preference can be explained by the presence of 'intense competition' between and among the students and trainees, where each of them sees to it that he outdoes another individual in terms of presentation and actual baking. It, thus, paves the 'strongly response' of the students to favor the traditional classroom over the online and blended mode of learning, in displaying their ability and creativity in all of the baked products presented. In contrast to non-traditional mode of learning where there may not be much competition except to himself, any individual may satisfy him/herself for a mediocre presentation of their product to simply comply with the requirement of the

program. Such may be regarded as "off-activities" [18] where trainees show a low level of interest to what they are doing.

Relationship between the availability of laboratory resources and the National Certificate-II result of Bread and Pastry Production.

The assessment records of the different HEIs revealed that, for the first semester 2018-2019, HEIs 1, 2, and 4 obtained a 100% passing rate on Bread and Pastry Production (NC-II) while HEI-3 obtained a rating of 98%. A deficiency of only 2% may be challenging to HEI-3 as a training and assessment center as there may be other factors which led to the trainee's failure to pass it. Nonetheless, the result of the Bread and Pastry Production NC-II assessment, as shown in Figure 1, is still remarkable indicating that the four training centers showed full competence and provided adequate training to their students.

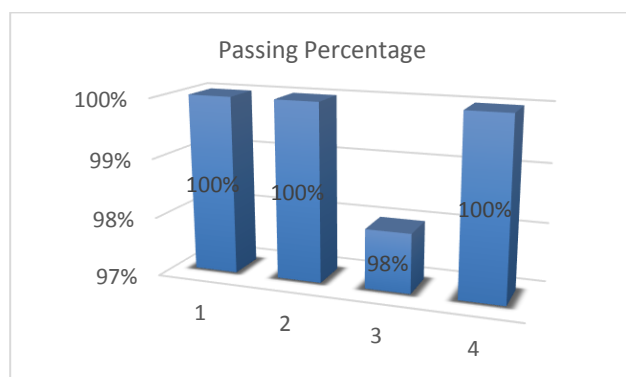


Figure 1: BPP-NCII Result during the 1st semester of 2018-2019

Using the Pearson correlation, the value obtained in table 10 showed that there is a low correlation between the actual status of the laboratory resources of the different centers to its result in the Bread and Pastry Production training and assessment. It may also be inferred from this data that the variables used, such as the tools, equipment and training materials may not exactly be the sole indicators of success of the trainees in passing the BPP-NC II Assessment. Informal interview through casual conversation between the trainers and her trainees revealed that several factors such as the personal motivation of students in passing the NC-II, or the tools and equipment being personally owned by the trainees, and the previous experience in baking may all contributed to the achievement of the training and assessment of trainees.

Table 10. Correlation between availability of laboratory resources and NC-II Result of BPP

	Assessment Result		
	r-value	p-value	N
Tools, Equipment, Training Materials	.498	.502	4

* Sig. (2-tailed)

It may therefore be gathered from this information that no matter how equipped, or not equipped a training center is, the success of the individual in acquiring a national certificate does not heavily depend on the availability of resources of a training center, but on the individual’s capacity and motivation to meet and/or exceed the expectations of the assessors’ standards.

CONCLUSION AND RECOMMENDATIONS

The availability of school resources enhances the effectiveness of schools as these are basic things that can bring about good academic performance in the students. The findings of this study support that of Akomolafe, and Adesua [19] who posited that the availability and effective utilization of school physical facilities play a significant role in enhancing students’ academic performance, while inadequacy of such physical facilities could contribute to poor academic performance in students. Therefore, if physical facilities are available and judiciously utilized to meet the needs of the students, this could invariably facilitate students’ interest in learning and lead to high performance [19]. The result of this study further reveals that if the training centers or the HEIs can ensure that teaching facilities and laboratories are available and adequate, and that the preferred teaching environment is present, such could be utilized to ensure students’ interest to learn. Eventually, it is assumed that the presence of adequate laboratory facilities and teaching environment can contribute to improved performance in eventual performance assessments. Likewise, when the right quantity and quality of human resources is brought together, it can be used to influence the use of other resources towards realizing institutional goals and objectives [20]. In the case of TESDA’s short programs being offered to all interested learners, a national certificate is highly favorable as it guarantees high quality assurance to its graduates the knowledge, attitudes and technical skills necessary to make one a proficient and skilled worker. Notably, the result of this undertaking proved that the selected campuses and training centers in Camarines Sur recognized by TESDA as venues for the students training, are mostly equipped with laboratory facilities

that able them to pass and obtain the national certificate and which qualified its graduates to work in an establishment which will require their specific skills. Laboratory experiences, as well, provided in a traditional classroom is necessary and effective in developing the competency of an individual. It not only enhances the mastery of the subject matter, but it also increases an individuals’ understanding of the intricacy of any given set of knowledge, which adds up to his creativity and skills.

Based on the findings of this study, it is suggested that further research be done to include trainees, both under the online learning scheme and who utilized the blended learning. Given the fact that majority of this research’s respondents were trained in a traditional classroom, it must be a good idea to include trainees, both under the online learning scheme and who utilized the blended learning as respondents of a similar study. Along this line, HEIs and other training centers must support and strengthen the TESDA’s initiative of encouraging tech-voch trainees to go online during this “new normal” to help them become useful and self-sufficient individuals in the future. Also, a limited number of respondents in this study was used since not all students/trainees can identify specifically the tools, equipment and training materials in their laboratory and may provide an incorrect information regarding its availability and functional use in the said training center. It is therefore recommended that survey-questionnaires be translated in the ‘bikol’ dialect or pictures that will go with the laboratory resources to be placed beside each kitchen tool must be considered in future researches for clarity and convenience of all respondents. In the case of HEIs which are non-compliant to the training regulations of TESDA, it must, probably be more helpful to request a quarterly or yearly monitoring and evaluation of BPP facilities by TESDA personnel to ensure safekeeping procedures by the laboratory custodian. Also, laboratory rules and policies on the use of the resources must be carefully and strictly observed to facilitate smooth flow of activities inside the training center.

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