Level of Satisfaction of Automotive Mechanical Engineering Students' Session 1 2024/2025 Towards the Facilities Provided at the Automotive Workshop of Polytechnic Sultan Azlan Shah

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Abstract: Ensuring customer satisfaction is essential for maintaining comfort within an organization. In an educational institution, students act as customers whose needs must be met by management. To dignify the polytechnic as a premier educational institution, the level of customer satisfaction with the quality of education, infrastructure facilities, and services must be maintained to produce quality and competitive students in line with the vision and mission aspirations of the polytechnic. This study evaluates the satisfaction of automotive mechanical engineering students with the facilities at the Automotive Workshop Polytechnic Sultan Azlan Shah, Behrang (PSAS). A total of 110 automotive students from the second through the fifth semester who utilized the workshop during session 1 of the 2024/2025 academic year were selected as study samples. This study focuses on workshop layout, tools and equipment facilities, and safety around the workshop. This research study uses a quantitative approach as the primary instrument to collect the study data and was conducted online. Quantitative data obtained from the survey are descriptively analyzed using the Statistical Package for Social Sciences (SPSS) to get the mean score and standard deviation. As a result, the level of satisfaction of Automotive Mechanical Engineering students towards the facilities in the Automotive Workshop is at a moderate-high level, highlighting areas for improvement. These results serve as a guide for polytechnic management to enhance the quality of the facilities in automotive workshops, benefiting future automotive students. Further studies are also recommended for research at other departments in PSAS.

Keywords: Customer Satisfaction, Automotive Workshop, Facilities, Survey, Improvement

1.0 Introduction

The automotive workshop at the polytechnic functions as a practical learning environment where automotive students at Polytechnic Sultan Azlan Shah (PSAS) acquire foundational skills in vehicle repair and maintenance. Automotive workshops play a vital role not only in offering essential and effective practical learning facilities but also in providing specialized automotive training to prepare students for professional practice in the industry. According to Md Salleh and Tasir (2011), simulations can help students in the learning process because they can provide guidance and make it easier for students to understand and remember the content of the lessons learned. Therefore, automotive workshops need to provide quality facilities aligned with the development of facilities available at workshops in today's industrial sector.

The automotive workshop serves as the second most significant learning environment for automotive students at PSAS, complementing traditional classroom instruction. The goals of learning implemented in automotive workshops are as follows:

i. Provide a fun and rewarding automotive learning experience to catalyze academic success in line with the needs of the automotive industry sector.
ii. Create a suitable learning environment for personal and industrial needs to achieve good self-performance.

iii. To produce a generation of students who are responsible, cultured of knowledgeable, and intelligent, with high leadership, able to compete internationally, and have good morals and culture of the nation.

In addition, Polytechnics Malaysia focuses on skill-based subjects related to technical and vocational education and training (TVET) (Omar et al., 2020). In line with these, the vision and mission of PSAS itself are to be a superior TVET institution, providing widespread access to quality and recognized TVET programs, as well as producing graduates who are holistic, entrepreneurial, and balanced. Therefore, providing complete and comfortable facilities is critically important for the students. Hence, a study on PSAS campus facilities from the students' point of view is crucial. This will help facilitate the achievement of PSAS's vision and mission more effectively.

1.1 Problem statement

At PSAS, automotive workshops are offered to students from the second through the fifth semester as part of their practical training curriculum. The automotive workshop that has been developed is an important requirement for students in learning the ins and outs of maintenance and the basics of vehicles, for the preparation of students for future employment sector. The achievement of automotive students in academic and non-academic fields is one of the important elements in being a yardstick for the quality of the facilities provided by PSAS to the students. The receipt of complaints from most students using the automotive workshops through the complaint box provided at the PSAS automotive workshop has resulted in this study being established to identify the main problems related to automotive workshops. Complaints have been assessed and weighed to provide satisfactory facilities to students who follow this automotive program. PSAS should provide the best and most satisfactory automotive workshop facilities to make PSAS a world-class technical education institution and graduate with high marketability values in line with the IR 4.0 Revolution. Therefore, this study aims to assess the level of satisfaction of the automotive students with the facilities provided in the polytechnic automotive workshop. Hence, the researchers hope that the findings from this study will innovate the provision of facilities as well as improve the automotive workshops available at PSAS.

1.2 Study objectives

The general objective of the study is to determine the level of satisfaction of automotive students in PSAS with the facilities provided at the PSAS Automotive Workshop. Specific objectives of the study:

i) To assess students' satisfaction with the ease of layout in automotive workshops.

ii) To assess students' satisfaction with the tools and equipment available in the automotive workshop.

iii) To assess students' satisfaction with the safety in the automotive workshop.

1.3 Limitations of the study

This study was conducted exclusively within the automotive workshop of the Mechanical Engineering Department at PSAS. The population and samples consist of automotive students undergoing learning sessions in session 1 of 2024/2025. This study also only focuses on three possible modifiers, namely the layout of the workshop, the completeness of the tools and equipment provided, and the safety of students in the automotive workshop during the learning process. The results of this study should not be generalized to automotive workshops in other polytechnics throughout Malaysia. The results of the study are limited to the automotive student population at PSAS only. The results of the study also depend heavily on the honesty of the students who have been selected as respondents in giving correct answers to the probing questions raised. According to Mohamad Najib (2003), researchers can use the existing questionnaire. The researchers also assumed that the respondents cooperated and responded well and honestly about their satisfaction with the infrastructure provided.

Demographic data involving the year of study is not considered in this study because the researcher wants to emphasize the overall opinion of students regarding satisfaction regardless of the year of study. If the calculation of the year of study is considered, second-semester students may give a high evaluation because they have less experience related to the workshop. Fifth-semester students, having had extended exposure to the workshop environment, are more likely to recognize its limitations. As a result, their evaluations tend to be lower, reflecting their greater experience and critical awareness of the workshop's weakness. With that, the demographic analysis in this study only focuses solely on gender-related assessments.

2.0 Literature Reviews

According to A. Kahar, (2008), customer satisfaction is one of the terms business for measuring the extent to which a product or service provided by the organization meets the customer's expectations, namely Customer Expectation or in other words, customer satisfaction is the part that shows the customer's wishes, needs and expectations that need to be achieved or fulfilled to create customer loyalty to the product or service offered. In other words, customer satisfaction is the perception that a customer’s expectations have been met or exceeded (Gerson, 2010). It refers to the comparison between what the consumer expects and what they actually experience when using a product. If the consumer feels that the product's performance is equal to or exceeds their expectations, they are considered satisfied. Conversely, if the product's performance falls short of their expectations, they are considered dissatisfied. Satisfaction is the level of a person's feeling after comparing the performance or outcome they perceive with their expectations.

The revolution in satisfaction with the facilities found in an organization is a phenomenon that greatly influences the management system of the organization itself. Quality management in the service sector is seen as emphasizing customers who are stakeholders in the service delivery process. Beard

(2014) stated that customer satisfaction is crucial to managing, develop and enhance the market and business. In service, customers often play the role of co-productions, providing input directly or indirectly in the form of time, energy, and mental energy (Parasuraman, 2002). Customer satisfaction is a critical issue to ensure customers' comfort in an organization. According to Tuan Syarifah Atifahet al. (2013), students and educators are defined as clients or stakeholders who are directly and indirectly involved in using the infrastructure and facilities provided in an educational institution. According to Ashraf and Ibrahim (2009), the quality of education is difficult to measure and define, which includes the learning outcomes received by students from educators as well as the environmental conditions of the institution itself. Student satisfaction plays a vital role in university success and acts as an essential tool in improving the service quality (Mulyono et al., 2020). Therefore, the customer's assessment of the quality of higher education is comprehensive in the organization of the institution and is not only focused on specific divisions. Measurement of customer satisfaction is a way to determine the effectiveness of organizations in offering quality facilities.

Nadiah Hanani et al. (2015) affirm that the quality of services provided by the organization have a relationship and are closely connected with satisfaction of customer. Meanwhile, Nazeri (2014) insisted that efforts to improve and ensuring the quality of the services offered in line with developments and changes in the environment as well as the addition of customers using the service. Thus, organizations need to be skilled in meeting customer requirements.

Workshops and laboratories must be provided with the same criteria or at least close to the world of work. This really needs to be a major concern because in practical activities, facilities are a good primary learning resource which, if used properly, can help explain something so that information conveyed through practical activities will become clearer (Bafadal, 2004; Departmet of Education and Culture, 1981; Wotto, 2000). Therefore, the learning process in vocational schools must be carried out in such a way that graduates are truly prepared to enter the workforce, in the sense of having the knowledge, skills, and attitudes needed in the world of work.

At PSAS, students act as key clients who have wills from many different aspects. This requirement must be fulfilled by the management of the institution to ensure that the students are satisfied with all the facilities provided. Practically, the perception and acceptance of the consumer is more focused on conduct to find, evaluate, purchase, and use a product and service (Pine, 2002). Therefore, organizations that offer services to customers need to give emphasis not only to the services offered but also to include all the facilities provided to ensure that all parties achieve the goals and achievements that have been set.

3.0 Methodology

3.1 Population and sample studies

The total number of respondents involved in this study is 110 students from semesters 2 to 5 for the Diploma in Automotive Mechanical Engineering in session 1 of 2024/2025. The determinant of the number of respondents is based on a table built by Krejcie and Morgan (1970).

Table 3.1

Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is Population Size; S is Sample Size *Source: Krejcie & Morgan, 1970*

Figure 1: *Table for Determining Sample Size for a Finite Population*

The selection of the automotive students is based on their length of time using the facilities provided in the automotive workshop by PSAS. Therefore, this group was chosen as the respondents to this study. Referring to Table 1, the highest gender percentage of respondents is from the male group with a total of 106 respondents (95.5%) compared to only 5 female respondents (4.5%).

Table 1
Responded background

Gender	Amount	%
Male	106	95.5
Female	5	4.5

3.2 Study instruments

The study instrument used in this study is an online questionnaire. The research used in this study is divided into 5 parts, namely A, B, C, and D.

Section A contains the student's information, which includes name and gender. Parts B to D use agree and disagree scales where the respondents must answer by marking the space provided to meet their preferences.

Part B refers to the layout of the PSAS automotive workshop, which consists of 4 matters. The first point of the survey in part B is related to the layout of basic learning equipment such as chairs, work desks, and whiteboards. The arrangement of learning vehicles and the machinery is also included in part B. The third point is the arrangement of tools, and the last point asked in part B is the layout of workshop conditions that facilitate the inbound passage of students.

Part C, on the other hand, focuses on tools and equipment available in the automotive workshop. This part consists of 3 matters. The first point is the sufficiency of the tools and equipment for the learning process. The second point focuses on whether the items in the workshop are always functional, and the last point that has been asked is whether the tools and equipment are collinear with the automotive industry nowadays.

Part D focused on safety around the automotive workshop. In this section, 4 matters are asked regarding the safety information presented, such as safety rules and clear symbols. The second point focuses on the cleanliness of the workshop, and the third point focuses on the functionality of the exit door. The last point in part D focuses on the number of fire distinguishers available in the workshop for safety purposes.

The researcher used a questionnaire adapted from Zamri's study (2004) and adjusted it according to the researcher's year. A sample survey is a survey conducted on a portion of the population studied, and a random sample is used to represent the population studied. This study aims to examine the level of satisfaction of automotive students in session 1 of 2024/2025 with the quality of facilities provided at PSAS automotive workshops. The research method carried out for this study is a descriptive research method in the form of sample surveys. Data is collected from respondents using the online questionnaire method. A total of 110 questionnaires were distributed to the respondents in groups for each semester. They are given between 15 to 20 minutes to answer all the questions in the questionnaire.

The questionnaire of this study was adapted from the study of Tuan Syarifah Atifah et al. (2013), which contains 11 question items that are broken down according to sections as in Table 2.

Table 2
Number of items –items in each section

Section	Number of items
A. Demographics	1
B. Automotive workshop layout	4
C. Tools and equipment facilities provided	3
D. Safety around the workshop	3
Total	11

Data obtained through questionnaires from respondents is collected using the Google Forms application. In this study, items for parts B, C, and D were measured on a 4-point Likert scale, with scores ranging from 1 to 4, as shown in Table 3. Therefore, each question is provided with four proposed answers.

Table 3
Four-Eye Ordinal Scale Category

	Strongly Agree	Agree	Disagree	Strongly Disagree
Score	4	3	2	1

Mean scores are classified into three levels: low, moderate-low, moderate-high, and high, as in Table 4 below, to identify the level of satisfaction of automotive students with the facilities provided in automotive workshops in PSAS. The mean scale for the four-point Likert scale was adapted from Alico and Guimba (2015).

Table 4
Mean Score Level Classification

Mean Score	Level Markers
1.00-1.74	Low
1.75-2.49	Moderate-Low
2.50-3.24	Moderate-High
3.25-4.00	High

4.0 Data Analysis and Findings

This quantitative study aims to examine the level of satisfaction among automotive mechanical engineering students (session 1, 2024/2025) with the facilities provided at the automotive workshop of Polytechnic Sultan Azlan Shah. The data, collected through online questionnaires and analyzed using the Statistical Package for Social Sciences (SPSS) program, is presented in the form of mean scores and standard deviations. The research adopts a descriptive survey method with a sample-based approach, whereby a portion of the target population is selected using random sampling to represent the whole. Descriptive research, as defined by Mohd Majid Konting (2000), is designed to explain phenomena that

are currently occurring. The analysis and organization of the data were aligned with the predetermined research objectives.

4.1 Automotive workshop layout

The section for automotive workshop layout consists of four (4) sub-items evaluated by the respondents. Table 5 below shows the mean scores and standard deviations obtained for the item automotive workshop layout.

Table 5
Mean score and standard deviation for item automotive workshop layout

			Total Respondent (N=110)
Questions	**Mean score**	**Standard deviation**	
Equipment, chairs, work desks, and whiteboards are well arranged for learning session	3.22	0.709	Mean = 2.99
The arrangement of vehicles and machinery is neat for learning purposes	3.01	0.697	
Tools for practical use are neat and well-arranged	2.84	0.696	
The workshop arrangement eases the student movement during the practical session.	2.88	0.751	

The survey on workshop layout reveals that respondents generally agree that the arrangement of equipment, chairs, work desks, and whiteboards is conducive to learning sessions, with a moderate-high level of agreement reflected by a mean score of 3.22 and a standard deviation of 0.709. The mean score for the arrangement of vehicles and machinery is also at moderate-high, with a mean score of 3.01 and a standard deviation of 0.697. These readings show that respondents are moderately satisfied with these two sub-items, possibly due to the regular maintenance carried out by the PSAS administration to ensure that all equipment and practical necessities are arranged properly. In the same way, the reading of the mean score for the tools layout and arrangement is 2.84 with a standard deviation of 0.696, showing that respondents are also mediumly satisfied with the cleanliness and arrangement of the tools during practical sessions. These readings indicate that the effectiveness of students organizing workshop tools after they use has a significant impact on facilitating the next class's activities.

The final sub-item studied the ease of respondents' movement during practical class and showed a moderate-high level of satisfaction with a mean score of 2.88 and a standard deviation of 0.751. These readings are likely due to the disposal of old or damaged training cars and learning equipment, which

has resulted in a more spacious workshop, making it easier for students to move around while conducting practical sessions.

4.2 Tools and equipment facilities

The section for tools and equipment facilities consists of three (3) sub-items evaluated by the respondents. Table 6 below shows the mean scores and standard deviations obtained for the item tools and equipment facilities.

Table 6
Mean score and standard deviation for item tools and equipment facilities

			Total Respondent (N=110)
Questions	**Mean score**	**Standard deviation**	
Carpentry equipment is sufficient for learning needs	3.02	0.704	Mean = 2.88
Adequate and fully operational equipment and practical tools	2.97	0.627	
The carpentry equipment used is on par with the needs of the industry	2.65	0.584	

Based on data analysis, respondents generally agree that the carpentry equipment provided is adequate for learning purposes, reflected by a moderate-high mean score of 3.02 with a standard deviation of 0.704. Similarly, the mean score for item adequate and fully operational equipment and practical tools is also recorded as a moderate-high levels mean score of 2.97, and the standard deviation is 0.627. This is attributed to the periodic maintenance carried out by the PSAS administration to ensure all equipment and practical tools function properly. Students also expressed satisfaction with the carpentry equipment, noting that it aligns with industry standards. This is supported by a mean score of 2.65, categorized at a moderate-high level, with a standard deviation of 0.584. This satisfaction stems from the fact that the polytechnic procures equipment based on recommendations from industry partners during annual collaborative meetings.

4.3 Safety around the workshop

The section for safety around the workshop consists of four (4) sub-items evaluated by the respondents. Table 7 below shows the mean scores and standard deviations obtained for item safety around the workshop.

Table 7
Mean score and standard deviation for item safety around the workshop

			Total Respondent (N=110)
Questions	**Mean score**	**Standard deviation**	
Safety rules and symbols are displayed	2.60	0.804	Mean = 2.46
The workshop is clean, comfortable, and safe	2.48	0.688	
The emergency exit symbol is clear and function	2.43	0.772	
There are enough fire extinguishers available in the area	2.35	0.830	

The study findings show that respondents agree that safety rules and symbols are displayed, with the subscale achieving a mean score of 2.60, placing it at a moderate-high level, and a standard deviation of 0.804. These safety symbols are updated and replaced by the workshop technician approximately once a year. Conversely, the items related to workshop cleanliness, comfort, and safety received a moderate-low rating, with a mean score of 2.48 and a standard deviation of 0.688. This can be attributed to cleaning activities being hindered due to classes ending late in the evening and resuming with different groups early the next morning. Moreover, the low mean scores may also be attributed to clutter, dust, oil spills, poor lighting, and lack of proper ventilation, which affect the cleanliness and comfort of the workshop, making the environment feel congested and potentially unsafe, particularly during practical sessions. Additionally, the shared repair area with the Polymechanics activities further complicates the execution of cleaning tasks. Students also reported dissatisfaction with the visibility and functionality of the emergency exit signage, which scored a mean of 2.43, categorized at a moderate-low level, and a standard deviation of 0.772. This unsatisfactory state arises because the exit sign symbols on the doors are severely damaged due to messy wiring connections, which are also linked to electrical systems from other departments at PSAS. Additionally, the workshop building uses an outdated wiring design that frequently causes short circuits, resulting in damage to the electrical switches. In addition, certain emergency exits may be obstructed by unused or broken equipment, making them difficult to identify and not effectively highlighted during safety briefings, while the lack of regular safety drills may cause students to feel unsure about the correct procedures to follow in the event of an emergency. Regarding the availability of fire extinguishers, students expressed a moderately low level of satisfaction, with a mean score of 2.35 and a standard deviation of 0.830, indicating that the number of fire extinguishers is insufficient relative to the large area of the workshop. There may be too few extinguishers available, or they might be difficult to locate. In some cases, the extinguishers may not be in working condition or lack clear labeling, which contributes to students feeling unsafe and unprepared in the event of an emergency.

5.0 Discussion and Conclusions

Table 8 presents the overall analysis of students' satisfaction level with the facilities provided at the automotive workshop.

Table 8
Mean score for students' satisfaction level with the facilities provided at the automotive workshop

Item	Mean Score	Level
Automotive Workshop Layout	2.99	Moderate-High
Tools and Equipment Facilities	2.88	Moderate-High
Safety Around the Workshop	2.46	Moderate-Low

The average score for the automotive workshop layout is 2.99, indicating a moderate-high level of satisfaction among students. However, this also suggests that there is still room for improvement in the workshop layout. The presence of too many tools, along with outdated and worn equipment, contributes to difficulty in student movement during the learning process. The researcher recommends that the workshop be cleaned and reorganized at least once a year to remove torn, worn-out equipments, and obsolete tools, thus improving the flow and movement of students during learning sessions. Additionally, lecturers should encourage students to clean and organize the space at the end of each session to ensure that all equipment is properly arranged.

Overall, the average score for tools and equipment facilities stands at 2.88, indicating a moderate-high level of satisfaction among students regarding the tools and equipment available in the automotive workshop. Nevertheless, this also indicates that improvements can still be made, such as the implementation of monitoring by the lecturer before and after sessions to ensure all equipment is returned to its proper location and remains in good condition. A system for recording items entering and leaving the Tools Room should be established to track the availability of workshop tools during sessions. Furthermore, the workshop supervisor should report any damaged or outdated items for replacement with functional equipment that meets current industry standards.

The average score for safety around the workshop was 2.46, indicating a moderate-low level of satisfaction among students. Researchers suggest renewing the safety rules and symbols to adapt to students' knowledge and understanding nowadays. The regular cleaning schedule needs to be implemented by the PSAS administration, which ensures a clean, comfortable, and safe learning environment for students even after the class ends late evening. Lecturers should be stricter with students in ensuring they clean their learning spaces after every class session ends. The workshop supervisor is responsible for notifying the PSAS administration to ensure that all emergency exit symbols are repaired and remain fully functional. Additional fire extinguishers should be placed throughout the workshop, particularly near the high-risk zones, to ensure students' safety during learning sessions.

In order to enhance workshop facilities, it is recommended that the PSAS management implement a systematic and scheduled maintenance plan for all machinery and equipment, supported by a digital tracking system to monitor service status. Outdated tools and machines that frequently malfunction should be replaced with modern, efficient, and safer alternatives, with a dedicated annual budget allocated for new procurements. Safety measures must be improved by equipping the workshop with fire extinguishers, clear emergency exits, CCTV in critical areas, and proper safety signage and standard operating procedures, while enforcing the use of personal protective equipment (PPE) and conducting regular safety checks. A well-organized layout should be implemented using the 5S system (Sort, Set in order, Shine, Standardize, and Sustain) with proper storage racks, labeled zones, and tool cabinets. Supportive amenities such as rest areas with clean toilets, prayer spaces, and drinking water should also be provided. In addition, lighting and ventilation should be upgraded through the installation of industrial fans or ventilation systems to ensure a comfortable working environment. The workshop should be digitized through the use of a digital inventory system and, if applicable, an online tool/machine booking system to improve management efficiency. Regular training should be conducted for staff and students on equipment handling, safety protocols, and basic maintenance, and external experts can be invited for additional hands-on sessions. Lastly, a user feedback mechanism should be established via physical or digital forms to gather suggestions and complaints, which can be used for continuous improvement initiatives.

Hence, continuous and comprehensive research involving all PSAS members in using the facilities and infrastructure services, both directly and indirectly, should be carried out periodically. The researcher hopes to conduct a second series of action research to assess improvements in the quality of the facilities and infrastructure services at automotive workshops in the future. The scope of the study should be expanded to include the lecture room, lecture hall, and laboratory in the Mechanical Engineering Department. Also, the study should be expanded to include the Student Affairs Unit, Administration Unit, Counselling Unit, and even other academic departments at PSAS. The level of student satisfaction with the quality of the facilities provided at the automotive workshop PSAS should be at a high level, as it is the main catalyst for a positive and effective teaching and learning environment in producing quality and competitive students in line with the vision, aspirations, and mission of the polytechnic.

REFERENCES

A.Ashraf, M., & Ibrahim, Y. (2009). Quality education management at private universities in Bangladesh: An exploratory study. *Jurnal Pendidik dan Pendidikan, 24*, 17–32.

Abdul Kahar Abdul Latif. (2008). *Model kepuasan pelanggan bagi laman web e-runcit* (Master's thesis, Universiti Teknologi Malaysia, Faculty of Computer Science and Information System).

Alico, J. C., & Guimba, W. D. (2015). Level and causes of pre-university students' English test anxiety: A case study on Mindanao State University. *Researchers World, 6*(3), 1.

Bafadal, I. (2004). *Manajemen perlengkapan sekolah: Teori dan aplikasinya*. PT Bumi Aksara.

Beard, R. (2014, January 20). Why customer satisfaction is important (6 reasons). *Customer Satisfaction*. Retrieved October 22, 2015, from http://blog.clientheartbeat.com/why-customer-satisfaction-is-important/

Departmet of Education and Culture. (1981). *Pengelolaan sarana dan prasarana pendidikan*. Balai Pustaka.

Gerson, R. F. (2010). *Mengukur kepuasan pelanggan: Panduan menciptakan pelayanan bermutu*. PPM.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities: Educational & psychological measurement. *Journal of Educational and Psychological Measurement, 30*, 607-610.

Md Salleh, S., & Tasir, Z. (2011). Pembinaan sistem pembelajaran berasaskan simulasi interaktif menerusi web bagi kursus telekomunikasi dan rangkaian. *Jurnal Teknologi Pendidikan Malaysia, 1*(1), 49-61. Retrieved from https://www.academia.edu/494745/_Pembinaan_Sistem_Pembelajaran_berasaskan_Simulasi_Interaktif_menerusi_Web_bagi_Kursus_Telekomunikasi_dan_Rangkaian

Mohd Majid Konting. (2000). *Kaedah penyelidikan pendidikan*. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Oliver, R. (1997). *Satisfaction: A behavioral perspective on the consumer*. New York: McGraw Hill.

Omar, M. S., Aziz, S. F. A., & Salleh, N. M. (2020). Factors affecting job satisfaction among academic employees in polytechnic. *Malaysian Journal of Social Sciences and Humanities (MJSSH), 5*(11), 209–216.

Mohd. Najib Abdul Ghafar. (2003). *Reka bentuk tinjauan-soal selidik pendidikan*. Skudai: Penerbit UTM.

Mulyono, H., Hadian, A., Purba, N., & Pramono, R. (2020). Effect of service quality toward student satisfaction and loyalty in higher education. *The Journal of Asian Finance, Economics and Business, 7*(10), 929–938.

Nadiah Hanani Abdul Jalil, Jalaluddin Abdul Malek, & Er, A. C. (2015). Pusat Transformasi Bandar (UTC) sebagai pusat hentian setempat: Kajian kepuasan pelanggan terhadap perkhidmatan UTC Kuala Lumpur. *Malaysia Journal of Society and Space, 11*(1), 143-157.

Nazeri Mohammad. (2014). Kajian kepuasan pelajar terhadap perkhidmatan perpustakaan Al Basuti, IPG Kampus Sultan Mizan, Besut, Terengganu. *Seminar Kepustakawanan Memperkasak.*

Tuan Syarifah Atifah Binti Tuan Mat Zin, Normaslina Binti Jamil, & Mohd Zulfazli Bin Raub Khan. (2013). Tahap kepuasan pelajar terhadap kemudahan dan perkhidmatan prasarana yang disediakan di Politeknik Banting Selangor bagi sesi Disember 2012. *2nd International Seminar on Quality and Affordable Education (ISQAE 2013).*

Wotto, W. (2000). *Manajemen peralatan dan bahan praktek*. Gajah Mada University Press.

Zamri Mahamod. (2014). *Inovasi P&P dalam pendidikan Bahasa Melayu*. Tanjung Malim: Penerbit Universiti Pendidikan Sultan Idris.