

The Usability of QR-Code Electronic System in Lapu-Lapu City College: An Assessment Study

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Abstract:

As of today, many educational institutions adapted different strategies in gathering, writing, and utilizing data or information of documents. For 3 years of studying in Lapulapu City College, the researchers noticed that the school is still using paper-based method in gathering information of students and instructors in which it could cause an inaccurate and time-consuming of collecting data. In terms of collecting necessary information, Ayop, et.al. (2018) stated that the conventional attendance system was still used in most universities. However, this type of attendance system suffered problems like missing names, false attendance, missing attendance sheet, and tedious

management. This research aims to improve the efficiency of data recording through the use of 2 dimensional barcode or the QR-Code. This study used mixed research design to measure the usability of QR-Code Electronic System and the suggestions of technical experts and Slovin's formula in gathering the population and sample size of the respondents. Each respondent was given a questionnaire through Google forms to gather their responses. This study was also assisted by the technical experts in creating and designing the QR-Code Electronic System. The results of the study were garnered. Using the Likert scale, 1 is the lowest and 4 is the highest, it showed that QR-Code Electronic System is beneficial in attendance/ID system with a weighted mean of 3.35 where it showed that this is the most crucial process in data recording and the lowest is 2.28. According to the results, the top specific transactions that may be expedited or shortened when using QR-Code in Lapulapu City College are the following: Enrollment got the highest mean average of 3.41, followed by 3.38 for attendance of student respondents and 3.09 for attendance and school entry for administration and staff. The lowest mean rating are the clinic appointment and Student Affairs Office that garnered 3.16 for student respondents and 2.90 for administration and staff respondents respectively. The highest mean rating garnered were the most highly effective when in terms of data efficiency and the lowest mean rating garnered were the least effective on implementing the QR-Code Electronic System. The recommendations of the study were the proposed QR-Code Electronic System that would utilize in gathering, storing, reading, and recording data through the use of 2 dimensional barcode or QR-Code. This system would be beneficial to the specific transactions inside LLCC to ensure data efficiency, and data integrity.

Keywords: Educational institution, Gathering data, Utilizing data, Information documents, Lapulapu City College

Introduction

According to Comar (2022), Commercial, Educational, Government and Manufacturing institutions had specific transactions that needed to be done on time and there are records that had to be kept recent and accurate. Over the years, there were improvements in the conduct of these transactions from solely paper-based to hybrid system of paper and computerized data based as early as 1970. In the year 1974, the Universal Product Code introduced the first Barcode system whereby its data represented in a visual machine-readable form. These are proven more efficient than the hybrid system but these are proven to be more useful in the commercial and manufacturing setting. But in the year 1994, with the development of the world wide web or the internet, Denso Wave company has developed a system called the QR Code.

The QR code system would be a promising solution to the impending delays and record integrity issues surrounding the school. The paper-based school activities and attendance is a hassle and not reliable. The information may not be recorded properly due to its very slow and manual entry of information. In recent observations, some manufacturers are known for using modern techniques in gathering information like their employee attendance record and some are still using the traditional bar-code system to track the location and inventory of their materials and products. This has motivated the researchers to find ways to expedite the transactions and keep the records of the institution reliable, and error-free.

A QR-code electronic system is a type of barcode that can be read easily by a digital device and which stores information as a series of pixels in a square-shaped grid. QR code means quick-

response code and can hold up to hundreds of information on it. The difference between the QR code and the barcode is that the barcode holds information vertically and can store only a little amount of information while the QR code holds information horizontally and vertically. QR-code is used for gathering information, school attendance, and more school activities. To use a QR code you just need to scan the QR-code and then the data or the information would be transferred.

The purpose of the QR-code electronic system is to read and transfer information faster and easily than in paper-based mode. QR-code is working with or without an internet connection so even if there is no internet connection it can record information by just scanning the QR-code for example in recording attendance. With the proper implementation, the QR code electronic system would be applicable in every kind of school activity and event because of its characteristics.

QR-code is widely used in some industries because of the accuracy, easy, and faster transfer or record of data/information, and also it is used in commercial places to keep track of the employees and products. It became very famous because of its very effective ways and faster of gathering and recording information. The QR-code became famous in 2010 because it was added to some platforms like android phones and others and has been used in transferring money or online shopping.

It was also said that the QR code is more effective in transferring money than credit and debit cards. Some advantages of a QR-code are it is easy to use because all you need to do is to do the scanning when transferring information and there is no need for to fill up any forms or do unnecessary things. Also, it is very accurate in errors, that is why it is very reliable in collections or recording data/information. In times of COVID-19, QR-code has been used in tracking patients because it was convenient to use, faster, and more accurate in recording data/information.

The usage of the Quick Response (QR) Code System is popular nowadays especially in contactless transactions and data recording. According to Kan, et. al. (2011), the widespread use of mobile devices has led to a broad applicability of the code and has enabled the use of QR codes in areas such as trade (especially retail), marketing, logistics, education, tourism, entertainment etc.

The integration of Quick Response (QR) codes in classrooms has been identified as an important tool in promoting active as well as distributed learning, especially in higher education (Rabu, et. al, 2018). This would help the institutions in tracking and recording data through a system that would automatically record individual data and increase the efficiency of their work. Students' daily attendance in the college is recorded and tracked using a QR-Code electronic system. Here, it would be the professor's responsibility to record the student's attendance. A unique QR-code would be provided to each student, which they can use to track their attendance individually and as a group. This system generates a reliable report based on student attendance. The desired weekly and monthly attendance reports for the students are generated. The automated attendance system's primary goal is to automate the manual process of keeping track of attendance in institutions while also computerizing the old-fashioned technique of doing so.

The purpose of the study is to assess the usability of QR-code electronic systems in Lapulapu City College. The primary goal and target of this research are to disseminate ideas on the necessity of knowing the efficiency of implementing QR Code Electronic systems for classrooms and services to the school. Another, the beneficiaries must be firstly catered to upon the dissemination of the outcome of this research. Mostly, this would hopefully provide additional information and learnings to the students of the generation and of the future.

Literature Review

Keeping track of a class attendance by manually writing using a pen and paper is the old and customary way, which is seen as a tedious, monotonous, and ineffective task. This eats up more time that may leave the teacher tired especially with a huge class size. More paper is used in the traditional approach of creating and verifying attendance records. Over time, institutions would dump a lot of papers as they organize their piles. They utilized and discarded more paper as a result of this.

The time-consuming task of recording student attendance has a big impact on how well lessons are taught and learned. In addition to wasting lecture time, taking student attendance gives room for fraud.

According to Ayop, et.al. (2018), the conventional attendance system was still used in most universities. However, this type of attendance system suffered problems like missing names, false attendance, missing attendance sheet, and tedious management. The advancement in the attendance system has incorporated technological tools to improve the shortcomings of a conventional system. In this section, various technologies used to support current work in the attendance system would be discussed.

In education, most school libraries followed traditional data recording. According to Lobingco et.al. (2015), Using a manual recording system in the library, records may tend to be lost, as it only utilized the paper and pen method of recording. This manual method is time-consuming and not that convenient, it also maximizes the librarian's tasks. At the same time, recording manually also takes a lot of time.

According to Lobingco, et.al (2015), The students of Lapulapu City College are not satisfied with the manual techniques used in the college library. The proposed output needed to be implemented in order for the library record keeping to be computerized and improved.

According to Agripa and Astellero (2022), paper-based attendance mostly prone to occurrences of errors. It also time consuming when applied in monitoring checking and attendance checking and could also prone in loss of information because paper that is used in attendance could not be backup and possible it could be replaced somewhere.

With the technology, every data recording or data tracing that uses paper-base is slowly getting an upgrade and removed because of its hassle and time-consuming process. Although, paper-based is one of the best ways of tracing and recording information, there are still a lot of errors and can easily be manipulated by the people in the organization like employees and students for their wrong personal purposes. That's why authorities find ways to prevent this kind of action by the help of technology that they can apply for the benefits of their organization or institution, employees and students. Using paper-based can cause too much waste. One way to reduce its waste is to lessen the usage of paper instead, we can use technology and online document to store

the data and download it to a device where you can open the information even without the internet. In modern times, paper-based usage is slowly vanishing and some companies already implemented technology to record data. Although some of the institutions still use paper base due to their own purpose.

What is a QR Code

According to Tan (2008), a QR Code is a two-dimensional symbol. It was invented in 1994 by Denso, one of the major Toyota group companies, and approved as an ISO international standard (ISO/IEC18004) in June 2000. This two-dimensional symbol was initially intended for use in the production control of automotive parts, but it has become widespread in other fields.

QR code stands for 'Quick Response' code. It was developed by Denso Wave Corporation in Japan. QR codes are fast readable codes. According to Singh (2016), these codes had various significances over traditional barcodes like greater storage capacity, fast readability, 360-degree reading, small print size, error correction, support for more languages, and durability against soil and damage.

Rouillard (2008), stated that the main advantage of the QR code over a normal barcode is that a two-dimensional barcode contained information in both vertical and horizontal directions, whereas a classical barcode has only one direction of data, usually the horizontal one.

Use of QR-Codes in Education

QR codes enabled schools to speed up the process of taking attendance and would save teachers valuable teaching time. The core of the QR code attendance system is to provide reliable and functional attendance tracking and reporting system. According to Hendry (2017), QR code also help students to avoid consequences that may result from poor attendance which eventually penalized them from sitting their final exam as required by the administration.

Based on the study of Aktas and Cayci (2013), The usage of QR codes promoted efficiency in educational settings because it prevented students from losing time on search engines and encountering pointless material. The Educators could provide students easy access to more resources for the subject by placing QR codes on printed documents. subject. This enables students to get access to even more information while also preventing paper waste.

Schools-related activities such as enrollment that includes QR code could help create engagement but also need to be implemented correctly. Tretinjak (2015) stated that QR codes support both independent and collaborative learning and can create an interactive learning environment.

Use of QR-Codes in Industries

MK Schultz (2013) stated that QR code is commonly used in commercial establishments to better serve and achieve their overall institutional goals. Also, it is used to personalize one's visit to an institution like museums they need to adopt the QR code electronic system because it provides a cost-effective and potential tool for information provision.

Almutairi et.al (2019) stated that QR codes are applied for transacting because debit or credit cards and the security of personal information are deep issues for both consumers and banks, particularly when it comes to cash transfers or during internet purchasing.

Usage of QR-Codes in Medical Field

According to Tretinjak (2015), The patient tracking system based on QR codes is thought to be a helpful addition to the already popular identification wristband. The use of QR code prevents

incorrect or missing information in the HIS, or due to changes in the data after the code was created.

Contact Tracing

According to Bartolome et.al (2021), QR code was used in go-trace and proven that it was very effective in collecting data and information for COVID 19 patient and to monitor daily health surveys. Go Trace offered a promising mobile contact tracing technology that can be adopted in various environments through its dynamic, flexible, and user-friendly architecture. So with the help of QR code it will collect data accurately, reliable and real time.

According to Teleron et.al (2022), QR code helped to reduce the queues in entering the establishment like malls in others as a part of contact tracing. The QR code has an information about yourself and last exposure to a COVID patient or a COVID patient. QR code was suggested because the queues in writing or filling up information takes too long and with the help of QR code it takes only 3-5 seconds to scan and enter to the establishment.

Agriculture/Transaction

According to Arellaga 2021, QR-code helped in proper documentation of transaction also promotes transparency by providing real-time reports from the acquired transactions of the system by this it can help the agriculture transaction in market by recording the data in the number and name of the product sold and information of transaction made in real time.

Online Selling/Transaction

According to Asistores (2022), QR-code has very big positive impact and many benefits in online selling and business in Municipality of Hinatuan that means that the QR-code is already widely use in online selling and business in that area and it was proven that it helps and give benefits to the seller.

Attendance

According to Agripa and Astellero (2022), with the use of QR code in work place to the employees it proved that it has benefits like utilizing the attendance, became more accessible, cost effective and reduce the occurrences of errors. Also, they stated that if the QR code is used in monitoring the attendance, it met the acceptable needs and benefits to the company and employee because it is functional, reliable, efficient, accurate, usable, maintainable and portable.

School

According to Pascual (), QR code is used in the school setting for students for them to give the supplementary materials. After applying, they found out that there is a significant increase in the academic performance of Grade11 learners in the General Mathematics when QR-coded supplemental materials were used.

Research Design

This study utilized a descriptive research design to access characteristics such as demographic

College Department	Total Population (n)	Total Number of Respondents	Percentage
College of Education Students	581	85	26%
College of Hospitality and Management Students	648	93	29%
College of Technology Students	525	72	22%
College Instructors	65	65	20%
Administration and Staffs	13	13	3%
Total	1832	328	100%

profile of respondents, common uses of QR-code, transactions that will use QR-code, resources and cost, assessment of QR-code, and lastly the recommendations of the study. Descriptive research is an online process of data gathering, analyzing, classifying and arranging data about great conditions, practices, beliefs, processes, trends, cause and effect relationships and then accurate interpretation about the data gathered with or without the use of statistical treatment. In gathering data, the researchers used survey questionnaire administering the respondents of the assessment of the usability of QR-code electronic systems in Lapulapu City College through google forms. These data were then treated statistically for analysis and interpretation.

Respondents of the Study

The respondents of this study are the experts, instructors, students, and faculty and staff of Lapulapu City College. The researchers used stratified random sampling in choosing the respondents.

Table 1: Total Population and Sample size of Respondents

The researchers choose the confidence level of 95% giving a margin of error 0.05. Since the total population of the respondents in Lapulapu City College were 1985 (N), 333 (n) should be the sample size of the researcher respondents of the study.

INSTRUMENTATION

For this study, a survey questionnaire is primarily being used to gather the respondent's feedback. The instrument to be prepared focus on answering the statement of the problem to begin with, the researchers ask the respondents the usability of QR code in Industries, School and finance, the usage of QR-code electronics systems in the industry, experts opinion about the QR-code electronic system and its recommendations

Data Gathering Procedure

Data Gathering

In gathering data, the researchers submitted a transmittal letter signed by the research leader, instructor, and adviser requesting the Dean of the College of Technology for approval to conduct a research study.

The researchers gathered data using an online survey thru Google Forms that assessed the usability of the QR-code electronic system at Lapulapu City College. The researchers scheduled the distribution of the survey questionnaire to the respondents.

After the researchers garnered the data from the survey questionnaire, the data served as the subject for statistical treatment. This is used in drafting the proposed output of the study. The researchers assured that the answers of the respondents are used in this study.

Data Analysis

This research paper not only serves as training for researchers but is also an introductory analysis to focus on issues that are not given much attention to in our society. The data that will be gathered by the researcher on the students who responded to the questionnaires will be aggregated to obtain the correct and exact number of students regarding their perception. The results will be analyzed and compared according to the variability of the respondents. The recruitment will be conducted at the Lapu-Lapu City College-Main Campus to narrow the scope of the group of respondents for a more thorough study as a preliminary study of issues regarding students' project making in the new normal set-up.

The researchers will use the following indicators in conducting this research.

Indicators	Descriptions
4	Strongly Agree (SA) – It implies that the QR-code electronic system is strongly agreed to be used to different transactions
3	Agree (A) – It implies that the QR-code electronic system is agreed to be used to different transactions
2	Disagree (D) – It implies that the QR-code electronic system is disagreed to be used to different transactions
1	Strongly Disagree(SD) – It implies that the QR-code electronic system is strongly disagreed to be used to different transactions

Table 2: Indicators used by the Researchers

Indicators	Descriptions
4	Very Beneficial (VB) – It implies that the QR-code electronic system is very useful and very beneficial through its uses and function to different institutions.
3	Beneficial (B) – It implies that the QR-code electronic system is useful and beneficial through its uses and function to different institutions.
2	Moderately Beneficial (MB) – It implies that the QR-code electronic system is moderately useful and moderately beneficial through its uses and function to different institutions.
1	Less Beneficial (LB) – It implies that the QR-code electronic system is less useful and less beneficial through its uses and function to different institutions.

Table 3: Indicators used by the Researchers

Statistical Treatment

In gathering the data and the number of respondents of the study, the researchers used the Slovin's Formula in order to know the exact number of respondents needed in the study.

$$n = N / (1 + Ne^2)$$

Where: n= sample size
 N= Total Population
 e= margin of error

In presenting, analyzing, and interpretation of data, the research used the weighted mean in order to accumulate the weight of the respondents to use in this study. The Weighted mean formula was used to accumulate the weighted mean of the respondents to use in this study.

$$WM = \Sigma FW / N$$

Where:

- WM is the weighted mean
- Σ is the sum of
- F is frequency
- W is weight/level of indicators
- N is the total number of cases

This formula was used to calculate the respective interval of the scale.

$$\text{Range} = HD - LD$$

$$\text{Interval (i)} = \text{Range} / TC$$

Rating Scale or Four- Likert Scale		Description	
3.26	4.00	Strongly Agree	Very Applicable
2.51	3.25	Agree	Applicable
1.76	2.5	Disagree	Least Applicable
1	1.75	Strongly Disagree	Not Applicable at all

Table 4: Likert Scale

Rating Scale or Four- Likert Scale		Description	
3.26	4.00	Very Beneficial	Most Effective
2.51	3.25	Beneficial	Effective
1.76	2.5	Moderately Beneficial	Least Effective
1	1.75	Less Beneficial	Not at All Effective

Table 5: Likert Scale

Results and Discussion

The collected data presented were studied and examined according to the respective response to the questions communicated in the statement of the problem. The analytical procedures are arranged according to the sequence of specific questions.

Part 1. Respondents of the study

1.1 LLCC Student Respondents

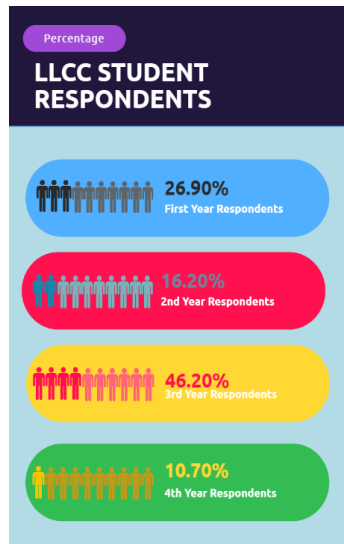


Figure 4: LLCC Student Respondents

Figure 4 showed the percentage of LapuLapu City College Student respondents per year level of the study. The top respondents of the study are the 3rd year students garnered 46.20%, followed by the 1st year respondents, garnered 26.90%. The second year respondents also garnered 16.20%. The least number of respondents with an average of 10.70% are the 4th year students. These respondents were garnered to be used in the research process ensuring the integrity of the research survey or data gathering process.

1.2 LLCC Administration and Staff Respondents

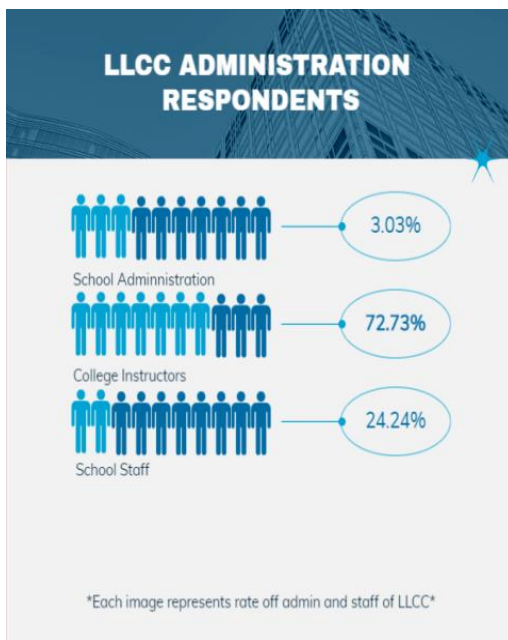


Figure 5: LLCC Administration and Staff Respondents

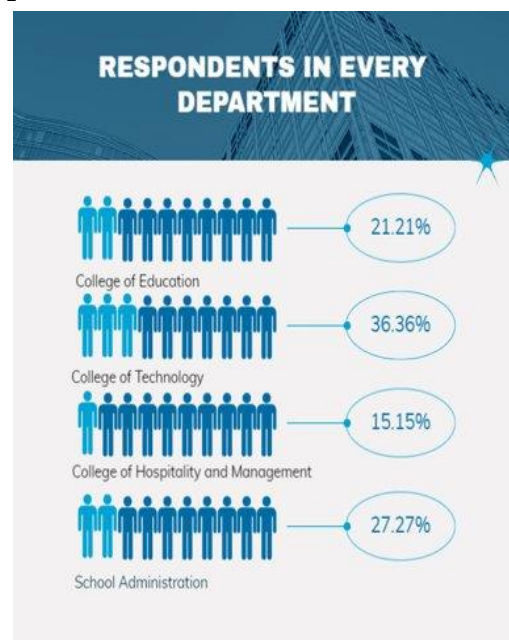


Figure 6: Respondents in every department

Figure 5 showed the number of LLCC administration and staffs respondents of the study. The top respondents of the study are the College Instructors garnered 72.73%. 24.24% from the school staffs, and the least number of respondents with an average of 3.03% are the School Administration.

Figure 6 presented the number of Respondents in Every Department. The top respondents of the study are the College of Technology garnered 36.36 percent (%). 27.27 percent (%) coming from the school administration and staff, 21.21 percent (%) coming from the College of Education. And lastly, the least number of respondents with an average of 15.15 percent (%) are the College of Hospitality and Management.

1.3 Respondents on Each Course

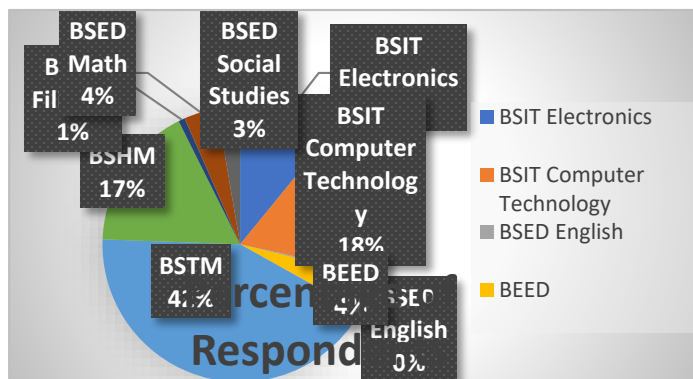


Figure 7 indicated the percentage of respondents in different college courses in Lapulapu City College. The highest number of respondents is the BSTM Course, garnered 42%. Next is the BSIT Computer Technology, garnered 18%. BSHM garnered 17%. BSIT Electronics Technology has 11% respondents. Next is BSED Math and BEED, garnered 4%. BSED Social Studies garnered 3%. BSED Filipino garnered 1%. The lowest number of respondents is the BSED English Course garnered 0.05 %.

Part 2. Specific Transactions in LLCC

2.1 Uses and Benefits of QR-Code Electronic System to different institutions student respondents

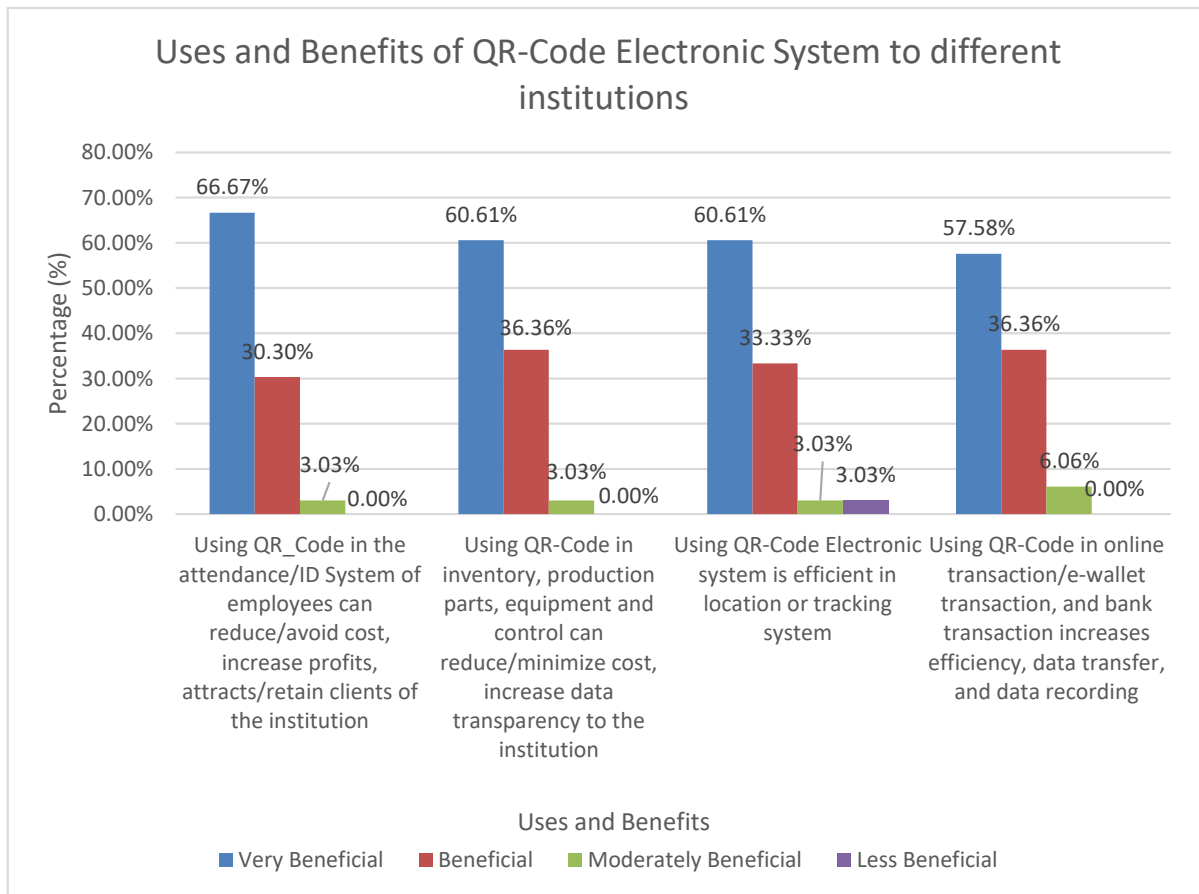


Figure 8: Uses and Benefits of QR-Code Electronic System to different institutions student respondents

2.2 Uses and Benefits of QR-Code Electronic System to different institutions School Administration and Staffs respondents

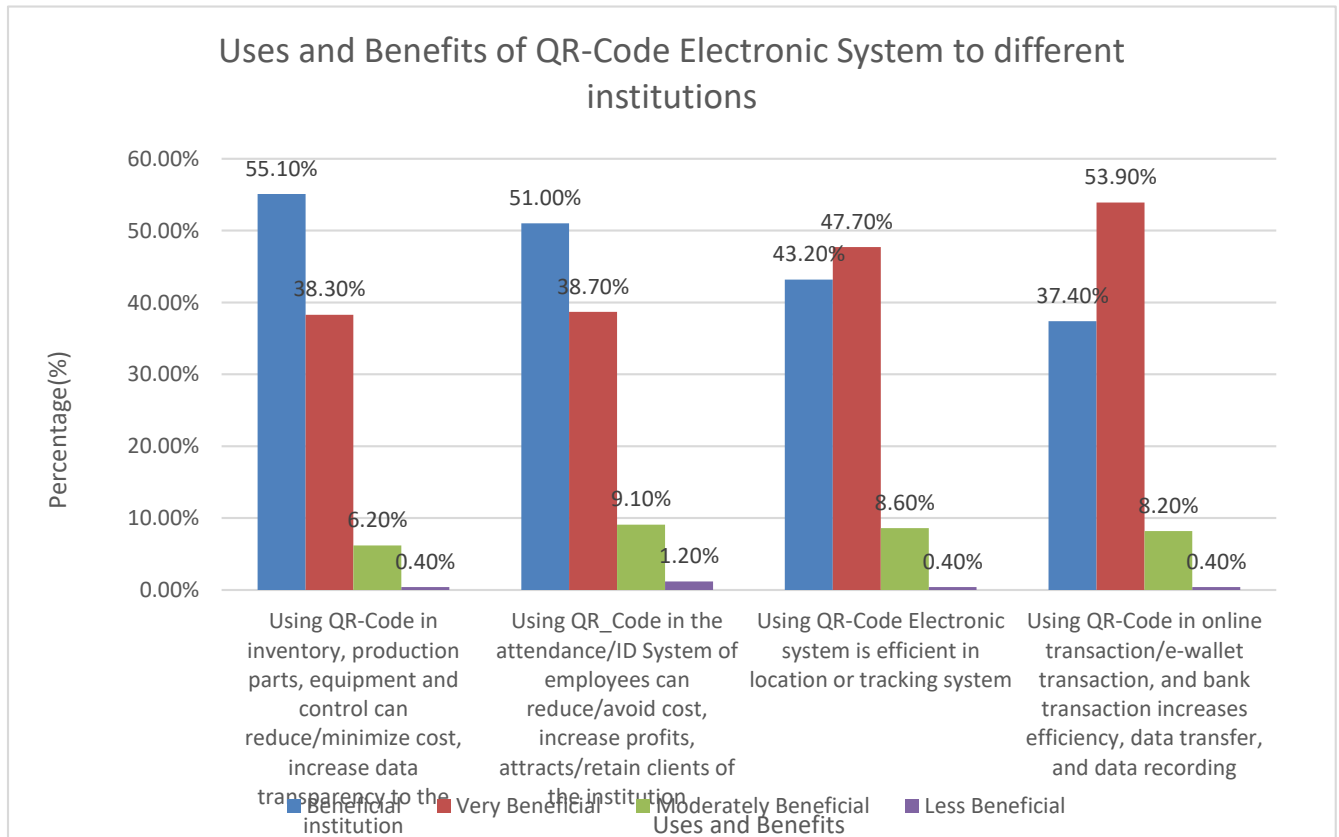


Figure 9: Uses and Benefits of QR-Code Electronic System to different institutions School Administration and Staff respondents

As reflected in the Figure 8 and 9, it showed the uses and benefits of QR-Code Electronic System to different institutions. The illustrative graph above presented that most of the respondents from students and school administration, agreed that QR-Code Electronic System is beneficial to different institution. This confirmed that this system is applicable to Lapulapu City College. Therefore, the researchers recommended this type of system to be implemented in the institution as it is very useful and beneficial with its applications.

2.3 Weighted mean of the uses and benefits of QR-Code to different institutions

Table 6. Uses and Benefits of QR-Code to different institutions student respondents weighted mean

Uses and Benefits of QR-Code to different institutions (Student Respondents)	Weighted Mean	Description
1. Using QR code in the attendance/ID system of employees can reduce/avoid cost, increase profit, attracts/retain clients of the institution	3.31	Beneficial

○ 2. Using QR Code in Inventory, production parts, equipment and control can reduce/minimize cost, increase data transparency to the institution	3.26	Beneficial
○ 3. Using QR-Code Electronic system is efficient in Location or tracking system	3.38	Beneficial
○ 4. Using QR Code in Online transaction/ e wallet transaction, and bank transaction can increase efficiency, data transfer, and data recording	3.45	Beneficial
Average Mean Rating	3.35	Beneficial

Table 6 above showed the uses and benefits of QR-code to different institutions (teacher's respondents) weighted mean, where it appears that the online transactions/E wallet transaction gain the highest weighted mean of 3.45 while the inventory, production parts, equipment and control garnered the lowest weighted mean of 3.26. Therefore, the results establish the fact that the QR-code is beneficial to different institutions with an average mean rating of 3.35.

2.4 Weighted mean of the uses and benefits of QR-Code to different institutions School Administration and staffs' respondents

Table 7. Uses and Benefits of QR-Code to different institutions school administration and staffs' respondents weighted mean

Uses and Benefits of QR-Code to different institutions (School Administration and Staffs' Respondents)	Weighted Mean	Description
○ 1. Using QR code in the attendance/ID system of employees can reduce/avoid cost, increase profit, attracts/retain clients of the institution	2.58	Beneficial
○ 2. Using QR Code in Inventory, production parts, equipment and control can reduce/minimize cost, increase data transparency to the institution	3.03	Beneficial
○ 3. Using QR-Code Electronic system is efficient in Location or tracking system	2.90	Beneficial
○ 4. Using QR Code in Online transaction/ e wallet transaction,	2.93	Beneficial

and bank transaction can increase efficiency, data transfer, and data recording		
Average Mean Rating	2.86	Beneficial

Table 7 above showed the uses and benefits of QR-code to different institutions (student's respondents) weighted mean, where it appears that the inventory, production parts, equipment and control gain the highest weighted mean of 3.03 while the inventory/ID system garnered the lowest weighted mean of 3.58. Therefore, the results established the fact that the QR-code is beneficial to different institutions with an average mean rating of 2.86.

Specific Transactions in LLCC that may be expedited or shortened when applied QR-Code Electronic System (Student Respondents)	WEIGHTED MEAN	DESCRIPTION
○ 1.Attendance	3.38	Agree
○ 2. Enrollment	3.41	Agree
○ 3. Guidance Counselor Office Appointment	3.30	Agree
○ 4. School Entry	3.35	Agree
○ 5. Borrowing	3.35	Agree
○ 6. Student Affairs Office Appointment	3.19	Agree
○ 7. Tracking	3.21	Agree
○ 8. Clinic Appointment	3.16	Agree
AVERAGE MEAN RATING	3.29	Agree

Table 8. Specific Transactions in LLCC that can be expedited or shortened (Student Respondents)

Table 8 above showed the specific transactions in LLCC that may be expedited or shortened when applied QR-Code weighted mean, where it appears that the enrollment gained the highest weighted mean of 3.41 while the clinic appointment garnered the lowest weighted mean of 3.26. Therefore, the results establish the fact that the QR-code is effective to transactions in LLCC with an average mean rating of 3.29.

2.5 Weighted mean of the Specific Transactions in LLCC that may be expedited or shortened when applied QR-Code Electronic System school administration and staff respondents.

Table 9: Specific Transactions in LLCC that can be expedited or shortened

Specific Transactions in LLCC that may be expedited or shortened when applied QR-Code Electronic System (School Administration and Staffs Respondents)	WEIGHTED MEAN	DESCRIPTION
○ 1.Attendance	3.09	Agree

○ 2. Enrollment	2.93	Agree
○ 3. Guidance Counselor Office Appointment	3.03	Agree
○ 4. School Entry	3.09	Agree
○ 5. Borrowing	2.96	Agree
○ 6. Student Affairs Office Appointment	2.90	Agree
○ 7. Tracking	2.96	Agree
○ 8. Clinic Appointment	2.93	Agree
AVERAGE MEAN RATING	2.99	Agree

Legend: Most Effective (3.26 – 4.00) Least Effective (1.76 – 2.50)
Effective (2.51 – 3.25) Not at All Effective (1 – 1.75)

Table 9 above showed the specific transactions in LLCC that may be expedited or shortened when applied QR-Code weighted mean, where it appears that the attendance and school entry gain the highest weighted mean of 3.09 while the student affairs office appointment garnered the lowest weighted mean of 2.90. Therefore, the results establish the fact that the QR-code is effective to transactions in LLCC with an average mean rating of 2.99.

The following are the findings of the study:

1. The researchers found that the profile of the respondents were:

1.1 Majority or 46.20% of the respondents were the third year students followed by 21.16% of the respondents are the first year respondents, followed by 16.20% were the second year students, and lastly, 10.70% were the fourth year students.

1.2 In LLCC Administration and staff respondents, majority (72.73%) of the respondents were the college instructors. Majority of the respondents in every department (36.36%) are from College of Technology.

1.3 Majority (42%) of the respondents took Bachelor of Science in Tourism Management followed by 18% who are from BSIT Computer Technology, followed by 17% from Bachelor of Science in Hospitality Management, followed by 11% from BSIT Electronics Technology, followed by BSED Math and BEED garnered 4%, followed by BSED Social Studies garnered 3%, followed by BSED Filipino garnered 1%, and lastly BSED English garnered 0.05%.

2. The researchers found that the QR-Code electronic system is commonly used in commercial, education Institution, Government, and Manufacturing Industries in terms of:

2.1. Attendance garnered 100% to the following sectors of industries.

2.2. Identification System also garnered 100%.

2.3. Data Transfer or Data Sharing garnered 100%.

2.4. Inventory, production parts, equipment, and control garnered 75%.

2.5. Location or Tracking System garnered 50%.

2.6. Bank Transaction garnered 50%.

2.7. Online Transaction or E-Wallet Transaction garnered twenty 25%.

3. The researchers found out that most of the respondents agreed that the QR Code electronic system can be expedited, shortened, usable and beneficial when applied in the specific transaction in LLCC:

3.1. Used in beneficial in the attendance and ID System of employees that garnered a weighted mean of 3.31 (student respondents) and 2.58 (administration and staff respondents).

3.2. Beneficial in location or tracking system that garnered a weighted mean of 3.38 (student respondents) and 2.90 (administration and staff respondents).

3.3. Beneficial in production parts, equipment and control that garnered a weighted mean of 3.26 (student respondents) and 3.03 (administration and staff respondents).

3.4. Beneficial in online transaction or E-Wallet Transaction, and bank transaction that garnered a weighted mean of 3.45 (student respondents) and 2.93 (administration and staff respondents).

3.5. The respondents garnered an average weighted mean of 3.35, Beneficial (student respondents) and 2.86, Beneficial (administration and staff respondents)

3.6. Attendance garnered a weighted mean of 3.28 for student respondents and 3.09 from administration and staff respondents

3.7. Enrolment garnered a weighted mean of 3.41 (student respondents) and 2.93 respectively (administration and staff respondents)

3.8. Guidance Counselor Office Appointment garnered a weighted mean of 3.30 (student respondents) and 3.03 (administration and staff respondents)

3.9. School entry garnered a weighted mean of 3.35 (student respondents) and 3.09 (administration and staff respondents)

3.10. Borrowing garnered a weighted mean of 3.35 (student respondents) and 2.96 (administration and staff respondents)

3.11. Student Affairs Office Appointment garnered a weighted mean of 3.19 (student respondents) and 2.90

3.12. Tracking garnered a weighted mean of 3.21 (student respondents) and 2.96 (administration and staff respondents)

3.13. Clinic Appointment garnered a weighted mean of 3.16 (student respondents) and 2.99 (administration and staff respondents)

3.14. With the average mean of 3.29 from student respondents and 2.99 from administration and staff respondents.

4. According to the experts, the researchers found out that the needed resources in terms of:

4.1 Manpower – people that are knowledgeable about coding and assembling are needed in this kind of research to successfully test the and implement the system to the institution.

4.2 Materials – QR-Code Scanner is used to scan the code that has information about the student. Arduino Uno is the program used for the system for the QR Code scanner. Arduino Uno software will be the source program for the code that to be tested and to be applied in the system.

4.3 Method – The researchers first assembled the QR-code electronic system then test the different codes to acquire its maximum efficiency and effectiveness in scanning and recording data.

4.4 Machines - this research only required 1 machine which is a computer to process the code that will be needed to acquired its maximum efficiency and to record or store the data that will be scanned by the QR-Code electronic system.

5. Based on the Pilot run, the researchers assessed the QR-Code Electronic System by making a QR-Code sample and scan it using the QR Code Electronic System to test its quality and capabilities with the help of the experts in terms of:

- Efficiency: The experts suggested that the QR-Code Electronic System must be simple and automated in order to reach maximum efficiency of data recording and data scanning.
- Effectiveness: With the help of the experts, they recommended a specific code to be applied in the QR-code system and achieve its effectiveness in terms of scanning and recording the exact data with the expected outcome.

- Data Accuracy and Integrity: the experts suggested different codes to be used in order for data accuracy and integrity to be tested.
- Functionality: the researchers found out that the QR code electronic system is functional based on the given code created by the researchers and recommended by the experts.
- Maintenance: the experts recommended that in the QR-code electronic system to achieve data accuracy and integrity, the system must have a periodical maintenance to ensure its effectivity.

Conclusion

This study concluded that the QR code is widely used in different industries according to MK Schultz (2013) that this system is used in commercial establishments to better serve and achieve institutional goals. It is also very beneficial to any kind of institutions as mentioned by Almutairi et.al (2019), these were applied for transacting because it is easier to gain information due to its security of personal information, like the Lapulapu City College. As the researchers gathered all the information from the survey and from the analysis, the respondents agreed that the QR-Code is beneficial to different institutions, and it has no significance between the student and the teachers during the data gathering process as shown in figure number 7, 8, 9, 10, and 11, proved that it can shortened and expedited the process in collecting and recording the data or information from the students and equipment in the school.

The researchers also concluded that based on the recommendations from the experts about the QR-Code Electronic System, it is very beneficial, functional and effective within terms of its pilot run and resources needed based on the findings garnered.

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