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UCAPAN ALUAN PENGARAH POLITEKNIK KOTA KINABALU, SABAH

Assalamualaikum warahmatullahi wabarakatuh dan salam sejahtera,

Dengan penuh rasa kesyukuran kepada Ilahi, e-digest Wood Technology, Engineering and Social Science (WoTES) (Edisi 7) sekali lagi dapat diterbitkan untuk tahun 2024. Kejayaan ini tidak mungkin dicapai tanpa sokongan padu daripada Unit Centre of Technology (CoT) Politeknik Kota Kinabalu, sidang editor, serta ahli jawatankuasa penerbitan e-diges WoTES. Ucapan tahniah dan penghargaan yang setinggi-tingginya diucapkan kepada semua pihak yang terlibat. Kompilasi penulisan ilmiah dalam e-diges ini merupakan hasil penyelidikan, inovasi, dan kreativiti warga akademik dari politeknik dan kolej komuniti seluruh Malaysia yang telah melalui proses penilaian rapi oleh panel akademik Politeknik Kota Kinabalu.

Penerbitan e-diges WoTES ini bertujuan untuk mempersembahkan hasil penyelidikan terkini, inovasi, dan kreativiti dalam bidang perkayuan, kejuruteraan, dan sains sosial kepada masyarakat umum. Ia juga diharapkan dapat menjadi sumber rujukan utama bagi pelbagai pihak yang memerlukan. Penyelidikan dan inovasi yang dikongsikan dalam e-diges ini memberikan perspektif yang mendalam terhadap perkembangan terkini dalam bidang-bidang ini, sekaligus memperkayakan pemahaman kita terhadap isu-isu yang relevan. Saya amat menyokong usaha berterusan untuk memupuk budaya penyelidikan, penulisan, dan penerbitan ilmiah dalam kalangan pensyarah politeknik dan kolej komuniti di Malaysia.

Dengan penuh rasa hormat, saya ingin merakamkan penghargaan dan tahniah kepada semua penyelidik dan ahli-ahli akademik dari dalam mahupun dari luar Politeknik Kota Kinabalu yang telah menyumbang hasil kajian mereka untuk diterbitkan dalam e-diges edisi kali ini. Sumbangan anda bukan sahaja memperkayakan kandungan ilmiah penerbitan ini, tetapi juga memperkukuhkan profesionalisme dalam kalangan ahli akademik. Sesungguhnya sumbangan semua ahli-ahli akademik amatlah dihargai dan diharapkan agar berlanjutan untuk edisi yang akan datang.

Akhir kata, saya berharap penerbitan e-diges ini dapat memberikan impak positif yang signifikan kepada semua pihak yang terlibat. Semoga inisiatif ini dapat diteruskan dengan kejayaan yang lebih gemilang pada masa hadapan. Terima kasih yang tidak terhingga kepada semua yang telah menyokong dan mengambil bahagian dalam menjayakan usaha ini.

Sekian, terima kasih.

'PKK CEMERLANG'

MD NOR BIN ABDUL HALIM
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UCAPAN ALUAN TIMBALAN PENGARAH AKADEMIK, POLITEKNIK KOTA KINABALU

Assalamualaikum warahmatullahi wabarakatuh,

Segala puji dan syukur dipanjatkan ke hadrat Ilahi kerana dengan limpah dan rahmat-Nya, saya diberi peluang untuk menyampaikan kata alu-aluan dalam e-diges WoTES (Edisi7), bagi tahun 2024 yang berjaya diterbitkan.

Saya ingin merakamkan penghargaan yang setinggi-tingginya dan ucapan tahniah kepada Unit Centre of Technology (CoT) Politeknik Kota Kinabalu serta semua pihak yang terlibat dalam menjayakan penerbitan e-diges WoTES (Edisi 7) ini. Penerbitan ini merupakan kompilasi hasil penyelidikan, inovasi, dan kreativiti warga akademik, dan penyelidik dari dalam mahupun dari luar politeknik, dan kolej komuniti seluruh Malaysia.

Sesungguhnya, e-diges WoTES memainkan peranan penting dalam mendorong aktiviti penyelidikan, pembangunan, dan inovasi. Ia juga menjadi platform yang efektif untuk mempromosikan penyebaran ilmu dan pertukaran maklumat, sekaligus memberikan peluang kepada tenaga akademik untuk berkongsi pengetahuan, pengalaman, idea, dan hasil penyelidikan mereka demi manfaat institusi, industri, dan masyarakat.

Kewujudan platform ini turut menjadi medium yang sangat berguna dalam membina jaringan kerjasama antara pensyarah politeknik dan kolej komuniti Malaysia, ahli akademik, industri, serta masyarakat. Kerjasama ini bukan sahaja menggalakkan perkongsian maklumat, tetapi juga memberi peluang kepada pembaca untuk mengaplikasikan pengetahuan dalam konteks yang lebih luas, memberikan manfaat yang nyata kepada industri dan masyarakat melalui pemindahan teknologi dan penyebaran ilmu pengetahuan.

Selain itu, aktiviti penyelidikan yang diketengahkan dalam e-diges ini membuka ruang kepada pengembangan diri dan peningkatan profesionalisme dalam kalangan pensyarah. Dengan melibatkan diri dalam penyelidikan, para pensyarah dapat terus mempertingkatkan kemahiran mereka, memperluas pemahaman mendalam dalam bidang masing-masing, serta muncul sebagai peneraju dalam perkembangan ilmu pengetahuan.

Sebagai penutup, saya berharap agar penerbitan e-diges WoTES ini terus memberikan inspirasi kepada pensyarah untuk memperkukuh dan memupuk budaya penyelidikan, terutamanya di peringkat politeknik dan kolej komuniti di seluruh Malaysia. Semoga usaha murni ini dapat diteruskan dengan kejayaan yang lebih besar pada masa hadapan.

Sekian dan terima kasih.

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UCAPAN ALUAN KETUA UNIT CoT

Salam Sejahtera dan Salam PKK Cemerlang,

Setinggi-tinggi kesyukuran dipanjatkan dan ucapan terima kasih dirakamkan atas kejayaan penerbitan e-Diges WoTES Edisi 7 Tahun 2024. Kejayaan ini diharapkan dapat memberikan impak yang signifikan terhadap pencapaian kecemerlangan warga akademik di seluruh politeknik dan kolej komuniti di Malaysia.

Penerbitan e-Diges WoTES ini menjadi satu contoh cemerlang bagaimana teknologi dan era Revolusi Industri 4.0 (IR 4.0) memberi sumbangan penting dalam memperkukuhkan aktiviti penyelidikan. Penerbitan dalam format digital ini mencerminkan transformasi ke arah penggunaan teknologi dalam proses penyelidikan dan penulisan ilmiah. Dengan memanfaatkan kelebihan teknologi digital, maklumat dapat disebarkan dengan lebih efisien dan mampu merentasi batasan geografi, menjadikan ilmu pengetahuan lebih mudah diakses oleh semua pihak.

Ucapan penghargaan yang setinggi-tingginya ditujukan kepada Encik Md Nor bin Abdul Halim, Pengarah Politeknik Kota Kinabalu (PKK), Sabah, dan Encik Abdul Razak Bin Mohd Daim, Timbalan Pengarah Akademik PKK, atas sokongan penuh yang telah diberikan dalam menjayakan program penerbitan ini. Komitmen mereka mencerminkan kefahaman dan kesedaran terhadap peranan penting penyelidikan dalam era IR 4.0. Integrasi teknologi dalam konteks ini tidak hanya menyumbang kepada kecemerlangan tetapi juga memastikan keberlanjutan dalam bidang akademik.

Akhir kata, saya ingin mengucapkan syabas dan tahniah kepada semua penulis atas hasil penulisan yang telah berjaya disumbangkan dalam penerbitan ini. Aktiviti penulisan dan penerbitan seperti ini bukan sahaja memperkukuhkan budaya penulisan ilmiah, tetapi juga membawa manfaat kepada komuniti akademik secara keseluruhan. Ia sekaligus memperkayakan lagi landskap penyelidikan di era IR 4.0, memanfaatkan teknologi untuk membina masa depan yang lebih cemerlang.

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Salam Sejahtera

Terlebih dahulu saya ingin merakamkan setinggi-tingginya kesyukuran kerana penerbitan e-Diges WoTES Edisi 7 Tahun 2024. ini berjaya diterbitkan. Penerbitan adalah satu media penyebaran maklumat yang penting dan mampu memberikan impak yang tinggi. Perkembangan teknologi, terutamanya penerbitan elektronik memberi impak terhadap pendokumentasian kecemerlangan warga akademik di seluruh Politeknik Malaysia dan Kolej Komuniti .

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GC-MS ANALYSIS OF THE COMPOSITION IN TWO INVASIVE PLANT: *MIKANIA MICRANTHA* AND *CROMOLAENA ODORATA* USING 2 EXTRACTION SOLVENT

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Abstract

Mikania micrantha and *Cromolaena odorta* are an invasive plant which consumed as traditional medicine by Malaysian practitioners. In this study, these two plants were divided into two parts: stem and leaf and extracted using methanol and petroleum ether in Soxhlet apparatus. The extractions were analyzed using Gas Chromatography Mass Spectrometry (GC-MS) for the identification of its biochemical components. The extraction results revealed that methanolic extract gives higher yield for both species and parts compared to petroleum ether extract. A wide range of phytochemical such as phenolic compound, fatty acids, hydrocarbon which are having antimicrobial and antioxidant activity were identified in both species and they can be recommended as a plant that have phytopharmaceutical importance.

Keywords: - Mikania micrantha; Cromolaena odorata; phytochemical; GC-MS

1. Introduction

Since centuries, local practitioners in Malaysian have inherited the herbs as a medicine. With tropical and subtropical climates, there are more than 1200 plants are potentially used in treating various disease or with medicinal properties including invasive plant (Hunter, 2011). Invasive plant is an allelopathy weed pest with aggressively grows and spreads, and displaces other plants. It is very difficult to control and can dominate in cultivation areas. In Malaysia, there are two plant invaders in palm oil plantation area are *Mikania micrantha* (*M. micrantha*) and *Cromolaena odorta* (*C. odorata*) (Murrell et al., 2011, RISDA, 2011). Both species have been listed as 100 of the world's worst invasive alien species (Lowe et al, 2000, IUCN, 2019).

M. micrantha has many name such as *selaput tunggul* (Ishak et al, 2016), bitter vine or climbing hemp vine or American rope (Dev, Hossain, & Islam, 2015),Chinese creeper or mile a minute (Werren, 2001) or *Sembung rambat* (Tantra, 2014). While, *C. odorata* locally known as *kapal terbang* (Jumaat et al., 2017), *Siam Weed*, *Christma Bush*, *Devil Weed Camfhur Grass* and *Common Floss Flower* (Nanadini et al, 2014). Both species are traditionally known for its medicinal properties and have been used as folk medicine (Bhardwaj & Gakhar, 2005; Vital, & Rivera, 2009). However, there is still limited study on the phytochemical of *M. micrantha* and *C. odorata* as a scientific evidence to prove its traditional uses.

Extraction may be expressed as the separation of medicinally active compound from plant tissue using selective solvents. Both plant sample were extract using two different solvent with different polarity polar (methanol) and non-polar (petroleum ether). Previous studies show that methanol has higher extraction compare to ethanol and others and petroleum ether was chose instead of hexane which quite stringent to be used. This paper will provide information on the phytochemical or bioactive compound in *M. micrantha* and *C. odorata* extracted which can provide baseline information for future research.

2. Methodology

Material

M. micrantha and *C. odorata* leaf and stem were collected from idle plantation area in Selangor, Malaysia. Authentications of the plant were done at Herbarium, Faculty of Forestry, Universiti Putra Malaysia where the voucher specimen was conserved under the reference number H030 and H031. The remaining leaf and stem were washed thoroughly with tap water, air dried for 4 days and grinded to fine powder and used for extraction.

Extraction process- Soxhlet extraction

Extraction was performed using Soxhlet apparatus followed the procedure by (Ahmad et al, 2009) with slight modification. The Soxhlet extraction processes using 2 different extraction solvents: methanol and petroleum ether. Two hundred mL of solvent is poured into weighted round bottom extraction flask and placed on the heating mantle. The thimble containing 5 g of sample was placed into the extraction chamber. Lastly, the condenser was placed on top of the extraction flask and all these parts were fixed vertically. The extraction was carried out for 8 h in 60°C temperature. The filtrates were concentrated under pressure in rotary evaporator until all methanol and petroleum ether removed. The extracted samples were calculated as percentage of extraction and calculated using Equation (1). The crude methanolic and petroleum ether extracts were stored in the refrigerator below 4°C until analyzed by GC-MS.

$$\% \text{ Extraction} = \frac{W1 - W2}{Y} \times 100 \qquad (1)$$

Where W1 is weight (g) of oven dried round bottom extraction flask and extract, W2 is weight (g) of empty round bottom extraction flask and Y is weight (g) of sample.

Gas Chromatography- Mass Spectroscopy (GC-MS) Analysis

GC-MS analysis was carried out on a Perkin Elmer Turbo Mass Spectrophotometer (Norwalk, CTO6859, and USA) which includes a Perkin Elmer Auto sampler XLGC. The column used was Perkin Elmer Elite - 5 capillary column measuring 30m × 0.25mm with a film thickness of 0.25mm composed of 95% Dimethyl polysiloxane. The carrier gas used was Helium at a flow rate of 0.5ml/min. 1µl sample injection volume was utilized. The inlet temperature was maintained as 250°C. The oven temperature was programmed initially at 110°C for 4 min, then increase to 240°C. And then programmed to increase to 280°C at a rate of 20°C ending with a 5 min. Total run time was 90 min. The MS transfer line was maintained at a temperature of 200°C. The source temperature was maintained at 180°C. GCMS was analyzed using electron impact ionization at 70eV and data was evaluated using total ion count (TIC) for compound identification and quantification. The spectrums of the components were compared with the database of spectrum of known components stored in the GC-MS library.

3. Finding and Analysis

Figure 1 show *M. micrantha* is a climber with heart-shaped leaf. It can be found growing along the roadside, swampy woods, bushes of moist places, forest borders, and also along streams and rivers (Saha, Mandal, & Chowdhury, 2015). While *C. odorata* is a vertical plant or shrub, can stands up to 2.5 m tall in the open and dense scrambling bushes up to 10 m high among trees, the leaves are sparsely hairy, occur in pairs and are pointed ovate to triangular. They vary in colour from light to medium green and obviously have a distinctive smell when crushed (Luwum, 2002).

Figure 1: Picture of invasive plant leave a: Mikania micrantha (left). b: Cromolaena odorata (Right)

Extraction yield of M.micrantha and C.odorata leaf and stem

Different polarities solvents were used to determine which one gives the highest recoveries of bioactive compound. The influences nature of solvent, species and plant parts on extraction yield percentage are presented in Table 1.

Table 1. The extraction yield of M.micrantha and C.odorata based on their parts and solvents.

Plant species	Type of extract	Yield (%)	
		Leaf	Stem
Mikania micrantha	Methanol	18.79±0.08	16.71±0.23
	Petroleum ether	4.11±0.94	0.87±0.03
Cromolaena odorata	Methanol	26.56±0.16	15.06±0.18
	Petroleum ether	5.54±0.3	0.79±0.03

Gas Chromatography- Mass Spectrometry (GC-MS)

Gas chromatography mass spectrometry analysis was carried out for methanol extracts of the *M. micrantha* and *C. odorata* leaf and stem. The total ion chromatogram (TIC) of methanol extract of *M. micrantha* leaf and stem showing the GC-MS profile of the compounds identified. The peaks in the chromatogram were integrated and were compared with the database of spectrum of known components stored in the GC-MS library. The detailed tabulations of GC-MS analysis of the methanolic extracts of *M. micrantha* leaf and stem, *C.odorata* leaf and stem are given in **Table 2, 3, 4** and **5** respectively.

Table 2: Phytocomponents Identified in the Methanol Extract of M. micrantha Leaf by GC-MS Peak Report TIC.

Peak	R. time	IUPAC Name/ Compound name/Common name	Molecular formula	Molecular weight	Area %
109	16.525	Phenol, 2,4-bis(1,1 dimethylethyl)	$C_{14}H_{22}O$	206	4.06
143	18.450	α-Bisabolol	$C_{15}H_{26}O$	222	1.47
144	18.522	Selina-6-en-4-ol	$C_{15}H_{26}O$	222	2.39
164	19.546	Neoclovene oxide	$C_{15}H_{24}O$	220	1.07
167	19.725	5,5,8a-Trimethyldecalin-1-one	$C_{13}H_{22}O$	194	1.29
170	19.867	Orcinol, monoacetate	$C_{11}H_{10}O_{13}$	116	1.17
175	20.158	Pentadecanoic acid, methyl ester	$C_{16}H_{32}O_2$	256	1.33
177	20.345	2-Pentadecanone, 6,10,14-trimethyl	$C_{18}H_{36}O$	268	1.28
183	20.661	Neoclovene oxide	$C_{15}H_{24}O$	220	1.05
192	21.200	Hexadecanoic acid, methyl ester	$C_{17}H_{34}O_2$	270	5.22
193	21.283	Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, methyl ester	$C_{18}H_{28}O_3$	292	2.34
195	21.533	l-(+)-Ascorbic acid, 2,6-dihexadecanoate	$C_{38}H_{68}O_8$	652	1.91
211	22.843	8,11-Octadecadienoic acid, methyl ester	$C_{19}H_{34}O_2$	294	2.14
212	22.901	Linolenic acid, methyl ester	$C_{19}H_{32}O_2$	292	1.95
213	22.992	Phytol	$C_{20}H_{40}O$	296	2.44
231	24.336	Lignoceric alcohol	$C_{24}H_{50}O$	354	0.19
264	32.867	Stigmasterol	$C_{29}H_{48}O$	412	2.16
269	35.080	Lupeol	$C_{30}H_{50}O$	426	1.43
271	36.517	Lup-20(29)-en-3-ol, acetate,	$C_{32}H_{52}O_2$	468	5.27

Table 3: Phytocomponents identified in the methanol extract of M. micrantha stem by GC-MS Peak Report TIC.

Peak	R. time	IUPAC Name/ Compound name/Common name	Molecular formula	Molecular weight	Area %
41	8.474	Diethylene glycol	$C_4H_{10}O_3$	106	5.09
45	8.920	2-Hydroxy-gamma-butyrolactone	$C_4H_6O_3$	102	3.39
46	8.975	1,5-Hexadien-3-ol	$C_6H_{10}O$	98	1.99
47	9.149	Glycerol	$C_3H_8O_3$	92	2.22
59	10.343	Palatone	$C_6H_6O_3$	126	1.24
64	11.206	Butanoic acid, 2-methyl-3-oxo-, ethyl ester	$C_7H_{612}O_3$	144	1.19
65	11.484	2-Tetrazene, 1,1-diethyl-4,4-dimethyl	$C_6H_{16}N_4$	144	4.50
124	16.525	Phenol, 2,4-bis(1,1-dimethylethyl)	$C_{14}H_{22}O$	206	3.30
126	16.700	Phenol, 4-methoxy-2,3,6-trimethyl	$C_{10}H_{14}O_2$	166	0.93

134	17.550	Carbonic acid, methyl octadecyl ester	$C_{20}H_{40}O_3$	328	0.98
138	17.865	D-Galactose, 6-deoxy	$C_6H_{12}O_5$	164	1.00
147	18.492	α-Bisabolol	$C_{15}H_{26}O$	222	0.71
192	21.092	Hexanoic acid	$C_{15}H_{24}O_2$	236	1.00
193	21.192	Hexadecanoic acid, methyl ester	$C_{17}H_{34}O_2$	270	1.95
194	21.277	Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)	$C_{18}H_{28}O_3$	292	1.51
197	21.525	l-(+)-Ascorbic acid 2,6-dihexadecanoate	$C_{38}H_{68}O_8$	652	3.18
213	23.129	Stearic acid, methyl ester	$C_{19}H_{38}O_2$	298	1.05
215	23.233	Linolenic acid	$C_{18}H_{30}O_2$	278	1.64
216	23.438	l-(+)-Ascorbic acid 2,6-dihexadecanoate	$C_{38}H_{68}O_8$	652	1.40

Table 4: Phytocomponents identified in the methanol extract of C.odorata leaf by GC-MS Peak Report TIC.

Peak	R. time	IUPAC Name/ Compound name/Common name	Molecular formula	Molecular weight	Area %
4	4.415	Methylbenzene	C_7H_8	92	4.49
61	12.845	5-Hydroxypipecolic acid	$C_6H_{11}NO_3$	145	0.97
68	13.752	n-Heptaldehyde	$C_7H_{14}O$	114	4.10
103	16.759	Azulene	$C_{15}H_{24}$	204	1.26
107	16.958	4-(3,3-Dimethyl-but-1-ynyl)-4-hydroxy-2,6,6-trimethylcyclohex-2-enone	$C_{15}H_{22}O_2$	234	1.22
111	17.246	1,6,10-Dodecatriene-3-carboxylic acid, methyl ester	$C_{14}H_{22}O_2$	222	0.90
117	17.633	Caryophyllene oxide	$C_{15}H_{24}O$	220	4.13
123	17.969	2,5,9-Trimethylcycloundeca-4,8-dienone	$C_{14}H_{22}O$	206	1.03
132	18.484	2-Naphthalenemethanol	$C_{15}H_{26}O_2$	222	1.07
136	18.695	Longiverbenone	$C_{15}H_{22}O$	218	0.90
138	18.787	11-Hexadecyn-1-ol	$C_{16}H_{30}O$	238	0.94
147	19.437	Tetradecanoic acid	$C_{14}H_{28}O_2$	228	1.57
151	19.725	Globulol	$C_{15}H_{26}O$	222	2.10
152	19.865	4-Cholesten-3-one	$C_{27}H_{44}O$	384	0.91
179	21.193	Hexadecanoic acid, methyl ester	$C_{17}H_{34}O_2$	270	0.97
184	21.533	l-(+)-Ascorbic acid 2,6-dihexadecanoate	$C_{38}H_{68}O_8$	652	3.45
202	22.992	Phytol	$C_{20}H_{40}O$	296	1.27
205	23.236	Linolenic acid	$C_{18}H_{30}O_2$	278	0.94
238	28.561	Benzene, 1-methoxy-4-(4-methyl-4-pentenyl)	$C_{13}H_{18}O$	190	1.40
245	29.942	Ethanone, 1-(3,4,5-trimethoxyphenyl)	$C_{11}H_{14}O_4$	210	1.01

Table 5: Phytocomponents identified in the methanol extract of C.odorata stem by GC-MS Peak Report TIC.

Peak	R. time	IUPAC Name/ Compound name/Common name	Molecular formula	Molecular weight	Area %
3	4.104	Glycerol	$C_3H_8O_3$	92	1.60
5	4.425	Methylbenzene	C_7H_8	92	8.49
22	8.481	Diethylene glycol	$C_4H_{10}O_3$	106	10.65
26	8.930	Glycerol	$C_3H_8O_3$	92	2.81
42	11.483	Hexanoic acid, 2-acetyl-, ethyl ester	$C_{10}H_{18}O_3$	186	2.40
59	12.850	5-Hydroxypipecolic acid	$C_6H_{11}NO_3$	145	2.34
94	16.257	Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-7-methyl-4-methylene-1-(1-methylethyl)	$C_{15}H_{24}$	204	1.61
98	16.525	Phenol 2,4-bis(1,1-dimethylethyl)	$C_{14}H_{22}O$	206	2.01
99	16.675	4-Hexanoylresorcinol	$C_{12}H_{16}O_3$	208	1.07
102	16.826	Octanedioic acid, 4-methoxy-, dimethyl ester	$C_{11}H_{20}O_5$	232	1.25
103	16.952	Azulene	$C_{15}H_{24}$	204	1.90
104	17.079	1,4-Benzenediol, 2-(1,1-dimethylethyl)	$C_{10}H_{14}O_2$	166	1.37
105	17.125	Tridecanoic acid	$C_{13}H_{26}O_2$	214	0.94
106	17.277	5-Hydroxypipecolic acid	$C_6H_{11}NO_3$	145	7.15
107	17.629	omega. -3 Marine Triglycerides	$C_{22}H_{32}O_2$	328	1.78
109	17.858	1,3-Diethoxy-5-methylcyclohexane	$C_{11}H_{22}O_2$	186	1.43
110	17.966	4-Tetradecanoyl-2,6-piperazinedione	$C_{18}H_{32}N_2O_3$	324	1.43
152	21.195	Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, methyl ester	$C_{18}H_{28}O_3$	292	1.01
155	21.535	l-(+)-Ascorbic acid 2,6-dihexadecanoate	$C_{38}H_{68}O_8$	652	4.54

The result in **Table 1** revealed that, methanol solubility is higher than petroleum solubility. The extract yielded differently between solvent i.e methanol and petroleum ether for both species and part was due to polarities of solvents (Ahmad et al., 2009). This showed that more cytotoxic potential *C. odorata* has the highest methanol solubility yield compare to *M. micrantha* on leaf. Methanol solubility is slightly higher in stem for *M. micrantha*. While the lowest extraction yield for leaf was obtained by using petroleum ether 5.54% in *C. odorata* and 4.11% in *M. micrantha*. This trend was same with extraction yield in stem for both species. This was due to polar compounds in plant matrix would be easier to extracts with polar solvent (Bimakr et al., 2011) while non- polar solvent has higher compound selectivity and produced lower yield (Jumaat et al., 2017).

Phytochemical analysis of the *M. micrantha* and *C. odorata* extract by GCMS revealed the presence of various compound such as phenol, fatty acid, sesquiterpenes, diterpenes, alkane hydrocarbon and others which have diverse use.

The occurrence of l-(+)-Ascorbic acid 2,6-dihexadecanoate in all extract for the present study may be the reason for the use of the extract from *M. micrantha* and *C. odorata* in the treatment of skin diseases such as wounds, heal cuts and stop minor external bleeding (Dev et al., 2015). Natural ascorbic acid is crucial for the body performance. It is required for connective metabolism especially the scar tissue, bones and teeth and this function of ascorbic acid also accounts for its requirement for normal wound healing (Okwu & Ighodaro, 2009). This also supported the use of *M. micrantha* and *C. odorata* in treating wounds by the local practitioner.

Phenol 2,4-bis(1,1-dimethylethyl) is a phenolic present in the extracts and play major roles as antioxidant agent (Amirah Haziyah Ishak, 2018) and Das et al., 2012 reported that in most cases, the inhibitory activity of extracts has been attributed to the most dominant compounds.

α-Bisabolol known as sesquiterpenes, were found abundant in *Mikania* genus (Rufatto, Gower, Schwambach, & Moura, 2012) could also act as antioxidant compounds. Phytol which also have sesquiterpenes nature is one among the compounds appear in leaves for both *M. micrantha* and *C. odorata* methanolic extract of the present study. Similarly, (Sermakkani & Thangapandian, 2012) observed the presence of phytol in the Cassia Italica leaves. Similar result was also observed in the leaves of *Syzygium polyanthum, Monocarpia marginalis* and *Chromolena odorata* (Jumaat et al., 2017). Sermakkani & Thangapandian, (2012) reported that phytol has antibacterial activities against Staphylococcus aureus and have potential anticancer, cancer preventive, diuretic anti-inflammatory.

Hexadecaonic acid methyl ester also known as palmitic acid methyl ester and linolenic acid belong to the class of organic compound of fatty acid (Aji, Gutti, Highina, & Kyari, 2015). (Okwu & Ighodaro, 2009) found that the fatty acids and alcohols in the plant undergoes esterification reaction to form esters which frequently exudes out of the plant as resins/exudates and is used in African medicine in treating wounds, craw-craw and ringworms.

Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, methyl ester present in this extract and similarly to (Akpuaka et al., 2013). He reported that they have antifungal and antioxidant activity.

4. Conclusion

It is concluded there are more polar solubility than non-polar solubility compounds in *M. micrantha* and *C. odorata*. Between parts leave has more bioactive compound than in stem. This study reveals various chemical compound that can lead to pharmaceutical used and from its extensive use as herbal medicine, it was identified several of these compounds as being highly pharmacological interest towards antioxidant activity. It is suggested that separation and fraction of extract should be done to get accurate phytochemical result.

References

Akpuaka, A., Ekwenchi, E.E, Dashak D.A., & Dildar, A. (2013). Biological Activities of Characterized Isolates of n-Hexane Extract of Azadirachta Indica A. Juss (Neem) Leaves. *Nature and Science, 11*(5).

Ahmad, A., Alkarkhi, A. F. M., Hena, S., & Khim, L. H. (2009). Extraction, Separation and Identification of Chemical Ingredients of Elephantopus Scaber L. Using Factorial Design of Experiment. *International Journal of Chemistry, 1*(1). https://doi.org/10.5539/ijc.v1n1p36

Aji, M. M., Gutti, B., Highina, B. K., & Kyari, S. A. (2015). Soxhlet extraction and characterization of oil from *Schweinfurthii* (Black Date) fruits for domestic purpose. *Applied Research Journal*, *1*(2), 41–45.

Bhardwaj, S., & Gakhar, S. K. (2005). Ethnomedicinal plants used by the tribal of Mizoram to cure cuts & wounds. *Indian Journal of Traditional Knowledge, 4*(1), 75–80.

Bimakr, M., Rahman, R. A., Taip, F. S., Ganjloo, A., Salleh, L. M., Selamat, J., Zaidul, I. S. M. (2011). Comparison of different extraction methods for the extraction of major bioactive flavonoid compounds from spearmint (*Mentha spicata L.*) leaves. *Food and Bioproducts Processing, 89*(1), 67–72. https://doi.org/10.1016/j.fbp.2010.03.002

Dev, U. K., Hossain, M. T., & Islam, M. Z. (2015). Phytochemical investigation, antioxidant activity and anthelmintic activity of *Mikania micrantha* leaves. *World Journal of Pharmaceutical Research, 4*(5), 121–133.

Hunter, M. (2011). *Ethno-botany Behind the Malay Herbal Industry*. School of Bioprocess Engineering Northern Malaysia University College of Engineering (KUKUM).

Ishak, A. H. (2018). From Weed to Medicinal Plant: Antioxidant Capacities and Phytochemicals of Various Extracts of *Mikania micrantha*. *International Journal of Agriculture and Biology, 20*(03), 561–568. https://doi.org/10.17957/IJAB/15.0522

Ishak, A. H., Shafie, N. H., Mohd Esa, N., & Bahari, H. (2016). Nutritional, Phytochemical and Pharmacological Properties of *Mikania micrantha Kunth*. *Pertanika Journal of Scholarly Research Reviews, 2*(3), 123–132. https://doi.org/10.1016/S2005-2901(11)60010-1

Jumaat, S. R., Tajuddin, S. N., Sudmoon, R., Chaveerach, A., Abdullah, U. H., & Mohamed, R. (2017). Chemical constituents and toxicity screening of three aromatic plant species from Peninsular Malaysia. *BioResources, 12*(3), 5878–5896. https://doi.org/10.15376/biores.12.3.5877-5895

Lowe S., Browne M., Boudjelas S., De Poorter, M. (2000). 100 of the World's Worst Invasive Alien Species: A selection from the global invasive species database. The Invasive Species Specialist Group ISSG a specialist group of the Species Survival Commission SSC of the World Conservation Union IUCN 12pp. https://doi.org/10.1614/WT-04-126.1

Luwum, P. (2002). Control of Invasive *Chromolaena odorata*: An evaluation in some land use types in KwaZulu Natal, South Africa. International Institute for Geo-information Science and Earth Observation.

Murrell, C., Gerber, E., Krebs, C., Parepa, M., Schaffner, U., & Bossdorf, O. (2011). Invasive knotweed affects native plants through allelopathy. *American Journal of Botany, 98*(1), 38–43. https://doi.org/10.3732/ajb.1000135

Nanadini, N., Nagababu, P., Umamaheswara Rao, V., & Venugopal, N. (2014). Phytochemical, antimicrobial and antioxidant properties of an invasive weed-*Chromolaena odorata* (L.) King & Robinson. *International Journal of Phytomedicine, 6*(2), 286–292.

Okwu, D. E., & Ighodaro, B. U. (2009). GC-MS evaluation of the bioactive compounds and antibacterial activity of the oil fraction from the stem barks of *Dacryodes edulis* G. Don Lam. *International Journal of Drug Development and Research, 1*(1), 117–125.

RISDA (2011). Pejabat RISDA Pulau Pinang. *Panduan Pekebun Kecil: Getah.* Retrieved from http://www.risda.gov.my/pulaupinang

Rufatto, L. C., Gower, A., Schwambach, J., & Moura, S. (2012). Genus Mikania: Chemical composition and phytotherapeutical activity. *Brazilian Journal of Pharmacognosy, 22*(6), 1384–1403. https://doi.org/10.1590/S0102-695X2012005000099

Saha, S., Mandal, S. K., & Chowdhury, H. R. (2015). Anato-pharmacognostic studies of *Mikania micrantha* Kunth: a promising medicinal climber of the family Asteraceae. *International Journal of Research in Ayurveda & Pharmacy, 6*(6), 773–780. http://doi.org/10.7897/2277-4343.066144

Sermakkani, M., & Thangapandian, V. (2012). GC-MS analysis of *Cassia italica* leaf methanol extract. *Asian Journal of Pharmaceutical and Clinical Research, 5*(2), 90–94.

Tantra, R. G. Y. (2014). Efektivitas Antimikroba Ekstrak Daun Sembung Rambat (*Mikania micrantha*, H.B.K) Terhadap Bakteri Gram Positif yang Resisten Penisilin. Institut Pertanian Bogor.

Vital, P. G., & Rivera, W. L. (2009). Antimicrobial activity and cytotoxicity of *Chromolaena perrottetii* (A. Rich) Merr. extracts. *Journal of Medicinal Plants Research, 3*(7), 511–518.

Werren, G. (2001). *Environmental weeds of the wet tropics' bioregion: risk assessment & priority ranking*. Rainforest CRC. Australia.

Teacher Perspectives on English-Only Instruction: Challenges and Strategies in ESL Classrooms

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Abstract

This study explores the strategies ESL teachers employ to address the challenges of English-only instruction in multilingual classrooms. Through a qualitative analysis of teacher interviews, key themes emerged related to the difficulties encountered by teachers and the pedagogical approaches they adopt to overcome these barriers. The primary challenges identified include students' low proficiency in English, demotivation, and disengagement due to comprehension difficulties. Teachers reported using various strategies to address these issues, including simplified and step-by-step instruction, code-switching, and integrating technology and engaging methods. Teachers found that simplifying language and instructions, while helpful in improving immediate comprehension, did not always foster long-term language proficiency. Similarly, code-switching helped clarify content but could encourage students to rely too much on their native language, thus limiting their immersion in English. Technology and interactive methods were viewed positively, as they promoted engagement and autonomy in learning. However, the overall effectiveness of these strategies varied depending on the proficiency level and engagement of the student group. The findings suggest that while these strategies provide short-term benefits, a more balanced approach that combines scaffolding and immersive language experiences may be necessary to promote sustainable English language development. Future studies should explore the long-term impact of these strategies on English fluency and consider the role of cultural context in shaping teachers' perceptions of effective pedagogy.

Keywords: ESL classroom, ESL teachers, English-only policy

1. Introduction

Implementing **English-only instruction policies** in English as a Second Language (ESL) classrooms remains a highly debated topic, particularly in diverse, multilingual settings. These policies, which mandate English as the sole medium of instruction, are rooted in the belief that immersing students in the target language accelerates language acquisition and leads to better academic performance. The **Input Hypothesis**, proposed by Stephen Krashen (1982), is a foundational theory that supports this approach. Krashen's hypothesis suggests that learners acquire language when exposed to comprehensible input beyond their current level, allowing them to infer meaning and develop new language skills through contextual clues.

Proponents of English-only instruction argue that exclusive exposure to English minimizes reliance on the students' first languages (L1) and promotes faster acquisition of English language proficiency. This approach enhances academic success and social integration by ensuring students access the dominant language of instruction and social communication (Rossell & Baker, 1996). **Crawford (2004)** further asserts that English-only policies aim to equalize opportunities, especially in English-dominant countries like the United States, where English proficiency is often key to academic and career advancement.

English-only policies have been especially prominent in the United States, particularly with legislative initiatives such as California's Proposition 227 (1998) and Arizona's Proposition 203 (2000), which mandated English-only instruction in public schools. These policies were largely influenced by the perception that bilingual education had failed to improve educational outcomes for English Language Learners (ELLs) and that full immersion in English would better serve students academically (Gándara & Hopkins, 2010).

However, the **effectiveness of English-only instruction** remains contentious, particularly in classrooms characterized by wide-ranging proficiency levels and cultural diversity. Research indicates that enforcing English as the sole language of instruction can exacerbate inequities by not accounting for students' linguistic backgrounds and

varying proficiency levels (Lucas & Villegas, 2013). For many students, comprehensible input in English-only classrooms is inaccessible, making it difficult for teachers to meet their learning needs, especially for beginners with limited English skills. As a result, students may disengage from lessons due to language barriers, leading to demotivation and frustration (Cummins, 2000; García & Kleifgen, 2018).

Furthermore, **linguistic diversity** in ESL classrooms brings an array of resources that, if leveraged effectively, can facilitate language learning. Research by **Cummins (2000)** and **García and Kleifgen (2018)** underscores the cognitive and academic benefits of incorporating students' L1 as a scaffold for learning new concepts. For instance, using L1 in the classroom can enhance comprehension, support cognitive development, and improve students' ability to transfer knowledge across languages. However, English-only policies often restrict the use of L1, potentially undermining these benefits.

Teachers also encounter significant challenges in implementing English-only policies, such as managing classroom behavior and maintaining engagement when students struggle to understand instructions delivered solely in English (Creese & Blackledge, 2010). When students do not fully grasp English explanations, teachers often resort to code-switching or using students' L1 to maintain order and ensure comprehension. Though effective in the short term, this practice contradicts the principles of English-only policies and raises questions about the feasibility of such policies in practice.

Moreover, many teachers feel **underprepared** to effectively implement English-only instruction due to insufficient professional development opportunities tailored to the specific needs of multilingual classrooms (de Jong & Harper, 2005). Teachers frequently develop their strategies, such as using visual aids, code-switching, or employing more simplified English, to bridge the gap between policy expectations and classroom realities (Palmer et al., 2014). However, there remains a lack of comprehensive research on the effectiveness of these strategies and how they may support or hinder student outcomes over the long term.

While English-only instruction may theoretically promote faster acquisition of English, it may also contribute to unintended negative outcomes, such as increased anxiety, reduced engagement, and lower self-esteem for students with limited proficiency (Cummins, 2000; Gándara, 2015). Furthermore, excluding students' L1 from the classroom can devalue their linguistic and cultural identities, which are critical to fostering a positive learning environment. As **García (2009)** points out, linguistic diversity should be seen as an asset rather than a barrier in language learning environments.

In conclusion, while English-only policies have theoretical merit, particularly within the framework of immersion education, they fail to account for the complexities of multilingual classrooms. Teachers' experiences suggest that a more flexible, inclusive approach that values students' linguistic resources may be more effective in promoting language acquisition and academic success. By examining the **nuanced challenges** and **adaptive strategies** reported by ESL teachers, this study highlights the need for **revised language policies** prioritizing immersion in the target language and using students' L1 as a scaffold for learning. This approach could bridge the gap between policy and practice, ultimately enhancing the quality of ESL education for all students.

Research questions

The following research questions guide the study:

1. How do ESL teachers describe their primary challenges in implementing English-only instruction?

2. What strategies do ESL teachers report using to address the challenges of English-only instruction, and how do they perceive the effectiveness of these strategies?

2. Literature Review

The debate around English-only instruction in ESL (English as a Second Language) classrooms has been ongoing, with various stakeholders presenting differing perspectives on its effectiveness. At the heart of this debate are the teachers who implement these policies and face daily challenges in diverse classroom settings. This literature review examines recent research on ESL teachers' challenges with English-only instruction and their strategies to overcome them. By focusing on current studies, this review aims to provide a comprehensive understanding of the complexities involved and identify areas needing further investigation.

Theoretical Foundations and Rationale

The concept of English-only instruction is rooted in the immersion model and Krashen's Input Hypothesis (1982), which advocates for maximum exposure to the target language to facilitate acquisition. Proponents argue that this method accelerates language learning and improves academic outcomes by immersing students in English (Rossell & Baker, 1996). However, critics such as Cummins (2000) and García and Kleifgen (2018) suggest that excluding students' native languages can impede learning and negatively affect their cultural and linguistic identities.

Challenges Faced by ESL Teachers

Student Proficiency Levels

Recent studies highlight the significant challenge posed by varying levels of English proficiency among students. Kang and Cheng (2021) note that ESL classrooms often have students with diverse language backgrounds and differing proficiency levels, making it difficult to provide uniform instruction. Teachers must balance the needs of advanced students with those of beginners, often without adequate resources or support.

Cultural and Linguistic Diversity

The increasing cultural and linguistic diversity in ESL classrooms presents another challenge. According to Harper and de Jong (2022), students bring various cultural backgrounds and native languages, which can be leveraged as educational resources. However, English-only policies often disregard these assets, potentially alienating students and hindering their learning experiences.

Classroom Management

Classroom management is a critical issue under English-only instruction. García and Wei (2022) found that when students do not fully understand instructions in English, teachers may need to use students' native languages to maintain classroom order and ensure comprehension. This necessity often conflicts with strict English-only policies, creating tension and inconsistency in instructional practices.

Professional Development

Insufficient professional development is a recurring theme in the literature. Faltis and Valdés (2020) emphasize that many teachers feel unprepared to meet the demands of English-only instruction due to inadequate training. Professional development programs often fail to address the specific needs of teachers working in multilingual environments, leaving them without effective strategies to support their students.

Strategies Employed by Teachers

Scaffolding and Differentiation

Teachers often employ scaffolding techniques to address the diverse proficiency levels in their classrooms. Gibbons (2020) discusses how scaffolding can help bridge the gap between student's current proficiency, and the curriculum demands using visual aids, gestures, and simplified language. Differentiation, as explored by Tomlinson (2021), involves tailoring instruction to meet individual student needs, providing additional support for those who struggle while challenging more advanced learners.

Code-Switching

Code-switching remains a prevalent strategy among ESL teachers. Sayer (2021) found that teachers often use students' native languages to clarify instructions, explain complex concepts, and manage classroom behaviour. While this practice may conflict with English-only policies, it is a practical tool to enhance understanding and engagement.

Translanguaging

Translanguaging, the strategic use of multiple languages within the classroom, has become beneficial. According to García and Lin (2017), translanguaging allows students to use their entire linguistic repertoire to make sense of new content, thus promoting deeper understanding and cognitive development. This approach not only aids comprehension but also validates students' cultural and linguistic identities.

Collaborative Learning

Encouraging collaborative learning activities is another strategy used by ESL teachers. As Lantolf and Poehner (2014) discussed, Vygotskian theories suggest that peer support and social interaction are crucial for language learning. Teachers often organize group work and peer tutoring sessions where students can use their native languages alongside English, facilitating a more inclusive and supportive learning environment.

Impact on Student Outcomes

The impact of English-only instruction on student outcomes remains a contentious issue. Proponents like Krashen (1982) argue that immersion in English leads to better language proficiency and academic success. However, recent research indicates potential negative effects, such as increased anxiety and reduced engagement among lower proficiency students (Cummins, 2000; Gándara, 2021). Additionally, excluding students' native languages can devalue their cultural identities and hinder their learning motivation (García & Kleifgen, 2018).

Despite the extensive research on English-only instruction, several gaps remain. Most studies focus on theoretical and policy aspects, often neglecting the practical challenges and strategies from the teachers' perspectives. Future research should investigate teachers' specific strategies and evaluate their effectiveness in various contexts. Additionally, there is a need for more comprehensive studies on the impact of professional development programs tailored to the needs of teachers in multilingual classrooms.

Understanding teacher perspectives on English-only instruction is crucial for developing effective ESL educational practices and policies. Teachers face significant challenges, including varying student proficiency levels, cultural and linguistic diversity, classroom management issues, and insufficient professional development. Despite these obstacles, they employ strategies to support their students and make English-only instruction more effective.

It is essential to consider the practical realities of these policies from the teachers' viewpoint. By addressing the gaps in the literature and focusing on teachers' experiences, future research can contribute to developing more inclusive and effective instructional approaches that better support teachers and students in ESL classrooms.

3. Methodology

Research Design

This study employs a qualitative research design to explore the challenges and strategies associated with English-only instruction from the perspectives of ESL teachers. The qualitative approach is suitable for capturing teachers' nuanced experiences, perceptions, and strategies, providing an in-depth understanding of their realities in implementing English-only policies. The study will involve twelve ESL teachers as respondents. These participants will be selected through purposive sampling to ensure they have relevant experience with English-only instruction policies. The selection criteria include:

Experience: Teachers with at least two years of experience in ESL classrooms where English-only instruction policies are implemented.

Diversity: A range of teaching contexts, including urban and rural schools, different educational levels (primary, secondary, and post-secondary), and varied student demographics to capture diverse perspectives.

Data Collection

Data will be collected using semi-structured interviews. This method allows for flexibility in exploring each participant's experiences while maintaining a consistent framework for comparison. A semi-structured interview guide will be developed to ensure that key topics related to challenges and strategies in English-only instruction are covered. The guide will include open-ended questions and prompts to encourage participants to elaborate on their experiences. Interviews will be scheduled at times convenient for participants and conducted in person or via video conferencing platforms, depending on participants' preferences and accessibility. Each interview will last approximately 45-60 minutes.

Recording and Transcription: Interviews will be audio-recorded with participants' consent and transcribed verbatim for analysis. Data analysis will follow an inductive approach to identify themes and patterns related to the challenges and strategies of English-only instruction. Transcription: Transcribed interviews will be reviewed for accuracy and completeness. Initial coding will be conducted to identify significant statements and concepts. Open coding will be used to categorize the data into preliminary themes. Thematic analysis will be employed to organize

codes into broader themes and sub-themes. Themes will be derived from participants' descriptions of their experiences and perceptions. Findings will be interpreted to understand how teachers perceive the challenges and the effectiveness of strategies related to English-only instruction. The analysis will provide insights into the practical implications of these policies on teaching and learning.

Ethical Considerations

The study will adhere to ethical guidelines to ensure the protection of participants' rights:

Informed Consent: Participants will be provided with an informed consent form detailing the purpose of the study, procedures, potential risks, and benefits. Consent will be obtained before conducting interviews.

Confidentiality: Participants' identities will be kept confidential. Data will be anonymized, and personal identifiers will be removed from transcripts.

Voluntary Participation: Participation will be voluntary, and participants will have the right to withdraw from the study at any time without consequence.

Limitations

The study's findings may be limited by the small sample size of twelve participants, which may not fully represent the diverse experiences of all ESL teachers. Additionally, the qualitative nature of the research means that findings are context-specific and may not be generalizable to all educational settings. This qualitative study will provide valuable insights into the challenges and strategies associated with English-only instruction from the perspectives of ESL teachers. By focusing on teachers' experiences and perceptions, the research aims to contribute to a deeper understanding of the practical implications of English-only policies and inform future educational practices and policies.

4. Findings

Teachers' primary challenges in implementing English-only instruction.

Students' Low Proficiency in English

This category addresses how teachers describe the challenge of students with low English proficiency. Teachers often mention that students lack the necessary vocabulary or grammar skills to follow lessons delivered entirely in English since the lack of proficiency results in comprehension difficulties and disengagement.

> "Students have limited vocabulary and lack motivation to learn the language as they do not use it at home or while communicating with others. It means that they struggle with basic comprehension when I try to teach in English." (P1)

> "It's challenging to use only English... many of them get lost." (P9)

> "Students have problems understanding and comprehending instructions. Some students even asked, 'What to do?' even though the task was started 5 minutes ago." (P5)

Demotivation and Engagement Issues

Teachers describe the challenge of students losing motivation or becoming disengaged due to the difficulty of understanding lessons conducted in English. When students feel overwhelmed by language barriers, their interest wanes, leading to passive participation and, in some cases, disengagement from learning tasks.

> "Demotivation increases when instructions are 100% in English. They feel left out because they don't understand what's going on." (P3)

"At one point, they lost focus and decided to do something else. It's hard to maintain their attention when they don't grasp the lesson." (P8)

"English is treated as a subject... they can never write a sentence on their own." (P11)

Teachers' strategies to address the challenges of English-only instruction and how they perceive the effectiveness of these strategies.

Simplified and Step-by-Step Instruction

Teachers address the challenges of English-only instruction by simplifying their language and giving instructions in smaller, step-by-step increments. Visual aids, repetition, and gradually increasing the difficulty of tasks also help students understand the lessons. These methods aim to build a foundation of comprehension and engagement, slowly progressing to more complex tasks as students become comfortable with the language.

"I use a step-by-step approach, giving simple and straightforward instructions. I utilize textbook materials and online resources... gradually increasing the difficulty of tasks as students' progress." (P2)

"I use simpler English, write instructions on the board, and give examples... Repetition is key... Game-based learning has been effective." (P7)

"I complement my delivery with simple actions... Drilling is also a strategy... to help them get accustomed to the sentence structures." (P8)

Code-Switching and Use of Native Language

Many teachers report using code-switching and occasionally resorting to the student's native language to ensure comprehension. They find that using English and the student's first language can help bridge understanding, particularly for lower proficiency students. However, teachers also acknowledge the risk of students becoming reliant on their native language, which may limit their ability to develop English skills over the long term.

"I use code-switching... to ensure that my students understand. I simplify the vocabulary, but switching to their native language helps them grasp concepts quickly." (P3)

"When students don't understand... I repeat instructions in Malay... I've found that peer support yields the best results." (P5)

"I use code-switching often... It tends to encourage reliance on the first language, but for writing tasks, I prefer English-only instruction to develop their comprehension." (P10)

Use of Technology and Engaging Methods

Teachers incorporate technology and interactive methods like game-based learning to engage students at all proficiency levels. By using accessible activities to every student, teachers can increase participation and improve student autonomy. Engaging methods like games and technology create a more dynamic learning environment, making lessons more enjoyable and helping students practice their English skills in a low-pressure setting.

"I apply technology-based activities that are suitable for all proficiency levels... allowing every student to participate. Tailoring lessons improves their competency in English." (P6)

"I use game-based learning... Repetition helps reinforce what they've learned, while the games keep them interested." (P7)

"I select a leader for each group who repeats instructions... Providing students with sample assignments helps give them a clearer picture." (P11)

Perceived Effectiveness of Strategies

Teachers have mixed perceptions regarding the effectiveness of their strategies. While strategies like peer-assisted learning and repeated instruction are deemed highly effective, code-switching is seen as a temporary solution that can limit English language development. Teachers prefer using English-only instruction for tasks like writing and reading

comprehension, even though it is more challenging to implement.

> "Peer-assisted learning and repeated instructions are the most effective strategies... Repeating instructions in their native language ensures that everyone is on the same page." (P5)

> "Effectiveness depends on the group... Some need more code-switching, while others benefit from immersion... I don't want them to rely on their native language too much." (P9)

> "Code-switching works in the short term, but I prefer English-only instruction for writing tasks... It takes more effort, but it's crucial for long-term development." (P10)

5. Discussion

How do ESL teachers describe their primary challenges in implementing English-only instruction?

Implementing English-only instruction in ESL classrooms is fraught with numerous challenges, particularly when students have limited exposure to English outside the classroom. ESL teachers often grapple with students' varying proficiency levels, demotivation, and difficulty engaging with lessons conducted entirely in English. These challenges align with broader research in language acquisition and bilingual education, suggesting that rigid adherence to English-only policies may not always be the most effective approach for fostering language development. In this discussion, we critically examine how ESL teachers describe these challenges, connecting the findings from the table to existing research in the field.

Students' Low Proficiency in English

One of the primary challenges highlighted by ESL teachers is students' low proficiency in English, which makes it difficult for them to comprehend lessons taught exclusively in the target language. According to the findings, teachers consistently reported that students struggle with understanding instructions, which impedes their participation and engagement. For instance, teachers noted that students "do not understand instructions in English" and that their "proficiency level is too low for English-only instruction" (R4, R2). This challenge is widely acknowledged in current research.

Studies by García and Kleyn (2016) argue that multilingual students often benefit from instructional strategies incorporating their native language, particularly in the early stages of language acquisition. English-only policies can exacerbate comprehension difficulties and widen the gap between students who are proficient in English and those who are not. As Cummins (2007) points out, expecting students to learn complex concepts in a language they have not yet mastered may result in cognitive overload, which leads to passivity in the classroom and hinders language development. The teachers in this study expressed similar concerns, reporting that students often became disengaged when they could not follow the lesson (R8).

Demotivation and Engagement Issues

In addition to proficiency challenges, ESL teachers reported significant issues related to student demotivation and disengagement during English-only instruction. The findings revealed that many students lose interest when they struggle to comprehend lessons, with one teacher explaining that "students lose focus and decide to do something else" (R8). This is consistent with research on language learning motivation, which emphasizes the importance of students' self-efficacy and confidence in their ability to succeed (Dörnyei, 2001). When students consistently experience failure or confusion in English-only environments, their learning motivation diminishes, resulting in lower participation and poorer learning outcomes.

The issue of demotivation also ties into how students often perceive English. One teacher noted that students view English as an academic rather than a practical skill, stating that "students get good marks, but they can never write a sentence on their own" (R11). This reflects the findings by Norton (2013), who argues that how language is positioned in education systems can affect learners' attitudes and engagement. If students do not see English as a meaningful tool for communication in their daily lives, they are less likely to engage fully with lessons conducted entirely in English.

Relating the Findings to Broader Pedagogical Challenges

The challenges of varying proficiency levels in English-only instruction also align with current research on differentiated instruction and translanguaging. According to García and Wei (2014), translanguaging practices, where

students use all their linguistic resources, including their native language, can foster better understanding and engagement. The teachers in the study reported difficulties in ensuring that all students were on the same page, with some mentioning that they needed to "repeat instructions in Malay" (R5) or rely on other students to help those struggling. This reflects the broader pedagogical challenge of balancing adhering to English-only policies and ensuring that students with lower proficiency are not left behind.

Research on bilingual education further supports the idea that English-only instruction may not always be the most effective strategy for all learners. Collier and Thomas (2017) argue that providing students access to their first language in the classroom can enhance their cognitive development and help them transfer skills between languages. In the context of the study, teachers who reported the need to code-switch or use simplified language (R3, R9) were implicitly recognizing the limitations of English-only policies. As these teachers noted, strict English-only instruction is often "demotivating" and "difficult for students to follow" (R3, R4). This is consistent with studies showing that students benefit from instruction that acknowledges and incorporates their linguistic and cultural backgrounds (Cummins, 2017).

Policy vs. Classroom Realities

Another key theme from the findings is the tension between policy mandates for English-only instruction and classroom realities. Many teachers described how their students' varying proficiency levels made it impossible to adhere strictly to English-only instruction. One teacher explained, "It is challenging to use only English... I often need to code-switch to ensure my message is understood" (R9). This reflects a broader concern in language education policy: while English-only instruction may be ideal in theory, it often does not account for the linguistic diversity in many classrooms (Gándara & Escamilla, 2017).

The reliance on English-only instruction, particularly in regions where English is not widely spoken outside of school, can place undue pressure on students and teachers. In such contexts, code-switching becomes necessary to ensure that lessons are understood. However, as some teachers in the study pointed out, this strategy may also inadvertently encourage students to rely on their first language, limiting their English development in the long run (R10). This dilemma highlights the need for flexible instructional policies that allow teachers to adapt their strategies to meet the needs of their students.

ESL teachers describe the primary challenges of English-only instruction as revolving around students' low proficiency, demotivation, and difficulties in maintaining engagement. The findings from the study align with broader research in language acquisition and bilingual education, which suggests that strict adherence to English-only policies may not be effective for all learners, particularly those with limited exposure to the language. Instead, a more flexible approach incorporating students' native languages and differentiated instruction may be necessary to address these challenges effectively. While English-only instruction remains a goal for many educational systems, policies must allow for adaptation to the realities of diverse classrooms.

What strategies do ESL teachers report using to address the challenges of English-only instruction, and how do they perceive the effectiveness of these strategies?

Using English-only instruction in ESL classrooms presents significant challenges for teachers and students, especially in multilingual contexts. ESL teachers adopt various strategies to address these challenges to support student comprehension, engagement, and overall language development. In this discussion, we explore the strategies ESL teachers report using to mitigate the difficulties of English-only instruction and assess their perceived effectiveness. By relating the findings to the current research, we critically analyze the pedagogical approaches used in response to the challenges of English-only instruction.

Simplified and Step-by-Step Instruction

One of the teachers' most commonly reported strategies is simplifying instructions and breaking lessons into step-by-step processes. Teachers in the study noted that using "simple and straightforward instructions" and gradually increasing task difficulty helped students comprehend lessons better (R2). This is particularly crucial in ESL settings, where students' varying proficiency levels can make following complex instructions in English daunting.

Current research supports this strategy, highlighting the importance of scaffolding in language learning (Gibbons, 2015). Scaffolding refers to gradually introducing more complex language and tasks as students' proficiency improves. By adjusting the difficulty level and supporting students at each stage of their learning, teachers can foster understanding and confidence in using English. As Hammond and Gibbons (2005) note, scaffolding allows teachers

to provide students with the necessary support while challenging them to expand their linguistic and cognitive abilities. The teachers in this study reported similar approaches, with one noting using visual aids and repetition to reinforce understanding (R7).

The effectiveness of this strategy was viewed positively by most teachers, who found that breaking down instructions and reinforcing them with visual aids or actions helped students engage with the content (R8). This aligns with findings from research on comprehensible input, which suggests that learners need language access beyond their current proficiency level but still understandable with the help of contextual clues (Krashen, 1985). However, while simplified instruction helps students comprehend lessons in the short term, it may not fully address the long-term goal of developing independent English language proficiency.

Code-Switching and Use of Native Language

Another frequently employed strategy is code-switching, or alternating between English and students' native language(s), to facilitate understanding. The study's teachers reported using code-switching to clarify instructions or explain complex concepts. One teacher mentioned that they "code-switch and use simple vocabulary" (R3), while another described repeating instruction in Malay to ensure comprehension (R5).

While the use of students' native language is sometimes viewed as counterproductive in English-only classrooms, research on translanguaging suggests that drawing on all of a learner's linguistic resources can enhance understanding and foster language development (García & Wei, 2014). Translanguaging, which allows students to move fluidly between languages, encourages deeper cognitive engagement and helps bridge the gap between students' existing knowledge and the new language they are learning.

Teachers in this study acknowledged the short-term effectiveness of code-switching in ensuring comprehension, but they also recognized its limitations. Some noted that too much reliance on students' first language could discourage them from using English in the classroom (R10). This concern is consistent with research by Turnbull and Arnett (2002), which found that while code-switching can be useful for scaffolding understanding, excessive use can inhibit students' immersion in the target language. Teachers often face a dilemma: while code-switching is necessary for facilitating immediate understanding, over-reliance on it may hinder the development of English language fluency.

Use of Technology and Engaging Methods

Several teachers also reported using technology-based activities and engaging methods such as game-based learning to address the challenges of English-only instruction. One teacher mentioned using "technology-based activities tailored to all proficiency levels" to encourage participation and autonomy in the classroom (R6). Similarly, another teacher highlighted using games and repetition to keep students engaged (R7).

Technology in ESL classrooms is increasingly recognized as an effective tool for enhancing language learning. Research by Warschauer and Matuchniak (2010) found that digital tools can provide personalized learning experiences and allow students to practice English in interactive ways. Technology can also make abstract concepts more tangible through visual and auditory support, particularly helpful in English-only environments where students may struggle with language comprehension. Game-based learning, in particular, promotes student engagement by making learning more enjoyable and lowering the affective filter, an emotional barrier that can block language acquisition when students feel anxious or demotivated (Krashen, 1982).

Teachers who employed these strategies found them to be highly effective in fostering student participation and improving language competency (R6, R7). This aligns with findings from research on task-based language learning, which emphasizes the role of meaningful, interactive tasks in promoting language development (Ellis, 2003). By engaging students in activities requiring them to use English in real-world contexts, teachers can create more opportunities for authentic language use, supporting comprehension and fluency.

Perceived Effectiveness of Strategies

The teachers in the study had mixed perceptions about the effectiveness of their strategies. For instance, one teacher found peer-assisted learning to be particularly helpful in ensuring that students understood tasks (R5), while another acknowledged that the effectiveness of strategies largely depended on the student group (R9). This variability in perceptions is consistent with research on differentiated instruction, which argues that the effectiveness of any instructional strategy depends on the individual needs and abilities of the learners (Tomlinson, 2001).

Teachers who employed code-switching and mixed-language instruction noted its utility in the short term but expressed concern about its long-term implications for English language acquisition. As one teacher explained, while

code-switching helps students understand the lesson at the moment, it may discourage them from using English when interacting with the teacher (R10). This sentiment reflects a broader debate in language education: while bilingual instructional strategies can enhance immediate comprehension, they may conflict with the long-term goal of full English proficiency (Cummins, 2009).

ESL teachers report using various strategies to address the challenges of English-only instruction, including simplifying instructions, code-switching, incorporating technology, and engaging students with interactive tasks. These strategies reflect a pragmatic approach to the realities of multilingual classrooms, where students' varying proficiency levels require flexible and adaptive teaching methods. While most teachers find these strategies effective in improving comprehension and engagement in the short term, concerns remain about the long-term impact of code-switching and the development of English fluency. These findings underscore the need for balanced instructional practices that allow for the strategic use of students' native language while still promoting immersive English language learning experiences.

6. Research Implications

The findings from this study on ESL teachers' strategies for addressing challenges in implementing English-only instruction have significant implications for classroom practices and educational policy. A key implication is the need for greater flexibility in language instruction. The strict enforcement of English-only policies may hinder learning, especially for students with low proficiency in English. As teachers in this study reported, students' limited vocabulary and comprehension skills often lead to disengagement and demotivation, raising the question of whether an English-only approach is suitable for all classroom contexts (García & Lin, 2017). Policymakers and educators must reconsider whether bilingual or code-switching strategies might be more effective in supporting language acquisition, especially in multilingual settings.

Additionally, **differentiated instruction** is critical in ESL classrooms. Teachers in this study frequently employed simplified, step-by-step approaches to scaffold learning, aligning with Vygotskian scaffolding theories that suggest learners benefit from structured guidance before achieving independent mastery (Wood et al., 1976). This supports the notion that ESL teaching should not be one-size-fits-all but should instead account for the diverse needs of students at different proficiency levels.

Moreover, **technology and interactive methods** emerged as essential tools for fostering student engagement. As reported by the participants, integrating game-based learning and technology helped make lessons more accessible and participatory for students at various proficiency levels (Stockwell, 2020). This has broader implications for educational policy, which should promote greater access to technological resources in classrooms. Training programs should also prioritize preparing teachers to effectively integrate digital tools and interactive activities into their teaching strategies.

Lastly, the mixed responses to **code-switching** highlight the importance of teacher autonomy in deciding when and how to use students' first languages in the classroom. While some teachers found code-switching useful for clarifying instructions, others noted it could hinder English immersion and long-term language development. This finding calls for a more nuanced approach to language policy in education, one that balances the immediate needs of learners with the long-term goal of English fluency (Creese & Blackledge, 2010).

7. Recommendations for Future Studies

The findings from this study point to several avenues for future research that could further elucidate effective strategies for ESL instruction in multilingual classrooms. One key area for future research is the **long-term impact** of the strategies employed by teachers, particularly code-switching and simplified instruction. While these methods were reported effective in addressing immediate comprehension challenges, their influence on students' overall language development and fluency remains unclear. Longitudinal studies that track students' progress over time would provide valuable insights into whether these strategies foster or impede long-term English proficiency (Macaro, 2009).

Another important direction for future research is the **effectiveness of technology-based learning tools**. Teachers in this study found game-based and interactive methods useful for engaging students and facilitating learning. However, the precise mechanisms by which these tools enhance language acquisition are not fully understood. Future research could focus on identifying the specific features of digital tools that most effectively support ESL learners and how these tools can be integrated with traditional teaching methods to create a blended learning environment (Warschauer & Meskill, 2000).

Additionally, future studies should explore the **role of cultural and contextual factors** in shaping teachers' instructional choices. The participants in this study reported varied perceptions of code-switching, with some viewing it as essential while others saw it as a barrier to language immersion. This suggests that local educational policies, cultural norms, and student demographics may influence how teachers approach English-only instruction. Comparative studies across different cultural contexts or countries would help clarify how these factors impact teaching strategies and outcomes (Canagarajah, 2011).

Finally, there is a need for research on **teacher training and professional development** in the context of ESL instruction. Teachers in this study expressed the need for more support in handling the diverse needs of their students, particularly concerning scaffolding techniques, differentiation, and the strategic use of native languages. Future studies could investigate the effectiveness of specific teacher training programs in preparing educators for these challenges and how professional development can better equip teachers to use digital tools and interactive methods in the classroom (Richards & Farrell, 2011).

8. Conclusion

This study investigated the strategies ESL teachers use to address the challenges of English-only instruction in multilingual classrooms. Through a thematic analysis of interview data, several key challenges emerged, including students' low proficiency in English, demotivation, and disengagement. Teachers reported using simplified and step-by-step instruction, code-switching, integrating technology and engaging methods to address these issues. While these strategies were perceived as effective in improving short-term comprehension and participation, concerns were raised about their long-term impact on students' overall language proficiency.

The study highlights the importance of flexible instructional practices catering to ESL learners' varying needs. Simplified and scaffolded instruction allows students to gradually build their language skills, while code-switching is a necessary support mechanism for students with lower proficiency levels. However, teachers also acknowledged the potential drawbacks of over-reliance on code-switching, as it may limit students' opportunities to practice English in the classroom. This finding aligns with existing research on the balance between native language support and immersive English instruction, suggesting a nuanced approach is needed.

Moreover, technology and interactive methods emerged as promising tools for enhancing student engagement and autonomy. Teachers found that incorporating game-based learning and digital resources not only made lessons more accessible but also fostered a more engaging and dynamic learning environment. These findings suggest that technology integration into ESL classrooms could significantly benefit students.

In conclusion, while the strategies reported in this study provide valuable insights into how ESL teachers navigate the challenges of English-only instruction, they also highlight the need for further research and profession. Specifically, there is a need for longitudinal studies that explore the long-term impact of these strategies on language proficiency and fluency. Additionally, teacher training programs should focus on equipping educators with the skills and knowledge necessary to balance scaffolding, code-switching, and immersive language experiences in diverse, multilingual classrooms. By addressing these gaps, future research and educational policy can contribute to developing more effective instructional practices in ESL education.

References

Canagarajah, S. (2011). Translanguaging in the classroom: Emerging issues for research and pedagogy. *Applied Linguistics Review, 2*(1), 1-28.

Crawford, J. (2004). *Educating English learners: Language diversity in the classroom* (5th ed.). Bilingual Education Services.

Creese, A., & Blackledge, A. (2010). Translanguaging in the bilingual classroom: A pedagogy for learning and teaching? *The Modern Language Journal, 94*(1), 103-115.

Cummins, J. (2000). *Language, power, and pedagogy: Bilingual children in the crossfire*. Multilingual Matters.

de Jong, E., & Harper, C. A. (2005). Preparing mainstream teachers for English-language learners: Is being a good teacher good enough? *Teacher Education Quarterly, 32*(2), 101-124.

Ellis, R. (2005). Principles of instructed language learning. *System, 33*(2), 209-224.

Faltis, C., & Valdés, G. (2020). *Language, schooling, and inequality: Ethnographic approaches to theory, practice, and policy*. Routledge.

Gándara, P. (2015). The implications of deeper learning for adolescent immigrants and English language learners. *Review of Research in Education, 39*(1), 378-394.

Gándara, P. (2021). *The students we share: Preparing US and Mexican educators for transnational students*. SUNY Press.

García, O. (2009). *Bilingual education in the 21st century: A global perspective*. John Wiley & Sons.

García, O., & Kleifgen, J. A. (2018). *Educating emergent bilinguals: Policies, programs, and practices for English learners* (2nd ed.). Teachers College Press.

García, O., & Lin, A. M. Y. (2017). Translanguaging in bilingual education. In O. García, A. M. Y. Lin, & S. May (Eds.), *Bilingual and multilingual education* (pp. 117-130). Springer.

García, O., & Wei, L. (2022). *Translanguaging: Language, bilingualism and education* (2nd ed.). Palgrave Macmillan.

Gibbons, P. (2020). *Scaffolding language, scaffolding learning: Teaching English language learners in the mainstream classroom* (2nd ed.). Heinemann.

Harper, C. A., & de Jong, E. J. (2022). *ESOL teaching: An integrated approach for K-12 educators*. Pearson.

Kang, H., & Cheng, H. (2021). *Language proficiency and multilingual education: Global perspectives and practices*. Springer.

Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Pergamon Press.

Lantolf, J. P., & Poehner, M. E. (2014). *Sociocultural theory and the pedagogical imperative in L2 education: Vygotskian praxis and the research/practice divide*. Routledge.

Lucas, T., & Villegas, A. M. (2013). Preparing linguistically responsive teachers: Laying the foundation in preservice teacher education. *Theory into Practice, 52*(2), 98-109.

Macaro, E. (2009). Teacher use of codeswitching in the second language classroom: Exploring 'optimal' use. *Language Teaching Research, 13*(1), 63-83.

Palmer, D. K., Martínez, R. A., Mateus, S. G., & Henderson, K. (2014). Reframing the debate on bilingual education: A new way forward. *Educational Leadership, 71*(8), 54-58.

Richards, J. C., & Farrell, T. S. C. (2011). *Professional development for language teachers: Strategies for teacher learning*. Cambridge University Press.

Rossell, C. H., & Baker, K. (1996). The educational effectiveness of bilingual education. *Research in the Teaching of English, 30*(1), 7-74.

Sayer, P. (2021). Translanguaging, pedagogical translanguaging, and translanguaging space. In S. May (Ed.), *The encyclopedia of language and education* (3rd ed., pp. 133-149). Springer.

Stockwell, G. (2020). Mobile-assisted language learning: Concepts, contexts, and challenges. *Language Learning & Technology, 24*(1), 1-15.

Tomlinson, C. A. (2021). *How to differentiate instruction in academically diverse classrooms* (3rd ed.). ASCD.

Warschauer, M., & Meskill, C. (2000). Technology and second language teaching. In *Handbook of undergraduate second language education* (pp. 303-318).

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry, 17*(2), 89-100.

NORWILNAN SIDE TABLE: AN EXPERIMENTAL PROJECT IN COMBINING CONCEPTUAL FURNITURE MAKING AND RFID TECHNOLOGY AS SAFETY MECHANISM

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Abstract

This project emphasizes combining both furniture making and radio-frequency identification (RFID) technology as a safety mechanism in side-table products, named Norwilnan. As a constantly evolving necessity in consumers' lives, furniture must integrate with technology to reflect its growth and improve the user experience. The design of the side tables is inspired by the Minion character from the animated movie Despicable Me 2, while the concepts used are stackable and applicable across age groups. Three side tables with distinct features were produced. The main material used in making the side tables is finger-jointed board, and each table has the dimensions of 19 inches wide, 16 inches long, and 24 inches tall. Each side table can be used separately as an independent unit or stacked vertically to form a single unit. This allows the user to arrange the side tables however they see fit or according to the spaces available. The side tables' RFID locking mechanism distinguishes them from other commonly available items on the market while maintaining the same degree of performance and quality. Compared to other side tables on the market, the product's unique concepts and features, as well as the RFID locking mechanism, appeal to a broader range of clients, regardless of age or lifestyle. A possible suggestion for improvement would be to enable access to the product's storage unit through any device equipped with a near-field communication (NFC) chip. In conclusion, this project has effectively integrated RFID locking technology into furniture making. The side tables' main features are their functionality and design, which can be improved further, particularly with better finishing colours to better satisfy user needs.

Keywords: Furniture making, side table, RFID technology

1. Introduction

Furniture and its' design are a constantly evolving necessity that reflects advancements in technology, materials, cultural norms, and consumer preferences. The evolvement plays a vital role in creating functional spaces, providing comfort and aesthetic appeal to our living spaces (Sophia Home, n.d.). Modern furniture making now incorporates not only craftmanship but also integrates contemporary technology to enhance user experience (Ventura Interiors, n.d.).

Side tables are a common and versatile type of furniture, valued for their compact size and adaptability in various spaces (Wooden Street, n.d.). Features like stackability allow side tables to be arranged flexibly, making them particularly useful in areas with limited space (Cube Furniture Egypt, n.d.).

Technological advancements have significantly influenced furniture design, leading to the incorporation of features such as Radio-Frequency Identification (RFID) technology. RFID enhances furniture functionality by providing secure and convenient access to storage compartments, thereby improving safety and user convenience (Pretty Progressive, 2022).

This paper explores the integration of furniture making and RFID technology to develop innovative products. Additionally, this project also discusses how simple and flexible designs can cater to a diverse range of users, accommodating various ages and lifestyles.

2. Literature Review

2.1 Conceptual Furniture

Conceptual furniture combines art and function, offering new and creative ways to design everyday objects. These designs often use unusual materials, flexible shapes, and modern technology to challenge traditional furniture ideas (Design Milk, 2016). The Elements collection by Conceptual Furniture Design features modular pieces that adapt to different spaces and needs, showing how furniture can be both creative and practical (Conceptual Furniture, n.d.). The examples from the website, show how conceptual furniture turns functional items into artistic and innovative designs.

2.2 Side Table

Side table is a small piece of furniture typically placed next to a sofa, bed or chair. It provides a surface for things like lamps, books, or drinks. Over time, side tables have changed from being simple and practical to becoming stylish and decorative (Fine Woodworking, 2005). Today, side tables come in many designs and materials, making them both useful and attractive in modern homes.

2.3 Radio-Frequency Radio (RFID)

RFID is a technology that uses radio waves to identify and track objects with small electronic tags. An RFID system includes tags with electronically stored information and readers that can capture this data without needing a direct line of sight. This makes RFID useful for tracking and managing items efficiently in many industries (Encyclopedia Britannica, n.d.).

2.4 Minions in Despicable Me 3

The minions are very popular among animation lovers. They are known for their playful and mischievous nature. In Despicable Me 2, the Minions turn from yellow to purple after being injected with a serum called PX-41, which transforms them into aggressive and monstrous versions of themselves (Illumination Entertainment, 2013).

3. Methodology

3.1 Design Inspiration and Concept Development

The design of this side tables draws inspiration from the Minion character from the animated film Despicable Me2, making it appealing to a wide demographic across age groups. This inspiration translates into a playful yet functional concept that accommodates various user needs. The primary concept involved stackability, enabling the side tables to function individually or as a combined unit. Each side table has its own apparent characteristic which is the storage unit.

Figure 1: The purple and yellow minions (Source: Google image)

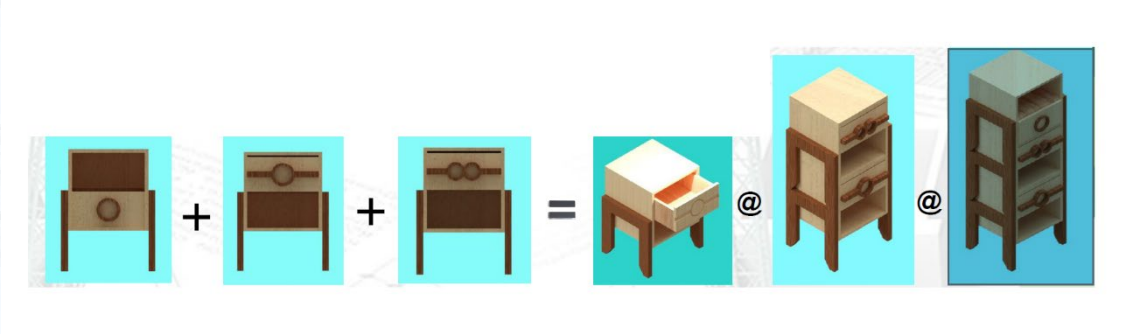

Figure 2: The render picture of the design as individual unit and combined unit

3.2 Material Selection

The material selection focused on using finger-jointed board, chosen for its strength, durability, and ease of use. This material provides a reliable base for crafting furniture that is sturdy enough to support stacking. Its smooth surface allows for precise shaping and finishing, making it an ideal choice for this project.

3.3 Dimensions Specification

Dimensional specifications for the side tables were standardized to 19 inches in width, 16 inches in length, and 24 inches in height, which is to ensure practicality and versatility. They make the tables suitable for use as standalone units while also allowing for secure stacking, enabling users to save space or adapt to different room arrangements as needed.

3.4 Production

The manufacturing process involved several key steps. First, the finger-jointed boards were cut and shaped to the required dimensions, with edges smoothed to ensure safe handling and a polished appearance. These components were then assembled into three distinct side tables, with structural integrity carefully maintained to support the stackability feature. The interlocking design of the tables allows them to stack securely without additional fixtures, ensuring stability during use.

Figure 3: A series of pictures showing the making process

3.5 Incorporation of Radio-Frequency Identification (RFID) Technology

A standout feature of the Norwilnan side tables is the integration of RFID which provides a secure locking mechanism for the tables' storage compartments. RFID tags and readers were installed during the production process, enabling contactless access and ensuring user convenience. The technology was thoroughly tested to guarantee reliable performance, with all components configured to work seamlessly together.

4. Result and Analysis

Figure 4: The finished products as individual unit

Figure 5: The finished products stacked as a combine unit

At the end of this project, the stackable design worked as expected, providing flexibility for different spaces. The RFID locking mechanism was effective but required clearer instructions for some users.

The Minion-inspired design was well-received by the public especially parents and younger users. The feedback indicates that the product meets core user needs, particularly in functionality and space optimization. However, some users wanted more color options to match their living spaces.

The RFID locking system made the product secure and unique compared to regular side tables. Adding NFC technology could make the system even more convenient for users and broaden the product's appeal.

5. Conclusion

The Norwilnan side table project has shown how furniture design can combine creativity and modern technology to improve both function and user experience. The Minion-inspired design makes the tables unique appealing, while features like stackability and the RFID locking system add practical value, which sets it apart from regular side tables.

The user feedback showed that the design and features were appreciated, but there is room for improvement, such as adding more colour options and making the locking system more user-friendly by including NFC compatibility.

In conclusion, the Norwilnan side tables successfully integrate design and technology, creating a product that meets the needs of a wide range of users. With some small improvements, this product could appeal to even more customers and set a good example of how technology can enhance furniture.

References

Conceptual Furniture. (n.d.). *Elements collection – Furniture that can adapt*. Retrieved from https://conceptualfurniture.com/elements/

Cube Furniture Egypt. (n.d.). *The evolution of furniture design: From tradition to innovation*. Retrieved from https://cubefurniture-egypt.com/en/blog/the-evolution-of-furniture-design-from-tradition-to-innovation?

Design Milk. (2016, September 15). *Conceptual furniture design by Marc Englander*. Retrieved from https://design-milk.com/conceptual-furniture-design-marc-englander/

Despicable Me 3. (2017). *Illumination Entertainment*. Retrieved from https://en.wikipedia.org/wiki/Despicable_Me_3

Encyclopedia Britannica. (n.d.). *RFID*. Retrieved from https://www.britannica.com/technology/RFID

Fine Woodworking. (2005, September 13). *A short history of tables*. Retrieved from https://www.finewoodworking.com/2005/09/13/a-short-history-of-tables

Pretty Progressive. (n.d.). *The evolution of furniture design from traditional to contemporary*. Retrieved from https://prettyprogressive.com/the-evolution-of-furniture-design-from-traditional-to-contemporary/?

Sophia Home. (n.d.). *Importance of furniture in our life*. Retrieved from https://www.sophiahome.com/blog/importance-of-furniture-in-our-life/

Ventura Interiors. (n.d.). *The evolution of furniture design: A journey through time.* Retrieved from https://venturainteriors.com/the-evolution-of-furniture-design-a-journey-through-time/

Wooden Street. (n.d.). *The importance of furniture*. Retrieved from https://www.woodenstreet.com/blog/importance-of-furniture?

The Development of Malaysia Selected Timber Digital Identifier (MASTIN)

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Abstract

Malaysia Selected Timber Identifier (MASTIN) is a digital application project on wood identification. This project was developed with the aim of helping to identify 75 types of commercial timber available in Malaysia. The identification method used in this application is inspired from the dichotomous key identification method from the book written by Lim Gan & Nordahlia (2017) issued by the Forest Research Institute Malaysia (FRIM). In order to test the effectiveness of this application, a total of 50 respondents from Politeknik Kota Kinabalu Wood Based Technology Diploma students were selected for the purpose of a questionnaire survey on the effectiveness of the MASTIN application. Information based on research that has been carried out as much as 100% agree that the content of this project contains simple and compact information. In addition, as many as 96.1% of respondents agreed that they were attracted by the design and color combination on the MASTIN display. Next, as many as 95.8% of respondents agreed that the order in the information/data is neat. In addition, 96% of respondents agreed that the size and type of font used was appropriate. In addition, as many as 98% of respondents agreed that this digital application can improve usage when making wood identification. 98% of respondents also agreed that this digital application can help to identify wood easily. In another question 98% of respondents agreed that the dichotomy key method is easy to understand. Apart from that, up to 98% of respondents agreed that this digital application created can satisfy users. Finally, as many as 98% of respondents agreed that the MASTIN digital application is an easier tool for wood identification than a book. From this it can be concluded that MASTIN had the potential to be used as digital tool for timber identification in field or for wood identification learning material in classes.

Keywords: - Wood identification, dichotomous key.

1. Introduction

1.1 Understanding Wood

One of the first things that should understand about wood is variability. As a biological material it is inherently different than other building products such as steel. Wood is used to make buildings, furniture, and for art. Firewood is a fuel. Paper is made from wood fibres. Wood is a renewable resource although it has become scarcer in recent centuries. Woods are categorized into hardwoods and softwoods. These terms relate to the tree's botanical classification and not the properties of the wood, which can cause some confusion.

1.2 Wood Identification

Wood may also be identified by observing its anatomical features. However, for now only hardwood species may have such advantages since softwood species lack in distinguish observable feature of clear anatomical properties such as vessel and parenchyma which is mostly visible under at least 10 times magnification. For experts, wood identification may easily be done by observing the pattern of vessels and parenchyma arrangement. However, it takes years of experience to train a person that had the ability to distinguish different wood species as it is not easy to familiarize the difference of hundreds of wood species. Thus, one way to help guiding in wood identification is by using dichotomous key which had been developed by many renowned researchers in wood science field. In Malaysia, such technique had been developed by Forest Research Institute Malaysia (FRIM) to accommodate people interested in wood identification which had been adapted to identify mostly with local selected timbers.

2. Literature Review

Data from wood anatomy have extensive uses including in systematics and plant evolution before the advent of molecular approaches (Herendeen & Miller 2000). The study of wood anatomy began in Malaysia around 1932 and

after that many studies and publications have been recorded, and among the most famous publications on wood anatomy in Malaysia is "The Anatomy and Identification of Malaysian Hardwoods" by Menon (1971), "Structure and Identification of Malayan Woods "by Ani and Lim (1993)," A Dictionary of Malaysian Hardwood "by Lim and Chung (2002) and" Identification and Properties of Malaysian Timbers "(Lim et al. 2016).

The anatomical properties of wood also have a meaningful relationship to the strength and density of wood, have importance for wood grade identification in the timber industry and this can help the proper use of wood in accordance with its use. This is especially important for the use of wood as a building material, roof frame, the use of wood for applications exposed to weather and the use of wood for heavy applications such as platforms. The importance of wood anatomical studies is also evident in the taxonomic classification of plants based on certain diagnostic characteristics of wood. The anatomical features of wood have significant value in the taxonomy, systematics and phylogenetics of angiosperms. Wood anatomical features such as duct cell arrangement, duct cell perforation type, duct cell pit wall, duct cell wall thickening, tyrosyls, axial distribution of parenchyma and staple arrangement have significant taxonomic value in aiding the classification system in plants (Metcalfe & Chalk, 1950).

In terms of the dichotomous key system, it is a tool for identifying species or things in the natural world, such as plants, animals, or rocks. The key consists of a series of paired statements or clues about features or characteristics, providing a stepwise guide toward identifying each entity. As the user proceeds from one step to the next, the clues gradually narrow down the list of entities until all are identified. Dichotomous keys are useful for biological classification as well as identification. Dichotomous keys are extremely useful because they allow non-expert users to identify organisms by directing them to look at the known, important organisms. (O'Neill Riley, 2017)

3. Methodology

Figure 1 shows the process flowchart to produce the MASTIN application. The flowchart starts from collection of related information, design of application interface, fill in application data, product testing and the last one is improvement ideas and apps.

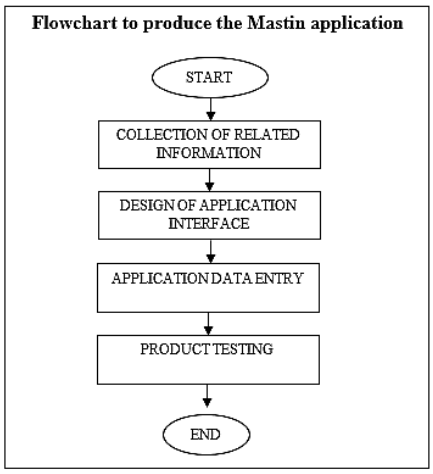

Figure 1: Methodology flowchart

3.1 Collection of Related Information

The fundamental part of these project is the sources of data in which are incorporated within the MASTIN application. The timber dichotomous key identification technique are specifically based of the book Identification of Malaysian Timbers Using Dichotomous Key by S.C. Lim, A. S Nordahlia, M.Abd. Latif, K.S. Gan & S.Rahim publish by Forest Research Institute Malaysia(FRIM) which can identify 75 species of commercial timbers in Malaysia.

3.2 Design of Application Interface

This application is created using Thunkable digital application builder which does not require no-code platform to build mobile application. As in figure 2, the information has been inputted in a simple and compact way. Red and blue are chosen as color combinations as it is eye - catching.

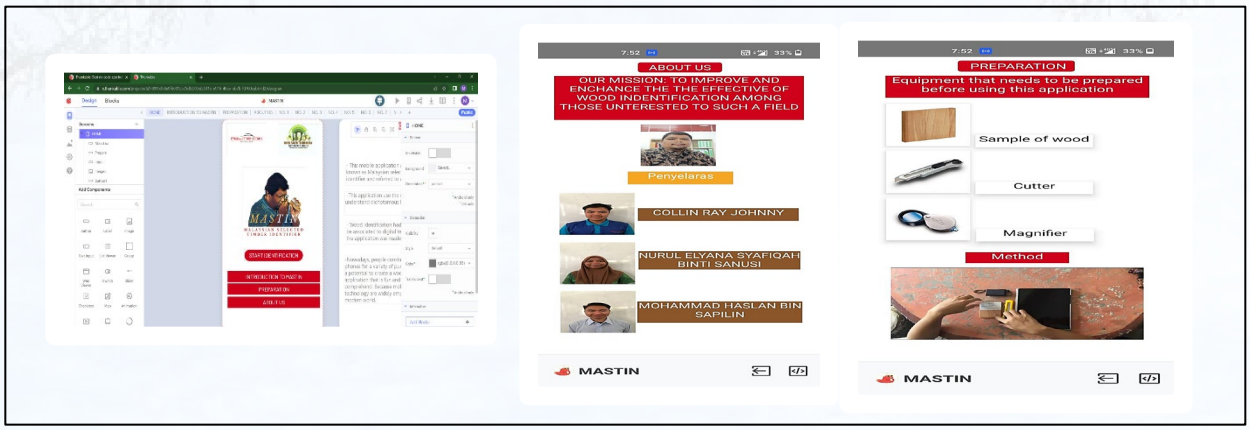

Figure 2: Templates of MASTIN interface design

3.3 Application Data Entry

The data that are needed inside the apps are filled in within each page of the apps according to the design earlier. Figure 3 shows how the data of wood specimens' vessel are visualized within the page of the timber information. The usage of coding through drag and drop technique make it easier to assemble a working digital application

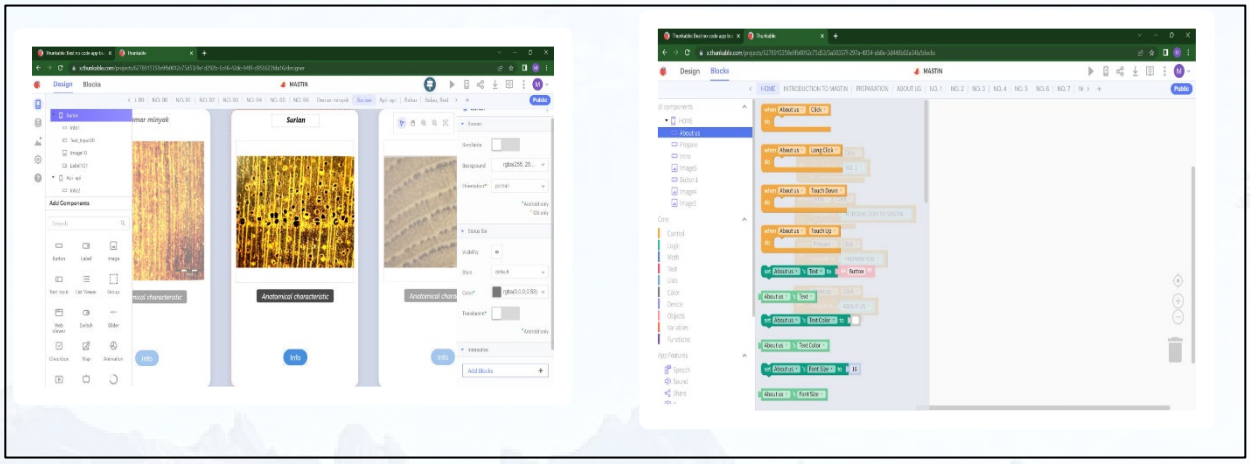

Figure 3: Data being incorporated within the templates of MASTIN

3.4 Product Testing

A quantitative survey was made to get feedback about the effectiveness of the MASTIN application. The target were 50 students who had already taken the subject of DCW10033 Wood Anatomy and Physical Properties course in semester 1. This is necessary because to test the efficacy of MASTIN, basic knowledge about wood identification is needed so that the test conducted can be smoothly conducted.

4. Finding and Analysis

A quantitative survey about the user's satisfaction towards MASTIN application had been done. A number of 50 students among students of Wood Based Technology Diploma from Politeknik Kota Kinabalu who had taken the subject of DCW10033 Wood Anatomy and Physical Properties had participated in this survey. Table 1 shows the result of the survey that had been done. A total of 49.1% (25) are female students and 51% (26) are male students of Diploma in Wood-Based Technology at Politeknik Kota Kinabalu. The respondents were asked to test wood identification by using two different method which were by using MASTIN application and by using Identification of Malaysian Timbers Using Dichotomous Key booklet. 10 wood samples were given to the respondent to test out these two methods. After the respondent had test both method and compare the result of wood identification between each method, they were asked to answer a questionnaire consist of 8 scaled questions (closed questions). The questionnaire is divided into 2 parts, namely part A which related to the interface design of MASTIN and part B consist of questions about the effectiveness of MASTIN compared by using booklet.

Table 1: Quantitative Survey Items

NO.	ITEM	SCALE SCORE				
		1	2	3	4	5
	SECTION A					
1	The minimalist design and colour combinations are very attractive.	*2%*	*2%*	*7.8%*	*21.6%*	***66.7%***
2	Arrangement of information/data in a neat condition.	*2%*	*2%*	*2%*	*22.5*	***68.6***
3	The fonts size and font style proper.	*2%*	*2%*	*4%*	20%	**72%**
	SECTION B					
4	Does this application increase your enjoyment of learning?	*0%*	*2%*	*4%*	*16%*	***78%***
5	Does this application help you to identify wood easily?	*2%*	*0%*	*4%*	*20%*	***78%***
6	Applications created can satisfy user?	*2%*	*0%*	*4%*	*18%*	***76%***
7	Is the dichotomous key method easy to understand?	*2%*	*0%*	*6%*	*20%*	***72%***
8	MASTIN is an easier tool for identifying wood than a book	*0%*	*2%*	*6%*	*16%*	***76%***

Based on item 1, a total of 34 (66.7%) respondents chooses strongly to agree that the minimalist design and color combination are very attractive. While 11 (21.6%) respondents chose to agree. then 4 (7.8%) respondents answered somewhat agree. Furthermore, 1(2%) respondent chose to disagree with the statement and one respondent (2%) chose to strongly disagree. It can be concluded that 96.1% of respondents agreed that they were attracted by the design and color combination on the MASTIN display. For item 2, it can be seen that the highest percentage is from Strongly agree that the arrangement of information in this application is in order 35 (68.6%). While 13 (25.5) were among the respondents who agreed with the statement. Further, 1(2%) respondent answered somewhat agree and 1(2%) answered disagree and 1(2%) respondents answered strongly disagree. However, it can be concluded that 95.8% of respondents agreed that the order in the information/data is neat. As for item 3, a total of 36 people (72%) strongly agreed that the size of the font used was appropriate. While there were 10 respondents who agreed. then two people were from among the respondents who stated that they just partially agreed with the statement. Following that, one person responded disagree, while one responded strongly disagree. The conclusion, 96% of respondents agreed that the size and type of font used was appropriate.

Item 4 shows that the highest percentage is from Strongly agree that this application can increase the enjoyment of learning 39 (78%). While eight are from among the respondents who agree with the statement. Further, two respondents answered somewhat agree and 1 answered disagree. As many as 98% of respondents agreed that this digital application can improve usage when making wood identification. Based on the results for item 5, the highest percentage is a total of 37 (74%) respondents who choose strongly to agree. While 10 (20%) respondents chose to agree. Then 2 respondents answered somewhat agree. No response chose not to agree to the statement. While only one respondent chose to strongly disagree. It can be concluded that 98% of respondents agreed that this digital application can help to identify wood easily. Assessment for item 6 identify that the highest percentage is a total of 38 (76%) respondents who choose strongly to agree. While 9(18%) respondents chose to agree. Then 2 respondents answered somewhat agree. No response chose not to agree to the statement. While only one respondent chose to strongly disagree. It can be concluded that 98% of respondents agreed that the dichotomy key method is easy to understand. While for item 7, a total of 36 respondents (72%) chose to strongly agree, which represents the highest percentage. However, 10 (20%) respondents choose to concur. Then three people gave a somewhat agreeing response. No respondent chooses to disagree with the assertion. One person, though, made the decision to strongly disagree. We

can get the conclusion that 98% of respondents thought the developed digital application might satisfy consumers. Last but not least, item 8 depicted a total of 38 respondents (76%) chose to strongly agree, which represents the highest percentage. However, 8 (16%) respondents choose to concur. Then three people gave a somewhat agreeing response. One respondent declined to accept the assertion. Only one responder chooses to disagree strongly. We can infer that 98% of respondents thought the MASTIN digital application was more user-friendly than a book for identifying wood.

5. Conclusion

Based on the result of the survey, it was concluded that the respondents show significant satisfaction when using MASTIN in the process of timber identification. This shows that MASTIN had the potential to be used by people who wanted to learn and train their ability in timber identification. The element of digitalization significant to IR 4.0, implementation of user-friendly apps navigation, usage of dichotomous key in timber identification are among the factors that makes MASTIN as an ideal application for students or workers that need guidance in timber identification within wood technology and forestry field. As a conclusion, there maybe some way for future research and innovation to develop a better MASTIN version so that it may help in identifying more species of timber in Malaysia or cover a much wider geographical area.

Acknowledgment

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References

Herendeen, P. S., & Miller, R. B. (2000). Utility Of Wood Anatomical Characters In Cladistic Analyses. *Iawa Journal, 21*(3), 247–276. https://doi.org/10.1163/22941932-90000247

Lim, S. C., Gan, K. S., & Nordahlia, A. S. (2017). *Identification of Malaysian timbers using dichotomous key*.

Metcalfe & Chalk. (1950) in Nair. (1998). *Anatomy of The Dicotyledons Vol I*. Retrieved from: https://archive.org/details/anatomyofthedico033552mbp/page/n15/mode/2up

O'Neill Riley. (2017). *Dichotomous Key*. Retrieved from: https://kids.britannica.com/students/article/dichotomous-key/624999

Hubungan Latihan Pembangunan Profesional Berterusan (CPD) Dengan Peningkatan Profesionalisme Guru-Guru Sekolah Rendah Luar Bandar Sabah

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Abstrak

Tujuan utama kajian ini adalah untuk mengenal pasti faktor-faktor yang mempengaruhi penglibatan guru sekolah rendah luar bandar Sabah dalam latihan Pembangunan Profesional Berterusan (CPD) mengikut aspek (a) Perancangan Latihan, (b) Kandungan Latihan, (c) Penyampaian Kursus, (d) Hari dan Tempoh Masa Latihan serta (e) Tempat Latihan. Kajian ini juga melihat hubungan antara faktor-faktor yang mempengaruhi penglibatan aktif guru sekolah rendah dalam latihan Pembangunan Profesional Berterusan (CPD) dengan peningkatan profesionalisme para guru luar bandar Sabah. Pengenalpastian faktor-faktor yang mempengaruhi penglibatan aktif guru sekolah rendah luar bandar Sabah dalam latihan Pembangunan Profesional Berterusan (CPD) diukur menggunakan inventory Dimensi Kesesuaian Latihan Dalam Perkhidmatan Menerusi Program CPD dan Dimensi Profesionalisme Guru. Tinjauan ini telah dilakukan terhadap responden kajian seramai 217 orang guru di sekolah rendah luar bandar Sabah menggunakan persampelan rawak mudah. Guru ini dikenal pasti sebagai responden berdasarkan rekod pendaftaran daripada sekolah terbabit. Bagi tujuan analisis data, Statistical Package for the Social Sciences (SPSS) telah digunakan untuk memproses dapatan data kajian. Hasil kajian menunjukkan tidak terdapat perbezaan antara faktor demografi dengan peningkatan profesionalisme guru. Ini bermaksud faktor profesionalisme sebagai seorang guru bukan semata-mata ditentukan oleh perbezaan Jantina, Tahap Pendidikan, Umur, Bangsa atau Etnik, Gred Jawatan, Pengalaman Mengajar dan Status Perkahwinan. Sementara ujian korelasi menunjukkan terdapat hubungan yang signifikan antara pemboleh ubah Faktor Penglibatan Guru ($r = .526$, $k < .01$), Perancangan Latihan ($r = .432$, $k < .05$), Kandungan Latihan ($r = .539$, $k < .01$), Penyampaian Latihan ($r = .443$, $k < .05$) serta Hari dan Tempoh Masa Latihan ($r = .368$, $k < .05$) dalam latihan CPD dengan peningkatan Profesionalisme Guru Sekolah Rendah. Dapatan ini sangat penting kerana ia secara langsung membantu di dalam memantapkan proses pengajaran dan pembelajaran. Pada masa yang sama ia dapat mewujudkan para guru yang lebih baik khususnya untuk melahirkan pelajar yang seimbang dalam aspek perkembangan Jasmani, Emosi, Rohani dan Intelektual (JERI) selari dengan Falsafah Pendidikan Negara.

Kata kunci: Pembangunan Profesional Berterusan, Peningkatan Profesional, Guru Sekolah Rendah, Luar Bandar Sabah

1. Pendahuluan

Pembangunan Profesional Berterusan atau Continuous Professional Development (CPD) dalam konteks perkhidmatan awam merupakan Dasar Latihan Sumber Manusia Sektor Awam (DLSM) yang menetapkan supaya setiap anggota perkhidmatan awam dapat melengkapkan diri dengan Sikap (Attitude), Kemahiran (Skills) dan Pengetahuan (Knowledge) yang bersesuaian. Ia merupakan Program Pembangunan Sumber Manusia yang terancang berteraskan pembangunan kompetensi dan pembelajaran berterusan (Jabatan Perkhidmatan Awam Malaysia, 2021).

Sehubungan dengan itu, guru yang terdiri daripada penjawat awam, secara langsung mempunyai hubungan dengan konsep Pembangunan Profesional Berterusan (CPD) di dalam melengkapkan diri sebagaimana yang dihasratkan. Perkara ini kerana, dengan adanya Sikap (Attitude), Kemahiran (Skills) dan Pengetahuan (Knowledge) yang bersesuaian, para guru akan diiktiraf sebagai mempunyai Standard Guru Malaysia (SGM). Ia selaras dengan Kementerian Pendidikan Malaysia (2021) yang menyatakan bahawa, guru SGM perlu mempunyai tahap amalan nilai

profesionalisme keguruan, pengetahuan dan kefahaman, serta kemahiran Pengajaran dan Pembelajaran (PdP) yang tinggi bagi membolehkan mereka berfungsi sebagai guru profesional dengan berkesan (Kementerian Pendidikan Malaysia, 2021).

Selain itu, tinjauan literatur juga menunjukkan bahawa, Pembangunan Profesional Berterusan (CPD) secara langsung sangat penting untuk membentuk SGM kerana ia merupakan satu usaha bersepadu bagi memastikan guru atau Pegawai Perkhidmatan Pendidikan (PPP) dapat melengkapkan diri dengan pengetahuan, kemahiran dan nilai profesional di dalam amalan keguruan melalui program CPD terancang berteraskan pembangunan kompetensi, pembelajaran berterusan dan laluan kerjaya. Hasilnya, ia akan meningkatkan kualiti guru di dalam kepimpinan atau pengurusan pendidikan secara berterusan. Guru juga melalui CPD akan dapat membina sifat Memperoleh (Acquire), Menambahbaik (Improve), Menguasai (Master) dan Berkongsi (Share). Sifat kompetensi tersebut yang telah diperolehi kemudiannya dapat digunakan untuk Keberkesanan, Keberhasilan serta Kemenjadian murid di dalam PdP (Kementerian Pendidikan Malaysia, 2021).

1.1 Objektif Kajian

Secara umum, tujuan kajian ini boleh diterangkan sebagaimana berikut :

i) Mengenal pasti faktor-faktor yang mempengaruhi penglibatan aktif guru sekolah rendah dalam Pembangunan Profesional Berterusan (CPD) mengikut aspek:

   (a) Perancangan Latihan Dalam Perkhidmatan.
   (b) Kandungan Latihan Dalam Perkhidmatan.
   (c) Penyampai Kursus.
   (d) Hari dan Tempoh Masa Latihan Dalam Perkhidmatan.
   (e) Tempat Latihan Dalam Perkhidmatan.

ii) Mengenal pasti hubungan antara faktor-faktor yang mempengaruhi penglibatan aktif guru sekolah rendah dalam Pembangunan Profesional Berterusan (CPD) dengan peningkatan profesionalisme para guru.

1.2 Hipotesis Kajian

Ho1: Tidak terdapat perbezaan yang signifikan di antara kelompok mengikut Demografi (Jantina, Umur, Bangsa/Etnik, Tahap Pendidikan, Gred Jawatan, Pengalaman Mengajar, Status Perkahwinan, Jenis Latihan) dalam Peningkatan Profesionalisme Guru-Guru Sekolah.

Ho2: Tidak terdapat hubungan yang signifikan di antara Faktor Penglibatan Guru (Perancangan Latihan Dalam Perkhidmatan, Kandungan Latihan Dalam Perkhidmatan, Penyampai Kursus, Hari dan Tempoh Masa Latihan Dalam Perkhidmatan, Tempat Latihan Dalam Perkhidmatan) dengan Peningkatan Profesionalisme Guru-Guru Sekolah.

2. Tinjauan Literatur

Pembangunan Profesional Berterusan atau Continuous Professional Development (CPD) dalam konteks perkhidmatan awam merupakan Dasar Latihan Sumber Manusia Sektor Awam (DLSM) yang menetapkan supaya setiap anggota perkhidmatan awam dapat melengkapkan diri dengan Sikap (Attitude), Kemahiran (Skills) dan Pengetahuan (Knowledge) yang bersesuaian. Ia merupakan Program Pembangunan Sumber Manusia yang terancang berteraskan pembangunan kompetensi dan pembelajaran berterusan (Jabatan Perkhidmatan Awam Malaysia, 2021).

Selain itu, sorotan literatur juga menunjukkan terdapat pelbagai terma yang digunakan untuk menerangkan perkara yang berkait dengan latihan dalam perkhidmatan menerusi program CPD ini. Beach dan Reinhartz (2000) merangkumkan program CPD sebagai perkembangan profesional, perkembangan staf, latihan dalam perkhidmatan (in-service training) dan pendidikan lanjutan. Walaupun pelbagai istilah telah muncul namun ia dilihat sebagai sesuatu yang sama sahaja atau merujuk kepada CPD. Cuma istilah ini diguna pakai secara tukar ganti.

Penyataan oleh pengkaji tersebut disokong oleh pengkaji tempatan iaitu Abdul Ghani Abdullah (2009). Menurutnya, program CPD juga dikenali sebagai pendidikan dalam perkhidmatan, pembangunan staf, latihan dalam perkhidmatan, pembangunan profesional, pendidikan lanjutan dan juga usaha ke arah pencapaian ijazah tinggi secara formal mahupun tidak formal.

Kementerian Pendidikan Malaysia pula telah menggariskan program CPD dengan maksud latihan dalam perkhidmatan. Menerusi Program CPD ini, para peserta melalui sebarang bentuk pembelajaran seperti kursus, latihan

semasa bekerja dan program mentoring atau coaching atau yang seumpamanya. Menerusi CPD ini ia dapat menyumbang kepada pembangunan individu dan kecemerlangan organisasi. Ini menunjukkan perlaksanaan program CPD telah menyebabkan berlaku proses pemindahan ilmu pengetahuan secara kemas dan berdisiplin. Seterusnya ia juga dapat menambah pengetahuan dan kemahiran untuk memenuhi keperluan dan tuntutan semasa dalam organisasi seperti sekolah (Kementerian Pendidikan Malaysia, Pekeliling Perkhidmatan Bilangan 6, Tahun 2005).

Sorotan literatur juga menunjukkan, Pelan Pembangunan Pendidikan Malaysia (2013-2025), merupakan konsep latihan dalam perkhidmatan menerusi program CPD dengan tujuan menambah baik pengetahuan, kemahiran dan kompetensi para guru yang menjadi kunci kepada kecemerlangan untuk proses pengajaran dan pembelajaran yang lebih baik di sekolah. Malah ia menggariskan hanya guru-guru yang berkualiti dan mempunyai pencapaian yang tinggi dalam peperiksaan awam akan mengisi sistem pendidikan negara Malaysia. Maka dengan itu, kerajaan mempromosikan pembangunan profesionalisme secara berterusan (CPD) bagi guru-guru yang sedia ada sebagai satu langkah menambahkan kualiti dan kelayakan mereka seterusnya dapat mencapai anjakan dalam Pelan Pembangunan Pendidikan Malaysia 2013-2025 (Kementerian Pendidikan Malaysia, 2012).

Tinjauan literatur turut mendapati Dasar Pendidikan Kebangsaan 2012 pula menerangkan bahawa latihan dalam perkhidmatan menerusi program CPD merupakan sebahagian daripada usaha kerajaan Malaysia untuk melaksanakan pembangunan profesional secara berterusan di sekolah. Ia dianggap sebagai alat penambahbaikan kualiti guru sepanjang masa. Guru-guru diberi latihan ataupun kursus mengenai pengetahuan dan kemahiran baharu agar dapat meningkatkan keupayaan guru tersebut untuk mengajar dengan lebih berkesan. Ini kerana, guru yang berkompetensi akan dapat meningkatkan kualiti pembelajaran murid (Kementerian Pendidikan Malaysia, 2012).

Sementara Lieberman (1996) berdasarkan kepada modelnya menyatakan, program CPD boleh dikelaskan kepada tiga jenis. Pertama, CPD adalah merupakan pengajaran langsung seperti kursus, bengkel dan sebagainya. Kedua, CPD merupakan proses belajar di sekolah seperti bimbingan rakan sebaya, persahabatan kritis, pementoran, penyelidikan tindakan dan pasukan perencanaan yang berkaitan dengan tugas. Ketiga, melibatkan pembelajaran di luar sekolah seperti rangkaian pembelajaran, lawatan ke sekolah lain, perkongsian sekolah-universiti dan sebagainya. Manakala Gray (2005) pula membuktikan individu yang terlibat dalam program CPD sering kali didapati mempunyai keinginan untuk memperolehi umur yang panjang dan berlaku pertumbuhan peribadi. Mereka juga ingin mempunyai rasa tanggungjawab moral, mengekalkan dan meningkatkan kecekapan profesional, meningkatkan kemajuan kerjaya, mengikuti teknologi dan praktik baharu di samping mempunyai keupayaan untuk mematuhi peraturan organisasi secara profesional.

Tinjauan literatur terhadap penulisan oleh Muhamad Nazri Samsudin (2013) menunjukkan, latihan dalam perkhidmatan menerusi program CPD dapat melahirkan guru yang mampu untuk melakukan perubahan dan inovasi terhadap kurikulum di dalam bilik darjah. Kompetensi guru sebegini amat diperlukan untuk memenuhi kehendak dan keperluan pelajar yang telah berubah dari semasa ke semasa selari dengan keperluan kurikulum pada zaman sekarang yang juga telah banyak berubah. Menurutnya lagi, dewasa ini para pelajar telah mula belajar secara kolaboratif dan tanpa sempadan. Situasi ini menjadikan pelajar lebih aktif, kreatif, bermotivasi sehingga memerlukan seorang guru yang dinamik terhadap perlaksanaan kurikulum di dalam bilik darjah yang sentiasa mengalami perubahan. Oleh itu, program CPD dilihat mampu menangani situasi ini kerana ia dapat memastikan para guru lebih berkemahiran terhadap perubahan kurikulum dan inovasi di dalam bilik darjah (Muhamad Nazri Samsudin, 2013).

Sehubungan dengan itu, berdasarkan kepada beberapa tinjauan literatur ini, ia jelas menunjukkan bahawa program CPD ini memberikan kesan yang baik terhadap peningkatan profesionalisme para guru. Pada masa yang sama, wujudnya hubungan di antara Program Pembangunan Profesional Berterusan (CPD) dengan prestasi kerja guru secara umumnya. Oleh yang demikian, menerusi kajian ini, penyelidik akan melaporkan dapatan kajian mengenai kesan program CPD terhadap profesionalisme guru-guru sekolah rendah luar bandar Sabah.

3. Metodologi

Kaedah penyelidikan di dalam kajian ini boleh diterangkan sebagaimana berikut :

3.1 Reka Bentuk Kajian

Reka bentuk penyelidikan di dalam kajian ini adalah berbentuk keratan rentas melalui kaedah tinjauan dengan menggunakan soal selidik bertujuan mendapatkan data diskiptif dan inferensi. Kaedah tinjauan dipilih kerana bersesuaian dengan bilangan sampel dan dapat menjimatkan masa serta tenaga berbanding kualitatif. Pada masa yang sama, kutipan data menggunakan soal selidik dapat mengurangkan ralat penghitung dan membolehkan jawapan

responden dibandingkan (Mohd Majid Konting, 1998). Oleh itu, pendekatan penyelidikan yang dipilih secara langsung membantu dalam menyusun atur, mengumpul data dan menganalisis data diskriptif serta inferensi berkaitan hubungan latihan pembangunan profesional berterusan (CPD) dengan peningkatan profesionalisme guru-guru sekolah rendah luar bandar Sabah.

3.2 Sampel dan Tempat Kajian

Sampel dan tempat kajian di dalam penyelidikan ini boleh diterangkan sebagaimana berikut :

3.2.1 Sampel Kajian

Pemilihan sampel kajian di dalam kajian ini adalah menggunakan persampelan rawak mudah. Persampelan sebegini sesuai untuk kajian yang melibatkan penggunaan responden yang ramai. Ia juga mampu meminimumkan potensi bias dalam kajian seterusnya memaksimumkan kesahan luaran dan hasil kajian kelak dapat digenaralisasikan kepada seluruh populasi kajian (Vogt, 2006). Jesteru, memandangkan kajian ini menggunakan suatu jumlah yang ramai dan melibatkan sekolah, maka persempelan rawak mudah adalah paling bersesuaian digunakan dalam kajian ini.

Oleh yang demikian, setelah lokasi sekolah ditentukan, tindakan seterusnya adalah menentukan jumlah sampel yang boleh digunakan mengikut jumlah populasi. Bagi tujuan ini, jadual Krejcie dan Morgan (Sabitha Marican, 2009) telah digunakan untuk menentukan sampel yang mana, daripada populasi guru seramai 525 orang di sekolah rendah luar bandar Sabah, seramai 217 orang boleh digunakan sebagai sampel di dalam kajian ini (Portal Rasmi Jabatan Pendidikan Negeri Sabah, 2020).

3.2.2 Tempat Kajian

Lokasi kajian yang dipilih adalah sekolah rendah luar bandar Sabah dengan tujuan mendapatkan data responden dalam kalangan guru untuk mengkaji hubungan latihan pembangunan profesional berterusan (CPD) dengan peningkatan profesionalisme guru-guru sekolah rendah luar bandar Sabah.

3.3 Alat Kajian

Alat kajian yang digunakan oleh pengkaji di dalam kajian ini adalah sebagaimana berikut:

(i) Bahagian A : Demografi

Bahagian ini mengandungi maklumat-maklumat berkaitan sosiodemografi responden yang dibina sendiri oleh pengkaji bersesuaian dengan kehendak kajian. Ia bertujuan mendapatkan maklumat latar belakang responden yang terlibat dalam kajian ini seperti Jantina, Umur, Bangsa atau Etnik, Tahap Pendidikan, Gred Jawatan, Pengalaman Mengajar dan Status Perkahwinan.

(ii) Bahagian B : Faktor-Faktor Kesesuaian Latihan Dalam Perkhidmatan Menerusi Program CPD

Bahagian ini mengandungi penyataan-penyataan yang mengukur Faktor-Faktor Kesesuaian Latihan Dalam Perkhidmatan Menerusi Program CPD. Ia telah dibina oleh oleh Siti Nur Aisya Sugumarie Abdullah & Ahmad Zabidi Abdul Razak (2018) dan boleh diterangkan sebagaimana Jadual 1 berikut:

Jadual 1: Dimensi Kesesuaian Latihan Dalam Perkhidmatan Menerusi Program CPD

Dimensi Kesesuaian Latihan	Item	Jumlah Item
(i) Faktor Umum		
Jenis Latihan Yang Dihadiri	1-6	6
Jenis Cabaran Dihadapi Dalam Latihan Yang Dihadiri	7-12	6
Faktor Penglibatan Dalam Latihan Yang Dihadiri	13-17	6
(ii) Faktor Khusus		
Perancangan Latihan Dalam Perkhidmatan		
Kandungan latihan dalam perkhidmatan	18-23	6
Penyampai Latihan Dalam Perkhidmatan	24-29	6
Hari dan tempoh masa latihan dalam perkhidmatan	30-35	6
Tempat latihan dalam perkhidmatan	36-42	6
	43-48	6
Jumlah Keseluruhan		**48**

(iii) Bahagian C : Dimensi Profesionalisme Guru

Bahagian ini mengandungi penyataan-penyataan yang mengukur Konsep Peningkatan Profesionalisme Guru-Guru Sekolah Berasaskan Latihan Dalam CPD. Ia telah dibina oleh oleh Siti Nur Aisya Sugumarie Abdullah & Ahmad Zabidi Abdul Razak (2018) dan boleh diterangkan sebagaimana Jadual 2 berikut:

Jadual 2: Dimensi Profesionalisme Guru

Dimensi Profesionalisme Guru	Item	Jumlah Item
Konsep Profesionalisme Guru	49-54	6
Jumlah Keseluruhan		6

3.4 Prosedur Kajian

Terdapat beberapa prosedur yang terlibat untuk melakukan kutipan data dalam kajian ini. Pertama sekali, sebelum memulakan kajian, pengkaji melakukan tinjauan literatur terhadap kajian-kajian lepas untuk mendapatkan gambaran tentang isu-isu berkaitan latihan dalam perkhidmatan menerusi program CPD secara umum dan dalam kalangan guru. Seterusnya, pengkaji mengenal pasti instrumen kajian yang bersesuaian dan menemui Alat Ukur Hubungan Dasar Latihan Dalam Perkhidmatan dengan Peningkatan Profesionalisme Guru-Guru yang telah dibina oleh Siti Nur Aisya Sugumarie Abdullah et al., (2018). Setelah itu, pengkaji memohon kebenaran daripada pihak sekolah berkaitan setelah lokasi kajian telah dikenal pasti. Kemudian, mengedarkan instrumen kajian setelah kebenaran rasmi diperolehi.

3.5 Analisis Data

Statistical Package for the Social Science atau IBM SPSS versi terbaharu telah digunakan untuk mendapatkan data daripada set soal selidik yang telah ditadbir. Data-data yang ditadbir ini kemudiannya dianalisis menggunakan pengujian t-test dan Anova Sehala untuk mengenalpasti perbezaan daripada data responden. Manakala korelasi Pearson digunakan sebagai analisis untuk mengenalpasti hubungan antara pembolehubah-pembolehubah yang telibat.

4. Hasil Kajian Dan Perbincangan

Statistical Package for the Social Science atau IBM SPSS versi terbaharu telah digunakan untuk mendapatkan data deskriptif dan inferensi. Ia boleh diterangkan sebagaimana berikut:

4.1 Keputusan Pengujian Analisis Perbezaan T-Test

Pada bahagian ini pengkaji melaporkan hasil dapatan kajian mengikut hipotesis yang dibina sama ada ia diterima atau ditolak berdasarkan analisis perbezaan setelah melakukan pengujian terhadap data kajian. Ia boleh diringkaskan sebagaimana Jadual 3 berikut.

Jadual 3: Keputusan Ujian t dan ANOVA Sehala Terhadap Peningkatan Profesionalisme Guru-Guru Sekolah Berdasarkan Demografi

Pemboleh ubah	Min ± S.P.	Nilai *k*
Jantina	-	.735
Lelaki	4.42 ± 0.36	-
Perempuan	4.08 ± 0.23	-
Umur	-	.351
21 – 30	4.17 ± 0.19	-
31 – 40	4.02 ± 0.43	-
41 – 50	4.21 ± 0.15	-
51 – 60	3.97 ± 0.14	-
Bangsa	-	.950
Melayu	4.00 ± 0.17	-
Cina	4.33 ± 0.00	-
Kadazan	4.05 ± 0.44	-

Dusun	4.17 ± 0.15	-
Bajau	4.10 ± 0.26	-
Murut	4.08 ± 0.12	-
Lain	4.00 ± 0.00	-
Tahap Pendidikan	-	.633
Ijazah	4.11 ± 0.32	-
Master	4.05 ± 0.19	-
Gred Jawatan	-	.997
41	4.10 ± 0.38	-
44	4.10 ± 0.25	-
48	4.10 ± 0.25	-
52	4.06 ± 0.10	-
	-	.660
Pengalaman Mengajar		
1 - 10	4.17 ± 0.19	-
11 – 20	4.04 ± 0.40	-
21 – 30	4.17 ± 0.19	-
31 dan ke atas	4.00 ± 0.14	-
Status Perkahwinan	-	.991
Bujang	4.10 ± 0.19	-
Berkahwin	4.10 ± 0.33	-
Duda	4.00 ± 0.00	-
Janda	4.08 ± 0.12	-
Keseluruhan	**4.09 ± 0.29**	-

Berdasarkan kepada Jadual 3, Ujian Independnet T Test menunjukkan tidak terdapat perbezaan yang signifikan di dalam peningkatan profesionalisme guru-guru sekolah berdasarkan Jantina ($t = 0.341$, $k > .05$). Maka, hipotesis nol diterima. Ertinya, walaupun peningkatan profesionalisme guru sekolah lelaki (4.42 ± 0.36) mencatatkan min yang lebih tinggi daripada perempuan (4.08 ± 0.23), namun peningkatan tersebut adalah tidak signifikan secara statistik. Dalam erti kata lain, peningkatan profesionalisme guru lelaki dan perempuan adalah sama tinggi. Selain itu, peningkatan profesionalisme guru sekolah berdasarkan tahap pendidikan juga tidak melaporkan perbezaan yang signifikan ($t = 0.483$, $k > .05$).

Ujian ANOVA Sehala di dalam Jadual 2 turut menunjukkan tidak terdapat perbezaan yang signifikan peningkatan profesionalisme guru-guru sekolah berdasarkan umur ($F = 1.141$, $k > .05$), bangsa ($F = 0.261$, $k > .05$), gred jawatan ($F = 0.018$, $k > .05$), pengalaman mengajar ($F = 0.539$, $k > .05$), dan status perkahwinan ($F = 0.35$, $k > .05$). Maka, hipotesis nol adalah diterima. Min keseluruhan mencatatkan 4.09 (±0.29), menunjukkan bahawa peningkatan profesionalisme guru-guru sekolah adalah tinggi dan tidak wujud perbezaan berdasarkan demografi guru sekolah rendah.

4.2 Keputusan Pengujian Analisis Korelasi Pearson

Ujian Pearson Correlation di dalam Jadual 4 menunjukkan terdapat hubungan yang signifikan ($r = .526$, $k < .01$) antara pemboleh ubah Faktor Penglibatan Guru dalam latihan CPD dengan peningkatan Profesionalisme Guru Sekolah Rendah. Selain itu, pemboleh ubah Perancangan Latihan juga melaporkan terdapat hubungan yang signifikan dengan peningkatan Profesionalisme Guru Sekolah Rendah, $r = .432$, $k < .05$.

Pada masa yang sama, pemboleh ubah Kandungan Latihan mencatatkan hubungan yang signifikan ($r = .539$, $k < .01$) dengan peningkatan Profesionalisme Guru Sekolah Rendah. Hasil kajian juga melaporkan $r = .443$, $k < .05$ pada pemboleh ubah Penyampaian Latihan dalam CPD dengan peningkatan Profesionalisme Guru Sekolah Rendah, menunjukkan terdapat hubungan yang signifikan (Ho13). Tambah pula, Hari dan Tempoh Masa Latihan juga mempunyai hubungan yang signifikan ($r = .368$, $k < .05$) dengan peningkatan Profesionalisme Guru Sekolah Rendah. Penerangan secara ringkas adalah ditunjukkan sebagaimana Jadual 4 yang berikutnya.

Jadual 4 : Keputusan Pearson Korelasi Antara Pemboleh ubah Kajian

Pemboleh ubah	1	2	3	4	5	6	7	8	9
1. Jenis latihan	-								
2. Cabaran dihadapi	-.166	-							
3. Faktor penglibatan	.236	.773**	-						
4. Perancangan Latihan	.327	.292	.482**	-					
5. Kandungan Latihan	.413*	.077	.390*	.474**	-				
6. Penyampaian Latihan	.298	-.367*	-.076	.034	.366*	-			
7. Hari dan Tempoh Masa Latihan	.425*	-.189	.019	.409*	.361	.340	-		
8. Tempat Latihan	.469**	-.128	.060	.266	.091	-.118	.327	-	
9. Peningkatan Profesionalisme	.287	.162	.526**	.432*	.539**	.443*	.368*	.170	-

*k < .05; **k < .01; ***k < .001

4.7 Perbincangan dan Rumusan

Pada bahagian ini perbincangan keputusan kajian akan dihuraikan dalam dua bahagian iaitu perbincangan yang memberi fokus kepada hasil dapatan pengujian perbezaan dan korelasi.

4.7.1 Perbincangan Keputusan Analisis T-Test

Setelah melakukan pengujian perbezaan dengan menggunakan analisis t-test Bebas terhadap pembolehubah Jantina dan Tahap Pendidikan dengan Peningkatan Profesionalisme Guru-Guru di sebuah sekolah rendah, dapatan menunjukkan tidak terdapat perbezaan yang signifikan terhadap pembolehubah–pembolehubah tersebut. Ini bermaksud, peningkatan profesionalisme para guru tersebut adalah sama tinggi dan tidak ditentukan oleh faktor perbezaan jantina mahupun perbezaan tahap akademik.

Begitu juga halnya dengan faktor demografi lain seperti Umur, Bangsa atau Etnik, Gred Jawatan, Pengalaman Mengajar dan Status Perkahwinan apabila Ujian ANOVA Sehala turut menunjukkan tidak terdapat perbezaan yang signifikan dengan peningkatan Profesionalisme Guru-Guru di sekolah rendah berkenaan. Ini menunjukkan bahawa, peningkatan profesionalisme guru-guru sekolah terbabit adalah tinggi dan tidak ditentukan oleh faktor perbezaan demografi. Maka dengan itu, kesemua hipotesis nol adalah diterima.

Pada pengkaji, setelah meneliti hasil dapatan ini, justifikasi yang boleh dinyatakan mengapa keputusan sedemikan berlaku mungkin disebabkan oleh faktor-faktor lain dan bukannya faktor-faktor demografi yang tersebut. Antara justifikasi mengapa berlakunya keputusan sedemikian boleh dikaitkan dengan tinjuan literatur iaitu Pelan Pembangunan Pendidikan Malaysia (2013-2025) yang telah dibentuk oleh Kementerian Pendidikan Malaysia (2012).

Menurut pelan tersebut, antara intipati untuk melahirkan guru berkualiti tinggi di Malaysia haruslah mengikut satu piawaian yang dikenali sebagai Standard Guru Malaysia (SGM). Piawaian SGM ini diguna pakai untuk melahirkan para guru yang mempunyai tahap amalan nilai profesionalisme keguruan, pengetahuan dan kefahaman, serta kemahiran Pengajaran dan Pembelajaran (PdP) yang tinggi bagi membolehkan mereka berfungsi sebagai guru profesional dengan berkesan.

Sehubungan dengan itu, piawaian SGM ini dari awal lagi telah dijadikan rujukan oleh pihak KPM di dalam pemilihan calon-calon guru baharu yang menggariskan hanya individu yang berkualiti dan mempunyai pencapaian yang tinggi dalam peperiksaan awam akan mengisi peranan sebagai guru dalam sistem pendidikan negara Malaysia. Ini khususnya SGM yang diguna pakai terhadap pemilihan calon guru-guru baharu yang akan mengikuti latihan perguruan di Institut Pendidikan Guru Malaysia (IPGM).

Maka dengan itu, jika dibandingkan tinjauan literatur ini dengan hasil dapatan kajian, didapati ia adalah selari kerana para guru yang mempunyai nilai SGM akan tertanam dalam diri mereka nilai profesionalisme keguruan, pengetahuan dan kefahaman, serta kemahiran Pengajaran dan Pembelajaran (PdP) yang tinggi bagi membolehkan mereka berfungsi sebagai guru profesional dengan lebih berkesan sedari awal. Ini menunjukkan faktor diri mereka sendiri menjadi penyebab untuk meningkatkan profesionalisme sebagai seorang guru dan bukan ditentukan oleh perbezaan Jantina, Tahap Pendidikan, Umur, Bangsa atau Etnik, Gred Jawatan, Pengalaman Mengajar dan Status Perkahwinan.

Selain itu, tinjauan literatur juga menunjukkan bahawa, banyak peranan yang dimainkan oleh pihak kerajaan untuk melahirkan guru-guru yang berkualiti. Penyataan ini selari dengan penulisan oleh Syed Ismail Syed Mustapa et al., (2010), menyatakan bahawa penyediaan guru yang terlatih oleh pihak kepimpinan sesebuah negara serta mempunyai daya kreatif dan inovatif mampu mencetuskan idea baharu dalam pelaksanaan pengajaran dan pembelajaran. Ia diterjemahkan melalui kehendak dan matlamat kurikulum dengan menggunakan kaedah, pendekatan, strategi pengajaran dan pembelajaran yang kreatif dan inovatif.

Noriati A. Rashid et al., (2010) dalam penulisan mereka pula menyatakan bahawa penyediaan guru-guru terlatih oleh pihak kepimpinan akan dapat meneruskan kelangsungan pengajaran dan pembelajaran di dalam bilik darjah di samping dapat mengurangkan berlakunya isu hilang tumpuan dalam kalangan murid. Pendapat ini disokong oleh Halizah Hamzah et al., (2010) yang berpandangan bahawa guru terlatih yang telah disediakan oleh pihak kepimpinan seharusnya mampu melaksanakan kaedah atau teknik baharu dan efektif yang dapat merangsang minat murid.

Oleh itu, beberapa tinjauan literatur ini didapati selari dan boleh menyokong hasil dapatan yang menunjukkan tidak terdapat perbezaan antara faktor demografi dengan peningkatan profesionalisme guru kerana peranan kerajaan dalam perkara ini secara langsung telah membentuk peribadi guru itu sendiri. Ini bermaksud selain faktor diri guru, peranan kerajaan juga menjadi faktor untuk meningkatkan profesionalisme sebagai seorang guru dan bukan semata-mata ditentukan oleh perbezaan Jantina, Tahap Pendidikan, Umur, Bangsa atau Etnik, Gred Jawatan, Pengalaman Mengajar dan Status Perkahwinan.

4.7.2 Perbincangan Keputusan Analisis Korelasi Pearsons

Setelah melakukan pengujian korelasi dengan menggunakan analisis Pearsons R terhadap pembolehubah Latihan Pembangunan Profesional Berterusan (CPD) dengan Peningkatan Profesionalisme Guru-Guru di sebuah sekolah rendah luar bandar Sabah, dapatan menunjukkan tidak terdapat hubungan yang signifikan terhadap pembolehubah Jenis Latihan Yang Dihadiri, Jenis Cabaran Dihadapi Dalam Latihan Yang Dihadiri dan Tempat Latihan Yang Dihadiri. Ini bermaksud, peningkatan profesionalisme para guru di dalam kajian ini adalah tidak dipengaruhi oleh faktor hubungan dengan pembolehubah bebas tersebut. Maka dengan itu, kesemua hipotesis nol berkait dengan pembolehubah ini adalah diterima.

Namun begitu, halnya berbeza dengan pembolehubah Latihan Pembangunan Profesional Berterusan (CPD) yang lain seperti Faktor Penglibatan, Perancangan Latihan, Kandungan Latihan, Penyampai Latihan dan faktor Hari serta Tempoh Masa latihan dalam perkhidmatan apabila ujian Korelasi Pearson R menunjukkan terdapat hubungan yang signifikan dengan peningkatan Profesionalisme Guru-Guru di sekolah berkenaan. Ini mengesahkan bahawa, peningkatan profesionalisme guru-guru sekolah terbabit adalah dipengaruhi oleh pembolehubah bebas tersebut. Maka dengan itu, kesemua hipotesis nol berkaitan dengan pembolehubah ini adalah ditolak.

Rentetan daripada keputusan kajian ini, sekali lagi, pengkaji, setelah meneliti hasil dapatan ini, mempunyai justifikasi untuk menyatakan mengapa keputusan sedemikan boleh berlaku dengan sokongan beberapa tinjauan literatur yang telah dilakukan.

Pertama, bagi keputusan kajian yang tidak mempunyai hubungan yang signifikan, dapatan ini boleh dikaitkan dengan prinsip pertama teori Stimulus Organisme Response (SOR) yang telah dikemukakan oleh Hovland (1953). Hal ini kerana, hubungan yang tidak signifikan menunjukkan Program CPD berdasarkan faktor Jenis Latihan, Jenis Cabaran dan Tempat Latihan ketika menghadiri program CPD (Stimulus) oleh para guru di sekolah tersebut dianggap kurang efektif dalam mempengaruhi perhatian para guru (Organisme) untuk meningkatkan tahap profesionalisme mereka (Respons).

Sebaliknya, Program CPD berdasarkan Faktor Penglibatan, Perancangan Latihan, Kandungan Latihan, Penyampai Latihan dan faktor Hari serta Tempoh Masa latihan dalam perkhidmatan ketika menghadiri program CPD (Stimulus)

oleh para guru di sekolah tersebut, telah diterima dengan baik sehingga menghasilkan perubahan efektif dalam mempengaruhi perhatian para guru (Organisme) untuk meningkatkan tahap profesionalisme mereka (Respon). Hubungan yang signifikan ini selari dengan prinsip kedua teori SOR.

Sehubungan itu, melalui tinjauan literatur berdasarkan teori SOR ini, ia amat jelas untuk mengaitkan dapatan kajian tersebut dengan faktor-faktor yang menentukan keberkesanan perlaksanaan Program Pembangunan Profesional Berterusan (CPD). Hal ini kerana, kewujudan hubungan signifikan menunjukkan terdapat faktor-faktor dalam program CPD seperti yang telah dinyatakan mempengaruhi peningkatan profesionalisme guru. Sebaliknya, ketiadaan hubungan yang signifikan menunjukkan terdapat juga faktor-faktor dalam program CPD ini yang gagal mempengaruhi peningkatan profesionalisme para guru yang terlibat dalam kajian ini.

Selain itu, peranan latihan dalam perkhidmatan menerusi program CPD untuk meningkatkan profesionalisme guru-guru yang terlibat dalam kajian ini disokong oleh Craft (2009) yang menyatakan latihan CPD dilihat sebagai satu alat untuk meningkatkan profesionalisme guru-guru secara umum. Buktinya, sebahagian faktor di dalam latihan CPD yang ditunjukkan menerusi dapatan kajian ini mempunyai hubungan yang signifikan dengan peningkatan profesionalisme guru selari dengan pendapat pengkaji tersebut.

Selain itu juga, hubungan signifikan Faktor Penglibatan, Perancangan Latihan, Kandungan Latihan, Penyampai Latihan dan faktor Hari serta Tempoh Masa latihan menerusi program CPD dengan peningkatan Profesionalisme Guru dalam kajian ini, turut disokong oleh Kwakman (2008) dengan penegasan bahawa guru-guru yang profesional akan sentiasa memperbaharui pengetahuan supaya dapat mengadaptasi perubahan yang berlaku dalam sistem pendidikan. Ini bermaksud latihan dalam perkhidmatan menerusi program CPD memberikan peluang kepada guru-guru untuk memperkayakan pengetahuan mereka mengenai mata pelajaran yang diajar seterusnya meningkatkan pembentukan Sikap (Attitude), Kemahiran (Skills) dan Pengetahuan (Knowledge) supaya proses pengajaran dan pembelajaran akan berjalan dengan lebih berkesan.

Pada masa yang sama, Kementerian Pendidikan Malaysia melalui Taklimat Perlaksanaan Memaksimumkan Masa Instruksional dalam proses pengajaran dan pembelajaran pada tahun 2012 telah menurunkan kuasa kepada pihak pengurus sekolah untuk merancang latihan dalam perkhidmatan menerusi program CPD. Peluang ini boleh dioptimumkan oleh pihak pengurus sekolah untuk menentukan kandungan yang lebih futuristik, berkait dengan pengamalan dalam bilik darjah, pentaksiran baharu dan sebagainya bagi guru-guru di sekolah mereka. Oleh itu, perkara tersebut selari dengan dapatan kajian ini apabila wujudnya hubungan yang signifikan antara Faktor Penglibatan, Perancangan Latihan, Kandungan Latihan, Penyampai Latihan dan faktor Hari serta Tempoh Masa latihan dengan peningkatan profesionalisme guru dalam kajian ini (Kementerian Pendidikan Malaysia, Taklimat Perlaksanaan Memaksimumkan masa Instruksional, 2012).

Seterusnya, dapatan kajian ini yang mempunyai hubungan signifikan antara faktor-faktor dalam latihan CPD dengan peningkatan profesionalisme guru, boleh disokong dengan kajian Ong. C. S. (2012). Beliau menyatakan, Penyampai Kursus yang mempunyai pemahaman yang kukuh dan memiliki kepakaran dalam sesuatu bidang seharusnya dapat memindahkan pengetahuan, kemahiran dan keupayaan kepada guru-guru. Ini bermaksud, dalam melaksanakan latihan CPD, ciri-ciri yang ada dalam penyampai latihan (Penceramah, Fasilitator atau Instraktor) dapat meningkatkan profesionalisme para guru.

5. Penutup

Oleh itu dapatlah ditegaskan bahawa, dapatan kajian ini sama ada mempunyai perbezaan yang signifikan atau sebaliknya dapat disokong dengan tinjauan literatur. Begitu juga halnya dengan dapatan kajian ini yang mempunyai hubungan yang signifikan atau sebaliknya, beberapa tinjauan literatur juga berjaya ditemui untuk menyokong hasil dapatan kajian ini. Ia selaras dengan huraian yang telah dikemukakan melalui kajian ini.

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Rujukan

Abdul Ghani Abdullah. (2009). *Kepimpinan Dan Penambahbaikan Sekolah*. PTS Professional Publishing Sdn. Bhd.

Beach, D.M.,& Reinhartz, J,. (2000). *Instructional leadership*. Needham Heights, M.A: Alyn & Bacon.

Craft, A. (2009). *Continuing Professional Development, A Practical Guide For Teachers Dan Schools.* New York: Routledge.

Field, A. P., & Hole, G. J. (2003). *How to design and report experiments*. London: Sage Publications.

Gray, S. L,. (2005). *An Enquiry Into Continuing Professional Development for Teachers*. Esmée Fairbairn Foundation/Villiers Park Educational Trust/University of Cambridge. Cambridge.

Haliza Hamzah & Joy Nesamalar Samuel. (2010). *Pengurusan Bilik Darjah dan Tingkah.* Selangor: Oxford Fajar Sdn. Bhd.

Hovland, P. P., Janis, I. L., & Kelly, H. H. (1953). *Communication and Persuasion: Psychological Studies of Opinion Change*. New Haven, CT: Yale University Press.

Jabatan Perkhidmatan Awam Malaysia. (2021). Portal Rasmi Jabatan Perkhidmatan Awam Malaysia. Laman sesawang http://jpa.gov.my diakses pada 29/08/2021

Kementerian Pendidikan Malaysia. (2021). Portal Rasmi Kementerian Pendidikan Malaysia di laman sesawang: *http://www.moe.gov.my* diakses pada 29/08/2021.

Kementerian Pendidikan Malaysia. (2012). Dasar Pendidikan Kebangsaan 2012.

Kementerian Pendidikan Malaysia. (2012). Pelan Pembangunan Pendidikan 2013-2025, Sept 2012.

Kementerian Pendidikan Malaysia. (2012). Taklimat Pelaksanaan Memaksimumkan Masa Instruksional

Kementerian Pendidikan Malaysia. (2005). Pekeliling Perkhidmatan Bilangan 6, Tahun 2005.

Kwakman, K. (2008). Factors Affecting Teachers' Participation In Professional Learning Activities. *Teaching And Teacher Education, 19*(2), 149-170. doi: 10.1016/s0742-051x(02)00101-4.

Lieberman, A. (Ed.). (1996). *Practices that support teacher development: Transforming conceptions of professional learning*. In M. W. McLaughlin & I. Oberman (Eds.), Teacher learning: New policies, new practices (pp. 185–201). New York: Teachers College Press.

Mohd Majid Konting. (1998). *Kaedah Penyelidikan Pendidikan. (4th edition)*. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Muhamad Nazri Samsudin. (2013). *Kepentingan Perubahan Inovasi Kurikulum Bilik Darjah* http://nazuris.blogspot.my/2013/10/kepentingan-perubahan-dan- inovasi.html Diakses pada 26 Ogos 2021 (Khamis).

Noriati A. Rashid, Boon Pong Ying, & Sharifah Fakhriah Syed Ahmad. (2010). *Murid dan Alam Belajar*. Selangor: Oxford Fajar Sdn. Bhd.

Ong C.S. (2012). *Effectiveness Of The In-Service Training Programme For Secondary School Principals At Institut Aminuddin Baki. Tesis*. Sarjana Pendidikan. Kuala Lumpur. Fakulti Pendidikan. Universiti Malaya. (tidak diterbitkan).

Portal Rasmi Jabatan Pendidikan Negeri Sabah. (2020). Laman sesawang http://jpnsabah.moe.gov.my diakses pada 09/01/2020.

Sabitha Marican. (2009). *Penyelidikan Sains Sosial Pendekatan Pragmatik.* Kuala Lumpur: Edusystem Sdn. Bhd.

Siti Nur Aisya Sugumarie Abdullah & Ahmad Zabidi Abdul Razak. (2018). Hubungan Dasar Latihan Dalam Perkhidmatan dengan Peningkatan Profesionalisme Guru-Guru Pendidikan Islam Sekolah Menengah Daerah Petaling Utama. *Jurnal Masalah Pendidikan, Jilid 40*. Universiti Malaya.

Syed Ismail Syed Mustapa dan Ahmad Subki Miskon. (2010). *Guru dan Cabaran Semasa*. Selangor Darul Ehsan: Penerbitan Multimedia Sdn. Bhd.

Vogt, W.P. (2006). *Quantitative Research Methods for Professionals*. Boston: Allyn & Bacon

Exploring the Role of Translation in Enhancing ESL Learning Outcomes

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Abstract

This study examines the attitudes and opinions of ESL teachers and learners regarding the use of translation in language training, emphasising its effects on understanding and memory of English language content. Data was collected through thematic analysis from interviews with ESL educators and students in bilingual classrooms. The results indicate that both groups regard translation as essential for enhancing comprehension, particularly for learners with limited English competence. Educators emphasised the significance of translation in closing linguistic divides, conserving instructional time, and improving student participation, especially in heterogeneous classrooms. Conversely, learners indicated that translation facilitates the comprehension of intricate vocabulary and concepts while enhancing memory retention by linking new information to their native language. Concerns regarding excessive dependence on translation arose, with educators and students recognising the necessity of progressively transitioning to English-only education as competency develops. The study's findings indicate that although translation facilitates language acquisition, it must be employed strategically to prevent impeding learners' long-term fluency. This study's findings contest inflexible English-only policies and promote a more adaptable, balanced methodology for ESL training that utilises translation as a provisional support. Future studies should concentrate on the enduring impacts of translation, its function in digital learning contexts, and cross-cultural disparities in its use. This study enhances current discourse regarding the significance of bilingual techniques in language acquisition and offers pragmatic insights for ESL instructors.

Keywords: Translation, ESL classroom, learners and teacher, attitude, perception

1. Introduction

Linguists and educators have long contested the role of translation in ESL programs. The grammar-translation method dominated language teaching until the mid-20th century. Communicative language instruction (CLT), which emphasises immersion and target language exclusivity, replaced this method. However, recent research has begun to reassess the benefits of translation in language learning, particularly in multilingual classrooms where learners' first languages can be used as resources.

Several theories support translation in language teaching. According to Vygotsky's sociocultural theory, social contact and cultural skills are crucial to learning, and learners' first languages can help them understand the target language (Lantolf, 2000). Cummins' (2007) concept of linguistic interdependence states that translation operations can improve linguistic and cognitive skills across languages.

Recent empirical research has examined translation's many roles in ESL education. Caruso (2018) examined how translation activities affect vocabulary acquisition in Italian high school English learners. Students who translated had better vocabulary memory than monolingual students. This suggests that translation can help people understand new words.

Translation enhances metalinguistic awareness, allowing learners to compare and contrast language structures, according to Cook (2010). Comparative analysis helps learners grasp grammar rules and usage in their first and target languages. Cook discovered that translation exercises enhanced grammatical accuracy and language confidence in learners.

Recent research show that students like translation exercises. Mavrou (2020) found that most Cyprus university students found translation beneficial for understanding complicated materials and clarifying content. Students said translation made learning easier by letting them use their language skills.

Recent research has examined how translation improves comprehension. Hall and Cook (2012) examined how translation activities affected UK adult ESL learners' reading comprehension. Translation improved text comprehension and recall, according to the study. Translation helped students understand and engage with the text.

In another study, Stibbard and Appel (2013) examined translation in listening comprehension. They found that translation activities helped Spanish-speaking English learners grasp spoken texts, especially colloquial language and complicated sentence patterns. Translation may improve hearing and comprehension, according to one study.

Effective translation in ESL classes requires understanding teachers' and students' views. Recent studies illuminate these ideas. Sanchez and Garcia-Mateus (2022) examined US bilingual education teachers' translation attitudes. Their findings showed that teachers who used translanguaging strategies, including translation, saw them as good for content knowledge and language development.

Fernández-Guerra (2014) polled Spanish ESL students concerning translation in language learning. The results showed pupils liked the translation's clarity and security, especially with challenging ideas. However, several students worried about overusing translation and not learning the target language.

Effective pedagogical practices are needed to maximise translation benefits in ESL instruction. González Davies (2014) suggested task-based translation, where students do real-life activities. This method emphasises translation's communication role and encourages learners to consider audience, purpose, and culture.

Additionally, dual-language programs efficiently include translation into their educational programs. These programs promote bilingualism and biliteracy by deliberately translating information. Howard et al. (2018) found that US dual-language students who translated performed better academically and language-wise than monolingual pupils.

Translation is complex in ESL classrooms. A recent study suggests it may improve vocabulary, comprehension, and metalinguistic awareness. Positive views from teachers and students imply that planned translation can improve language acquisition. To develop language fully, translation and immersion communicative practices must be balanced. Further empirical investigations are needed to discover novel approaches to integrate translation into ESL instruction to help learners achieve their language goals.

Educators and scholars disagree on using translation in ESL classrooms. Translation can help bridge linguistic gaps and improve comprehension, but it may also hamper immersive language learning and target language proficiency. Despite the controversy, there is little scientific evidence on how translation procedures affect ESL learners' language learning, comprehension, and retention.

Teacher and student attitudes towards translation in ESL instruction are also unclear. This lacuna in the literature makes it difficult for educators to use evidence-based translation procedures in their teaching. Systematic research on how translation might improve learning outcomes and meet the needs of ESL learners from varied linguistic backgrounds is needed.

This study addresses this gap by analysing how translation affects ESL students' comprehension, vocabulary, and language competency. It also examines ESL teachers' and students' views on translation as a pedagogical tool to understand better its practical applications and possible benefits in language teaching.

Research Questions

1. How do ESL learners perceive the impact of translation on their comprehension and retention of English language material?
2. What are ESL teachers' and learners' attitudes and perceptions towards using translation in language instruction?

Research Objectives

1. To assess the impact of translation on ESL learners' comprehension and retention.
2. To explore ESL teachers' and learners' attitudes and perceptions towards translation.

2. Literature Review

Translation in ESL classes has garnered fresh attention and scholarly debate. Translation has been abandoned in

favour of immersive practices in traditional language teaching, but modern research has shown that using learners' first languages improves comprehension, retention, and language acquisition. This literature review summarises recent studies on translation's efficacy, attitudes, and ESL teaching applications.

Historical and Theoretical Contexts of Language Teaching Translation

Translation was important to the grammar-translation process, emphasising textual form and precision. This method was criticised for neglecting spoken language and communication (Richards & Rodgers, 2014). The latter half of the 20th century saw the growth of communicative language teaching (CLT), which emphasised language immersion and interactive usage of the target language, frequently ignoring translation. Vygotsky's sociocultural theory (Lantolf & Thorne, 2006) and Cummins' (2007) linguistic interdependence hypothesis advocate using first languages as cognitive resources in second language acquisition. Vygotsky believed that social interaction and cultural tools, including a learner's first language, were vital to cognitive development. Translation can improve linguistic and cognitive skills, according to Cummins' idea.

Empirical Proof: ESL Classroom Translation Benefits

Recent empirical research demonstrates the benefits of translation in ESL education. Caruso (2018) found that Italian high school students learning English who translated had better vocabulary retention and understanding. Caruso's findings suggest that translation tasks help people grasp new words. Translation enhances metalinguistic awareness, allowing learners to compare and contrast language structures, according to Cook (2010). Comparative analysis helps learners grasp grammar rules and usage in their first and target languages. Cook discovered that translation exercises enhanced grammatical accuracy and language confidence in learners.

Another Hall and Cook (2012) study evaluated how translation improves reading comprehension in UK adult ESL learners. Translation improved text comprehension and recall, according to the study. Translation helped students understand and engage with the text.

Translation/Listening comprehension

Translation has also been studied in listening comprehension. Stibbard and Appel (2013) examined Spanish-speaking English learners' translation assignments. Translation improved student comprehension of spoken texts, particularly colloquial language and complicated sentence patterns. Translation may improve hearing and comprehension, according to one study.

Teachers' and Students' Views

Effective translation in ESL classes requires understanding teachers' and students' views. Sanchez and Garcia-Mateus (2022) examined US bilingual education teachers' translation attitudes. Their findings showed that teachers who used translanguaging strategies, including translation, saw them as good for content knowledge and language development. Fernández-Guerra (2014) polled Spanish ESL students about language learning translation. The results showed pupils liked the translation's clarity and security, especially with challenging ideas. However, several students worried about overusing translation and not learning the target language.

Methods of Teaching Translation

Effective pedagogical practices are needed to maximise translation benefits in ESL instruction. González Davies (2014) suggested task-based translation, where students do real-life activities. This method emphasises translation's communication role and encourages learners to consider audience, purpose, and culture. Additionally, dual-language programs have shown promise in incorporating translation. These programs promote bilingualism and biliteracy by deliberately translating information. Howard et al. (2018) found that US dual-language students who translated performed better academically and language-wise than monolingual pupils.

Challenges and worries

Translation is beneficial in ESL classrooms, but it also has drawbacks. The over-reliance on the first language may hinder the immersion experience needed to learn the target language. Fernández-Guerra (2014) notes that some students worry that frequent translation may impede their English thinking and spontaneous language development. Translation's instructional efficiency depends on learners' competence levels. Advanced learners may find translation exercises more restricted than beginners (Cook, 2010). Thus, educators must adapt translation exercises to students' proficiency and requirements. Recent research has shed light on translation in ESL teaching, although numerous areas need further study. First, longitudinal research on translation's long-term effects on language competency and

academic achievement is needed. Such investigations could clarify how translation affects language development.

Second, additional study is needed on the best translation procedures for diverse educational situations. Comparative studies could examine how word-for-word translating, paraphrasing, and summarising affect learners' language skills and cognitive processes. Third, ESL classroom translation research should address sociocultural factors. According to Vygotsky's sociocultural theory, their social and cultural contexts influence translation activities' effectiveness. Studying how cultural attitudes towards bilingualism and translation affect teaching practices and learner outcomes may help educators.

The role of translation in ESL teaching is complex. A recent study suggests it may improve vocabulary, comprehension, and metalinguistic awareness. Positive views from teachers and students imply that planned translation can improve language acquisition. To develop language fully, translation and immersion communicative practices must be balanced. Further empirical investigations are needed to discover novel approaches to integrate translation into ESL instruction to help learners achieve their language goals.

3. Methodology

This qualitative study examines how translation improves English as a Second Language (ESL) learning results, focusing on ESL teacher's and students' attitudes and perspectives. The qualitative approach was chosen for examining complicated, context-dependent issues like language education because it provides rich, in-depth insights into participants' subjective experiences and beliefs. Purposive sampling selected five ESL teachers and five ESL learners for the study. This strategy guarantees that the chosen candidates have expertise in using translation as a teaching tool in ESL classes. Teachers and students from varied educational backgrounds and competence levels allow a balanced examination of how translation is perceived and used across language acquisition stages. Each participant has semi-structured interviews with open-ended questions to discuss their experiences and attitudes regarding translation in ESL instruction. This flexible interview approach allows for a deeper investigation of major themes while covering all important topics. The interviews discuss translation's pros and cons, its effects on language learning, and participants' classroom experiences. With approval, all interviews are audio-recorded to ensure accuracy. Following verbatim transcription, the recordings form a comprehensive dataset for study. Transcribed data is analysed using thematic analysis to find, analyse, and understand qualitative data patterns and themes. This technique is ideal for this study since it reveals explicit and implicit meanings in participants' responses. Starting with repeated transcript reads, the analysis is systematic. After initial coding, significant phrases, ideas, and concepts are grouped into themes that reflect data patterns. Reviews and refinements guarantee that these themes appropriately represent participants' opinions and answer study objectives. The approach considers both teachers' and students' perspectives, offering a nuanced understanding of translation in ESL instruction. The final themes reveal participants' views on translation, as well as both agreement and disagreement. Research ethics are properly followed. All participants give informed consent, and the final report anonymises their responses. This scientific technique rigorously examines translation in ESL learning, revealing how teachers and students view and use it.

4. Findings

How do ESL learners perceive the impact of translation on their comprehension and retention of English language material?

Translation as a Comprehension Aid

Translation is frequently seen as an advantageous resource for comprehending novel vocabulary or complex topics in English. Numerous participants initially employed translation to comprehend the meaning of the English phrase in their original language before reverting to the English term. This technique enhances their understanding of new content.

> Learner 1 (Q2): “It’s a useful tool for learning a new language, but it shouldn’t be the only method used. It’s important to also learn to understand and think in the target language. Relying too much on translation might prevent you from truly mastering the language.”

> Learner 4 (Q4): “When I use translation, it helps me understand some words that I don’t know. But with translation, sometimes the order of words gets mixed up, which can be confusing. That’s why I think it’s better to learn the meaning of words directly in English, without relying too much on translation.”

> Learner 5 (Q2): “As time passes, I realize that translation in the native language is quite helpful. However, I’m

trying not to depend on it too much. I think it's better to build my understanding without relying entirely on translation."

Translation as a Retention Tool

Participants characterise translation as facilitating memory retention. Translating new content into their home language enhances their ability to remember English vocabulary and concepts more efficiently. Repeated translation and exposure to translated content can increase retention, particularly in academic settings.

Learner 3 (Q6): "In high school, I used translation from Malay to English to understand the material better, especially in Science. The Malay sentences are usually longer, but when translated into English, they become shorter. This helped me memorize the content more effectively."

Learner 5 (Q6): "Translation has been very helpful, especially during exams when it helps the students understand the questions. Since I often read the same thing, I tend to remember it well through repeated translation."

Learner 3 (Q7): "Translation helps us memorize things effectively. When we translate from Malay to English, it becomes shorter, making it easier to memorize. This process helps me recall the material better when I need it."

Translation as a Double-Edged Tool

While translation is a useful tool, some participants warn against over-reliance. They note that relying too much on translation may prevent them from fully thinking in English. Translation may also distort word order or meaning, leading to confusion.

Learner 1 (Q2): "It's a useful tool for learning a new language, but it shouldn't be the only method used. It's important to also learn to understand and think in the target language. Relying too much on translation might prevent you from truly mastering the language."

Learner 4 (Q4): "When I use translation, it helps me understand some words that I don't know. But with translation, sometimes the order of words gets mixed up, which can be confusing. That's why I think it's better to learn the meaning of words directly in English, without relying too much on translation."

Learner 5 (Q2): "As time passes, I realize that translation in the native language is quite helpful. However, I'm trying not to depend on it too much. I think it's better to build my understanding without relying entirely on translation."

Translation and Vocabulary Acquisition

Translation facilitates the acquisition and retention of new terminology for participants. Translating foreign terms into their original language enhances comprehension and facilitates vocabulary development. This procedure is particularly beneficial when dealing with intricate or formal terminology.

Learner 4 (Q3): "I was reading a novel and came across the word 'myriad,' and I was a little confused. So, I translated it into Malay, which helped me understand what the author meant in that sentence. Without translation, I wouldn't have understood the word."

Learner 2 (Q3): "I think when I learned words and phrases in Malay first, I needed translation to include them in my writing. By understanding them in my native language, I could better incorporate them into my English work."

Learner 5 (Q7): "When there is a new word, especially vocabulary, I tend to remember it well because it is something new to me. Translation of these new words enhances my ability to use them in writing and in speaking."

Translation and Confidence in Language Use

Translation bolsters participants' confidence in utilising English. Comprehending intricate content via translation enhances their confidence in class participation and assignment completion. Translation enhances their proficiency in utilising English in both verbal and written circumstances.

Learner 3 (Q3): "Last semester, we studied Accounting concepts, and the notes were in English. I had trouble understanding them, so I translated them into my native language first. After I understood it in my language, I memorized it, which gave me more confidence when studying the material in English."

Learner 5 (Q4): "As I entered my diploma year, I realized that there's a deeper side of vocabulary that I hadn't discovered before. I use translation frequently, and it has improved my understanding of complex words. This has made me more confident when using English in academic contexts."

Learner 3 (Q7): "Translation helps us memorize things effectively, especially when translating from Malay to English. The translation process makes it more efficient to write and memorize in English, which has boosted my confidence in using English for writing and presentations."

Translation and Independent Learning

Certain participants endeavour to minimise their reliance on translation and favour acquiring knowledge directly in English. Their engagement with English media and extensive learning have enhanced their ability to comprehend content without the necessity of translation. Nevertheless, translation continues to be beneficial for unfamiliar notions.

Student 2 (Q6): "Actually, I prefer things to be explained in English since I watch a lot of English content and read a lot of articles or research in English. This exposure has helped me become more comfortable with the language, and I don't need to rely as much on translation."

Student 5 (Q6): "Both English and native language explanations are fine for me. I've been taught ESL for more than 10 years, so now I don't have a problem understanding the content even if it is explained in English first."

Student 5 (Q4): "I use translation quite often because I face a lot of different languages and new words. However, I try to learn the words in English directly so I don't have to rely on translation too much. It's important to build the skill of thinking in English."

What are the attitudes and perceptions of ESL teachers and learners towards the use of translation in language instruction?

Teacher attitudes and perceptions

1. Translation as a Support for Low-Proficiency Students

ESL educators typically regard translation as essential for aiding low-proficiency learners in comprehending English. Translation is seen essential for poorer pupils, facilitating their learning and comprehension by enabling access to knowledge that would otherwise be excessively challenging.

Teacher 1 (Q1): "I feel the use of translation is helpful for weak students. However, it is not encouraged for students with good language skills."

Teacher 2 (Q1): "With their limited English competence, I can't teach them without translating the lesson into their first language. It helps them comprehend better and improve language L2 acquisition & fluency."

Translation is regarded as a vital instrument for assisting students with limited English competence, enabling their participation in learning and comprehension of the material.

2. Translation as a Bridge to Language Learning Success

Educators view translation as a conduit linking pupils' pre-existing knowledge in their native language to the new language they are acquiring. This bridge is essential for facilitating students' navigation through the learning process and enabling them to attain linguistic proficiency.

Teacher 2 (Q2): "Translation has worked as a bridge in my classroom... I have never achieved my lesson objectives without it."

Teacher 3 (Q2): "It facilitates between two languages—native and English. It helps in better understanding of the English language to avoid language barriers."

Educators perceive translation as a means to facilitate pupils' comprehension of new linguistic structures by linking them to their native language.

3. Efficiency and Time-Saving Tool

Translation is seen as an efficient technique, especially in educational settings where instructing grammar and intricate topics in English would be laborious. By elucidating fundamental concepts in the student's native language,

educators can concentrate more on practice and application in English.

Teacher 2 (Q3): "Using translation helps me to save my teaching time. Instead of taking longer trying to explain to them in English, why not use their mother tongue?"

Teacher 5 (Q4): "Students understand instructions faster using the translation method."

Educators value translation as a means to enhance classroom efficiency, enabling a concentration on effective language practice.

4. Translation as a Motivational Tool

Educators assert that translation serves to enhance student motivation, particularly for those who find English challenging. Employing translation alleviates emotions of frustration and exclusion, so enhancing students' confidence and willingness to engage in class.

Teacher 5 (Q3): "It improves students' motivation to learn ESL, especially for students with poor results in exams."

Teacher 5 (Q4): "Students score better marks and pass exams for English because they can adequately answer questions using sentences learned through translation."

Translation fosters student engagement, enhances participation, and cultivates confidence in their English learning capabilities.

5. Translation and Cognitive Engagement

Educators observe that translation stimulates students' cognitive faculties by prompting critical thought regarding the transition between their native language and English. This cognitive involvement enhances students' language processing and comprehension.

Teacher 4 (Q1): "Using the translation method engages students' cognitive ability because they need to discern between two languages and find the connection to comprehend."

Teacher 4 (Q3): "It helps learners connect with their current knowledge, making it easier to understand the new language."

Teachers perceive translation as a way to enhance students' cognitive skills, requiring them to think more analytically about language.

6. Practicality in Mixed-Ability Classrooms

Description: In classrooms with students of varying language abilities, translation is seen as a practical tool that ensures all students are included in the learning process. Teachers find that it helps manage the diverse language needs in the classroom by providing additional support where necessary.

Teacher 4 (Q1): "Using translation in language instruction is an effective method, especially in a mixed-ability classroom."

Teacher 5 (Q4): "In my language classroom, I teach mixed-ability students... translation helps students understand instructions faster."

Translation is viewed as an inclusive strategy that helps meet the diverse needs of students in ESL classrooms, ensuring that everyone can access the material.

7. Concerns Over Over-Reliance on Translation

Some teachers express concerns that students may become too dependent on translation, which could slow their progress in developing English proficiency. They emphasize the need for students to gradually reduce their reliance on translation and focus more on using English directly.

Teacher 1 (Q2): "Teachers need to guide their students to understand the language slowly without depending too much on translation."

Teacher 1 (Q4): "I advised them not to use translation during the examination."

While translation is seen as a helpful tool, there is concern about over-reliance, which could prevent students from

fully engaging in English and developing fluency.

ESL learner attitudes and perceptions

1. Translation as a Learning Aid

Learners perceive translation as a valuable tool to aid in comprehending new vocabulary and concepts. Translation is seen as a bridge to better understanding difficult material, especially in the early stages of learning English.

Learner 1 (Q1): “It's a fun new way to learn something."

Learner 2 (Q1): "It gives great exposure...to get a better understanding of new words."

Learner 3 (Q1): "I translate to native language...and then I go back to English."

Learner 3 (Q2): "Translation is very important for learning, especially for me."

Learner 4 (Q2): "It made my understanding easier, especially with our phones."

Translation is positively viewed as a tool that makes learning more accessible and bridges understanding, especially for beginners.

2. Translation as a Reassurance

For some learners, translation provides reassurance, affirming their understanding of previously learned words or phrases. Translation is a supportive mechanism to confirm that they are on the right track.

Learner 2 (Q2): "It reassures the words or phrases I already recognize."

Learner 4 (Q5): "Translation helps me remember well, especially during exams."

Translation is viewed as a safety net, providing a sense of security by reinforcing understanding, especially in high-stakes situations like exams.

3. Translation for Vocabulary and Concept Clarification

Learners often rely on translation to help clarify complex vocabulary or abstract concepts. They use translation to navigate more technical or unfamiliar material in their academic work.

Learner 1 (Q3): "Not often, mostly unfamiliar words aren’t used often."

Learner 3 (Q3): "When I got back, I translated...then I understood better in native language."

Learner 4 (Q3): "I was confused by 'myriad' and translated it to Malay."

Learner 5 (Q3): "Translation is helpful during assignment and paperwork."

Translation is a functional tool for clarifying complex terms, particularly academic or less common vocabulary, making learning more manageable.

4. Reliance on Translation

Several participants acknowledged their frequent reliance on translation, especially when faced with complex vocabulary or when instructions and content are predominantly in English.

Learner 3 (Q4): "I rely on translation a lot because many subjects use English."

Learner 5 (Q4): "Most of the time I rely on translation due to deeper vocabulary."

While translation is essential for understanding, reliance on it may be viewed as a limitation that can hinder direct engagement with English over time.

5. Translation and Time Efficiency

Translation is viewed as a time-saving tool that speeds up comprehension. Learners find that it reduces the need for lengthy research or external help, making learning more efficient.

Learner 3 (Q5): "Without translation, understanding takes more time and research."

Learner 5 (Q5): "Translation makes comprehension faster and clearer."

Translation is valued for its learning efficiency, helping learners quickly grasp new concepts without excessive time deciphering difficult English.

6. Translation in Retaining Information

Translation helps with the retention of English vocabulary and phrases. Learners use it to reinforce their memory, especially in academic settings or when revisiting material.

Learner 3 (Q6): "Using translation helped me remember better, especially in high school."

Learner5 (Q6): "Translation used in exams helped me retain information."

Translation is regarded as a tool that enhances memory retention, especially for learners who use it repeatedly during study or exams.

7. Mixed Preferences for Translation

Learners express mixed feelings toward translation. While they acknowledge its usefulness, some feel it could lead to over-dependence and prefer explanations directly in English as their language proficiency improves.

Learner 1 (Q6): "Yes and no, depends on the clarity of the speaker."

Learner 2 (Q6): "I prefer explanations in English because I consume English content."

Learner 4 (Q6): "I can’t understand much in Malay but translation helps sometimes."

Learners appreciate the balance between using translation and gradually shifting to understanding English directly, with preferences evolving as they become more proficient.

8. Translation's Influence on Recalling and Using English

Translation helps learners recall and use English vocabulary in various contexts. Learners feel that translating new words aids in memorization and enhances their ability to use English in writing and speaking.

Learner 1 (Q7): "Translation is helpful and fun, encouraging frequent use of English."

Learner 3 (Q7): "Translation helps memorize things effectively and efficiently."

Learner 5 (Q7): "New vocabulary enhances writing and speaking ability."

Learners recognize translation as a tool that strengthens their recall and active use of English, especially in writing and speaking.

5. Discussion

How Do ESL Learners Perceive the Impact of Translation on Their Comprehension and Retention of English Language Material?

In multilingual ESL classrooms, learners frequently alternate between their first language (L1) and the target language (L2) to comprehend new vocabulary and intricate grammatical structures. Translation has become a significant instructional technique to enhance understanding and retention of English language content. Research indicates that learners possess diverse beliefs regarding the role of translation in language learning, with numerous recurring themes elucidating its perceived influence on comprehension and retention.

Translation as a Tool for Comprehension

For numerous ESL learners, translation is essential for understanding, especially when faced with foreign or abstract terminology. Students indicate that translating challenging English terminology into their native language enhances comprehension, alleviating cognitive burden and facilitating improved understanding. This is particularly

pertinent for learners with lower competence who may find it challenging to contextualise new terminology without the support of their original language (García & Wei, 2014).

The current examination of interview transcripts reveals that several learners expressed the belief that translation aids them in deconstructing challenging content and progressing in their studies. One responder indicated that translating difficult words into their home tongue provides clarity prior to reverting to the English context. This iterative practice of alternating between languages corresponds with Cummins' (2007) interdependence theory, which asserts that learners' comprehension of L2 is enhanced by the foundational knowledge acquired in L1.

Furthermore, students identify translation as an effective means of linking new English concepts to existing knowledge, especially in educational contexts. A learner articulated that interpreting technical terminology and phrases throughout assignments and examinations facilitated a deeper comprehension of intricate topics. The capacity to utilise translation as a means of understanding underscores its effectiveness in enhancing language processing, a perspective corroborated by recent studies indicating that cross-linguistic transfer increases learning efficiency (Cenoz & Gorter, 2011).

Translation as a Memory Aid for Retention

ESL learners regard translation as an essential instrument for retention. Connecting new vocabulary and structures in a second language to known notions in the first language facilitates the memorisation and retrieval of English phrases. This viewpoint corresponds with the cognitive theory of learning, which posits that retention is enhanced when new information is linked to pre-existing knowledge (Sweller, 2010).

In the interview responses, participants often indicated that translating content into their home language helped their retention of English vocabulary. One participant indicated that translating scientific terminology from Malay to English facilitated information retention and enhanced exam performance. These data align with Cook's (2010) research, which demonstrated that employing L1 as a support mechanism improves retention by alleviating the cognitive burden usually linked to learning exclusively in L2.

Although translation is frequently viewed as a transient resource, participants in the current study recognised its enduring advantages in developing a substantial mental lexicon in English. Reinforcing vocabulary via repetition and bilingual encoding enables learners to retain new language content more efficiently, corroborating studies that indicates translation can improve lexical retention (Laufer & Girsai, 2008).

Concerns about Over-Reliance on Translation

Notwithstanding its apparent advantages, several learners articulate apprehensions regarding excessive dependence on translation, thinking it may impede their capacity to think and communicate directly in English. The danger of over reliance is a significant issue highlighted in the research, as an overdependence on translation may restrict opportunities for immersive second language acquisition (Macaro, 2005). Participants in the study recognised that although translation is beneficial during the early phases of language learning, it is crucial to progressively transition to comprehending material in English without reverting to the first language.

This viewpoint aligns with scholars advocating for a balanced translation methodology in ESL environments. Although translation facilitates understanding and memory, excessive reliance may hinder learners from cultivating the cognitive flexibility necessary for proficient language usage (Nation, 2003). The incremental decrease in translation usage, along with heightened exposure to English in immersive environments, may facilitate improved internalisation of the target language by learners.

Cognitive and Emotional Impact of Translation

The emotional and cognitive impacts of translation on learners' linguistic experiences also surfaced as a significant subject. Students indicated that translation alleviated anxiety and enhanced their confidence in utilising English, especially in demanding academic environments. This indicates study findings on language acquisition anxiety, suggesting that offering L1 help via translation can mitigate the apprehension of making errors in L2, hence promoting increased engagement (Horwitz, 2001).

Moreover, students reported that translation enabled them to interact with English content more profoundly, cultivating a sense of proficiency as they advanced in their language education. This corresponds with Vygotskian scaffolding theories, wherein L1 functions as a provisional cognitive aid that can be eliminated as learners achieve fluency in L2 (Vygotsky, 1978).

ESL learners' perspectives of translation in language education indicate a complex awareness of its advantages and drawbacks. Translation is predominantly regarded as an essential instrument for understanding and retention, enabling learners to traverse intricate information with greater ease. Nonetheless, learners acknowledge the necessity of diminishing their dependence on translation over time to cultivate a more authentic fluency in English. Current research indicates that translation functions as both a cognitive scaffold and a mnemonic device, with its efficacy enhanced when combined with immersive, English-only learning environments. ESL educators face the difficulty of balancing various methodologies, ensuring that translation is employed strategically to facilitate, rather than impede, long-term language development.

What are the attitudes and perceptions of ESL teachers and learners Toward the use of translation in language instruction?

The incorporation of translation in ESL (English as a Second Language) training has generated significant debate, reflecting diverse views and perspectives among educators and students. Some consider translation an essential instrument for overcoming linguistic barriers, whilst others warn against excessive dependence, fearing it may impede immersion in the target language. Analysing the viewpoints of ESL educators and students allows for a deeper comprehension of the perception of translation in classroom environments and the alignment or divergence of these perspectives with contemporary research on language acquisition.

ESL Teachers' Perceptions: Translation as a Pedagogical Tool

Numerous ESL educators consider translation an excellent method for enhancing understanding and assisting low-proficiency learners. In multilingual classrooms, where students commonly share a mutual L1 (first language), translation is sometimes employed to elucidate intricate terminology, syntax, or concepts that may remain unintelligible (Cook, 2010). Educators in the current study affirmed this notion, emphasising that translation serves as a framework to assist students in comprehending new content. Several educators indicated that translation facilitates the elucidation of abstract concepts more effectively, conserving time and enhancing student participation.

Research substantiates this perspective, with studies demonstrating that the prudent application of translation can improve language acquisition by rendering teachings more accessible and culturally pertinent for learners (García & Wei, 2014). This is especially relevant in situations when students exhibit considerable disparities in competence levels, rendering English-only instruction a less feasible choice. Educators frequently regard translation as an essential measure in these contexts, enabling all students to engage in lessons without experiencing exclusion or intimidation from the source language (Macaro, 2005).

Nonetheless, albeit acknowledging the advantages of translation, several educators voice apprehensions over pupils' potential overreliance on it. One teacher in the study observed that although translation aids students' comprehension, over reliance on it may hinder their capacity to think directly in English. This issue corresponds with Cummins' (2007) interdependence hypothesis, which posits that whereas L1 information facilitates L2 development, excessive dependence on L1 may impede the internalisation of the target language. Consequently, several educators recommend a progressive diminishment of translation utilisation as students' language skill escalates, facilitating greater immersion in English.

Learners' Perceptions: Translation as a Tool for Comprehension and Retention

ESL learners predominantly regard translation as a beneficial and effective instrument, especially for comprehending challenging content and assimilating new vocabulary. In the interview transcripts, learners consistently indicated that translating unfamiliar words into their first language facilitates comprehension, alleviates anxiety, and enhances understanding. One responder observed that the learning process would significantly decelerate in the absence of translation, necessitating dependence on external resources or specialists to elucidate challenging topics. This viewpoint corresponds with the findings of Laufer and Girsai (2008), which indicated that translation facilitates vocabulary retention by fostering more robust mental associations between L1 and L2 terms.

Students regard translation as an effective technique for enhancing memory retention. Numerous participants in the study indicated that translating materials into their native language facilitated recall during examinations or class discussions. This illustrates cognitive learning theories, indicating that connecting new information to pre-existing knowledge in L1 can improve retention and retrieval (Sweller, 2010). Moreover, translation enhances learners' confidence in their linguistic skills, enabling them to engage with the target language via a familiar linguistic structure. For students with limited English proficiency, translation offers a sense of security and empowerment, thereby motivating them to persist in their learning endeavours.

Nonetheless, akin to the apprehensions expressed by educators, certain students recognise the dangers of excessive dependence on translation. They observe that although translation is beneficial in the preliminary phases of language acquisition, it is crucial to transition away from it to progressively immerse oneself in English. This perspective aligns with Vygotsky's (1978) concept of scaffolding, wherein translation serves as a provisional aid that ought to be withdrawn when learners achieve autonomy in the target language. Students who excessively rely on translation may forfeit the immersion experiences essential for achieving fluency and the capacity to think directly in English.

The Role of Translation in Multilingual Classrooms: A Balanced Approach

Teachers' and learners' attitudes and perceptions suggest that translation plays a complex and multifaceted role in ESL instruction. While it is viewed as a useful tool for facilitating comprehension and retention, there is also a recognition of the need for balance. Teachers and learners caution against over-reliance on translation, advocating for a gradual shift toward English-only learning as students' proficiency improves. Research supports this balanced approach, emphasizing that translation can enhance learning in multilingual classrooms but must be used strategically (Nation, 2003). Macaro (2005) argues that translation should be seen as a communication strategy that complements, rather than replaces, immersion in the target language. By incorporating translation judiciously, teachers can ensure that students benefit from the cognitive advantages of bilingual learning while still developing the skills necessary for fluency in English. In addition, scholars have noted the importance of considering students' cultural and linguistic backgrounds when deciding how to use translation in the classroom. García and Wei (2014) advocate for translanguaging, a pedagogical approach encouraging students to draw on all their linguistic resources, including L1, to make meaning and express themselves in the target language. This approach validates the students' linguistic identities and allows for more flexible and creative use of language, which can enhance learning outcomes in diverse ESL settings. ESL teachers and learners perceive translation as a valuable tool for improving comprehension and retention of English language material. Teachers view it as a practical and time-saving strategy, particularly for low-proficiency students, while learners appreciate its role in helping them grasp difficult concepts and remember new vocabulary. However, there is a shared understanding of the potential drawbacks of over-reliance on translation, with both groups advocating for a gradual reduction in its use as language proficiency improves. A balanced approach to translation, one that recognizes its benefits while encouraging immersion in English, appears to be the most effective strategy for supporting ESL learners in their language acquisition journey. By strategically integrating translation into ESL instruction, educators can provide a supportive learning environment that fosters comprehension and long-term language development.

6. Research Implications

This study has major implications for ESL instruction, especially in multilingual and multicultural classrooms where students bring varied language origins. One consequence is rethinking ESL classrooms' English-only instruction rules. According to several study participants and teachers, translation helps children with lower skill levels understand, retain, and learn language. Strategically integrating translation can scaffold learning to help students understand new concepts and vocabulary rather than overwhelm them with English-only information.

This undermines the idea that English-only training is better. Translanguaging research by García and Wei (2014) suggests that multilingual learners benefit from employing their entire linguistic repertoire, including L1 when learning a new language. According to the current study, translation helps learners negotiate complicated language structures and improves cognitive processing by tying new knowledge to their linguistic basis. Therefore, translation should be seen as a genuine instructional technique that helps L1 learners become L2 proficient.

Other implications include translation's emotional and cognitive benefits. Translation made many learners feel more confident and less apprehensive, supporting Horwitz's (2001) results on language anxiety and acquisition. Teachers can avoid cognitive overload by engaging students in both L1 and L2 and creating a more inclusive classroom. This aids comprehension and creates a positive emotional link to language learning, encouraging active participation.

Finally, translation appears to be important for vocabulary and language retention. Creating cognitive linkages between L1 and L2 helps pupils learn and remember English. According to Sweller's (2010) cognitive load hypothesis, minimising cognitive burden improves learning. Thus, educators can employ translation to improve retention and English comprehension.

7. Recommendations for Future Studies

Based on this study, future research should examine numerous areas to understand translation in ESL learning and instruction better. First, additional longitudinal research is needed to determine how translation affects language acquisition over time. Future studies could track learners over several years to establish how early translation affects English fluency and competency. While this study highlighted the immediate benefits of translation, a longitudinal approach might provide significant insights into whether students who use translation substantially in the early stages continue to rely on it or if they move naturally into English-only understanding and production.

Further studies should examine translation in virtual or hybrid classrooms. We should explore how students and teachers use digital translation tools like Google Translate or other AI-based systems as education technology grows, especially following the COVID-19 epidemic. Do these technologies improve comprehension like teacher-guided translation? How do students rate these tools for language retention? These crucial topics must be addressed in the changing digital education scene.

Cultural translation in ESL instruction might be studied further. Different linguistic and cultural origins may affect how students and teachers view classroom translation. Studying how students from languages with very different structures from English (e.g., Chinese or Arabic) use translation as a learning tool is possible. Understanding these cross-cultural variances might help ESL instructors better serve multilingual learners.

Finally, further experimental research is needed to compare translation-based instruction to other bilingual methods like code-switching or translanguaging in various ESL circumstances. This study found positive views towards translation but comparing these methodologies could help determine when and how to incorporate it into the curriculum. Future studies should use bigger, more diverse sample sizes to generalise findings across educational environments.

8. Conclusion

The study illuminates translation's vital role in ESL instruction and how teachers and students view it. Many believe translation aids language acquisition by improving understanding, retention, and emotional well-being. Translation helps teachers construct lessons and engage students of different competence levels by bridging the gap between students' previous linguistic knowledge and the destination language. Translation helps students learn English vocabulary and concepts by lowering anxiety and improving retention. The findings also warn against over-reliance on translation. Translation is helpful in early language acquisition, but teachers and students recognise the need to move away from it as learners improve. This balance is essential for pupils to think and speak English without using their L1. Research on translanguaging, such as García and Wei (2014), highlights the importance of integrating diverse language resources while promoting English immersion.

Given these findings, ESL educators must establish translation-based educational practices that do not impair students' English competence. Translation is a scaffolding technique that can be eliminated as English learners improve. Teachers can use translation strategically to improve English fluency. In conclusion, ESL teaching and learning depend on translation. It may not be a permanent answer, but judicious application can aid learners, especially early language learners. Future studies should examine how translation and other bilingual methods might be implemented into ESL training to help diverse learners reach their full language potential.

References

Caruso, G. (2018). The role of translation in second language acquisition: An empirical study. *Language Learning Journal*, 46(1), 1-16.

Cenoz, J., & Gorter, D. (2011). Focus on Multilingualism: A Study of Trilingual Writing. *The Modern Language Journal*, 95(3), 356-369.

Cook, G. (2010). *Translation in Language Teaching: An Argument for Reassessment*. Oxford University Press.

Cook, V. (2010). *Second Language Learning and Language Teaching*. Oxford University Press.

Cummins, J. (2007). Rethinking Monolingual Instructional Strategies in Multilingual Classrooms. *Canadian Journal of Applied Linguistics*, 10(2), 221-240.

Fernández-Guerra, A. (2014). The use of translation in the language classroom: A critical overview. *The Language Learning Journal*, 42(3), 1-13.

García, O., & Wei, L. (2014). *Translanguaging: Language, Bilingualism and Education*. Palgrave Macmillan.

González Davies, M. (2014). *Multiple Voices in the Translation Classroom*. John Benjamins Publishing Company.

Hall, G., & Cook, G. (2012). Own-language use in language teaching and learning. *Language Teaching*, 45(3), 271-308.

Horwitz, E. K. (2001). Language Anxiety and Achievement. *Annual Review of Applied Linguistics*, 21, 112-126.

Howard, E. R., Lindholm-Leary, K. J., Rogers, D., Olague, N., Medina, J., & Kennedy, B. (2018). Effective Features of Dual Language Education Programs: A Review of Research and Best Practices. *Center for Applied Linguistics*.

Lantolf, J. P. (2000). *Sociocultural Theory and Second Language Learning*. Oxford University Press.

Lantolf, J. P., & Thorne, S. L. (2006). *Sociocultural Theory and the Genesis of Second Language Development*. Oxford University Press.

Laufer, B., & Girsai, N. (2008). Form-focused instruction in second language vocabulary learning: A case for contrastive analysis and translation. *Applied Linguistics*, 29(4), 694-716.

Macaro, E. (2005). Codeswitching in the L2 Classroom: A Communication and Learning Strategy. In *Non-native Language Teachers* (pp. 63-84). Springer, Boston, MA.

Mavrou, K. (2020). Students' perceptions of the role of translation in English as a foreign language classes. *English Teaching & Learning*, 44(3), 285-302.

Nation, P. (2003). The role of the first language in foreign language learning. *Asian EFL Journal*, 5(2), 1-8.

Richards, J. C., & Rodgers, T. S. (2014). *Approaches and Methods in Language Teaching* (3rd ed.). Cambridge University Press.

Sanchez, M. T., & Garcia-Mateus, S. (2022). Translanguaging and Identity Development in Emergent Bilinguals: Perspectives from a Dual Language Bilingual Education Program. *Journal of Multilingual and Multicultural Development*, 43(2), 123-137.

Stibbard, R., & Appel, R. (2013). Translation as a learning method in language teaching. *Language Learning Journal*, 41(1), 1-14.

Sweller, J. (2010). *Cognitive Load Theory*. Springer Science & Business Media.

Vygotsky, L. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.

Kajian Kerangka Bumbung Rumah Tradisional Di Muzium Negeri Sabah

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Abstrak

Setiap rumah tradisional kaum di Sabah mempunyai ciri dan perbezaan kerangka bumbung serta susunannya. Muzium di Kota Kinabalu mempunyai kampung budaya yang terdiri daripada rumah tradisional etnik-etnik di Sabah. Objektif kajian ini adalah untuk mengenalpasti jenis kerangka bumbung di Rumah Tradisional Muzium Sabah dan juga menghasilkan e-katalog yang mengandungi maklumat berkaitan kerangka bumbung rumah-rumah etnik di Muzium Negeri Sabah. Kajian ini melibatkan 9 buah rumah etnik dan melibatkan kerja lapangan, pengumpulan data melalui temubual serta rujukan di perpustakaan, penyusunan data dan penghasilan e-katalog yang boleh diakses oleh pengguna dengan mengimbas kod QR yang disediakan. Soal selidik turut dijalankan, bagi mengetahui keberkesanan e-katalog yang dihasilkan. Soal selidik ini melibatkan seramai 95 orang responden. Berdasarkan kajian ini, didapati 8 daripada 9 buah rumah etnik yang dikaji menggunakan kerangka bumbung jenis king post truss, manakal hanya 1 buah rumah etnik menggunakan kerangka bumbung jenis attic truss. Berdasarkan soal selidik yang dijalankan, 60 % responden menunjukkan pemahaman yang baik berkaitan kerangka bumbung selepas melakukan pembacaan e-katalog berkaitan kerangka bumbung yang dihasilkan.

Keywords: - rumah etnik Sabah, kerangka bumbung.

1. Pengenalan

Muzium di Kota Kinabalu merupakan muzium yang unik kerana bukan sahaja memuatkan artifak bersejarah tetapi juga mempunyai Kampung Budaya. Di Kampung Budaya inilah terdapat rumah-rumah tradisional etnik Sabah yang boleh memberikan gambaran kepelbagaian dan perbezaan rumah-rumah tradisional etnik yang ada di Sabah. Namun informasi berkaitan kekuda bumbung Muzium Negeri Sabah tidak dinyatakan. Oleh yang demikian penghasilan e-katalog yang mengandungi maklumat berkaitan rekabentuk binaan dan jenis kerangka bumbung bagi setiap rumah etnik yang ada di Kampung Budaya Muzium Negeri Sabah akan dapat membantu memberikan maklumat kepada pengunjung serta memudahkan para pelajar terutama pelajar yang ingin menguasai kursus *Timber Structure Design.*

2. Kajian Literatur

Sabah adalah sebuah negeri yang masih kaya dengan warisan kesenian silam dan pembinaan rumah turut dipengaruhi elemen tertentu yang juga berkisarkan kepada aspek kepenghunian, reka bentuk, bahan binaan, konsep ruangan dan pantang larang yang berkaitan. Pada amnya, arkitek asli etnik tempatan berkongsi prinsip-prinsip asas pembinaan. Ciri-ciri seni bina diasaskan kepada infrastruktur binaan tiang seri dan gelegar serta atap yang menutup seluruh ruang rumah. Sambungan sendi gelegar tiang selain tiang seri diikat kuat dengan rotan atau diperkukuh dengan pasak kayu Belian. (Roosfa Hashim, 2007)

Pembinaan juga bergantung kepada rupa bentuk bumi kawasan rumah tersebut didirikan. Namun, pada asasnya, rumah vernakular tradisional etnik tempatan dibina dengan penyesuaian terhadap keperluan sosioekonomi, budaya dan adat resam serta alam persekitaran. Ia lebih disesuaikan dengan gaya hidup yang direncanakan oleh kepercayaan serta upacara ritual. Lazimnya, masyarakat etnik tempatan menggunakan bahan binaan yang terdapat dengan banyak daripada persekitaran tempat tinggal. (Roosfa Hashim, 2007)

Kerangka bumbung telah digunakan secara meluas dalam pembinaan bumbung dan jambatan. Kerangka dahulunya dibina dengan menggunakan kayu di tempat tinggal primitif sekitar tahun 2500 SM. Namun dengan menggunakan kayu sebagai kerangka, ianya agak sukar diperolehi dan berat, maka ianya digantikan dengan besi namun tidak lama kemudiannya, kerangka telah banyak direka dengan menggunakan keluli kerana ianya lebih tahan, ringan dan mudah didapati pada masa kini. Dalam seni bina dan kejuruteraan struktur, kerangka adalah satu struktur yang terdiri daripada

satu atau lebih unit segi tiga yang dibina dengan ahli-ahli lurus yang berakhir disambungkan pada sendi yang disebut sebagai nod. Daya luaran dan tindak balas kepada kuasa-kuasa dianggap hanya untuk bertindak pada nod dan mengakibatkan daya dalam anggota yang sama ada daya tegangan atau mampatan. (James Ambrose, 2012).

3. Metodologi

Kajian ini melibatkan kerja lapangan, pengumpulan data, penyusunan data dan proses menganalisis data.

3.1 Kerja Lapangan

Kerja lapangan melibatkan aktiviti mengenalpasti lokasi kajian, meninjau kawasan kajian, membuat pemerhatian jenis-jenis kerangka bumbung rumah-rumah etnik yang terdapat di Muzium Negeri Sabah.

3.2 Pengumpulan Data

Pengumpulan data berkaitan kajian dilakukan melalui temubual yang melibatkan dua pegawai muzium yang bertanggungjawab mengendalikan rumah-rumah etnik di Muzium Negeri Sabah. Soalan-soalan temubual adalah menjurus kepada latar belakang dan sejarah setiap rumah etnik, struktur binaan bagi setiap rumah etnik dan kerangka-kerangkan binaan rumah-rumah etnik yang ada di muzium.

Pengumpulan data juga melibatkan aktiviti pencarian maklumat di perpustakaan. Antara maklumat yang diperlukan bagi kajian ini adalah berkaitan binaan dan kerangka rumah-rumah etnik di Sabah.

3.3 Penyusanan data

Data-data yang diperolehi melalui temubual dan pencarian maklumat di perpustakaan disusun untuk memenuhi keperluan maklumat yang dimasukkan di dalam e-katalog dan dapat diakses melalui imbasan kod QR. Antara maklumat yang di masukkan di dalam e-katalog ialah rekabentuk rumat etnik, bahan utama yang digunakan untuk binaan rumah etnik, jenis kerangka bumbung yang digunakan dalam binaan rumah etnik serta lakaran kerangka bumbung yang dihasilkan menggunakan perisian AutoCAD 2022.

3.4 Soal Selidik

Soal selidik dilaksanakan bagi mengenalpasti keberkesanan e-katalog yang dihasilkan. Soalan-soalan pada soal slidik adalah berbentuk close-ended dan ukuran skala Likert. Soal selidik ini mengandungi 8 soalan yang menguji pengetahuan umum responden berkaitan kerangka bumbung, berdasarkan maklumat yang ada pada e-katalog yang dihasilkan.

4. Keputusan Kajian

Bedasarkan kajian ini, didapati majoriti rumah-rumah etnik yang ada di Muzium Negeri Sabah menggunakan kerangka bumbung king post truss, manakala daripada 9 buah rumah-rumah etnik ini, hanya sebuah rumah etnik yang menggunakan kerangka bumbung aticc truss, iaitu rumah etnik Bonggi. King post truss merupakan kerangka bumbung yang sesuai digunakan untuk binaan yang bersaiz kecil dan sederhana, manakala kerangka jenis attic truss sesuai digunakan untuk binaan yang besar. Jadual 1 menunjukkan rumah-rumah etnik dan jenis kerangka bumbung bagi setiap rumah etnik tersebut.

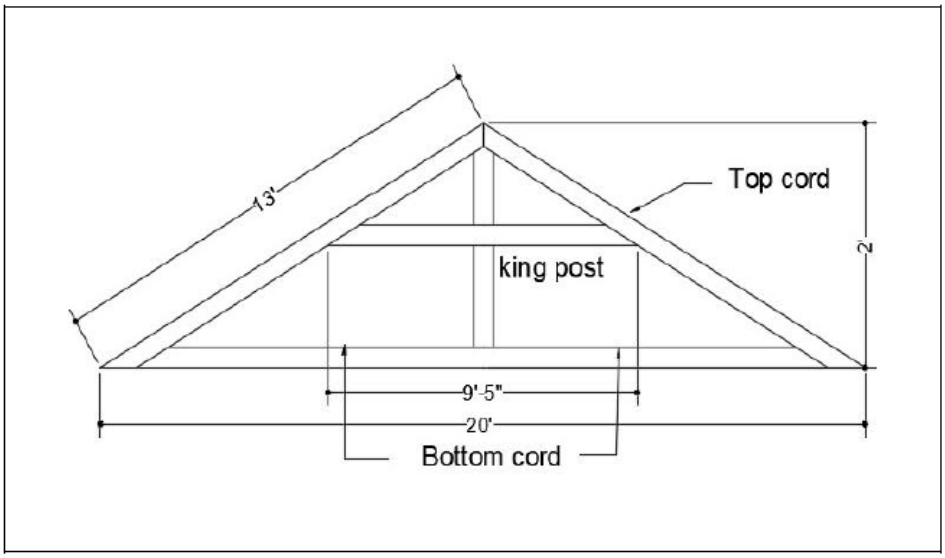
Jadual 1: Jenis kerangka bumbung rumah-rumah etnik di Muzium Negeri Sabah

Etnik	Rumah Etnik	Jenis Kerangka Bumbung
Suluk		*King post truss*
Iranun		*King post truss*
Cina		*King post truss*
Brunei		*King post truss*

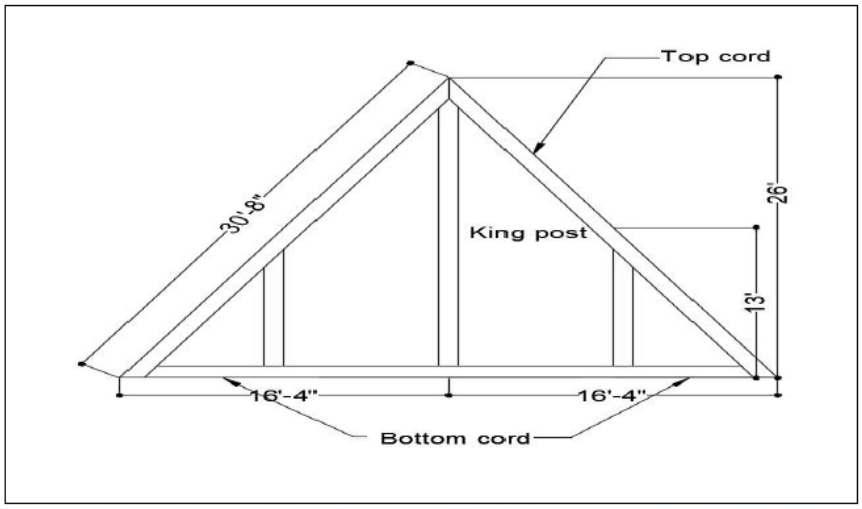
Lotud		 *King post truss*
Murut		 *King post truss*
Dusun Tambunan		*King post truss*
Rungus		 *King post truss*

Bonggi		*Attic truss*

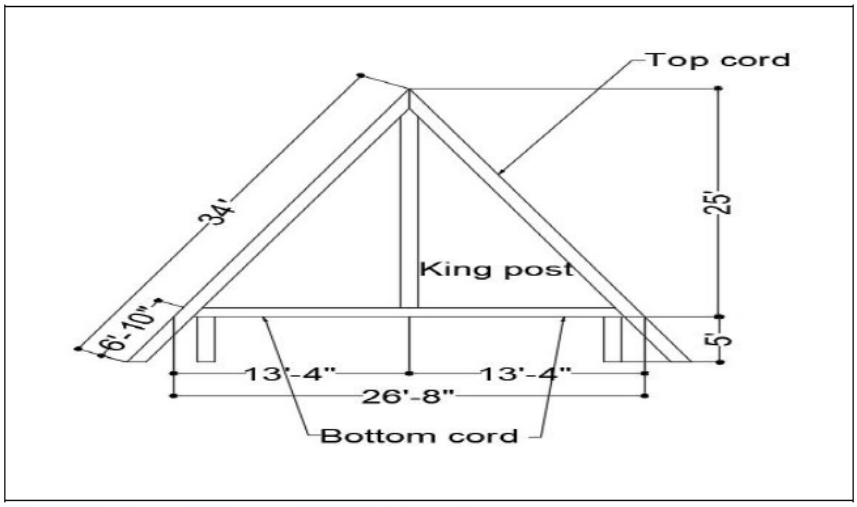
Setiap rumah etnik didapati mempunyai bilangan kerangka dan jarak kerangka yang berbeza untuk membentuk kerangka bumbung rumah. Berdasarkan pengumpulan data semasa kerja lapangan yang dilakukan, jarak kerangka bagi rumah-rumah etnik adalah diantara 1.5 m sehingga 2.6 m, manakala bilangan kerangka yang paling minimum digunakan adalah 2 dan maksimum adalah 7 kerangka.



Rajah 1: Lakaran kerangka bumbung rumah etnik Suluk; *king post truss*, menggunakan 3 kerangka, jarak antara kerangka ialah 1. m



Rajah 2: Lakaran kerangka bumbung rumah etnik Murut; *king post truss*, menggunakan 8 kerangka, jarak antara kerangka ialah 2m



Rajah 3: Lakaran kerangka bumbung rumah etnik Bonggi; *attic truss*, menggunakan 2 kerangka, jarak antara kerangka ialah 2m

Rajah 4: Paparan e-katalog yang dihasilkan yang boleh diakses dengan mengimbas kod QR; (a) muka hadapan e-katalog, (b)

maklumat berkaitan kerangka bumbung rumah etnik di Muzium Sabah

Soal selidik yang dilakukan melibatkan 95 responden yang terdiri daripada pelajar Politeknik Kota Kinabalu, dengan latar belakang program pengajian yang berbeza. Berdasarkan analisa yang dilakukan, secara keseluruhan 60 % responden menunjukkan pemahaman yang baik berkaitan kerangka bumbung selepas melakukan pembacaan e-katalog berkaitan kerangka bumbung yang dihasilkan.

5. Kesimpulan

Melalui kajian ini, didapati terdapat dua jenis kerangka bumbung yang digunakan dalam binaan rumah etnik yang ada di Muzium Negeri Sabah, iaitu post king truss dan attic truss. Selain itu, maklumat komprehensif berkaitan latar belakang rekabentuk binaan terutamanya berkaitan kerangka bumbung 9 buah rumah etnik yang terdapat di Muzium Negeri Sabah telah dihasilkan dan dibukukan dalam bentuk e-katalog untuk dijadikan sebagai rujukan para pelajar.

Penghargaan

Pengkaji ingin mengucapkan ribuan terima kasih kepada pihak Muzium Negeri Sabah yang telah memberi kebenaran dan kerjasama untuk menjadikan Muzium Negeri Sabah sebagai lokasi kajian. Pengkaji juga ingin mengucapkan terima kasih yang tidak terhingga kepada pegawai Muzium Negeri Sabah, En. Agus bin Lambuqu dan En. Lukman Hakim yang banyak membantu dan memberi maklumat komprehensif yang diperlukan oleh para pengkaji.

Rujukan

Abdul Rahman Al-Ahmadi. (2000). *Tajul Muluk. Dlm Petua Membina Rumah Melayu Dari Sudut Etnis Dan Antropplogist*. Kuala Lumpur: Perpustakaan Negara Malaysia.

James Ambrose. (2011). *Simplified Engineering For Architects And Builder*. Retrieved from http://ndl.ethernet.edu.et/bitstream/12345 6789/1353/1/285.pdf

Kamarul Afizi Kosman & Nik Lukman Nik Ibrahim. (2007). "Identiti Seni Bina Malaysia: Masalah dan Penyelesaiannya". *SARI: Jurnal Alam dan Tamadun Melayu*, 25. pp. 270-290.

Ken Flemming et al. (2020). *Design guide for timber roof trusses*. Retrieved from https://dcstructural.com/wp-content/uploads/2020/09/TFEC-4-2020-Design-Guide-for-Timber-Roof-Trusses.pdf on the 4 April 2023

Muhammad Ammar Harith Idris., Mohd Anuar Ramli., & Mohammaddin Abdul Niri. (2019). "Kearifan Tempatan Dalam Fiqh Makanan Di Alam Melayu". *Jurnal Fiqh*, 16(1): 57-82.

Mohd Sarim Hj.Mustajab. (2004). *Inventori Budaya Etnik Negeri Sabah*. Universiti Malaysia Sabah.

Roosfa Hashim. (2007). *Rumah Tradisional Etnik Sabah*. Perpustakaan Muzium Negeri Sabah.

Zaimi Sahibil. (2015). *Konsep dan Reka Bentuk Rumah Bonggi*. Dewan Bahasa dan Pustaka.

Pengajaran Berkesan Dalam Mata Pelajaran Sejarah: Satu Kajian Kes Di Salah Sebuah Sekolah Rendah Di Pedalaman Pulau

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Abstrak

Kajian kualitatif ini adalah untuk mengenal pasti keberkesanan pengajaran dalam kalangan guru sejarah agar murid berminat mengikuti proses Pengajaran, Pembelajaran dan Pemudacaraan (PdPc) tanpa merasa bosan. Guru sejarah perlu kreatif, inovatif dan bijak merancang kaedah PdP agar semangat patriotisme murid selari dengan kehendak Kementerian Pendidikan Malaysia (KPM). Pengajaran berkesan merujuk kepada kemahiran guru menyampaikan maklumat kepada murid agar mudah difahami, menarik dan menyeronokan. Daya kreativiti dan inovasi yang tinggi membolehkan kaedah pengajaran mencorakkan perkembangan minda, emosi, sikap, nilai dan keperibadian murid. Hasil Kajian mendapati ketiga-tiga responden bersetuju menyatakan bahawa pengajaran guru berkesan dan sesuai mempunyai kolerasi yang sangat erat dengan pemahaman dan menarik minat murid terhadap subjek sejarah. Ini menunjukkan bahawa semakin tinggi pengajaran guru maka semakin tinggi kesan pemahaman dan minat murid terhadap subjek sejarah. Sebaliknya pengajaran guru yang rendah menimbulkan sikap kurang memahami dan tidak menarik minat murid mengikuti proses PdP.

Kata Kunci: Pengajaran Berkesan, Kaedah Pengajaran, Minat

1. Pendahuluan

PdPc mata pelajaran sejarah penting kepada murid untuk mereka menghayati makna sejarah. KPM memperkenalkan subjek ini peringkat sekolah rendah untuk melahirkan murid bersikap patriotisme dengan mencintai agama, bangsa dan negara. Justeru, melalui mata pelajaran sejarah kecintaan mereka terhadap peradabaan negara bangsa dapat disemai di peringkat awal. Hal ini sejajar dengan pendapat Haslinda (2012), bahawa sejarah mempunyai perkaitan rapat dengan disiplin ilmu yang lain kerana mata pelajaran sejarah merentas kurikulum dan merupakan satu-satunya subjek yang paling banyak membincangkan aspek kewarganegaraan dan ketamadunan manusia. Aspek seumpama ini perlu disebatikan dalam jiwa kanak-kanak sejak di bangku sekolah lagi. Beliau juga berpendapat bahawa kewujudan negara bangsa harus dilaksanakan melalui pelbagai saluran, antaranya melalui sistem pendidikan yang berperanan menjadi wahana utama dalam pembentukan perpaduan masyarakat berbilang kaum khususnya di Malaysia. Dalam Falsafah Pendidikan Kebangsaan, KPM 1992, pendidikan di Malaysia adalah suatu usaha berterusan ke arah memperkembangkan lagi potensi individu secara menyeluruh dan bersepadu untuk mewujudkan insan yang seimbang dan harmonis dari segi jasmani, emosi, rohani dan intelek berdasarkan kepercayaan dan kepatuhan kepada Tuhan. Usaha ini adalah bagi melahirkan rakyat Malaysia berilmu pengetahuan, berketerampilan, bertanggungjawab dan berkeupayaan mencapai kesejahteraan diri serta memberi sumbangan terhadap keharmonian dan kemakmuran masyarakat dan negara.

Perubahan konsep pengajaran kurikulum dalam sistem pendidikan kebangsaan meletakkan subjek sejarah sebagai mata pelajaran yang perlu diberi perhatian. Pada tahun 2014, KPM menjadikan mata pelajaran sejarah wajib diajar di tahap 2 dan bermula di tahun 4. Di peringkat sekolah menengah pula mata pelajaran sejarah dijadikan subjek teras dan wajib lulus peringkat Sijil Pelajaran Malaysia (SPM). Pada 29 Oktober 2010, Kabinet telah bersetuju membentuk Panel Pembelajaran Sejarah yang memastikan mata pelajaran ini wajib lulus peringkat SPM bermulai tahun 2013 dan subjek teras di sekolah rendah pada tahun 2014 (Utusan Malaysia 2010; Lisa Yip Shukey, 2014). Isu kepentingan PdP mata pelajaran sejarah sebelum ini turut dihangatkan melalui penyataan Profesor Emeritus Tan Sri Dr. Khoo Kay Kim kepada pemberita selepas menghadiri Program Wacana One Malaysia: Cabaran dan Harapan, sempena Program Semarak Perpaduan dan Patriotisme Institut Pendidikan Guru Malaysia Peringkat Kebangsaan. Beliau mengatakan kebanyakan rakyat negara ini tidak tahu dan tidak memahami sejarah negara sehingga

menyebabkan mereka berfikiran secara sempit (Bernama 2009; Lisa Yip Shukey, 2014).

1.1 Objektif Kajian

i. Mengenal pasti sama ada guru memahami definisi pengajaran berkesan.
ii. Mengenal pasti guru menggunakan kemahiran mengajar dengan berkesan terhadap murid.
iii. Mengenal pasti guru menggunakan amalan pengajaran yang sesuai kepada murid terutamanya dalam bilik darjah.
iv. Mengenal pasti adakah guru positif terhadap perubahan sistem pendidikan sesuai konteks masa kini atau masih ditakuk yang lama.
v. Mengenal pasti kriteria atau ciri-ciri guru berkesan melaksanakan PdP subjek sejarah di sekolah rendah khususnya di Pulau.

2. Tinjauan Literatur

Pendekatan minat serta bakat murid atau pelajar boleh diasah sekiranya guru menggunakan pengalaman mengajar positif dan mempunyai nilai-nilai inovasi, kreatif serta menarik. Menurut Subadrah dan Malar (2005), penglibatan pelajar secara aktif sewaktu proses PdPc membantu mereka mengukuhkan pemahaman tentang sesuatu konsep atau fakta sejarah dengan lebih baik. Pelajar juga dapat mengukuhkan pemahaman tentang konsep atau fakta melalui pembentangan dan penjelasan serta perbincangan dalam kumpulan kecil. Menurut pengkaji, Lima Fasa Needham dapat meningkatkan minat pelajar terhadap mata pelajaran sejarah. Pengalaman mengajar guru dalam penggunaan model ini menjadikan proses PdPc sejarah lebih berpusatkan pelajar dan dapat menarik perhatian pelajar terhadap mata pelajaran tersebut.

Sulaiman et al. (2004); Lezah dan Rosy (2018), menyatakan pengajaran berkesan ialah pengajaran yang mengambil kira pelbagai aspek. Aspek-aspek tersebut termasuklah psikologi dan profesional. Oleh yang demikian para pendidik seharusnya menggunakan kaedah pengajaran yang betul untuk menghasilkan pembelajaran berkesan. Kenyataan ini selaras dengan kajian Anuar et al. (2009); Lezah dan Rosy (2018) terhadap tahap keupayaan pengajaran guru sejarah dari persepsi pelajar terhadap lima aspek pengajaran guru. Kajian mereka mendapati kemahiran mengajar guru sejarah merupakan aspek yang paling banyak menyumbang kepada pencapaian pelajar bagi mata pelajaran sejarah berbanding kebolehan guru, kaedah pengajaran guru, penggunaan BBM dan perhatian guru sejarah terhadap kerja pelajar.

Menurut Thomson (1969); Lisa Yip Shukye (2014), sejarah telah berkembang lebih 200 tahun daripada babad atau rekod peristiwa yang lebih berkaitan kepada suatu disiplin yang bermatlamat menginterpretasi pelbagai bukti untuk memahami masyarakat dahulu. Oleh itu, kaedah PdP mata pelajaran sejarah memerlukan kebiasaan minda (habits of mind) dan kemahiran pemikiran yang khusus bagi disiplin itu sendiri Lisa Yip Shukye, 2014). Memandangkan matlamat PdPc sejarah ialah memahami masa lalu maka pemikiran sejarah membolehkan murid-murid menggunakan maklumat sejarah untuk memahaminya. Pemikiran sejarah bukan setakat mempelajari fakta, tarikh dan peristiwa yang lalu tetapi juga membantu murid-murid mengaitkannya dengan masa kini serta keputusan untuk masa akan datang (Seixas, 1999; Wineburg, 2001; Lisa Yip Shukye, 2014).

Kajian ini sejajar dengan kajian Norafizah (2017), yang menjelaskan bahawa melalui Kurikulum Standard Sekolah Rendah (KSSR) bagi mata pelajaran sejarah sekolah rendah, murid-murid diberi pendedahan untuk menganalisis dan menilai fakta sejarah secara kritis dan kreatif. Kurikulum tersebut dibina berasaskan 6 tunjang iaitu komunikasi, kerohanian, sikap dan nilai, kemanusiaan, literasi sains dan teknologi, serta keterampilan diri. Pengkaji juga menyatakan bahawa keenam-enam tunjang tersebut merupakan nilai yang menyokong antara satu dengan lain dan disepadukan dengan elemen membina Kemahiran Berfikir Aras Tinggi (KBAT). Melalui kesepaduan kesemua aspek ini, modal insan yang seimbang dan harmonis, berpengetahuan dan berketerampilan dapat dilahirkan. Hal ini bertepatan dengan matlamat Falsafah Pendidikan Negara yang ingin melahirkan pelajar seimbang dalam jasmani, emosi, rohani dan intelek.

Berpandukan kepada kajian masa lalu yang diketengahkan dalam kajian ini, kebanyakan pengkaji menjelaskan bahawa mata pelajaran sejarah mempunyai kekuatan tersendiri untuk dihayati oleh generasi muda sebagai pengajaran bahawa sejarah itu boleh membentuk jati diri yang utuh untuk menjadikan pelajar mencintai dan menjaga agama, bangsa dan tanah air.

3. Metodologi

Kajian menerangkan tentang kaedah penyelidikan seperti berikut :

3.1 Reka Bentuk Kajian

Kajian ini menggunakan konsep temu bual berstruktur antara penyelidik dengan responden secara individu dan berfokus. Kaedah ini digunakan untuk mendapat kefahaman lebih mendalam tentang sebuah tajuk, contohnya motivasi, tingkah laku, perasaan, strategi membuat keputusan atau pendapat orang tertentu terhadap sesuatu isu atau topik (Kamarul, 2012).

3.2 Sampel dan Tempat Kajian

Dalam kajian ini hanya tiga responden terlibat iaitu Guru Besar, Penolong Kanan Pentadbiran dan Ketua Panitia Sejarah kerana mereka adalah guru mata pelajaran sejarah sekolah. Situasi temu bual dilaksanakan dalam keadaan santai tetapi formal. Kajian ini berlatarbelakangkan sebuah sekolah yang terletak di pedalaman pulau.

3.3 Alat Kajian

Pengkaji mengemukakan lima soalan temu bual berdasarkan tema utama persoalan kajian. Dalam sesi temu bual, responden bebas menjawab soalan dan memberikan pandangan serta idea mengikut situasi, pengalaman dan persekitaran. Semua jawapan, pandangan serta idea dianggap benar. Penyelidik juga mengemukakan soalan-soalan spontan semasa sesi temu bual untuk memberi penjelasan kepada soalan yang kurang difahami oleh responden. Berikut adalah contoh soalan temu bual mengikut tema utama yang digunakan dalam kajian ini:

Jadual 1: Tema Utama Dan Soalan Temu Bual

NO SOALAN	KATEGORI SOALAN	TEMA UTAMA
Soalan 1 (S1)	Apakah yang dimaksudkan dengan pengajaran berkesan?	Definisi Pengajaran Berkesan
Soalan 2 (S2)	Apakah kemahiran yang sesuai yang perlu diperoleh oleh guru dalam pengajaran berkesan?	Kemahiran Mengajar Dengan Berkesan
Soalan 3 (S3)	Apakah amalan yang perlu ditunjukkan oleh guru dalam pengajaran yang berkesan?	Amalan Pengajaran Yang Sesuai
Soalan 4 (S4)	Apakah mereka dapat menyesuaikan dengan perubahan konteks di sekolah?	Sesuai Dengan Konteks Yang Berubah
Soalan 5 (S5)	Apakah kriteria yang ingin anda usulkan untuk guru yang berkesan di sekolah?	Kriteria Guru Yang Berkesan

3.4 Prosedur Kajian

Fasa pertama kajian bermula dengan memilih sekolah yang sesuai untuk melaksanakan kajian. Mengenal pasti pencapaian sekolah dan sumber manusia. Menyediakan keperluan yang sesuai dengan kaedah kajian berkonsepkan temu bual termasuk membina soalan berdasarkan tema utama. Memastikan guru sejarah memberikan kerjasama padu dalam kajian ini. Fasa kedua memberi makluman kepada pentadbir sekolah untuk memohon kebenaran melaksanakan kajian dan memerlukan responden dalam kalangan guru-guru sejarah. Memulakan sesi temu bual bersama guru sejarah dengan mengemukakan 5 soalan yang menjadi tema utama kajian. Fasa ketiga menganalisis data untuk mengenal pasti hasil dapatan dan perbincangan melibatkan pandangan dan ulasan pengkaji.

3.5 Analisis Data

Kajian ini menggunakan konsep temu bual yang dilaksanakan antara pengkaji dengan responden secara individu dan berfokus. Mengandungi lima tema utama yang menjadi dasar kepada pembinaan soalan temu bual kajian dan menjadi data kajian yang dianalisis secara mutlak.

4. Hasil Kajian Dan Temubual

Hasil kajian menunjukkan bahawa semua responden sangat positif dengan keberkesanan pengajaran subjek sejarah di sekolah. Berikut merupakan hasil kajian, temu bual dan perbincangan pengkaji bersama responden.

4.1 Definisi Pengajaran Berkesan

Responden menjelaskan definisi pengajaran berkesan seperti berikut mengikut kefahaman individu.

".....bermaksud satu set aktiviti penyampaian dan penerimaan ilmu pengetahuan daripada sumber utama iaitu guru kepada murid agar berlaku perubahan tingkah laku berdasarkan kriteria-kriteria kejayaan seperti yang dihasratkan di dalam hasil pembelajaran yang perlu dicapai pada, semasa atau akhir satu sesi pengajaran dan pembelajaran". (R1_S1_hlmn1)

".....ialah pengajaran yang mampu masuk ke pemikiran pelajar sehingga dapat digunakan untuk hal yg lain seperti menjawab peperiksaan, diamalkan dalam kehidupan dan dikongsikan dengan orang lain. " (R2_S1_hlmn2).

".....merupakan kebolehan dan kemampuan seseorang guru itu untuk menyampaikan maklumat pengajaran dengan baik dan berkesan bersama BBM yang sesuai " (R3_S1_hlmn3)

Berdasarkan temu bual di atas, ketiga-tiga responden mendefinisikan pengajaran berkesan sebagai tindakan manusia dalam satu kelompok yang mana berlaku proses menyampai dan menerima untuk hal-hal tertentu dalam komunikasi pelbagai hala. Hal ini merujuk kepada akitiviti atau proses penyampaian PdP daripada seorang guru kepada murid dengan berkesan sehingga boleh memberi impak positif dalam kemenjadian murid. Selain itu, BBM juga diperlukan untuk mempengaruhi dan menghiburkan murid. Ini merupakan komponen penting dalam Kurikulum yang tidak boleh dipisahkan dengan aktiviti dan proses PdP kerana membentuk pelbagai rangkaian mata pelajaran yang telah digariskan oleh KPM. Mata pelajaran yang ditawarkkan di sekolah rendah adalah pelajaran wajib dan teras. Perlu diajar dengan memasukkan elemen-elemen inovasi yang boleh menarik perhatian murid. Guru perlu mempelbagaikan kaedah PdP termasuk menginovasikan proses PdP mereka dalam bentuk idea mahupun benda yang digunakan sebagai BBM.

Anuar et al., (2009), turut menjelaskan bahawa keberkesanan mata pelajaran sejarah bergantung kepada perancangan dan kualiti guru sejarah semasa proses PdP berlangsung. Dengan erti kata lain guru mempunyai kebolehan dan kemampuan luar jangka menyampaikan proses PdP atau maklumat dengan berkesan dan secara tidak langsung mewujudkan perubahan tingkah laku positif dalam kalangan murid. Apabila kita kaitkan definisi ini dengan proses PdP guru bersama murid seperti dalam kajian ini, ia merujuk kepada power seorang guru menyampaikan pengajaran berkesan agar minat murid semakin meningkat untuk mengikuti proses pembelajaran tanpa bosan, mengantuk atau tidak memberi perhatian semasa guru mengajar. Ini sejajar dengan kajian yang dilaksanakan oleh Subadra dan Malar (2005), yang menjelaskan bahawa kaedah pengajaran berkonsepkan khutbah amat popular dalam kalangan guru sejarah. Pengkaji juga turut menjelaskan pelajar menunjukkan sikap negatif jika guru mengajar menggunakan kaedah pengajaran yang membosankan.

4.2 Kemahiran Mengajar Dengan Berkesan

Pengertian kemahiran mengajar dengan berkesan dan sesuai adalah seperti berikut mengikut butiran temu bual bersama ketiga-tiga responden yang terlibat.

".....kemahiran penguasaan DSKP, merungkai dan merangkai DSKP, kemahiran merancang pengajaran, kemahiran mengawal pembelajaran, kemahiran komunikasi, kemahiran membimbing, kemahiran mendorong dan kemahiran sebagai penilai". (R1_S2_hlmn1)

" Guru mesti ada kemahiran berkomunikasi dengan baik kerana mereka hari-hari menyampaikan ilmu kepada pelajar....." (R2_S2_hlmn1)

".....dengan komunikasi yang berkesan itu maka pengajaran akan dapat disampaikan kerana komunikasi ini melibatkan sikap guru yang perhatin mengambil berat berkenaan dengan latar belakang murid, emosi murid, pengetahuan ada murid dan kemahiran sampingan yang lain. " (R3_S2_hlmn1)

Dalam hal ini, semua responden bersetuju bahawa kemahiran berkomunikasi adalah penting untuk

menyampaikan PdPc berkesan kepada murid. Kemahiran lain seperti merancang, mengawal, membimbing keseluruhan isi pelajaran membolehkan guru dapat mengenal pasti dan menilai tahap penguasaan dan impak yang diperolehi oleh murid semasa guru menyampaikan proses pengajaran. Ini sejajar dengan pendapat Aisha (2012), yang mengatakan bahawa ahli pendidikan sentiasa memperbaiki proses pengajaran supaya dapat menghasilkan satu persekitaran PdPc bersesuaian dengan pelajar. Membimbing serta memberi dorongan kepada murid menjadikan seorang guru sebagai fisilitator terbaik untuk memastikan kemenjadian murid tercapai. Ini selaras dengan hasrat KPM ingin melahirkan pelajar seimbang jasmani, emosi, rohani dan intelek selaras dengan Falsafah Pendidikan Kebangsaan dan PPPM 2013-2025 merapatkan jurang perbezaan antara murid bandar dan luar bandar dalam penguasaan sistem pendidikan Malaysia.

4.3 Amalan Pengajaran Yang Sesuai

Amalan pengajaran yang sesuai menurut pandangan dan pengertian responden adalah seperti berikut:

"Guru perlu sentiasa memiliki sikap keterujaan dalam bidang profesionnya, menguasai ilmu pengetahuan, mengamalkan sikap simpati dan emapati yang tinggi, bersedia menerima kepelbagaian tahap kebolehan muridnya, sentiasa bersifat dinamik dalam menentukan kaedah,strategi dan teknik pengajaran, memastikan kualiti pengajarannya sentiasa bermakna untuk kemenjadian murid." (R1_S3_hlmn1)

"Guru yang mempunyai kepakaran dan kecekapan dalam subjek yang diajar, boleh mempelbagaikan kaedah mengajar, boleh memberi penerangan yang jelas tentang perkara yang hendak disampaikan dan *enthusiasm*" (R2_S3_hlmn1)

".....menerapkan nilai-nilai murni untuk mendisiplinkan para murid tersebut kerana nilai-nilai murni ini apabila dipupuk secara berkesan akan membentuk perangai murid secara menyeluruh dan dengan perangai serta disiplin yang baik." (R3-S3_hlmn1)

Amalan pengajaran yang sesuai menurut responden merujuk kepada sikap profesional dan komited melaksankan apa yang telan dirancang, dilaksana dan dinilai tahap pencapaian, bagaimana tindak balas murid, apakah murid seronok, adakah murid aktif dan berminat dengan PdPc guru. Menjadi seorang guru perlu ada nilai-nilai murni yang sangat tinggi agar dapat merasa kekuatan dan kelemahaan murid. Guru perlu mempunyai sikap simpati dan empati agar murid merasa disayangi dan diberi perhatian terutamanya ketika mereka berada di sekolah. Guru hendaklah memiliki keperibadian dan kecerdasan emosi yang baik untuk mengenal pasti subjek mereka terus diminati oleh murid. 80% kejayaan seseorang bergantung kepada emotional quotient (EQ) atau perasaan dan kecerdasan emosi berbanding dengan lebih kurang 20% sahaja disebabkan oleh IQ atau kecerdasan mentalnya (Daniel Goleman, 1995; Suzana dan rakan, 2016). Berdasarkan kajian ini, guru perlu mempunyai peranan hati yang positif untuk menjadi tunjang kepada perasaan dan kecerdasan emosi agar wujud kolerasi yang sangat rapat dengan kejayaan murid dalam memahami dan menghayat pelajaran sejarah dalam diri mereka.

Dalam proses PdP, guru perlu ada sikap dinamik dan adil kepada semua murid. Proses PdPc perlu melibatkan interaksi pelbagai hala untuk membolehkan semua murid mengikuti sesi pembelajaran khususnya dalam kelas. Nilai-nilai positif seumpama ini perlu diamalkan dan diperlihatkan kepada murid supaya mereka dapat mendisiplinkan diri untuk berinteraksi dan berkomunikasi secara aktif dan menerima pengajaran guru dengan penuh minat dan berkesan. Sekiranya guru mempunyai sikap proaktif, komitmen dan prihatin dengan murid, maka murid juga memberi respon positif kepada PdP guru ini kerana murid secara tidak langsung telah dipengeruhi oleh persekitaran yang positif dan mengaplikasikannya dalam pembelajaran mata pelajaran sejarah. Hal ini disokong oleh model-model pengajaran sejarah yang berkesan dan berkualiti yang diperkenalkan oleh Carroll (1963), Salvian (1987), Gage dan Berliner (1992), yang telah merumuskan bahawa pengajaran yang berkesan dan berkualiti perlu melibatkan kawalan guru yang baik dan penyertaan aktif murid (Anuar et al., 2009).

4.4 Sesuai Dengan Konteks Yang Berubah

Responden terlibat menjelaskan bahawa hampir keseluruhan guru menerima dan melaksanakan perubahaan positif dalam budaya kerja mereka di sekolah. Wujud persaingan positif ke arah melaksanakan tranformasi positif demi kemenjadian murid dalam pelbagai aspek. Berikut penjelasan mereka terhadap konteks yang berubah khususnya dalam organisasi di bawah kawalan masing-masing.

".....Mereka menguasai perubahan-perubahan yang ada dalam sistem pendidikan khususnya. Bahkan hampir keseluruhan guru-guru kelas mengamalkan kelas PAK-21 walaupun berada di pulau yang ramai menyipatkan bahawa sekolah-sekolah di pulau biasa- biasa sahaja. ".(R1_S4_hlmn2)

".....biarpun jauh daripada daratan, mereka tetap menyahut cabaran untuk sama-sama bersaing dengan guru-guru lain di daratan. Perubahan yang mereka bawa atau perkenalkan seiringan dengan perubahan semasa khususnya dalam pendidikan. Di sekolah ini terdapat jurulatih utama (JU) yang banyak membantu rakan guru daerah untuk menyebarluas ilmu berkaitan informasi pendidikan dibawa kawalan masing-masing. (R2_S4_hlmn2)"

" Mereka boleh hidup di mana sahaja diletakkan sama ada di sekolah luar bandar atau di dalam kawasan bandar sama ada di dalam persekitaran sekolah yang memerlukan penambahbaikan yang menyeluruh atau di sekolah yang sudah sedia baik." (R3_S4_hlmn2)

Dalam hal ini, responden menjelaskan bahawa, guru-guru di sekolah kajian merupakan guru yang bersedia menerima perubahan dalam sistem pendidikan dan berusaha menyebarluaskan perubahan tersebut demi kelangsungan penerimaan murid terhadap apa yang mereka sampaikan. Guru berusaha memberi pendedahan kepada murid mengenai tranformasi dalam dunia pendidikan seperti konsep PAK-21 yang turut dijelmakan dalam kelas. Penguasaan kemahiran Teknologi Maklumat dan Komunikasi (TMK) dalam diri guru turut digunakan dalam sesi PdPc membolehkan murid di pulau mengenali perisian dan komponen yang ada dalam pembelajaran TMK. Menurut Rubiah dan Jamilah (2014), kaedah pembelajaran melalui e- pembelajaran juga membolehkan pendidikan disampaikan kepada lebih ramai pelajar tanpa batasan jarak dan pembelajaran yang berterusan. Hasil kajian juga Selari dengan pendapat Nor Hafidah et al., (2016), yang menjelaskan bahawa pendidik atau pensyarah memainkan peranan penting dalam menjana pemikiran para siswa untuk mempunyai daya imaginasi yang tinggi serta kreatif dalam pembelajaran dan kepelbagaian teknologi yang wujud mampu digunakan ke arah yang lebih positif dan berkesan dalam persekitaran proses PdP.

4.5 Kriteria Guru Berkesan

Dalam hal ini, responden terlibat mempunyai pandangan tersendiri mengenai maksud kriteria guru berkesan khususnya dalam bidang pendidikan. Berikut adalah pandangan dan idea mereka berbentuk umum dan khusus dengan merujuk kepada organisasi dan sumber manusia dalam persekitaran mereka.

" Seorang guru perlu sentiasa sedia menerima perubahan persekitaran dengan cepat dan mudah mengadaptasikan diri mereka dalam apa jua keadaan sekali pun mereka juga perlu berautonomi dalam membuat perancangan dan membuat keputusan dengan pantas dan kreatif. Mereka juga perlu membudayakan persekitaran pembelajaran professional ke arah mengupayakan kompetensi diri agar sentiasa relevan dengan organisasi". (R1_S5_hlmn2)

".....ialah guru yang boleh membuat tranformasi dan inovasi dalam tugas-tugas organisasi dan sumber manusia khususnya PdP bersama murid seperti memasukkan unsur-unsur ICT". (R2_S5_hlmn2)

" Seorang guru yang sanggup berkorban untuk sekolah, untuk murid-murid dan untuk masyarakatnya tetapi dalam masa yang sama mengutamakan keluarga mementingkan pencapaian anak-anak tidak memutuskan hubungan dengan masyarakat dan yang pentingnya adalah mampu untuk menyatuhkanpadukan keseluruhan sistem di dalam sekolah". (R3_S5_hlmn2)

Responden menjelaskan bahawa, untuk menjadi guru yang berkesan perlu memiliki nilai-nilai diri yang positif seperti mempunyai wawasan diri, peka terhadap perubahaan semasa, berupaya mengubah dan mentransformasika diri seiring dengan kemajuan dalam sistem pendidikan, proaktif dan menggunakan kemahiran TMK dalam PdPc. Walaupun jauh daripada daratan namun nilai positif seperti kreatif dan inovatif dalam pelbagai perkara, sanggup berkorban demi mendidik murid untuk menjadikan modal insan cemerlang, professional dan relevan dalam mengurus kerjaya, mewujudkan hubungan baik sesama rakan dan komuniti setempat perlu diamalkan. Situasi seumpama ini, meletakkan organisasi dan sumber manusia berada pada tahap yang mempunyai kriteria guru berkesan dalam merealisasikan kemenjadian modal insan dalam kalangan murid.

Hal ini selari dengan maksud guru sebagai pengajar, pengasuh atau pendidik yang memberikan kesan yang

besar terhadap perkembangan personaliti, mental dan fizikal setiap manusia (Noran dan Ahmad, 1993), manakala Tajul Ariffin (1990), pula berpendapat ciri-ciri seorang guru yang baik adalah seorang yang beragama, mempunyai minat yang penuh terhadap keseluruhan tugasnya sama ada di sekolah mahupun di luar sekolah, mempunyai kebolehan akademik yang baik, memahami tugasnya dalam bilik darjah, memahami tugasnya sebagai ahli masyarakat, perlulah bersih dan tiada kepentingan individu atau lain yang melebihi tugasnya, mempunyai sifat berani dan tegas dalam soal kebenaran dan bertanggungjawab di dalam mengawasi disiplin pelajar

5. Ringkasan Perbincangan Dan Kesimpulan Hasil Kajian

5.1 Aspek Utama Kriteria Pengajaran Berkesan Mengikut Tema

Dalam konteks pengajaran berkesan, guru perlu memiliki sikap kreatif, inovatif dan proaktif dalam PdP mereka agar murid berminat mengikuti mata pelajaran sejarah. Menurut Mohd. Mahzan et al., (2016), terdapat hubungan yang signifikan antara kekerapan penggunaan sumber, kepelbagaian sumber dan penggunaan sumber dalam PdP dengan minat pelajar terhadap mata pelajaran sejarah. Ini bermakan guru-guru sejarah perlu menggunakan BBM dalam PdP mereka agar hubungan positif antara murid dengan guru wujud secara konsisten, proaktif dan kecintaan terhadap sejarah semakin menebal dalam kalangan murid. Matlamat mata pelajaran sejarah diperkenalkan peringkat sekolah rendah bukan sahaja melihat murid lulus peperiksaan semata-mata tetapi matlamat KPM mahu menyemai sikap patriotisme mencintai agama, bangsa dan negeri bermula di peringkat awal perkembangan kanak-kanak. Guru yang berkemampuan menjana dan menyampaikan pengajaran berkesan kepada murid adalah guru yang cemerlang dan menjadi teladan kepada guru lain untuk sama-sama meningkatkan motivasi diri ke arah memberi perkhidmatan cemerlang PdP kepada murid. Ini antara ulasan 3 responden dengan melihat kepada iklim pengajaran berkesan melibatkan guru.

Konsep pembelajaran abad ke-21 semakin mendapat tempat dalam kalangan guru demi mewujudkan suasana pembelajaran yang boleh menarik perhatian murid. Kaedah e-pembelajaran dalam PdP berasaskan TMK turut digunakan, ini menambahkan lagi suasana kelainan dalam PdP dan merupakan perubahan dalam kaedah pengajaran berkesan paling disenangi oleh murid di sekolah.

Situasi ini dapat diperhatikan apabila Penolong Kanan Pentadbiran sekolah membawa pengkaji melihat sendiri konsep kelas abad ke-21 dan bagaimana murid-murid dalam kelas ini memberikan respon yang sangat luar biasa apabila guru menggunakan kaedah e-pembelajaran dan pengajaran mata pelajaran sejarah. Pemerhatian memungkinkan pengkaji untuk melihat, merasakan dan memaknai dunia berserta ragam peristiwa dan gejala sosial dalamnya, sebagaimana subjek pengajian melihat, merasakan dan memaknainya (Moleong, 1989; Kamarul, 2012).

Murid bertindak balas dengan aktif semasa sesi PdP berlangsung dengan menggunakan kaedah pengajaran berteraskan TMK. Melihat suasana ini maka tidak hairanlah mengapa ketiga-tiga responden dalam kajian ini bersetuju menyatakan bahawa sikap pengajaran guru dengan minat murid terhadap pengajaran mata pelajaran sejarah mempunyai kolerasi yang sangat erat. Ini menunjukkan bahawa semakin tinggi sikap pengajaran guru maka semakin tinggi minat murid terhadap pengajaran guru. Sebaliknya sikap pengajaran guru yang rendah menimbulkan sikap kurang menarik minat murid terhadap pengajaran guru.

Responden menjelaskan bahawa menjadi guru berkesan perlu menguasai ilmu pengetahuan, berwawasan, percaya diri, berusaha, komited, prihatian dan mempunyai nilai-nilai murni seperti menyayangi murid dan memiliki ciri-ciri guru teladan. Menjadi idola atau motivasi kepada rakan guru yang lain untuk bersama-sama memperbaiki kaedah PdP agar proses pengajaran dapat diterima oleh murid semaksimum boleh. Fokus utama dalam konteks pengajaran berkesan ialah murid sebagai penerima dan guru sebagai pemberi. Kedua-dua entiti ini memainkan peranan penting dalam mewujudkan suasana PdP yang berimpak tinggi. Konsep kerja Plan Do Checked Action (PDCA) perlu diamalkan oleh guru agar budaya kerja semakin 'segar' dan modal insan cemerlang dapat dilahirkan selaras dengan hasratkan kerajaan inginkan rakyat yang kompeten dalam menerajui bidang politik, ekonomi dan sosial negara.

Hasil analisis temu bual yang dilaksanakan bersama 3 responden yang juga merupakan guru sejarah mendapati bahawa guru-guru mempunyai penerimaan positif terhadap tranformasi yang berlaku dalam sistem pendidikan khasnya kaedah pengajaran yang semakin jelas dan boleh diperolehi, dipelajari dan diaplikasikan kepada murid dengan mudah dan pelbagai cara.

5.2 Implikasi Atau Cadangan Berkaitan Dengan Pengertian Pengajaran Guru Berkesan

Implikasi yang sangat penting dalam kajian ini ialah ilmu pengetahuan, kreatif dan inovatif serta proaktif seorang guru dalam melaksanakan PdP mata pelajaran sejarah yang mereka ajar kepada murid. Guru mata pelajaran sejarah seharusnya menggunakan kelebihan mereka untuk memastikan murid menerima PdP dengan berkesan dan penuh minat. Guru perlu hindarkan diri daripada sikap 'asal ada', 'yang penting masuk kelas', 'nanti guru lain ajar', ' bukan tugas saya'. Sikap negatif seumpama ini akan menghapus sikap simpati terhadap murid. Guru sepatutnya mempunyai sikap empati agar murid merasa disayangi dan dihargai. Sudah tiba masanya guru-guru mata pelajaran sejarah melibatkan diri dalam mengurus perubahan kurikulum dan inovasi sekolah. Agar sekolah tidak ketandusan memiliki guru sejarah yang sejati dan mampu menghindarkan sikap bosan murid terhadap mata pelajaran sejarah.

Guru diiktiraf dalam profesion mereka sebagai orang yang berkelayakan mengajar, mendidik, membimbing, membentuk murid supaya matlamat Falsafah Pendidikan Kebangsaan tercapai. Jasmani, emosi, rohani dan intelek murid dibentuk oleh sikap sejati seorang guru yang komited dan prihatin dengan tugas mereka. Nilai-nilai kreatif dan inovatif perlu ada dalam diri guru agar mudah bagi mereka berhadapan dengan murid pelbagai tingkah laku. Konsep pengajaran guru berkesan dan berjaya menarik perhatian murid mengikuti PdP mereka dengan aktif dan seronok adalah guru yang berjaya mentransformasikan diri mereka sebagai Hero dalam dunia pendidikan.

Dunia pendidikan sekarang bukan lagi dunia bersama buku teks semata-mata. Dunia pendidikan semakin diwarnai dengan perubahan alat pendidikan berteknologi tinggi seiring dengan konsep dunia tanpa sempadan guru tidak ketinggalan untuk meneroka ilmu TMK dan diaplikasi dalam proses pengajaran mereka. Oleh itu, guru perlu menggunakan kreativiti dan TMK dalam proses PdP mereka selain untuk menarik minat murid menguasai pelajaran sejarah juga turut memberi pendedahan dan memperkenalkan kepada murid-murid konsep dunia moden yang senonim dengan pembelajaran secara maya. Pendedahan ini amat wajar, agar murid-murid daripada pulau tidak ketinggalan memahami dan menggunakan alat-alat teknologi yang semakin canggih apabila mereka meneruskan pelajaran di luar kawasan. Lezah dan Rosy (2018), menjelaskan bahawa guru-guru sejarah seharusnya lebih kompeten dalam mendepani dan menyesuaikan diri mereka dengan perkembangan ICT dalam dunia pendidikan dengan mengaplikasikan sepenuhnya kemahiran teknologi maklumat yang mereka miliki mengikut kesesuaian dan isi kandungan atau tajuk bagi menghasilkan proses PdP mata pelajaran sejarah yang lebih efektif.

Guru perlu menggunakan BBM yang menarik perhatian murid mengikuti pelaksanaan PdP harian mereka. Dalam dunia serba canggih dan berteknologi tinggi ini, wajar bagi guru menggunakan kemahiran TMK mereka untuk meneroka kaedah atau teknik PdP mata pelajaran sejarah berunsurkan digital seperti EDU 3.0 dan WEB 3.0. Sikap ingin tahu murid membantu mempercepatkan proses pembelajaran diri terhadap perkara-perkara yang sukar dan luar biasa bagi mereka. Menurut Abdul Razak dan Mohd. Mahzan (2017), guru sejarah juga perlu mahir dalam mencorakkan PdP yang lebih merangsang murid dengan menggunakan proses active learning. Ini membolehkan penglibatan murid secara aktif dalam PdP dan menjadikannya lebih nature dan diminati. Melakukan pemerhatian terhadap perkembangan murid adalah sangat perlu bagi seorang guru. Melalui pemerhatian, guru dapat mengenal pasti tahap pemahaman dan penerimaan mereka terhadap proses pengajaran guru dengan berkesan. Pemerhatian adalah satu proses meneliti kejadian secara kritikal bagi mengamati tingkah laku responden berdasarkan pemboleh ubah atau aspek yang dikenal pasti dan dilakukan secara sistematik dengan mencatat nota tentang apa yang berlaku semasa pemerhatian (Kamaruzaman & rakan, 2016).

Kesedaran semua pihak mengatasi masalah murid tidak berminat dalam mata pelajaran sejarah ini adalah perlu diberi perhatian. Cabaran tetap berlaku, namun pihak berkepentingan perlu saling membantu untuk melaksanakan perbagai kaedah. Guru khasnya, perlu meletakkan diri sebagai insan yang menjadi rujukan utama murid di sekolah. Justeru, guru perlu peka dengan situasi murid dan mencari pelbagai kaedah, pendekatan, strategi, teknik, inovasi, aktiviti yang boleh digunapakai dalam PdP seharian bersama murid. Guru harus mendepani setiap tranformasi dalam pendidikan untuk diaplikasi pengetahuan tersebut kepada murid. Guru hendaklah terbuka mempelajari kepelbagaian pedagogi dalam memastikan minat murid terhadap mata pelajaran sejarah tersemai dan berterusan.

Dalam pelaksanaan PdP misalnya, guru boleh mempelbagaikan BBM dengan memasukkan unsur- unsur inovasi agar proses PdP guru tidak kelihatan statik atau masih di takuk lama dengan amalan chalk & talk. Ini sejajar dengan pendapat Gardner & Laksin 2011, Amabile 2012; Nor Laila, Zaiton et al,. (2016), yang menjelaskan bahawa, individu yang kreatif mampu untuk menyelesaikan masalah daripada pelbagai sudut pandangan malah berupaya menghasilkan sesuatu yang baharu dan berguna dalam apa juga bidang.Pendidikan abad ke-20, memaparkan elemen- elemen perubahan kurikulum menembusi fasa perubahan yang semakin positif apabila dasar

pendidikan memulakan inovasi dalam setiap perubahan. Ini bermakna semua warga pendidikan secara langsung dan tidak langsung didedahkan dengan satu transformasi memerlukan pemimpin sekolah dan guru melibatkan diri sebagai agen utama perubahan berinovasi dan daya kreatif tersebut. Inovasi dan kreativiti golongan pendidik akan dijana dalam proses PdP guru bersama murid. Individu yang kreatif mampu untuk menyelesaikan masalah daripada pelbagai sudut pandangan malah berupaya menghasilkan sesuatu yang baharu dan berguna dalam apa juga bidang (Gardner & Laksin 2011, Amabile 2012; Nor Laila et al., 2016).

Guru Sejarah perlu kikis tanggapan bahawa mata pelajaran sejarah tidak perlu dititikberatkan dalam PdP sekolah rendah kerana mereka belajar sejarah lebih berfokus untuk lulus peperiksaan ketika di sekolah menengah kelak. Walhal mata pelajaran sejarah diperkenalkan di sekolah rendah bukan semata-mata mahu melihat murid lulus atau gagal dalam peperiksaan. Tujuan utama ialah menerapkan nilai-nilai patriotisme dalam kalangan murid supaya mereka mencintai agama, bangsa dan negara dengan jitu. Ini sejajar dengan pendapat Abdul Razak dan Mohd. Mahzan (2017), bahawa mata pelajaran sejarah adalah sangat dominan bagi melahirkan rakyat yang mempunyai kesedaran sivik yang tinggi, bangga, dan bertanggungjawab sebagai warga negara dan mempunyai sifat nasionalisme terhadap negaranya.

6. Penutup

Secara keseluruhannya, kajian ini berjaya mengenal pasti entiti penting dalam konsep pengajaran berkesan dalam kalangan guru sejarah yang di minati oleh murid. Murid cenderung kepada sikap guru yang dapat melaksanakan PdP dengan berkesan, seronok dan menarik perhatian murid. Mata pelajaran sejarah merupakan mata pelajaran baru kepada murid-murid tahun 4, 5 dan 6 di tahap 2. Seandainya guru tidak dapat menyampaikan proses PdP mereka dengan sebaik mungkin, sudah pasti murid kecewa dan mula tidak berminat mengikuti mata pelajaran yang baru ini. Murid-murid sekolah rendah suka kepada perkara-perkara yang menyeronokan. Justeru sebagai guru sejarah, seharusnya guru mempunyai sikap kreatif dan inovatif mendepani perubahan-perubahan yang diperkenalkan oleh KPM dalam usaha mencapai matlamat Kurikulum Pendidikan Kebangsaan dan Falsafah Pendidikan Kebangsaan. Sikap dan ciri-ciri positif guru sejarah dilihat sebagai satu motivasi dan sokongan yang sangat berkesan untuk menyemai minat mencintai mata pelajaran sejarah dalam kalangan murid sekolah rendah sekaligus menyemai semangat patriotisme dalam jiwa anak-anak didik yang nun jauh di seberang laut.

Kajian ini, sangat penting kepada guru dan murid sekolah rendah kerana berlatarbelakangkan sekolah yang terletak di pedalaman Pulau. Melalui kajian ini, guru dapat mengenal pasti keberkesanan proses PdP. Guru juga dapat menilai, merancang dan melaksanakan kaedah PdP yang lebih menarik dan teratur menggunakan BBM serta mempelbagaikan kaedah pengajaran berkesan agar murid tidak merasa bosan mengikuti proses pembelajaran khususnya dalam subjek sejarah. Guru dicadangkan menghadiri seminar, kursus, bengkel yang dianjurkan oleh jabatan agar PdPc mereka tetap ‘segar’ dan berimpak tinggi.

7. Penghargaan

Setinggi-tinggi penghargaan kepada warga pendidik sekolah kajian, Pejabat Pendidikan Daerah, Universiti Terbuka Malaysia dan rakan-rakan pengajian Doktor Pendidikan kerana telah membantu menjayakan penyelidikan ini.

Rujukan

Abdul Rahim Abdul Rashid. (1999). Pendidikan Sejarah: Falsafah Teori Dan Amalan. Utusan Publication Dan Distributor Sdn. Bhd. Kuala Lumpur.

Abdul Razak Ahmad dan Mohd. Mahzan Awang. (2017). Pengetahuan Guru Sejarah Dalam Pelaksanaan Kurikulum Sejarah Sekolah Rendah. Seminar Serantau Ke-8. Universiti Kebangsaan Malaysia.

Aisha. (2012). Penggunaan Sistem E-Pembelajaran Author Dalam Pengajaran Dan Pembelajaran Di UTHM. Universiti Tun Hussein Onn Malaysia.

Anuar Ahmad, Siti Haishah Abd. Rahman, Nur Atiqah T. Abdullah. (2009). Tahap Keupayaan Guru Sejarah Dan Hubungannya Dengan Pencapaian Murid Di Sekolah Berprestasi Rendah. *Jurnal Pendidikan Malaysia, 32*(1):53-66.

Nor Laila Kuslan, Zaiton Ismail, Md Rahaimi Rashid, Latifah Othman, Chua Siok Hong, Sulaiman Melan. (2016). Dalam Modul 3 Mengurus Perubahan Dan Inovasi. Institut Aminuddin Baki Kementerian Pendidikan Malaysia. Bandar Enstek.

Haslinda Mohd Ismail. (2012). Kesan Penggunaan Peta Minda Dalam Pembelajaran Mata Pelajaran Sejarah. Universiti Tun Hussien Onn Malaysia. Tidak Diterbitkan.

Kamarul Azmi. (2012). Metodologi Pengumpulan Data Dalam Penyelidikan Kualitatif. Dalam Kursus Penyelidikan Kualitatif Siri 1/2012. IPGM Kampus Temenggong Ibrahim. Johor Baharu. Kementerian Pendidikan Malaysia. Pelan Pembangunan Pendidikan Malaysia (2013 -2025).

Kamaruzaman et al. (2016). Kajian tindakan modul khas NPQEL. Institut Aminudin Baki, Kementerian Pendidikan Malaysia.

Lezah @ Liza Kiamsin dan Rosy Talin. (2018). Kaedah Pangajaran Sejarah Yang Diminati Pelajar Dan Justifikasinya. *Malaysian Journal of Sciences And Humanities, 3* (2): 137-145.

Lisa Yip Shukey. (2014). Kajian Tinjauan Kesediaan Guru-Guru Sejarah Menerapkan Kemahiran Pemikiran Sejarah Dalam Kalangan Murid-Murid. Jurnal Penyelididkan Kent Bilangan 13.

Mahaizura Abd Malik. (2016). Bukan Sekadar Mengajar. mahaizura@nmetro.com.my.

Mohd. Mahzan., Abdul Razaq., & Nur Syazwani. (2016). Penggunaan Multimedia Dalam Pendidikan Sejarah Pada Abad Ke-21 Dan Hubungannya. Jurnal Pemikir Pendidikan. Vol.7.

Muhammad Zaidil., Aziz., & Fadzilah. (2002). Agen Pedagogi Sebagai Tutor: Pemantapan Pemahaman Pelajar Di Dalam E-Pembelajaran. Dalam Prosiding Seminar ICT 2002. Universiti Utara Malaysia Sintok. Kertas Kerja 218- 224.

Norafizah Abdul Razak. (2017). Pupuk Nilai Nasionalisme Seawal Usia. Pendidik 10 Oktober 2017.

Nor Hafidah., Melor Fauzita., & Norzaliza. (2016). Multimedia Interaktif Mempertingkatkan Pengajaran Dan Pembelajaran Kursus Bahasa Melayu Pengurusan (SBLM 1053) Dalam Kalangan Pelajar Universiti Utara Malaysia. International Seminar On Generating Through Research, UUM UMSIDA, 25 – 27 Oktober 2016 Universiti Utara Malaysia.

Noran Fauziah Yaakub & Ahmad Mahdzan Ayob. (1993). Guru Dan Perguruan, Dewan Bahasa dan Pustaka.

Nor Laila Kuslan, Zaiton Ismail, Md Rahaimi Rashid, Latifah Othman, Chua Siok Hong, & Sulaiman Melan. (2016). Dalam Modul 3 Mengurus Perubahan Dan Inovasi. Institut Aminuddin Baki Kementerian Pendidikan Malaysia. Bandar Enstek. Pusat Perkembangan Kurikulum, Kementerian Pendidikan Malaysia (PPK KPM, 2004)

Rubiah dan Jamilah. (2014). Kesedaran, Penilaian dan Penerimaan e-Pembelajaran Dalam Kalangan Ahli Akademik. *Jurnal Pendidikan Malaysia 34*(1) (2009):155-172.

Subadrah Nair dan Malar Muthiah. (2005). Penggunaan Model Konstruktivisme Lima Fasa Needham Dalam Pembelajaran Sejarah. *Jurnal Pendidikan Dan pendidikan. Jil.20*:21-41. Universiti Sains Malaysia.

Suzana & Rakan (2016). Modul 6: Keberkesanan kendiri. Institut Aminudin Baki KPM. Bandar Enstek.

Tajul Ariffin Noordin (1990). Pendidikan Satu Pemikiran Semula. Dewan Bahasa Dan Pustaka Kuala Lumpur.

CADANGAN LALUAN DENAI HUTAN PANDU DIRI SEBAGAI SUMBER PEMBELAJARAN ALAM SEMULAJADI DI PUSAT SEJADI HUTAN SIMPAN KAWANG, SABAH

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Abstrak

Pusat Sejadi Hutan Simpan Kawang, Sabah merupakan kawasan Hutan Hujan Khatulistiwa yang kaya dengan spesies flora fauna dan sesuai dijadikan pusat pembelajaran alam semulajadi. Kajian ini dilakukan bagi mengenalpasti dan mencadangkan laluan denai yang bersesuaian di mana proses memilih, dan menanda pokok dilakukan bagi pokok-pokok yang terdapat di sepanjang laluan denai yang mempunyai jarak sejauh 4km. Sebanyak 17 batang pokok berlainan spesies telah dipilih, ditanda dengan label diperbuat dari plat aluminium yang dipaku pada batang pokok dan proses pengecaman spesies dilakukan dengan khidmat bantuan kakitangan Jabatan Perhutanan Kota Kinabalu, Sabah. Proses mengumpul maklumat terperinci dilakukan iaitu melibatkan famili serta ciri-ciri herbarium pokok iaitu melibatkan daun dan batang pokok. Kebanyakan pokok yang dipilih sebagai sumber pembelajaran alam semulajadi ini adalah pokok bukan dipterokarp iaitu dari famili Malvaceae, Casuarinaceae, Moraceae, Primulaceae, Bignoniaceae, Capparidaceae, Rutaceae, Rubiaceae, Loranthaceae, Dilleniaceae, Myrtaceae, Ebenaceae. Manakala, terdapat empat (4) pokok famili Dipterokarp yang direkodkan. Hal ini kerana, pokok famili Dipterokarp biasanya wujud pada paras ketinggian 300 hingga 750 meter aras paras laut. Laluan denai alam semulajadi bersifat pandu diri atau kendiri ini merupakan satu inisiatif ke arah peningkatan infrastruktur sokongan berkaitan interpretasi misalnya papan tanda arah dan papan informasi dengan rekabentuk yang sesuai dan kreatif bagi menambah pengalaman alam semulajadi di kalangan pengunjung.

Kata Kunci: Denai Hutan, Pembelajaran, Alam Semulajadi

1. Pengenalan

Hutan Simpan Kawang, Sabah merupakan salah satu khazanah alam semulajadi yang kaya dengan pelbagai spesies pokok hutan, landskap yang unik dan ekosistem Hutan Hujan Khatulistiwa. Merupakan kawasan hutan simpan yang dilindungi oleh Akta Perhutanan Negara 1984 (pindaan 1993), ia memainkan peranan penting di dalam memelihara habitat flora dan fauna serta merupakan makmal bagi pembelajaran alam semulajadi.

Walaubagaimanapun, potensi kawasan hutan berkeluasan kira-kira 1,551 hektar ini sebagai pusat pembelajaran alam semulajadi masih belum dimanfaatkan sepenuhnya. Justeru, konsep laluan denai hutan pandu diri diperkenalkan sebagai salah satu usaha inovatif bagi memberikan pengalaman pembelajaran kendiri kepada pelawat tanpa memerlukan pengawasan sepenuh masa oleh pemandu pelancong ataupun kakitangan Jabatan Perhutanan.

Bukan itu sahaja, laluan denai hutan ini juga berupakan salah satu platform bagi meningkatkan kesedaran masyarakat terhadap kepentingan memelihara alam semulajadi. Di dalam hal ini, pembangunan laluan denai hutan ini menawarkan peluang kepada pengunjung untuk meneroka hutan ini secara lebih bebas, sambil mempelajari pelbagai maklumat mengenai spesies pokok yang ditanda di dalam laluan denai ini. Justeru, kajian dilakukan bagi mengenalpasti laluan denai bersifat pandu diri (kendiri) yang sesuai, pemilihan dan penandaan pokok yang terdapat di dalam laluan denai yang dicadangkan, pengecaman spesies pokok yang dipilih dan pengumpulan maklumat pokok serta akhir sekali merupakan penyediaan buku poket spesies pokok tersebut.

2. Objektif Kajian

Objektif kajian adalah seperti berikut iaitu:

i. Mengenalpasti laluan denai bersifat kendiri yang sesuai sebagai sumber pembelajaran semulajadi di Pusat Sejadi Hutan Simpan Kawang, Sabah.
ii. Membuat pemilihan dan penandaan pokok yang sesuai di sepanjang laluan denai alam semulajadi di Pusat Sejadi Hutan Simpan, Kawang, Sabah.
iii. Menyediakan maklumat berkaitan pokok-pokok yang telah dipilih di sepanjang laluan denai hutan di Pusat Sejadi Hutan Simpan, Kawang, Sabah.

3. Metodologi Kajian

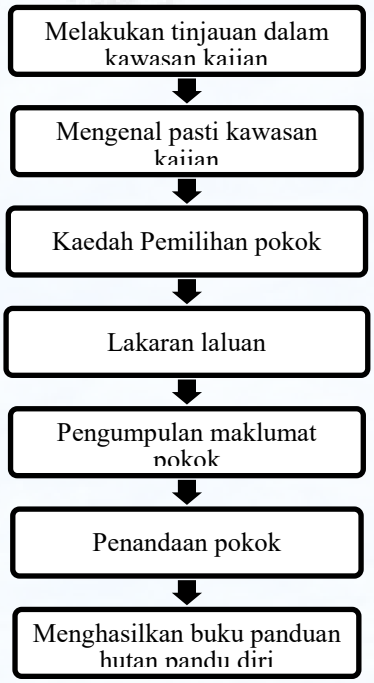
Dalam bahagian ini, pengkaji akan membincangkan tentang langkah-langkah berkaitan perlaksanaan kajian yang akan dijalankan. Antara aspek yang ditumpukan adalah berkaitan reka bentuk kajian, kerangka kajian dan instrumen kajian. Ini adalah untuk memastikan kajian dapat disempurnakan dengan lancar dan sistematik.

3.1 Reka bentuk kajian

Reka bentuk kajian merupakan keputusan yang pertama dibuat dalam metodologi kajian. Menurut Wiersma (2000), reka bentuk kajian dibina untuk mencari jawapan kepada persoalan yang timbul di dalam kajian. Pengkaji telah memilih untuk menggunakan kaedah tinjauan bagi mendapatkan data-data yang diperlukan berdasarkan taburan pokok yang terdapat di kawasan kajian. Instrumen yang digunakan di dalam kajian berupa jadual maklumat ciri herbarium pokok.

3.2 Kerangka kajian

Carta Alir bagi kerangka operasi bagi kajian ditunjukkan di dalam Rajah 1. Kajian bermula dari proses melakukan tinjauan dalam kawasan kajian iaitu Pusat Sejadi Hutan Simpan Kawang. Kawasan hutan simpan ini terletak di bawah pengurusan Jabatan Perhutanan Kota Kinabalu, Sabah. Proses seterusnya adalah mengenalpasti kawasan kajian iaitu denai sedia ada di hutan tersebut serta taburan pokok-pokok dan spesies yang terdapat khususnya berhampiran dengan laluan denai tersebut.. Kaedah pemilihan pokok dilakukan bagi mengenalpasti pokok yang bersesuaian dari segi fizikal, serta taburan spesiesnya agar tiada spesies yang berulang. Di dalam hal ini, pengecaman spesies pokok terpilih dilakukan dengan bantuan staf Jabatan Perhutanan yang bertugas di situ. Dalam masa yang sama, lakaran laluan dan kedudukan pokok yang dipilih turut dilakarkan di dalam peta. Maklumat spesies pokok dan ciri herbariumnya turut direkodkan ke dalam jadual maklumat yang disediakan. Penandaan pokok turut berjalan serentak di mana pokok ditanda menggunakan plat besi kecil yang ditulis nombornya menggunakan pen marker. Label tanda dipaku ke bahagian batang pokok yang sesuai tanpa mencederakannya. Akhir sekali, buku panduan hutan pandu diri bersaiz poket disediakan.



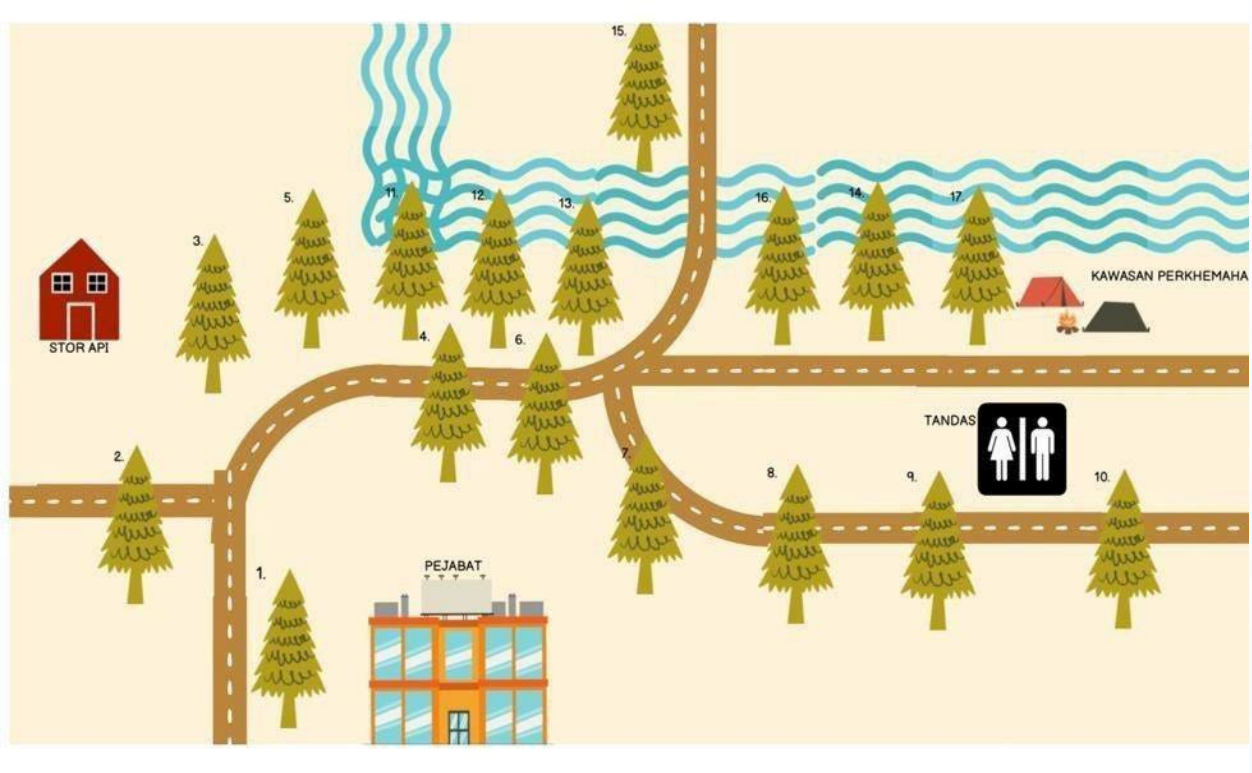
Rajah 1 : Kerangka kajian

3.3 Instrument kajian

Instrumen kajian yang digunakan adalah jadual maklumat ciri herbarium pokok. Jadual yang digunakan adalah seperti ditunjukkan dalam Jadual 1.

4. Dapatan Kajian

Di dalam hal ini, jarak laluan denai alam semulajadi yang dicadangkan adalah sejauh 4km. Keselesaan dan keselamatan kepada pengunjung turut di mana jarak ini sesuai buat pengunjung untuk meneroka denai ini tanpa pengawasan sepenuhnya daripada kakitangan Jabatan Perhutanan. Sebanyak 17 pokok telah dipilih dan maklumatnya direkodkan ke dalam Jadual 1. Peta laluan denai lengkap dengan kedudukan lokasi bagi kesemua 17 batang pokok juga ditunjukkan di dalam peta yang disediakan. Peta tersebut dimasukkan ke dalam buku poket Denai Alam Semulajadi Pusat Sejadi Hutan Simpan Kawang, Sabah. Kesemua 17 pokok diberi nombor label dan spesies setiap satunya dikenalpasti dengan bantuan kakitangan Jabatan Perhutanan yang bertugas di situ.



Rajah 2: Peta Laluan Denai Alam Semula Jadi Pusat Sejadi Hutan Simpan Kawang

Pengkaji kemudiannya membuat rujukan lanjut berkaitan nama famili pokok, nama saintifik dan ciri-ciri herbariumnya iaitu susunan daun, bentuk daun, jenis pangkal dan hujung bucu daun (apex dan bases), urat daun (vein) serta bucu keseluruhan daun (margin). Ciri-ciri herbarium ini sebenarnya juga merupakan ciri-ciri yang digunakan oleh seorang botanis untuk mengenalpasti spesies sesuatu pokok. Selain itu, jenis batang (bole) dan kulit pada batang pokok tersebut juga turut dikenalpasti kerana ianya juga merupakan salah satu elemen bagi pengecaman spesies pokok.

Selain Jabatan Perhutanan Kota Kinabalu, pengkaji turut merujuk kepada salah seorang pensyarah pakar Dendrologi yang terdapat di institusi ini, juga berpandukan sumber rujukan sahih bercetak dan digital yang lain. Buku poket yang mengandungi maklumat asas pokok ini bukan sahaja boleh digunakan oleh para pelajar berkaitan bidang Sains Perhutanan dan Teknologi Berasaskan Kayu, bahkan juga sesuai digunakan oleh orang awam bagi menambah pengetahuan mereka dalam bidang Dendrologi serta meningkatkan kesedaran mengenai pemeliharaan alam semulajadi khususnya pokok.

Jadual 1 : Jadual Maklumat Pokok di Laluan Denai Alam Semulajadi

NO.	FAMILI	NAMA SAINTIFIK	NAMA TEMPATAN	CIRI-CIRI DAUN & BATANG
1.	DIPTEROCARPACEAE	*Dryobalanops lanceolata*	Kapur Paji	Susunan: Alternate Bentuk: Elliptic Apex: Acute Bases: Cuneate Veins: Dryobalanoid Margin: Wavy Bole : Fluted bole Bark: Smooth hooped bark
2.	MALVACEAE	*Durio affinis*	Durian	Susunan: Opposite Bentuk: Elliptic Apex: Acute Bases: Cuneate Veins: Reticulate

				Margin: Entire Bole : Bole with resins Bark: Closely fissured bark
3.	CASUARINACEAE	*Gymnostoma sumatranum*	Semoilalu Bukit	Susunan: Spiral Bentuk: Elliptic Apex: Pointed Bases: Serrated Veins: Parallell Margin: Entire Bole: Fluted bole Bark: Cracked bark
4.	MORACEAE	*Artocarpus odoratissimus*	Tarap	Susunan:Alternate Bentuk: Ovate Bases: Asymmetric Veins: Looping near margin Apex: Obtuse Margin: Entire Bole : Streep buttress Bark: Fissured and scaly bark
5.	PRIMULACEAE	*Ardisia eliptica*	Serusup	Susunan: Alternate Bentuk: Elliptic Apex: Blunt Bases: Cuneate Veins: Trinerved base Margin: Entire Bole : Bole with resins Bark: Cracked bark
6.	BIGNONIACEAE	*Oroxylum indicum*	Kulai Bukit	Susunan: Spiral Bentuk: Ovate Apex: Acuminate Bases: Rounded Veins: Looping near margin Margin: Entire Bole: Bole with resins Bark: Typically rough
7.	DIPTEROCARPACEAE	*Shorea ovalis*	Belian Tagas	Susunan: Alternate Bentuk: Lanceolate Apex: Rounded Bases: Cuneate Veins : Veins pararel Margin: Prominently revolute Bole : Bole with resins Bark : Cracked bark
8.	CAPPARIDACEAE	*Crataeva nurvala*	Geronggong	Susunan : Opposite Bentuk: Elliptic Apex: Acute Bases : Cuneate Veins : Looping near margin Margin: Entire Bole : Bole with resins

				Bark: Fissured and scaly bark
9.	RUTACEAE	*Murraya paniculata*	Urat Mata Beludu	Susunan : Alternate Bentuk : Ovate Apex : Acute Bases : Cuneate Veins: Pinnate Margin: Entire Bole : Fluted bole Bark : Boat-shaped fissured
10.	DIPTEROCARPACEAE	*Shorea leprosula*	Seraya Tembaga	Susunan : Alternate Bentuk : Elliptic Apex : Blunt Bases : Rounded Veins : Veins parallel Margin: Entire Bole: Streep plank buttress Bark : Fissured bark
11.	RUBIACEAE	*Neonauclea artocaipoides*	Malitap	Susunan: Opposite Bentuk: Elliptic Apex : Acuminate Bases : Cuneate Veins : Pinnate Margin: Entire Bole : Fluted bole Bark: Boat-shaped fissured bark
12.	LORANTHACEAE	*Prosporum ferruginea*	Saipang	Susunan: Alternate Bentuk: Elliptic Apex : Acute Bases : Cuneate Veins: Looping near margin Margin: Entire Bole : Bole with resin Bark : Scaly bark
13.	DILLENIACEAE	*Dillenia suffruticossa*	Simpoh Bini	Susunan: Whoris Bentuk: Elliptic Apex: Rounded Bases: Cuneate Veins: Veins parallel Margin: Entire Bole: Bole with resin Bark: Scaly bark
14.	MYRTACEAE	*Eugenia polyantha*	Salam	Susunan: Alternate Bentuk: Ovate Apex : Acuminate Bases : Cuneate Veins : Pinnate Margin: Entire Bole: Fluted bole

				Bark: Fissured bark
15.	RUBIACEAE	*Anthocephalus chinensis*	Kelempayan	Susunan : Spiral Bentuk : Elliptic Apex : Acuminate Bases : Rounded Veins : Pinnate Margin: Entire Bark: Distinctive texture Bole: Fluted bole
16.	DIPTEROCARPACEAE	*Hopea dryoblanoides*	Solangan	Susunan: Alternate Bentuk: Elliptic Apex : Acuminate Bases : Cuneate Veins : Dryobalanoid Margin: Wavy Bole : Fluted bole Bark : Cracked bark
17.	EBENACEAE	*Diospyros sp.*	Kayu Malam	Susunan: Alternate Bentuk: Lanceolate Apex : Acuminate Bases : Asymmetric Veins : Looping near margin Margin: Wavy Bole : steep plank buttress Bark: Cracked bark

Berdasarkan Jadual 1, kebanyakan pokok yang terdapat di sepanjang 4km laluan denai merupakan pokok bukan dipterokarp iaitu dari famili Malvaceae, Casuarinaceae, Moraceae, Primulaceae, Bignoniaceae, Capparidaceae, Rutaceae, Rubiaceae, Loranthaceae, Dilleniaceae, Myrtaceae, Ebenaceae. Manakala, terdapat empat (4) pokok famili Dipterokarp yang direkodkan. Hal ini kerana, pokok famili Dipterokarp biasanya wujud pada paras ketinggian lebih tinggi dari kawasan tanah rata di pusat sejadi iaitu pada paras 300 hingga 750 meter aras paras laut.

5. Kesimpulan

Kajian ini memberi manfaat penting dan berguna kepada pengurusan Pusat Sejadi Hutan Simpan Kawang, Sabah khususnya untuk di dalam menambah ilmu pengetahuan di kalangan pengunjung. Selain 17 batang pokok yang ditanda di sepanjang denai hutan alam semulajadi ini, terdapat banyak lagi spesies pokok khususnya dari famili Dipterokarp yang terdapat di sini walaubagaimanapun ia terletak di ketinggian yang kurang bersesuaian sebagai denai pandu diri tanpa pengawasan kakitangan bertugas. Hasil kajian berupa cadangan laluan denai dan informasi terperinci mengenai ciri herbarium pokok terpilih ini merupakan pembuka kepada peningkatan infrastruktur berkaitan interpretasi di sini. Pihak pengurusan Pusat Sejadi boleh meneruskan infrastruktur tambahan bagi melengkapkan pengalaman pendidikan alam semulajadi di sini iaitu dengan menyediakan papan arah tanda bagi laluan denai dan papan informasi dengan rekabentuk yang sesuai bagi menarik minat pengunjung menambah ilmu pengetahuan berkaitan pokok di sini.

6. Cadangan

Seperti kita sedia maklum, Kawasan hutan ini mempunyai kekangan dari segi akses kepada liputan internet, justeru bahan interpretasi yang bersesuaian adalah penggunaan papan informasi serta sebarang bentuk interpretasi tradisional tetapi kreatif. Cadangan kajian pada masa hadapan adalah merekabentuk bahan interpretasi kreatif bersesuaian serta mengambil kira teori-teori komunikasi bagi sebaran maklumat alam semulajadi. Hal ini kerana kawasan hutan ini sesuai sebagai makmal hidup pembelajaran dan sekaligus meningkatkan kesedaran terhadap kepentingan menjaga

alam sekitar di kalangan pengunjung.

Rujukan

Faiqah bt Sihabudin, (2017). *Tree Species Composition and Structure in Upper Hill Dipterocarp Forest of Payeh Maga Highland, Long Tuyo, Lawas*. [Bachelor Degree Thesis, Universiti Putra Malaysia], Bintulu, Sarawak

Hamdan O., Valeria L. & Muhamad Afizzul M. (2021). *Guide to The Development of Forest Resources Inventory of Sabah*. Forest Research Institute Malaysia, Selangor. Attin Press Sdn Bhd.

Hamidah Mamat, Mr. Tan Kok Kiat & Mr. Yasser Mohamed Arifin. (2020). Diakses melalui https://www.mybis.gov.my/one/Accessed 12 DEC 2024 pada 12 Disember 2024

Lee, D., & Fagan, J. (2012). *Trail design and construction guidelines*. Trail Planning Institute.

Muhammad Amin Bin Ahmad Zaki. *"JENIS HUTAN DI MALAYSIA*. Diakses melalui " *Fliphtml5*, 2022, fliphtml5.com/yslhk/fffz/basic. pada 24 Mei 2023.

Mohd Aminur, Reuben N. & John B. S. (2018, July). "Forest ecosystem assessment of Nuluhon Trusmadi (Extension) Forest Reserve, Sabah." 18th Malaysian Forestry Conference,Kuching,Sarawak, Malaysia. Diakses melalui https://www.researchgate.net/publication/326920994_Forest_ecosystem_assass_of_Nuluhon_Trusmadi_Extension Forest Reserve Sabah pada 23 Oktober 2022. pada 24 Mei 2023.

Rebekah Carter. (2023). *Apakah itu pengurusan inventori? Panduan lengkap perisian pengurusan inventori*. Diakses melalui, https://ecommerce-platforms.com/ms/glossary/what-is-inventory-management. pada 24 Mei 2023.

Ricard Chung. (2021). *Kenal pasti spesies pokok sebelum menanam*. Diakses melalui https://www.100jutapokok.gov.my/news/437 pada 24 Mei 2023.

Wiersma, W. (2000). *Research methods in education: An introduction* (7th ed.). Allyn & Bacon.

Zaral Gaffar, Z. F., Badrun, M. K. A., & Nazeri, M. N. (2021). *Useful illustration guidelines of forest and herbarium characteristics for foresters*. Kolej Komuniti Temerloh, Pahang.

Laman Web Rasmi Jabatan Perhutanan Semenanjung Malaysia. Diakses melalui https://www.forestry.gov.my/my/ pada 13 Disember 2024

"Pusat Sejadi Hutan Lipur Kawang." *Made in Sabah*, 1 Jan. 2008. Diakses melalui madeinsabah.wordpress.com/2008/01/02/pusat-sejadi-hutan-lipur-kawang/. pada 24 Mei 2023.

Amalan Keberkesanan Kepimpinan Di Sekolah: Apa Pandangan Guru Sekolah Pedalaman?

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Abstrak

Amalan kepimpinan sering di kaitkan dengan corak dan gaya seseorang untuk mempengaruhi individu lain supaya segala apa yang dirancang dapat dilaksanakan dan seterusnya matlamat organisasi tercapai. Seorang pemimpin di sekolah harus mampu untuk bertindak secara fleksibel dan menggunakan corak kepimpinan yang sesuai ketika berhadapan dengan pelbagai bentuk krisis yang ada. Tujuan kajian ini untuk memahami pandangan guru pedalaman terhadap amalan keberkesanan kepimpinan di sekolah dari aspek peranan, ciri-ciri pemimpin dan juga etika kepimpinan. Kajian ini dijalankan dalam bentuk kualitatif dan data dikumpul melalui kaedah temubual semi struktur dengan melibatkan lima orang peserta. Maklum balas dari peserta diterjemahkan dalam bentuk tema untuk menjawab 4 persoalan kajian yang telah disediakan. Dapatan kajian menunjukkan bahawa peserta mempunyai kefahaman yang jelas berkaitan konsep keberkesanan kepimpinan di sekolah. Selain itu, kajian ini juga telah mengenalpasti beberapa bentuk peranan kepimpinan yang di harapkan oleh guru-guru dan beberapa ciri-ciri kepimpinan yang berkesan. Di samping itu, terdapat beberapa pertimbangan etika yang perlu ada dalam diri seorang pemimpin di sekolah.

Kata kunci: Amalan Keberkesanan Kepimpinan, Pemimpin, Sekolah, Guru

1. Pendahuluan

Setiap individu terlibat secara langsung dalam satu institusi, satu organisasi atau satu badan profesional yang lain. Organisasi merujuk kepada kerjasama dalam kumpulan untuk bersama-sama mencapai matlamat atau sasaran yang ditetapkan. Dalam sistem pengurusan sekolah, terdapat lebih dari dua ahli yang bekerjasama untuk menyebarkan maklumat dan pengetahuan kepada pelajar-pelajar untuk untuk meningkatkan prestasi sekolah di bawah pengurusan dan pentadbiran sekolah. Menurut Sergiovanni (2001), kejayaan sesuatu institusi bergantung kepada sokongan dan keberkesanan dalam kepimpinan instruksional. Kepimpinan instruksional terdiri daripada gabungan ciri-ciri personel, suasana persekitaran sekolah dan kakitangan staff sekolah. Kepimpinan instruksional juga merujuk kepada pelaksanaan aktiviti-aktiviti yang menjurus ke arah peningkatan pencapaian pelajar-pelajar. Menurut Zapeda (2012), kepimpinan instruksional yang kuat akan mampu untuk memacu kecemerlangan seterusnya mencapai kejayaan dalam sistem pendidikan.

Peranan dan tugas seorang Guru Besar atau ketua pentadbiran di sekolah secara umum adalah sebagai seorang perancang, pengurus, pengarah, penilai bagi sesebuah proses pengajaran & pembelajaran. Pada masa kini, peranan dan tugas semakin berkembang di mana Guru Besar atau pentadbir sekolah dilihat sebagai penyediaan sesuatu sumber, sumber kepada kepimpinan, pemudah-cara dan juga pelaksana kurikulum. Kepimpinan instruksional pula merujuk kepada perkembangan visi dan misi sekolah, membawa inovasi dalam kaedah pengajaran guru, menggalakkan peningkatan prestasi kakitangan, membangunkan kerjasama dalam iklim sekolah, mengurus aktiviti instruksional, menghasilkan keberkesanan dalam persekitaran sekolah, dan mengekalkan koordinasi aktiviti instruksional di sekolah. Matlamat kepimpinan instruksional ialah untuk meningkatkan pencapaian sekolah, menjadikan suasana yang harmoni di sekolah, meningkatkan pencapaian kakitangan sekolah terutama pencapaian dalam kalangan pelajar-pelajar (Akram, Shah, & Rauf, 2018).

1.1 Latar belakang Kajian

Kepimpinan merupakan tonggak utama dalam sistem pendidikan bagi sesebuah organisasi, pengurusan, dan pentadbiran. Kepimpinan dalam pendidikan di lihat sesuatu yang unik kerana memerlukan kemahiran yang luas dan ilmu pengetahuan yang tinggi untuk mengurus individu yang pelbagai lapisan umur dan latar-belakang. Kejayaan atau kegagalan mana-mana organisasi adalah bergantung kepada faktor kepimpinan. Keadaan ini merujuk kepada aspek cara mencapai sesuatu keputusan serta visi dan misi yang ingin dicapai oleh organisasi berkenaan (Sarvinder Singh &

Ahmad Esa, 2008).

Pemimpin yang di lihat sebagai transformasional sering berusaha dan meningkatkan fokus terhadap matlamat jangka masa panjang, memberi tumpuan terhadap pembangunan serta memberi inspirasi kepada orang bawahan untuk mencapai matlamat organisasi. Kepimpinan transformasional dilihat sesuai dalam suasana transformasi sekolah kerana ini akan dapat memberi peluang kepada guru-guru untuk meningkatkan amalan profesionalisme. Apabila amalan ini dapat diterapkan dalam persekitaran sekolah maka secara tidak langsung dapat menyuburkan budaya yang positif dalam iklim sekolah (Nursyafina Shaffie, Aida Hanim & Ghazali Darusalam, 2018).

Kejayaan bagi sesebuah sekolah sering bergantung kepada faktor kepimpinan Guru Besar. Guru Besar memainkan peranan yang penting dalam setiap program sekolah yang dirancang seperti aktiviti dalam bilik darjah, program bacaan, Pembangunan Profesional Berterusan (CPD) guru-guru, dan juga aktiviti kokurikulum. Semua aktiviti yang dirancang akhirnya untuk melahirkan pelajar-pelajar yang berkualiti, berilmu, berketrampilan, berkemahiran tinggi dan mampu untuk menyumbang sesuatu kepada masyarakat dan negara. Dalam memastikan hasrat dan impian ini dapat direalisasikan maka peranan Guru Besar dilihat sebagai orang yang penuh tanggungjawab, komitmen serta kreatif dalam membawa sekolah untuk berfungsi dengan lebih baik dan berkesan (Nursyafina Shaffie, Aida Hanim & Ghazali Darusalam, 2018).

Peranan dan tanggungjawab utama bagi seorang pemimpin organisasi ialah memastikan setiap apa yang di rancang dapat di laksanakan dengan sebaik mungkin agar visi dan misi yang ditetapkan dapat di capai. Dalam melaksanakan program yang dirancang, pemimpin mungkin akan berhadapan dengan pelbagai bentuk cabaran dan halangan dan pada masa ini kemahiran kepimpinan sangat diperlukan untuk memilih pendekatan yang sesuai dalam mengatasi masalah. Antara bentuk cabaran yang dihadapi ialah keselamatan, infrastruktur, disiplin, tanggungjawab dan arahan (Sarvinder Singh & Ahmad Esa, 2008).

1.2 Permasalahan Kajian

Apabila iklim sekolah dalam keadaan lemah, barisan staf sekolah tidak akan begitu seronok dan gembira untuk bekerja. Guru-guru dan pelajar mungkin menunjukkan kesungguhan mereka dalam aktiviti pengajaran dan pembelajaran tetapi mereka tidak akan dinilai dengan hasil pembelajaran yang baik. Sekolah yang tidak sihat bermaksud sangat tidak produktif untuk sesi pengajaran dan pembelajaran. Pelajar akan menghabiskan masa-masa mereka di sekolah tanpa mendapatkan apa-apa faedah dalam sesi pembelajaran dari persekitaran sekolah yang tidak sihat. Sekolah yang menyediakan persekitaran iklim yang baik dan positif akan mampu menyediakan pendidikan yang tinggi serta menyediakan kepimpinan yang berkesan.

Karisma bagi seorang pemimpin lebih terserlah dan menonjol dengan tahap keyakinan yang tinggi yang boleh diperhatikan melalui setiap tindakannya di sekolah. Menurut Nursyafina Shaffie, Aida Hanim & Ghazali Darusalam, (2018), antara sifat-sifat pemimpin yang berkarisma ini adalah pemimpin yang sanggup berkorban untuk kemajuan organisasinya, dan bersifat terbuka dalam menetapkan matlamat yang ingin di capai. Pemimpin seperti ini sering di lihat sebagai contoh dan teladan oleh orang bawahan serta dikagumi dan di hormati. Pemimpin berkarisma ini juga berani untuk menghadapi risiko dan mampu untuk menerangkan dengan baik akan hasratnya kepada orang bawahan.

Sekolah merupakan sebuah institusi yang mempunyai peranan yang besar dalam melahirkan insan, masyarakat dan negara selain memberi pengaruh dalam sistem kemasyarakatan seperti di dalam Laporan Jawatankuasa Kabinet 1974. Pelbagai pengiktirafan di beri kepada sekolah yang berjaya dan menonjol dalam pelbagai bidang. Pencapaian tertinggi pada masa kini ialah Sekolah Berprestasi Tinggi (SBT). Menurut Nur Faezah & Dayang Norizah (2018), pengiktirafan ini di beri kerana sekolah berkenaan sudah mencapai tahap cemerlang dalam aspek kurikulum, sahsiah dan kepimpinan. Kecemerlangan sekolah ini juga di lihat hasil daripada kebijaksanaan pemimpin yang mengurus sumber manusia dengan berkesan. Peranan pemimpin dalam memastikan mencapai kejayaan organisasi sangat penting tidak kira apa jua bentuk sektor sekali pun.

Dalam usaha pihak sekolah untuk mencapai impian dan hasrat yang ditetapkan, Guru Besar terpaksa berhadapan dengan pelbagai risiko seperti guru-guru tidak mahu terima perubahan, ada yang tidak boleh ditegur, tiada semangat bekerjasama, berfikiran negatif dan tidak bertolak ansur. Apabila ada guru-guru yang tidak berpuas hati maka Guru Besar akan dapat lihat kejadian seperti ponteng kerja, membuat protes, bersara awal, tertekan, prestasi merosot dan ada yang minta pindah sekolah. Nursyafina Shaffie, Aida Hanim & Ghazali Darusalam (2018) menyatakan bahawa apabila Guru Besar menggunakan kekerasan untuk memastikan apa yang dirancang dapat dilaksanakan sebenarnya keadaan ini hanya membuka dan menunjukkan kelemahan dalam kepimpinan.

1.3 Objektif Kajian

Terdapat beberapa objektif kajian yang telah dikenalpasti menerusi kajian ini antaranya ialah;-

1. Memahami pandangan guru berkaitan keberkesanan kepimpinan di sekolah.
2. Memahami peranan kepimpinan di sekolah yang di harapkan.
3. Mengenalpasti ciri-ciri kepimpinan yang berkesan.
4. Mengenalpasti etika yang boleh dikaitkan dengan kepimpinan.

Hasil kajian ini boleh menjadi rujukan kepada pelbagai pihak di sekolah agar mereka boleh melihat akan kelemahan dan kekuatan yang ada dalam aspek keberkesanan memimpin di sekolah. Selain itu, ianya juga dapat membantu pihak sekolah dan guru-guru dalm membuat penyesuaian terutama terhadap program-program yang telah dirancang. Tindakan ini boleh memberi manfaat dan kebaikan terus kepada murid-murid ketika amalan keberkesanan kepimpinan dapat di jiwai dengan baik. Hasil kajian ini juga sangat berguna kepada guru-guru dalam usaha untuk meningkatkan tahap profesionalisme perguruan. Aspek kepimpinan ini bukan sahaja perlu di miliki oleh para pentadbir sekolah tetapi ianya sesuai untuk dipelajari oleh semua guru. Selain itu, jika ada mana-mana guru yang berminat untuk meneruskan perkhidmatan guru dalam bidang pentadbiran, mereka boleh mempelajari kemahiran kepimpinan lebih awal sebelum mereka menjawat jawatan sebagai pentadbir sekolah.

2. Kajian Literatur

Menurut Troy, Michelle, & John (2014) sebahagian pendidik bersetuju bahawa terdapat hubungan antara faktor-faktor kepimpinan dengan iklim sekolah. Pentadbir dapat memanfaatkan hasil kajian ini dengan melihat persepsi guru mereka sebagai seorang pemimpin yang terbuka dalam iklim di sekolah, selain mampu untuk menyasarkan tingkah-laku kepimpinan tertentu dan juga menggalakkan iklim sekolah agar lebih berjaya. Menurut Hamedah (2010), gaya kepimpinan merupakan salah satu aspek yang harus diberi perhatian oleh Guru Besar. Pemilihan gaya kepimpinan oleh Guru Besar harus selaras dengan treat personaliti dirinya dan juga kumpulan staf di bawah pimpinannya. Guru besar perlu menyedari kekuatan serta kekurangan dirinya dan membina gaya kepimpinan berdasarkan keupayaan potensi diri yang sebenar. Namun begitu gaya kepimpinan terbukti berkesan apabila mereka belajar melalui teladan dan bukan disebabkan oleh personaliti, jantina, atau tahap akademik. Selain itu, Guru Besar juga harus berfikiran terbuka, tidak panik dalam berhadapan dengan konflik serta tidak berkompromi dalam urusan kerja yang tidak sempurna.

Menurut Button (2003) pemimpin transformasi biasanya mempunyai tingkah-laku dan kemahiran yang mampu untuk memotivasikan orang bawahannya, menaikkan semangat tanpa cepat mengalah, serta berupaya untuk berhadapan dengan cabaran mendatang. Pemimpin ini mampu menjelaskan dengan baik akan matlamat yang ingin di capai, dan dalam masa yang sama menunjukkan komitmen yang tinggi. Guru yang berkesan ialah guru yang mempunyai motivasi yang tinggi serta sentiasa melibatkan diri dalam penambah-baik PDP. Guru Besar pula di lihat sebagai pendorong dan pemberi semangat serta menyediakan keperluan untuk mengekalkan motivasi guru dalam menjayakan matlamat sekolah (Nursyafina Shaffie, Aida Hanim Abdul Hamid & Ghazali Darusalam, 2018). Pemimpin transformasi mampu untuk melahirkan sebuah sekolah yang berkualiti dan cemerlang melalui kepimpinan yang diamalkan serta pengaruh yang kuat. Dalam masa yang sama, guru-guru di sekolah juga mampu menunjukkan kepuasan kerja yang tinggi dan terkesan dari amalan kepimpinan yang ditunjukkan (Hishamuddin, Mohd Rizal & Supian, 2013).

Menurut Nurlaili & Mohd Yusof (2018), gaya kepimpinan dan pengurusan Guru Besar sering berkait rapat dengan kuasa untuk mencapai matlamat bagi sesebuah sekolah. Dalam kajian ini, hubungan kepimpinan dan pengurusan kerja dengan kepuasan kerja guru di sekolah agama di Johor menunjukkan gaya kepimpinan Guru Besar berada pada tahap yang tinggi bagi 3 jenis gaya iaitu autokratik, demokratik dan lepas bebas. Tahap pengurusan kerja Guru Besar dan juga tahap kepuasan kerja guru juga menunjukkan tahap yang tinggi. Selain itu, terdapat hubungan yang signifikan antara gaya kepimpinan Guru Besar dan pengurusan kerja Guru Besar dengan kepuasan kerja guru.

3. Metodologi Kajian

Kajian ini adalah kajian kualitatif untuk meneroka pandangan guru-guru pedalaman mengenai keberkesanan kepimpinan di sekolah. Kajian kualitatif mengutamakan proses dan membantu untuk memahami sesuatu fenomena. Selain itu, rekabentuk kajian kualitatif ini dilihat sesuai kerana kajian ini ingin memahami pandangan guru terhadap amalan keberkesanan kepimpinan di sekolah.

Selaras dengan penggunaan kajian kualitatif, kajian ini menggunakan persampelan bertujuan iaitu tapak dan individu dipilih dengan sengaja untuk memahami fenomena kajian yang dijalankan. Pemilihan sampel sebagai responden berdasarkan piawai yang digunakan iaitu sampel yang kaya dengan maklumat yang diperlukan dalam kajian. Pemilihan responden dibuat berdasarkan kepada individu yang mampu untuk memberikan maklumat yang banyak dan mendalam selain boleh memberi kerjasama yang baik kepada pengkaji. Pemilihan responden juga melibatkan beberapa keperluan iaitu guru yang terlibat dengan aspek perancangan dan pelaksanaan program di sekolah. Selain itu, responden yang sama juga mampu untuk memberi maklumat berkaitan amalan kepimpinan di sekolah.

Dalam kajian ini, pengkaji menggunakan kaedah temubual untuk memahami dan mengesahkan fenomena yang dikaji. Ini merupakan satu sesi perbualan bersemuka antara pengkaji dengan responden secara individu untuk mendapatkan maklumat dan penjelasan akan perkara yang dikaji. Temubual dijalankan berdasarkan protokol yang telah disediakan dan setiap sesi temubual mengambil masa antara 50-60 minit dengan bentuk temubual semi-struktur. Terdapat enam soalan yang disediakan namun dalam sesi temubual yang diadakan beberapa soalan tambahan terpaksa disediakan untuk meneroka jawapan yang diberi oleh responden.

4. Dapatan Kajian

4.1 Profil Peserta Kajian

Jadual 1: Maklumat Profil Peserta

Latar belakang Peserta		Kekerapan	Peratus
Jantina	Lelaki	4	80%
	Perempuan	1	20%
Akademik	Ijazah Pertama	5	100%
	Sarjana	0	0%
Pengalaman Mengajar	Lebih 15 tahun	5	100%
	1 - 5 orang	0	0%
Pengalaman berkhidmat bersama Guru Besar	6 - 10 orang	5	100%
	11 - 15 orang	0	0%

Seramai 5 orang guru dipilih sebagai peserta kajian yang terdiri daripada 4 orang guru lelaki dan 1 guru perempuan. Guru-guru yang dijadikan sebagai peserta kajian ini terdiri daripada guru yang pernah berkhidmat melebihi 3 sekolah yang berbeza. Semua peserta diberi kod sebagai menggantikan nama asal iaitu G1, G2, G3, G4, dan G5 dan mempunyai pengalaman mengajar melebihi 15 tahun.

4.2 Pandangan guru terhadap Keberkesanan Kepimpinan di sekolah

Jadual 2 : Pandangan guru terhadap keberkesanan kepimpinan di sekolah

Peserta	Pandangan Peserta
G1	…merujuk kepada pengurus sekolah atau penjana kepada agenda pembangunan sesebuah sekolah. Ia merangkumi mengurus fizikal sekolah, kaki tangan dan juga memastikan kemenjadian murid.
G2	…boleh diertikan bagaimana seseorang pemimpin itu untuk mempengaruhi kakitangannya.
G3	…merujuk kepada seseorang dalam mengurus suatu organisasi dan melibatkan sifat-sifat tertentu. Selain itu, menyusun atur organisasi supaya dapat berfungsi dengan baik.
G4	…melibatkan cara menyampaikan maklumat. Ia juga melibatkan cara hubungan yang melibatkan komunikasi dan kefahaman antara satu sama lain.
G5	…mampu untuk mendengar dengan baik, menerima pandangan orang lain, dan memberi bimbingan dalam banyak hal agar orang bawahan dapat manfaat. Boleh menjadi contoh yang baik kepada orang bawahan.

Dalam jadual 2 menunjukkan semua peserta mempunyai pandangan yang positif berkaitan konsep kepimpinan di organisasi terutama di sekolah. Para peserta bersetuju bahawa kepimpinan ini merujuk kepada keberkesanan pemimpin untuk pengurus pembangunan sekolah termasuk staff, guru dan murid-murid seperti yang dinyatakan oleh peserta G1 dan G3. Peserta G2 menyatakan bahawa kepimpinan melihat bagaimana pemimpin itu mempengaruhi orang bawahan dan pendekatan tunjuk ajar yang digunakan. Menurut peserta G4, kepimpinan dilihat dari cara pemimpin ini menyampaikan maklumat kepada orang bawahan dan pendekatan yang digunakan dalam membina hubungan, komunikasi dalam meningkatkan kefahaman. Bagi peserta G5, kepimpinan pula boleh difahami menerusi bimbingan yang diberi dan menjadi pendengar yang baik serta mampu memberi kesan yang positif dan contoh yang baik kepada orang bawahan.

4.3 Peranan kepimpinan sekolah yang diharapkan

Jadual 3 : Peranan kepimpinan sekolah yang di harapkan

Peserta	Pandangan Peserta
G1	…bukan hanya boleh mengarah tapi boleh membimbing. Perlu ada jiwa untuk memahami orang bawahan. Pemimpin mudah memberi penghargaan kepada orang bawahan dan harus peka.
G2	…mampu untuk mengatasi krisis yang berlaku. Setiap sasaran kerja dapat di capai secara bersama-sama. Mampu untuk menyediakan suasana kerja yang selesa dan harmoni.
G3	…tidak terlalu menekan orang bawahan, jelas dengan hala tuju yang ditetapkan, mampu untuk membimbing orang bawahan, dan menjadi contoh yang baik.
G4	…kita hanya menurut perintah dalam melaksanakan tugas. Perlu memahami orang bawahan dengan baik dan mampu untuk mewujudkan suasana kerja dalam suasana kerjasama.
G5	…dapat bimbing orang bawahan, jelas dengan matlamat yang ingin dicapai, dan berkongsi ilmu dan pengalaman yang ada.

Dalam jadual 4 menujukan setiap peserta mempunyai jangkaan dan harapan yang berlainan terhadap kepimpinan di sekolah. Pemimpin perlu memberi penghargaan, menyediakan keperluan dan peka terhadap orang bawahan seperti yang dinyatakan oleh peserta G1. Pemimpin juga mampu untuk mengatasi dan menyelesaikan krisis yang ada melalui kemahiran dan ilmu yang dimiliki seperti yang dinyatakan oleh peserta G2. Menurut peserta G3, G4 dan G5, pemimpin yang diharapkan dalam organisasi tidak selalu menekan orang bawahan ketika bersama-sama bekerja, perlu memahami orang bawahan dengan baik kerana setiap individu ada kekurangan dan kelebihan diri, dan pemimpin yang suka berkongsi ilmu baru dan pengalaman dengan orang bawahan. Semua peserta juga setuju bahawa antara peranan pemimpin di organisasi yang sering diharapkan ialah boleh membimbing dan membuat tunjuk ajar kepada orang bawahan dan menyediakan suasana kerja yang selesa dan kondusif untuk semua.

4.4 Ciri-ciri kepimpinan di sekolah yang berkesan.

Jadual 4 : Ciri-ciri kepimpinan dan pengurusan yang berkesan

Peserta	Pandangan Peserta
G1	…ambil berat perihal orang bawahan, mudah dan senang untuk didekati oleh sesiapa sahaja. Mesra, tidak berkira, mudah berunding, berfikiran terbuka. Sentiasa menjaga maruah orang bawahan ketika membuat teguran, ada semangat untuk membantu dan membimbing.
G2	…ada sikap keberanian dalam diri bila membuat sesuatu keputusan dan tindakan. Sanggup berhadapan dengan risiko dan sentiasa bersedia membuat sesuatu perubahan yang drastik. Seorang yang cerdas, pantas bergerak dalam banyak perkara. Berfikiran positif terutama dengan orang bawahan dan percaya dengan kemampuan mereka. Mudah didekati dan tidak campur aduk antara urusan kerja dan hal-hal di luar.
G3	…menepati masa, mudah memberi kerjasama, konsisten dalam ucapan, ada ketegasan dalam diri, dedikasi dan komitmen dalam kerja, mampu untuk mempengaruhi pekerja bawahan, bertolak ansur dan tidak menyulitkan urusan orang lain
G4	…merendah diri dan tidak malu bertanya dengan sesiapa sahaja. Orang bawahan bergerak tanpa paksaan dalam menjalankan tugas, tidak menimbulkan banyak masalah dan staff senang bekerja secara sukarela dalam menjalankan tugas sampingan.
G5	…mempunyai ketegasan dalam diri, membuat layanan sama rata dengan orang bawahan, sentiasa membuat tunjuk ajar kepada staff, rasa prihatin, bertimbang rasa, berfikiran terbuka.

Dalam jadual 5 menunjukkan pandangan guru terhadap ciri-ciri kepimpinan yang berkesan di sekolah. Para peserta bersetuju bahawa setiap pemimpin yang berkesan mempunyai ciri-ciri tertentu yang boleh dilihat. Antaranya ialah pemimpin yang suka merendah diri dan tidak malu bertanya dengan sesiapa sahaja seperti yang dinyatakan oleh peserta G4 dan G1. Peserta G3 pula menyatakan pemimpin ini sentiasa menepati masa, konsisten dalam ucapan, dedikasi dan komitmen dalam kerja, bertolak ansur dan tidak menyulitkan urusan orang lain. Selain itu, ada sikap keberanian dalam diri bila membuat sesuatu keputusan dan tindakan. Sanggup berhadapan dengan risiko dan sentiasa bersedia membuat sesuatu perubahan yang drastik. Seorang yang cerdas, pantas bergerak dalam banyak perkara. Berfikiran positif terutama dengan orang bawahan dan tidak campur aduk antara urusan kerja dan hal-hal di luar seperti yang dinyatakan oleh peserta G2 dan G5.

4.5 Pertimbangan etika yang boleh dikaitkan dengan kepimpinan.

Jadual 5 : Pertimbangan etika dalam pengurusan dan kepimpinan

Peserta	Pandangan Peserta
G1	…berpegang kepada integriti. Ada ketika pemimpin yang tidak berintegriti akan menyebabkan organisasi rosak dan matlamat sukar untuk dicapai. Harus bersikap jujur dan sentiasa membuat penilaian dan muhasabah diri.
G2	…pemimpin perlu peka dan fahami dengan baik setiap dasar-dasar berkaitan dengan pendidikan. Perlu ambil tahu berkaitan dengan kemajuan dan prestasi murid-murid dan juga guru. Sentiasa ada usaha untuk memperbaiki kelemahan yang ada dalam organisasi. Perlu melihat sesuatu perkara secara luas dan menyeluruh.
G3	… sifat integriti yang tinggi dalam diri, sifat amanah dan nilai-nilai moral. Ini semua kawalan diri seorang pemimpin untuk mengawal diri sebelum dapat mengawal orang lain. Pemimpin akan bekerja dengan jujur, berdedikasi dalam budaya kerja. Semua kita adalah pemimpin dalam kehidupan masing-masing. Setiap amanah perlu dipegang dan dijalankan dengan penuh tanggungjawab.
G4	…perlu ada integriti dan pendirian yang tetap. Jangan sesekali berubah pendirian. Dapatkan sebanyak mungkin pengalaman dalam memimpin terutama dalam berhadapan dengan guru, murid, ibu-bapa dan masyarakat. Pemimpin perlu bijak dalam membaca suasana dan iklim staff di sekolah. Pemimpin perlu faham dan hadam dengan baik maksud gaya kepimpinan yang ada.
G5	…tanggungjawab, prihatin , timbang rasa

Dalam jadual 7 menunjukkan pandangan guru dari aspek pertimbangan etika yang perlu ada dalam kepimpinan organisasi. Pemimpin perlu berpegang kepada integriti, amanah, bertanggungjawab dan ada timbang rasa seperti yang dinyatakan oleh peserta G1, G3, G4 dan G5. Selain itu, menurut peserta G1 pemimpin juga harus berpegang kepada amalan kerahsiaan ketika bertugas, dan tidak membuat andaian awal terhadap orang bawahan tanpa usul periksa. Dalam masa yang sama, peserta G2 menyatakan pemimpin juga harus faham setiap dasar-dasar pendidikan, ambil peduli setiap perkembangan prestasi guru dan murid serta melihat sesuatu perkara secara menyeluruh. Seorang pemimpin juga harus bijak dalam membaca dan memahami iklim yang ada di organisasi serta memahami gaya kepimpinan dengan baik sebelum di amalkan seperti yang dinyatakan oleh peserta G4.

5. Perbincangan

Secara keseluruhan guru-guru amat memahami dan mempunyai pandangan yang positif berkaitan konsep pengurusan dan kepimpinan dalam organisasi. Perkara ini dapat di lihat menerusi pandangan peserta kajian yang menunjukkan bahawa kepimpinan dan pengurusan merujuk kepada keberkesanan mengurus sekolah, staff dan murid. Selain itu, kepimpinan juga merujuk kepada cara seseorang itu mempengaruhi orang bawahan dan pendekatan yang sesuai digunakan dalam organisasi. Kepimpinan dan pengurusan juga boleh dilihat menerusi penyampaian maklumat kepada orang bawahan serta bagaimana hubungan dan komunikasi di bina untuk meningkatkan kefahaman. Dapatan ini selaras dengan Hao & Yazdanifard (2015) yang menyatakan bahawa kepimpinan merujuk kepada tanggungjawab dan mengawal organisasi dan membawa orang bawahan untuk mencapai matlamat yang ditetapkan dengan menggunakan pendekatan yang berkesan.

Menurut Baharom, Mohamat & Che Noraini (2009) kepimpinan merupakan salah satu faktor yang menjadi penentu terhadap kejayaan untuk sesuatu organisasi. Kepimpinan biasanya akan berlaku apabila seseorang itu membuat dorongan, memujuk, mempengaruhi untuk berusaha mencapai matlamat yang telah ditetapkan. Selain itu, kepimpinan juga boleh dilihat menerusi kebolehan seseorang untuk memimpin sekumpulan manusia dan memastikan mereka sentiasa bermotivasi dan semangat untuk bekerja dan berusaha.

Setiap guru mempunyai harapan atau jangkaan terhadap pemimpin yang ada di dalam organisasi seperti di sekolah. Antara harapan dan jangkaan guru-guru terhadap kepimpinan organisasi di sekolah ialah seseorang pemimpin perlu menyediakan penghargaan, keperluan dan peka terhadap orang bawahan. Pemimpin juga di harap mampu untuk mengatasi dan menyelesaikan krisis yang wujud dalam organisasi dan dilihat mempunyai kelebihan dari segi ilmu dan kemahiran yang baru. Pemimpin juga di harapkan tidak terlalu menekan orang bawahan dan sentiasa bersama-sama ketika bekerja. Selain itu, antara peranan pemimpin yang diinginkan oleh guru ialah boleh membimbing dan membuat tunjuk ajar kepada orang bawahan dan menyediakan suasana kerja yang selesa dan kondusif untuk semua.

Kenyataan ini disokong oleh Baharom, Mohamat & Che Noraini (2009) yang menyatakan bahawa kepimpinan yang berkesan mampu memberi kesan secara tidak langsung kepada guru dan warga sekolah. Pemimpin seperti ini sentiasa membuat pemantauan yang membina, memberi dorongan dan nasihat yang berguna kepada orang bawahan agar mereka sentiasa ada perasaan tanggungjawab dalam melaksanakan tugas. Pemimpin yang diharapkan sering membantu orang bawahan untuk menyelesaikan masalah dan menggalakkan untuk terus berusaha.

Kepimpinan yang berkesan yang sering diharapkan oleh setiap pekerja ialah boleh mempengaruhi pekerja bawahan dan memotivasikan mereka dengan mengukuhkan budaya organisasi yang positif. Kejayaan kepimpinan yang berkesan akan mewujudkan persekitaran yang baik dan orang bawahan berpeluang untuk berkongsi pandangan dan memberi cadangan secara lebih profesional.

Setiap kepimpinan yang berkesan di sekolah mempunyai ciri-ciri yang tertentu yang boleh dilihat oleh guru-guru di sekolah. Antara ciri-ciri ini ialah pemimpin yang sering merendah diri dan tidak malu untuk bertanya kerana proses pembelajaran boleh berlaku di mana-mana. Selain itu, pemimpin ini juga sentiasa menepati masa, mempunyai sikap yang konsisten, bertolak ansur dan tidak menyulitkan tugas orang lain. Dalam usaha untuk mencapai kejayaan dan matlamat dalam organisasi, seseorang pemimpin perlu berani untuk berhadapan dengan sebarang bentuk risiko, mempunyai matlamat yang jelas selain harus cergas dan pantas dalam melaksanakan sebarang tugas dan tindakan.

Dapatan ini disokong oleh kajian yang dijalankan oleh Wasim & Imran (2010) yang menyatakan bahawa antara ciri-ciri kepimpinan yang berkesan ialah mereka mempunyai hala tuju yang jelas, mempunyai komitmen dan yakin dengan pekerja bawahan, dapat mengenalpasti masalah dan halangan serta mampu untuk membawa pembaharuan dalam organisasi. Menurut Baharom, Mohamat & Che Noraini (2009) sebagai peneraju utama di sekolah, pemimpin perlu ada keberanian diri, suka membimbing dan menjadi sumber inspirasi kepada orang bawahan di sekolah. Kepimpinan yang mempunyai kompetensi adalah hasil daripada gabungan nilai, sikap, kemahiran, dan pengetahuan yang mampu untuk memberi panduan untuk mencapai matlamat yang ditetapkan.

Dapatan kajian menunjukkan bahawa terdapat beberapa etika kepimpinan yang perlu di pegang oleh pemimpin dan pengurusan terutama di sekolah. Antara etika yang perlu di pegang atau di pertimbangkan oleh seseorang pemimpin itu dalam memastikan matlamat yang ditetapkan dapat dicapai ialah harus ada nilai integriti ketika bertugas, bersikap amanah, bertanggungjawab, bertimbang rasa, tidak membuat andaian awal, peka terhadap prestasi orang bawahan dan bijak dalam membaca situasi di sekolah.

Dapatan ini disokong oleh Mihelic, Lipicnik, & Tekavcic (2010) yang menyatakan bahawa kepimpinan yang beretika mampu untuk menetapkan standard yang tinggi dalam melaksanakan tugas dan peranan mereka. Dalam masa yang sama, mereka perlu menyampaikan kepada pekerja bawahan untuk menjaga etika ketika melaksanakan tanggungjawab agar matlamat yang ditetapkan dapat dicapai. Kepimpinan yang berkesan dapat mempengaruhi organisasi melalui tingkah laku yang beretika, di mana mereka berperanan sebagai teladan kepada pekerja bawahan dan menunjukkan tingkah laku yang sesuai dalam organisasi. Mereka dilihat mengamalkan sikap yang jujur, amanah, bertanggungjawab, boleh dipercayai, berani, adil dan tegas.

Menurut YScouts Ethical Leaders, terdapat beberapa ciri-ciri etika yang baik dari segi kepimpinan dan ini menyokong hasil dapatan kajian yang di jalankan. Antaranya ialah mengamalkan keadilan untuk semua staff, menghormati setiap ahlinya dengan mendengar pandangan mereka dan menghargai sumbangan mereka, jujur dalam setiap perbuatan dan ini akan disenangi oleh semua orang di sekeliling, memberi galakan kepada staff yang berjaya mencapai sesuatu kejayaan dan mendorong staff lain untuk sama-sama meningkat, menjadi contoh yang baik kepada semua staff, bukan hanya bijak bercakap tetapi harus melaksanakan apa yang disampaikan.

6. Kesimpulan

Pentadbir yang cemerlang serta berwibawa sering di kaitkan dengan kecemerlangan sekolah. Mereka memainkan peranan dan tanggungjawab yang penting dalam merancang dan menyusun strategi yang berkesan untuk keperluan sekolah. Perkaitan antara sistem pendidikan negara dengan program yang dilaksanakan di sekolah harus selaras dan mengikut perkembangan teknologi semasa. Dalam transformasi nasional 2050, kemenjadian murid dan pendidikan menjadi tunjang kepada pendidikan yang berkualiti tinggi. Faktor utama kejayaan sebuah sekolah adalah pentadbir yang berperanan sebagai pemimpin yang membawa hala tuju yang baik serta menjadi suri teladan kepada kakitangan bawahnya.

Seorang pentadbir di sekolah harus mampu untuk bertindak secara fleksibel dan menggunakan corak kepimpinan yang sesuai ketika berhadapan dengan pelbagai bentuk krisis yang ada. Pemimpin juga perlu berjaya untuk sesuaikan gaya dan kemahiran kepimpinan mengikut keperluan keadaan guru-guru dan sekolah. Sekolah yang sentiasa menunjukkan pencapaian yang baik biasanya di ketuai oleh seorang pemimpin yang berkarisma tinggi, memberi pengaruh yang baik, dan sentiasa memberi inspirasi yang positif kepada guru-guru dan staf. Ini dapat mewujudkan satu hubungan yang rapat antara pentadbir dan staf dan menghasilkan kerjasama yang kuat, selesa, ceria dan penuh muhibah.

Rujukan

Akram M., Shah A., Rauf A., (2018). Head Teachers' Instructional Leadership Practices and School Climate at Secondary Schools, Journal of Arts and Social Sciences II (V).

Baharom Mohamad, Mohamad Johdi Salleh, & Che Noraini Hashim (2009). *Kepimpinan Pendidikan Berkesan.* Universiti Tun Hussein Onn, Universiti Islam Antarabangsa. Prosiding "Seminar Kepengetuaan Kebangsaan Ke-V1" – Halatuju Kepemimpinan Sekolah Untuk Penambahbaikan Yang Mapan – 10-12 Mac 2009. Institut Kepengetuaan, Kampus Kota, Universiti Malaya, Kuala Lumpur.

Hamedah Wok Awang dan Normah Teh. (2010). *Sinergi dalam Pengurusan Sekolah*. Selangor.PTS Professional Publishing Sdn Bhd.

Hao, M. J., & Yazdanifard, R. (2015). How effective leadership can facilitate change in organizations through improvement and innovation. *Global journal of management and business research*.

Hishamuddin Shah Bin Mokri, Mohd Rizal Bin Atan, Supian Bin Hashim. (2013). *Hubungan Antara Kepimpinan Transformasi Guru Besar Dengan Kepuasan Kerja Guru Di Sekolah Kebangsaan Kurang Murid Gemilang Tujuh Segamat, Johor*. Universiti Teknologi Malaysia.

Mihelic, K. K., Lipicnik, B., & Tekavcic, M. (2010). Ethical leadership. *International Journal of Management & Information Systems (IJMIS)*, *14*(5).

Nursyafina Shaffie, Aida Hanim Abdul Hamid & Ghazali Darusalam, (2018). Amalan Kepimpinan Transformasional Dalam Kalangan Guru Besar Terhadap Keberkesanan Sekolah Di Daerah Subis. Fakulti Pendidikan Universiti Kebangsaan Malaysia, Fakulti Pendidikan Universiti Malaya. *Malaysia Online Journal Education*, *12* (2): 21-28.

Norlaili Abd Wahab & Mohd Yusof Abdullah (2018). Hubungan Gaya Kepimpinan dan Pengurusan Kerja Guru Besar dengan Kepuasan Kerja Guru Sekolah Agama Kerajaan Johor. Fakulti Bahasa dan Pendidikan, Kolej Universiti Islam Melaka. *Journal of Ilmi, 8* (2018): 136-150

Nur Faezah & Dayang Norizah. (2018). Kepimpinan Pengajaran, Sekolah Berkesan, dan Peradapan Organisasi di Pedalaman Sarawak. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, *3*(2), (page 127 - 136), 2018 . Universiti Malaysia Sabah.

Sergiovanni, T. J. (2001). *The principalship: A reflective practice perspective*. Allyn & Bacon/Longman Publishing, a Pearson Education Company, 1760 Gould Street, Needham Heights, MA 02494. Web site: http://www. abacon. com

Sarvinder Singh & Ahmad Esa, (2008). *Kepimpinan dalam menghadapi isu-isu semasa pendidikan*. Jabatan Ikhtisas Pendidikan, Fakulti Pendidikan Teknikal, Universiti Tun Hussein Onn. Seminar Kebangsaan Pengurusan Pendidikan PKPGB 2008.

Troy A McCarley, Michelle L Peters and John M Decman. (2014). *Transformational Leadership Related To School Climate: A Multi-Level Analysis*. Educational Management Administration & Leadership 1–21

Wasim, A., & Imran, A. (2010). The role of leadership in organizational change. *Relating the successful organizational change to visionary and innovative leadership*, *3*(2), 9.

YScouts Ethical Leaders. (n.d.). 10 *Ethical leadership characteristics, attributes & traits*. Retrieved from http://yscouts.com/10-ethical-leadership-characteristics/

Zepeda, S. J. (2012). *Instructional supervision: Applying tools and concepts*. Eye on Education.

AI and its Pedagogical Effectiveness and Adaptability in ESL Classrooms

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Abstract

This study investigates the pedagogical effectiveness and adaptability of artificial intelligence (AI) in English as a Second Language (ESL) classrooms, addressing current gaps in how AI supports critical thinking, intercultural communication, and teacher-student interaction. While AI's potential for personalized language learning has been documented, limited research explores its impact on broader educational goals within diverse ESL contexts, particularly regarding teacher roles, equity, and data privacy. Using a qualitative approach, this study gathers insights from ESL teachers and learners to understand AI's role in enhancing language acquisition and adapting to various instructional needs. The expected findings include identifying the strengths of AI in supporting individualized language learning while highlighting limitations in addressing complex, culturally nuanced language requirements and real-world communication skills. Research implications suggest that AI must evolve to support holistic language competencies and provide ethical, accessible solutions across educational environments. Recommendations for future research include examining AI's long-term effects on ESL learning outcomes, exploring its potential to integrate cultural competence, and ensuring equity in AI-driven resources, especially in underfunded educational settings. This study aims to inform educators, policymakers, and AI developers on optimizing AI integration for meaningful, comprehensive ESL instruction. Ultimately, the research is expected to contribute to a framework that guides AI's ethical, effective deployment in ESL classrooms, ensuring that AI meets language proficiency needs and supports the broader educational goals of language learning in a globalized world.

Keywords: AI tools, pedagogical, adaptability, ESL classroom

1. Introduction

The application of artificial intelligence (AI) in English as a Second Language (ESL) classrooms has introduced innovative ways to support personalized learning, yet it also raises various pedagogical challenges. A primary issue involves the customization of learning experiences, as AI-powered tools are often designed to provide adaptive feedback tailored to individual learning needs, focusing on specific language skills like vocabulary and grammar (Wang & Tahir, 2020). While these features can enhance language acquisition, the real challenge lies in ensuring that these tools align with ESL's holistic educational goals, such as promoting communicative competence and fostering intercultural understanding (Li et al., 2021). Research suggests that ESL educators aim for a balanced approach beyond mere linguistic skills, integrating broader competencies that AI tools may not fully support (Cheng & Yoon, 2022).

Another significant issue is teacher readiness and adaptability in incorporating AI within their teaching practices. Teachers are often tasked with adjusting their instructional approaches to harness AI's potential effectively, yet many face barriers due to limited training or unfamiliarity with AI technologies (He et al., 2023). Studies highlight that teachers' successful integration of AI tools depends heavily on adequate professional development and institutional support (Park & Son, 2021). Without this foundation, AI's potential to enhance ESL pedagogy remains underutilized, leading to inconsistent classroom adoption. The gap in teacher preparedness underscores a critical need for structured training programs that equip educators to use AI effectively in promoting meaningful learning outcomes (García-Sánchez et al., 2022).

In addition to teacher readiness, the quality of feedback and language nuance provided by AI tools is a persistent issue. Although AI can offer immediate feedback, its limitations in addressing complex language aspects, such as idiomatic expressions and cultural nuances, pose challenges (Zhou & Zhao, 2021). Research indicates that AI often needs to improve understanding sociocultural language contexts, which is vital for ESL learners to develop pragmatic language skills (Chen et al., 2023). Effective ESL instruction requires a nuanced understanding beyond grammatical accuracy, encompassing contextually appropriate language use that AI cannot always discern. This shortfall raises

questions about how AI can supplement, rather than replace, the role of teachers in offering culturally aware feedback.

The issue of equity in access and learning opportunities further complicates AI integration in ESL classrooms. Access to AI-driven educational tools is often uneven, with students in underfunded schools or disadvantaged regions facing limited availability (Sun & Yang, 2022). Such disparities can widen the educational gap, as only students with adequate resources benefit fully from AI's adaptive capabilities. Research on digital equity highlights the importance of providing all students equal access to technological advancements, including AI, to ensure fair educational outcomes (Kim & Lee, 2021). Addressing this disparity is crucial to prevent unequal learning opportunities in ESL programs.

Lastly, AI's reliance on extensive data collection raises privacy and ethical concerns, particularly for younger and vulnerable populations (Lai & Shi, 2020). AI personalization often requires detailed data on students' learning habits, prompting data security and privacy worries (Luo & Lee, 2022). Educators and policymakers face the challenge of balancing AI's benefits with responsible data management to protect students' information. Studies emphasize the need for clear guidelines and ethical standards to govern AI's use in educational settings, ensuring data collection aligns with privacy laws and ethical practices (Chen et al., 2023). The ethical implications of AI in ESL classrooms underscore the need for a cautious approach that prioritizes student well-being while leveraging AI's educational potential.

Integrating AI in ESL classrooms presents an innovative approach to personalized and adaptable language learning. However, more research is needed into AI's overall effectiveness in meeting the pedagogical demands of ESL education, such as enhancing critical thinking, fostering intercultural communication, and supporting teacher-student interaction. Furthermore, questions remain about how well AI tools can be adapted across diverse educational contexts and how they impact equity, teacher roles, and data privacy. This study investigates these challenges by evaluating AI's effectiveness in enhancing ESL pedagogy and examining the adaptability of AI-driven solutions in varied classroom environments.

The research gap centres on insufficient empirical evidence regarding AI's effectiveness in fulfilling comprehensive pedagogical goals in ESL, particularly in cultivating critical thinking, intercultural communication, and effective teacher-student interaction (Wang & Tahir, 2020; Cheng & Yoon, 2022). While studies focus on AI's ability to personalize basic language skills, few address its adaptability in diverse educational settings and its implications for equity, teacher roles, and student data privacy (Sun & Yang, 2022; García-Sánchez et al., 2022). Further research is needed to explore AI's potential in meeting these nuanced educational requirements in ESL contexts (He et al., 2023).

1.1 Research Questions:

The following research questions guide this study:

1. How do ESL teachers perceive the effectiveness of AI tools in enhancing language acquisition and communicative skills among students?
2. What challenges do ESL teachers encounter when adapting AI-driven tools in diverse classroom settings?

2. Literature Review

Integrating artificial intelligence (AI) in English as a Second Language (ESL) classrooms has garnered attention for its potential to personalize learning and adapt to individual student needs. However, research on AI's effectiveness in meeting ESL education's comprehensive pedagogical objectives, such as enhancing critical thinking, fostering intercultural communication, and supporting teacher-student interaction, needs to be improved. This literature review examines existing studies on AI's role in ESL, exploring its adaptability across diverse educational contexts, its impact on equity and teacher roles, and issues related to student data privacy. Keywords such as "AI in ESL," "pedagogical effectiveness," "critical thinking in language learning," and "data privacy in education" guided the search for relevant research articles from the past five years.

2.1 AI in Personalized Language Learning

AI technology offers adaptive learning experiences that tailor instruction to each learner's specific needs, including vocabulary building, grammar correction, and comprehension exercises (Wang & Tahir, 2020). AI's ability to personalize content delivery and provide immediate feedback is a considerable advantage in ESL education, allowing students to progress at their own pace and revisit challenging topics (Li et al., 2021). Wang and Tahir (2020) emphasize

that AI-driven learning platforms adapt to students' responses, providing continuous assessments and customizations based on their performance. Similarly, Li et al. (2021) found that AI-enhanced learning improves students' engagement by providing a more interactive and individualized experience. Despite these benefits, researchers caution that personalization may narrowly focus on mechanical language skills, potentially limiting opportunities for students to engage in communicative and critical language use (Cheng & Yoon, 2022).

2.2 Enhancing Critical Thinking and Communicative Competence

Critical thinking and communicative competence are core objectives in ESL education, aiming to prepare learners for real-world language use. However, AI tools predominantly focus on essential language acquisition, with limited scope for fostering critical thinking and intercultural communication (Zhou & Zhao, 2021). Cheng and Yoon (2022) argue that while AI excels at individualized feedback on technical language skills, it lacks the complexity to simulate authentic, nuanced language interactions that build critical thinking. The study by Zhou and Zhao (2021) further highlights that AI tools often fail to account for idiomatic language and cultural references, essential for developing pragmatic competence. These findings underscore the need for AI systems that can integrate higher-order cognitive skills and cultural understanding, aligning more closely with the holistic goals of ESL instruction (Chen et al., 2023).

Research also points to AI's limited capacity for promoting communicative competence, particularly in cultural and social language nuances. Communicative language teaching (CLT), a widely adopted approach in ESL, emphasizes interaction, cultural knowledge, and the use of language in real-life contexts (He et al., 2023). However, AI's current capabilities are restricted to static interactions that may not effectively prepare students for authentic communicative scenarios. He et al. (2023) call for AI developers to incorporate culturally diverse language content, contexts, and interactive features that simulate real-world language use. Future studies are recommended to explore AI designs that enhance communicative and critical thinking competencies, thus aligning with the pedagogical aims of ESL education (García-Sánchez et al., 2022).

2.3 Teacher Readiness and Roles in AI-Enhanced ESL Classrooms

Effective integration of AI in ESL classrooms also hinges on teacher readiness, a factor influenced by training availability, teacher attitudes, and institutional support. Research indicates that many ESL teachers need help adapting to AI tools due to limited professional development and technical knowledge (He et al., 2023; Park & Son, 2021). Park and Son (2021) found that ESL teachers often need more training on incorporating AI tools into their teaching, leading to underutilization or inconsistent application of AI-driven methodologies. This gap affects the effectiveness of AI in classrooms and contributes to a sense of resistance or scepticism among educators (García-Sánchez et al., 2022).

Integrating AI tools also raises questions about shifting teacher roles, as AI technology increasingly assumes functions such as providing feedback and assessing student performance. While some educators view AI as a valuable assistant that can reduce their workload, others express concerns about AI's potential to devalue human interaction and diminish the teacher's role in student learning (Sun & Yang, 2022). García-Sánchez et al. (2022) argue that to support the meaningful use of AI, teachers must be provided with clear guidelines on balancing AI and traditional instruction. Additionally, research points to the need for AI training that emphasizes critical engagement with AI tools, enabling teachers to retain their role as facilitators and mentors rather than merely overseers of AI-driven learning (Kim & Lee, 2021).

2.4 Equity in Access to AI and Learning Opportunities

Equity is a significant concern in AI-enhanced ESL classrooms, as access to AI-driven resources varies significantly among students from different socioeconomic backgrounds. Studies reveal that students in underfunded schools or rural areas often need more access to advanced AI technologies, which can create disparities in educational opportunities and outcomes (Sun & Yang, 2022). Sun and Yang (2022) stress the need for policy interventions to ensure equitable access to AI tools, as unequal access can widen the achievement gap and perpetuate educational inequities. Similarly, Kim and Lee (2021) found that while AI tools promise personalized learning, their benefits are often disproportionately available to students in well-funded institutions.

To address these disparities, Kim and Lee (2021) recommend that policymakers focus on equitably distributing AI resources and developing initiatives supporting under-resourced schools. Equity considerations extend beyond access to encompass the adaptability of AI tools, as educational environments vary widely in resources, teacher expertise, and student demographics. Future research could investigate scalable AI models that can be adapted to different educational contexts, ensuring that all students have access to quality AI-enhanced ESL learning (Lai & Shi, 2020).

2.5 Student Data Privacy and Ethical Implications

Data privacy and ethical considerations are central to using AI in ESL education, given AI's reliance on data-driven personalization. To provide customized feedback, AI systems often require extensive data on student performance, raising concerns about data protection and the ethical implications of data collection (Luo & Lee, 2022). Luo and Lee (2022) caution that AI in education involves sensitive student information, necessitating stringent privacy protections to prevent misuse and protect students' rights. Similarly, Lai and Shi (2020) emphasize the need for ethical guidelines that dictate how student data is collected, stored, and used in AI-driven educational tools.

Moreover, the ethical use of data in AI applications extends to ensuring transparency and accountability, as students and parents may need more awareness of how their information is used. Researchers advocate for more transparent communication regarding AI's data usage policies and emphasize the importance of obtaining informed consent from students and guardians (Chen et al., 2023). As educational technology continues to evolve, future research should explore the development of ethical frameworks and data protection standards that safeguard students' privacy while enabling the benefits of AI-driven personalization in ESL classrooms.

The literature reveals a significant gap in understanding AI's role in achieving holistic pedagogical goals within ESL classrooms. While studies have shown AI's effectiveness in supporting personalized learning at the level of basic language skills (e.g., grammar and vocabulary) (Wang & Tahir, 2020; Li et al., 2021), there is limited research on AI's ability to foster essential competencies such as critical thinking, intercultural communication, and authentic communicative skills, which are core to ESL pedagogy (Cheng & Yoon, 2022; Zhou & Zhao, 2021). Furthermore, few studies have explored the impact of AI on teacher roles, especially regarding preparedness and adaptability in various educational settings, or addressed issues of equitable access to AI resources across diverse socioeconomic contexts (Sun & Yang, 2022; García-Sánchez et al., 2022). Data privacy and ethical considerations remain primarily unaddressed, underscoring a need for frameworks that balance the benefits of AI personalization with students' rights to privacy (Luo & Lee, 2022). Future research should focus on developing AI models that integrate these broader educational needs, supporting practical and ethical deployment in ESL education.

3. Methodology

3.1 Research Design

This study employs a qualitative research design to explore the effectiveness and adaptability of artificial intelligence (AI) in ESL classrooms, mainly focusing on how AI tools align with pedagogical goals such as critical thinking, intercultural communication, and teacher-student interaction. The qualitative approach allows in-depth insights into participants' experiences, perspectives, and attitudes, providing rich, detailed data for understanding the complexities of AI's role in ESL pedagogy.

3.2 Data Collection Method

Data will be collected using semi-structured interviews with open-ended questions, enabling participants to express their views freely and provide nuanced responses about their experiences with AI in the classroom. The interview protocol consists of eight open-ended questions designed to explore participants' perceptions of AI's impact on language teaching and its adaptability to various instructional contexts. The questions aim to address personalization, equity, data privacy, and the challenges and opportunities of AI integration in ESL classrooms.

3.3 Participants

The study's participants include 15 English lecturers from various Politeknik Malaysia campuses. These lecturers are experienced in teaching ESL to diverse student groups and have had some level of exposure to AI tools in educational settings. The participants' familiarity with ESL pedagogy and AI integration provides valuable insights into AI's practical effectiveness and adaptability in real-world language instruction.

3.4 Research Setting

This study will be conducted at Politeknik Malaysia, a network of polytechnic institutions across Malaysia that offers English language programs for various technical and vocational disciplines. The institutional context provides a unique perspective on AI integration in an educational setting that values technical skills and language competence. It is an ideal setting to explore AI's adaptability across different learning environments.

3.5 Data Analysis

Data will be analyzed using thematic analysis to identify and categorize critical themes related to the research questions. The thematic analysis allows for systematic coding of participants' responses, leading to the development of themes that capture the central ideas across multiple interviews. The analysis process involves multiple stages: familiarization with the data, initial coding, theme identification, theme review, and refinement. Key themes are expected to emerge around personalization, AI's impact on critical thinking and communication skills, teacher readiness, ethical considerations, and equity of access to AI tools.

4. Findings and discussion

1. ESL teachers perceive the effectiveness of AI tools in enhancing language acquisition and communicative skills among students.

Effectiveness of AI Tools

This category highlights how AI tools are perceived to enhance language acquisition and communicative skills. They provide real-time feedback, accelerate learning progress, and make learning more engaging through interactive features. However, they are less effective for developing verbal communication and may lead to over-dependence.

"AI tools enhance students' language learning by providing personalized, real-time feedback and fostering independent practice." (R4)
"It enhances students' writing accuracy, but reliance might limit spoken fluency." (R15)

Adaptability in ESL Classrooms

This category focuses on how well AI fits into classroom contexts. AI tools are valued for their flexibility, accessibility, and ability to cater to diverse learning needs. However, challenges arise when students or teachers lack the knowledge to use AI effectively or when prompts are poorly constructed.

"AI allows students to learn at anytime and anywhere." (R5)
"They know and are aware of AI but are sometimes clueless about how it could assist them in their learning." (R3)

Impact on Creativity and Critical Thinking

AI inspires students to explore new ideas and approaches. However, overuse can hinder creativity and critical thinking by encouraging dependency and limiting collaboration. Students may refrain from discussions and rely on AI for answers.

"Students became less creative, and most answers are identical with no critical thinking or self-opinion." (R5)
"AI tools help students explore new things." (R7)

Comparison with Traditional Methods

This category compares AI-based methods with traditional classroom techniques. AI excels in offering personalized learning experiences and immediate feedback but needs more depth and interactivity from human-led teaching. A balanced approach is recommended.

"AI tools offer a more personalized approach… However, traditional teaching excels in fostering deeper understanding through nuanced, contextual explanations." (R4)
"Both play their own role in students' learning." (R14)

Encouragement of Independent Learning

AI fosters autonomy by providing tools and resources for self-directed learning. It encourages practice and immersion outside class, mainly through simulated real-life scenarios. However, students must actively engage for these benefits to materialize.

"Having a 'companion' that is always willing to talk to you… is invaluable compared to a traditional classroom." (R9)
"AI tools help students quickly learn new language concepts and correct errors through immediate feedback." (R15)

2. Challenges do ESL teachers encounter when adapting AI-driven tools in diverse classroom settings

Equity and Access Challenges

Many students and teachers need more access to AI tools due to cost, inadequate internet connections, and incompatible devices. These limitations prevent the widespread use of AI-driven tools in ESL classrooms.

"Not all students have access to AI tools." (R2)
"Slow internet connection and expensive tools." (R12)
"Most AI tools have limited features for the free version." (R15)

Over-reliance and Misuse of AI

Over-dependence on AI for learning tasks can hinder critical thinking, creativity, and the ability to engage in unscripted, real-world conversations. Some students bypass learning by overusing AI tools.

"Students are over-dependent on AI and fail to function without it." (R1)
"Students likely to use AI to bypass learning." (R6)
"Relying solely on AI might limit students' ability to handle spontaneous, unscripted conversations." (R1)

Training and Technical Expertise

Teachers often need more training and technical expertise to integrate AI tools effectively. Current training programs cover basic features but fail to provide in-depth strategies for classroom use.

"The training and resources for using AI tools effectively often feel limited." (R4)
"Not enough training was given to the lecturers." (R5)
"One of the biggest challenges is the need for technical expertise." (R11)

Balancing AI with Traditional Methods

Balancing AI integration with traditional teaching methods is challenging. AI provides convenience and feedback but lacks emotional intelligence, cultural awareness, and nuanced explanations of human interaction.

"AI lacks the emotional intelligence that a teacher brings." (R10)
"Balancing AI use with traditional methods can be difficult." (R4)
"It can't replace human interactions or teach cultural values on a meaningful level." (R6)

Adaptability and Classroom Integration

Adjusting AI use to suit diverse classroom needs, such as customizing tasks to reflect cultural relevance or aligning with curriculum goals, is essential for maximizing effectiveness. Teachers need to mix AI with peer activities.

"I adjusted my teaching by supplementing AI-based pronunciation exercises with peer-to-peer speaking activities." (R4)
"Encourage students to combine AI tools to get the intended result." (R1)
"Focus on specific activities for students." (R10)

Cost and Sustainability of AI Tools

Premium features of AI tools often require subscriptions, which can be a barrier for students and educators. Free versions are limited in scope, reducing their utility in achieving comprehensive educational outcomes.

"Most AI tools have limited features for the free version." (R15)
"I had to subscribe to the tools to use premium features for better outcomes." (R13)
"I was given the training but had to pay for it." (R1)

Integrating artificial intelligence (AI) into English as a Second Language (ESL) classrooms offers opportunities and challenges. AI tools provide personalized learning experiences, immediate feedback, and flexible resource access, enhancing language acquisition (Lo et al., 2024; Wei, 2023). However, their effectiveness depends on equitable access, proper training, and balanced integration with traditional teaching methods.

A significant challenge is ensuring all students have access to AI tools. Cost, limited internet connectivity, and

device compatibility hinder widespread adoption. Additionally, many AI tools offer limited features in their free versions, restricting their utility in educational settings (Lee et al., 2022). Teachers also face hurdles in integrating AI into their practices. Many educators must gain the necessary knowledge to use AI effectively, often relying on traditional methods. This gap highlights the need for comprehensive training programs beyond essential functions to provide in-depth strategies for meaningful classroom integration (Huang & Chen, 2022). Over-reliance on AI tools can impede the development of critical thinking and communicative skills. Students may depend on AI for tasks, leading to decreased creativity and spontaneous communication (Lo et al., 2024). Balancing AI with traditional teaching methods is crucial to maintaining these essential skills (Wei, 2023). Despite these challenges, AI offers benefits such as personalized learning experiences that adapt to each student's pace and proficiency level. AI tools provide immediate feedback and interactive practice, enabling students to refine their language abilities independently and outside the classroom (Huang & Chen, 2022; Lee et al., 2022).

In conclusion, addressing access, training, and integration challenges is essential. Providing educators with comprehensive training, ensuring equitable access, and thoughtfully combining AI with traditional methods can maximize AI's potential in ESL classrooms.

5. Implication of the Study

This study highlights the transformative yet complex role of AI in ESL classrooms. AI tools enhance personalized learning by adapting to individual student needs, offering real-time feedback, and increasing accessibility to language resources. However, disparities in access due to financial constraints, unstable internet, and device incompatibility limit these benefits for many students. Moreover, reliance on AI can inhibit critical thinking, creativity, and verbal communication skills, as students may become overly dependent on AI-generated outputs. Teachers' limited technical expertise further complicates the integration of AI tools, emphasizing the need for targeted professional development programs. Policymakers and educators should prioritize equitable access to AI and comprehensive training to create inclusive and effective ESL learning environments.

6. Recommendation for Future Study

Future research should address pressing challenges to optimize AI integration. First, studies on affordable AI solutions and improved digital infrastructure in underprivileged areas can help bridge accessibility gaps. Second, research should evaluate the long-term impact of structured training programs for educators, identifying strategies for better classroom integration. Third, a deeper investigation into AI's ability to support verbal communication and spontaneous interaction is needed to balance its current focus on written skills. Fourth, cultural and contextual adaptation of AI tools should be explored to ensure relevance across diverse ESL settings. Finally, future research should examine the impact of AI on cognitive skills, including critical thinking, problem-solving, and creativity, to understand its broader implications for language learning.

7. Conclusion

AI offers significant potential to enhance ESL education through adaptive learning experiences, immediate feedback, and flexible accessibility. However, challenges such as inequitable access, teacher readiness, and over-reliance on AI must be addressed to maximize its effectiveness. By combining AI with traditional methods and tailoring its use to specific educational contexts, educators can strike a balance that fosters comprehensive language development. A collaborative effort among educators, policymakers, and developers is essential to ensure AI becomes a sustainable and impactful tool for ESL education. Future research should focus on strategies to make AI tools more inclusive, practical, and culturally relevant for diverse learners.

References

Chen, X., Zhang, Y., & Liu, J. (2023). The role of AI in sociocultural language learning contexts. *Journal of Educational Technology*, 18(2), 45-60.

Cheng, L., & Yoon, S. (2022). Bridging gaps in communicative competence with AI tools. *Language Learning in the Digital Age*, 12(4), 389-402.

García-Sánchez, M., López, P., & Ruiz, C. (2022). Teacher preparedness for integrating AI in ESL classrooms. *Teaching and Technology Quarterly*, 24(3), 112-128.

He, L., Wang, X., & Kim, J. (2023). AI and its influence on teaching methodologies in ESL classrooms. *Journal of Language Education*, 21(5), 67-89.

Kim, Y., & Lee, S. (2021). Digital equity and access to AI tools in education. *Technology in Education Review*, 9(2), 13-25.

Lai, P., & Shi, X. (2020). Ethical implications of AI in education: A focus on data privacy. *International Journal of Educational Ethics*, 5(1), 19–32.

Li, H., Wei, J., & Sun, Z. (2021). Personalized learning in ESL through AI applications. *Journal of Advanced Learning Technologies*, 8(3), 234-245.

Luo, Z., & Lee, J. (2022). Balancing AI-driven personalization with data privacy in classrooms. *Educational Research and Practice Journal*, 10(4), 78-90.

Park, M., & Son, J. (2021). Barriers to AI adoption in ESL teaching: A teacher's perspective. *Language Teaching Innovations*, 15(3), 120-135.

Sun, Y., & Yang, G. (2022). Addressing disparities in access to AI tools in rural education. *Journal of Educational Policy and Practice*, 14(1), 56-70.

Wang, Z., & Tahir, M. (2020). The impact of AI on language learning outcomes. *Applied Linguistics and Technology Review*, 7(2), 98-113.

Zhou, T., & Zhao, F. (2021). Challenges in using AI for teaching cultural nuances in language. *Intercultural Communication and Education*, 9(1), 76–89.

Fabrication of Wheelbarrow Sprayer

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Abstract

Wheelbarrow Sprayer is a product based on watering and fertilizing, which most of agricultural industry uses on it as daily basis but based on our research some of gardeners still use an outdate knapsack spray which may require more energy and take longer time. The objective of our product is to ease the burden of a gardener and save more time. This product has been assessed using three types of pumps and each of them has its function and uses an electric pump powered by a 12 v battery to control the flow of water. There are two ways of turning it on. The first is by switching on the power button and the second is rotate the spindle clockwise to change the flow speed to its maximum. This product also can hold up to 3 – 5 hours of progress until the battery runs out, the tank also can consist of up to 25 liters. The result of our project proved that it is easy to use and control, and the velocity of the water generated by the electric pump can save more time in spraying. In conclusion, this product is very suitable for the agricultural industry and hospitality industry, for example planting site that use watering and fertilizing technique daily in industry.

Keywords: - wheelbarrow, sprayer, watering

1. Introduction

Farmers need advanced technology and equipment to do their watering and fertilizing job. This project is about 'Wheelbarrow Sprayer'. The project is suitable for the theme "green" in the tourism and hospitality industries, where we use green elements that would not harm the environment. We considered making this project easier for the farmer work in multiple aspects. There are many types of places that we can use for this project, which is a farm and a garden, based on the environment and geography.

At this modern age of globalization, technology will be more advanced from time to time to make work processes more efficient and perfect. So, as people that live with advanced technology, we need to adapt to it quickly so that we will not be outdated and left behind. In the agricultural industry, farmers must use a few methods to water, fertilize, and pesticide the plant, such as a watering can, backpack sprayer, and more. These methods waste a lot of time and energy just for watering. Not only that, but it can also have a negative impact on the worker's health, such as back pain and leg strain. Hence, as engineers, it has become our responsibility to prevent these things and provide them with good equipment and technology to ease their work.

To solve the problem, we have worked on a project called "Wheelbarrow Spray." We designed this project to be simple to use and to serve multiple purposes. According to our analysis, based on the flow rate, this project has a higher rate than other tools or equipment that are usually used by farmers. So, based on the analysis, our project will save more time than most of the tools. The farmer's task will be done early, and there will be more production in the agricultural industry.

1.1 Objective

The objective of this project is:
1. To design the wheelbarrow sprayer using Autodesk Inventor.
2. To fabricate the wheelbarrow sprayer based on the design.
3. To test the functionality ofwheelbarrow sprayer

1.2 Scope Project

The scopes of this project are:

1. To focus on flat surface.
2. Supplying pressure without consuming more energy.
3. Give more water space.
4. Assessed with three different pumps with each of it has its own function.

2. Literature Review

Agricultural watering or irrigation is the agricultural process of applying controlled amounts of water to land to assist in the production of crops, as well as to grow landscape plants and lawns, where it may be known as watering. Agriculture that does not use irrigation but instead relies only on direct rainfall is referred to as rain-fed. The use of agricultural watering makes it possible to grow fruits and vegetables and raise livestock, which is a main part of our diet. External and fertilizer applications external, crop cooling (for example, light irrigation), and frost control. According to the United States Geological Survey (USGS), water used for irrigation accounts for nearly 65 percent of the world's freshwater withdrawals excluding thermoelectric power. There are 330 million acres of land used for agricultural purposes in the United States that produce an abundance of food and other products

When agricultural water is used effectively and safely, production and crop yield are positively affected. A decrease in applied water can cause production and yield to decrease. Management strategies are the most important way to improve agricultural water use and maintain optimal production and yield. The key is to implement management strategies that improve water use efficiency without decreasing yield.

Watering can is the most common product used by gardener in watering plants. It is easy to use, small and easier to carry it everywhere. But the small size can cause a problem in which the gardener needs to refill it every time it ran out of water, and this will take a long time and energy. Not just that, when the watering can is filled with water it has more weight and this will cause the gardener hand lame by carrying it.

For a middle range product, this Manual Knapsack Sprayer is the most common used product. It has a wide tank up to 16 Liter which make it become gardeners favorite. But the wide tank has its own disadvantage which will make it heavier, and this will cause the gardener back in pain. It also has the same problem with handheld tank sprayer in the pumping act that will take more energy from the gardener.

3. Methodology

In designing and fabrication of this farmer's spray tool wheelbarrow, a flow chart of method needs to be used to design and build the. Farmer's spray tool wheelbarrow. First, a process planning must be charted out. This chart is used as a guideline to be followed, so that the final product meets the requirement and time could be managed perfectly. This process will determine the efficiency of the project to be completed. Regulating and analyzing these steps is very important as each of it has its own criteria to be followed.

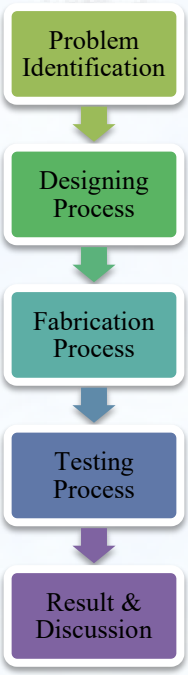

Figure 1: Flowchart of the making of Wheelbarrow Sprayer

4. Finding

The design that we select are the most suitable for spraying and fertilizing, it suits the criteria of the theme given. The design we select also will work perfectly and fit the application of multi sprayer. Such as being able to be spraying with 3 different hoses with each of them having its own function and use an electric pump powered by 12 v battery. The characteristic features of our design been made in Autodesk inventor and Fusion 360, this is to show the design of each part of our project to make it more researchable and more detailed so it can help with the progress of our project.

A wheelbarrow sprayer is used to spray plants in the flower and vegetable gardens. Apart from the source of electricity produced by the battery, the operation is easily carried out using human power. When using this wheelbarrow sprayer, turn on the power button in the power box. There are three different valves, each for a different sprayer. Turn the valve clockwise to activate the sprayer you want to use, and the sprayer will work with the help of the pump and battery power. The wheelbarrow sprayer will then be pushed by humans according to the desire to spray or water the plants because the wheelbarrow sprayer will operate as long as the power button is not turned off, the battery runs out, and the watering medium runs out. Based on my observations, this wheelbarrow sprayer successfully sprays and waters plants and flowers without causing any harm or injury.

a) Design b) Product

Figure 2: Wheelbarrow Sprayer

Table 1: Specification of Wheelbarrow Sprayer

Weight	10 kg
Dimension	0.6m x 1.3m x 0.8m
Function	Watering or fertilizing
Voltage	12 V

5. Conclusion

In conclusion, through this project of the Wheelbarrow Sprayer leads to allow all users especially gardener to ease their burden when doing a task of watering and fertilizing. Overall, our wheelbarrow sprayer has achieved the objectives of the project, which were to design and develop our pump system in terms of water pressure and flow rate velocity.

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References

Ahmad, I. [Ibrahim Ahmad]. (2020, September 30) Cara guna power sprayer Mitsubishi Kava [Video]. YouTube. https://youtu.be/aBy5E6Ylz5c.

DIY Lawrence Channel. (2020, September 4). Rechargeable Power Sprayer Homemade [Video]. YouTube. https://youtu.be/YvaSFJLW8DM.

JP Llani. (2021, September 5). 12v 80w 130psi 5.5l/min Portable Water Pump test overview [Video]. YouTube. https://youtu.be/zW0MJhpqyto.

Bourne, Val (2011). The ten-minute gardener's vegetable growing diary. Great Britain: Transworld. p. 12. ISBN 978-0593066713.

Peranan Subjek Sukan Dalam Membentuk Sikap Kepemimpinan Dan Kerjasama di Kalangan Pelajar Politeknik Kota Kinabalu

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Abstrak

Penyelidikan ini bertujuan untuk mengenal pasti sejauh mana subjek sukan yang diajar di Politeknik Kota Kinabalu (PKK) memberi kesan kepada kualiti kepimpinan dan kerjasama dalam kalangan pelajar. Dengan menggunakan pensampelan rawer mudah dan menggunakan metodologi tinjauan, seramai 214 pelajar PKK diberi peluang untuk menyertai kajian ini. Instrumen kajian adalah soal selidik yang diedarkan secara dalam talian menggunakan Google Form. Data yang diperoleh akan dianalisis secara deskriptif untuk mendapatkan nilai min. Hasil kajian menunjukkan majoriti pelajar bersetuju bahawa subjek sukan dapat membentuk sikap kepimpinan dan kerjasama dalam kalangan pelajar. Berdasarkan kepada dapatan ini, pelaksanaan kokurikulum sukan dilihat berjaya mendidik pelajar dari aspek insaniah melalui penglibatan mereka dalam pendidikan sukan. Dapatan ini juga dapat dijadikan sebagai kayu pengukur bagaimana aktiviti pendidikan sukan di laksanakan di Politeknik Kota Kinabalu.

Kata kunci: Subjek sukan, sikap kepimpinan, kerjasama

1. Pengenalan

Pendidikan Sukan ialah kurikulum dan model pengajaran yang direka untuk penyampaian dalam pendidikan jasmani. Aktiviti sukan dianggap mempengaruhi nilai, sikap dan tingkah laku ahli melalui proses pembelajaran. Banyak kajian menjelaskan aktiviti dalam apa sahaja bidang sukan memainkan peranan penting membentuk ciri peribadi yang positif seperti kepimpinan dan sikap kerjasama dalam kalangan pelajar. Dalam hal ini, peranan sukan tidak boleh diabaikan; adalah dinamik, berkuasa dan sangat popular. Kajian Dobosz dan Beaty (2010) berpendapat bahawa aktiviti sukan berkeupayaan untuk membawa kepada pencapaian matlamat bersama yang lain. Di samping itu, peserta sukan banyak pesaing untuk bersaing untuk tugas kepimpinan seperti kumpulan pelajar kapten atau carian pilihan raya kerajaan pelajar (Dobosz & Bits, 2010). Terdapat juga kajian menunjukkan kualiti kepimpinan yang agak lebih baik daripada mereka yang tidak mengambil bahagian dalam aktiviti sukan (Cruz et al., 2014).

Menurut Wan Daud et al. (2018), penglibatan pelajar dalam latihan sukan dan hubungannya dengan akademik adalah saling berkaitan. Bukan sahaja kerana pendidikan sukan adalah sebahagian daripada kurikulum, namun ianya juga dapat membantu dalam prestasi akademik. Ini kerana dalam subjek sukan, pelajar akan aktif dalam sukan dan mengambil pengalaman aktiviti fizikal, serta melaksanakan aktiviti subjek sebagai penilaian berterusan seperti menjadi ketua penyelaras aktiviti kumpulan, menjadi jurulatih, pegawai, publisiti dan ahli jawatankuasa sukan. Justeru, mendedahkan pelajar kepada peluang untuk mempelajari pelbagai kemahiran. Namun begitu, timbul persoalan, adakah subjek ini akan membantu pelajar mendalami kemahiran kepimpinan dan sikap kerjasama atau sekadar untuk lulus dalam subjek ini. Oleh yang demikian, kajian ini dijalankan secara empirikal untuk menilai sendiri sejauh mana subjek sukan yang mereka ambil di semester 1 pengajian benar-benar meningkatkan sikap kepimpinan dan kerjasama dalam kalangan pelajar. Kajian ini sangat penting kepada institusi TVET khususnya Politeknik bagi menambah baik pengisian dalam pembelajaran subjek sukan.

2. Objektif Kajian

Kajian ini akan menilai sejauh mana keberkesanan subjek Sukan yang ditawarkan kepada pelajar Politeknik Kota Kinabalu dalam;

1. Membentuk sikap kepimpimpinan dalam diri pelajar.
2. Memupuk semangat kerjasama dikalangan pelajar.

3. Sorotan Kajian

Subjek sukan memainkan peranan penting dalam memupuk kepimpinan dan kerjasama dalam kalangan pelajar (Mohamed, 2014; Hamzah et al., 2022). Ini kerana dalam subjek sukan akan diterapkan pembelajaran dan aktiviti yang memerlukan kerja berpasukan, di mana individu belajar untuk bekerjasama ke arah matlamat bersama iaitu mencapai kemenangan (Mat et al., 2022). Oleh yang demikian, pelajar yang bermain dalam pasukan mesti berkomunikasi dengan berkesan, boleh mempercayai rakan sepasukan mereka dan boleh memahami peranan setiap ahli kumpulan untuk berjaya. Persekitaran pembelajaran sukan tidak seperti subjek yang lain kerana subjek sukan akan menerapkan kualiti kepimpinan seperti komunikasi (Lussier & Kimball, 2023), membuat keputusan dan penyelesaian masalah. Oleh yang demikian, dalam pelajaran sukan, aspek kepimpinan melalui teladan, ketua boleh memberi inspirasi kepada rakan sebaya mereka, memotivasikan mereka untuk melakukan yang terbaik, dan memupuk rasa perpaduan dalam pasukan (Robin et al., 2020).

Selain itu, subjek sukan juga membuka peluang yang luas kepada pelajar untuk mengambil peranan kepimpinan di dalam dan di luar padang. Mereka akan diajar untuk mengetuai pasukan, menganjurkan acara atau melatih pelajar (Maksymchuk et al., 2020) yang lebih muda untuk mengembangkan kemahiran kepimpinan mereka. Pengalaman pembelajaran sukan ini membantu pelajar membina keyakinan (Falcao et al., 2020), daya tahan dan empati (Farias et al., 2020) semasa mereka belajar untuk menyokong dan membimbing rakan sepasukan mereka. Selain itu sukan sering terlibat dengan keadaan di mana peserta perlu menghadapi cabaran. Justeru sikap ketabahan dan kebolehsuaian merupakan kualiti yang penting untuk kepimpinan yang berkesan dalam apa jua konteks. Secara keseluruhannya, subjek sukan berfungsi sebagai platform untuk pelajar memupuk kualiti kepimpinan dan membina ikatan yang kukuh melalui kerjasama yang boleh memberi manfaat kepada mereka dari segi akademik dan peribadi.

4. Metodologi Kajian

Kajian berbentuk tinjauan untuk menilai peranan subjek sukan dalam membentuk sikap kepemimpinan dan kerjasama dijalankan dengan menggunakan pendekatan kuantitatif. Sampel kajian terdiri daripada 211 pelajar PKK dari semua jabatan. Latar belakang responden adalah seperti yang ditunjukkan dalam Jadual 1. Instrumen kajian menggunakan soal selidik 5 skala likat dan diedarkan secara dalam talian. Bagi menilai sejauh mana peranan subjek sukan, nilai purata min yang diperoleh daripada analisis menggunakan SPSS akan diterjemahkan kepada empat kategori, iaitu daripada rendah kepada tinggi. Tafsiran tahap adalah berdasarkan skor min ditunjukkan dalam Jadual 2, yang dipetik dalam kajian oleh Ngadiman et al. (2019).

Jadual 1: Tafsiran Skor Min

Skor min	Tafsiran
1.00– 1.99	Lemah
2.00– 2.99	Rendah
3.00– 3.99	Sederhana
4.00– 5.00	Tinggi

5. Hasil Kajian

5.1 Latar Belakang Responden

Jadual 2 menunjukkan latar belakang responden dari semua jabatan di Politeknik Kota Kinabalu, Sabah. Seramai 211 pelajar mengambil bahagian dalam kajian ini yang terdiri daripada pelajar lelaki (60.2 peratus) dan perempuan (39.8 peratus). Majoriti pelajar adalah daripada semester 2. Sekiranya dilihat daripada prestasi akademik pelajar, majoriti pelajar mempunyai CPGA yang baik iaitu melebihi 3.00.

Jadual 2: Latar Belakang Responden

Item		n	%
Jantina	Lelaki	127	60.2
	Perempuan	84	39.8
Semester	1	59	28.0
	2	92	43.6
	3	13	6.2
	4	31	14.7
	5	11	5.2
	6	5	2.4
Jabatan	JKA	53	25.1
	JKE	46	21.8
	JKM	27	12.8
	JP	69	32.7
	JPH	16	7.6
HPNM	1.00 - 2.00	1	0.5
	2.00 - 2.99	32	15.2
	3.00 - 3.33	31	14.7
	3.43 - 3.67	44	20.9
	3.68 - 4.00	44	20.9
	Semester 1 (Tiada HPNM)	59	28.0

5.2 Peranan Subjek Sukan Terhadap Sikap Kepimpinan

Jadual 3 menunjukkan kesan subjek sukan terhadap sikap kepimpinan dalam kalangan pelajar. Berdasarkan kepada hasil analisis, semua item berada pada tahap tinggi. Ini menunjukkan bahawa majoriti pelajar bersetuju subjek sukan dapat membentuk sikap kepimpinan dalam kalangan pelajar.

Jadual 3: Kesan Subjek Sukan Terhadap Sikap Kepimpinan

Pemboleh ubah/ item kajian	S.Piawai	Skor Min	Tahap
Memupuk Tanggungjawab: Membolehkan pelajar mengambil tanggungjawab sebagai pemimpin pasukan.	0.971	4.203	Tinggi
Membangunkan Kemahiran Pengarahan: Memberi peluang kepada pelajar untuk memberi arahan yang jelas dan efektif kepada ahli pasukan.	0.964	4.213	Tinggi
Menggalakkan Kreativiti dan Penyelesaian Masalah: Mendorong pelajar untuk menggunakan kreativiti dalam membangunkan strategi dan penyelesaian masalah.	0.958	4.194	Tinggi
Boleh Menjadi Contoh: Menjadi contoh yang baik untuk ahli pasukan dengan menunjukkan sikap disiplin dan semangat kerja keras.	0.921	4.255	Tinggi
Membangunkan Kesedaran Sosial: Membantu pelajar memahami pentingnya kerjasama dan keperluan untuk mengambil kira kepentingan orang lain.	0.935	4.251	Tinggi

5.3 Peranan Subjek Sukan Terhadap Sikap Kerjasama

Jadual 4 menunjukkan kesan subjek sukan terhadap sikap kerjasama dalam kalangan pelajar. Berdasarkan kepada hasil analisis, semua item berada pada tahap tinggi. Ini menunjukkan bahawa majoriti pelajar bersetuju subjek sukan dapat membentuk sikap kerjasama dalam kalangan pelajar.

Jadual 4: Kesan Subjek Sukan Terhadap Sikap Kerjasama

Pemboleh ubah/ item kajian	S.Piawai	Skor Min	Tahap
Membentuk Kepercayaan: Membina kepercayaan antara ahli pasukan untuk bergantung kepada satu sama lain.	0.966	4.237	Tinggi
Menggalakkan Komunikasi yang Berkesan: Memberi peluang kepada pelajar untuk berlatih berkomunikasi dengan jelas dan efektif.	0.973	4.246	Tinggi
Membangunkan Rasa Persaudaraan: Membina hubungan yang kuat dengan rakan sepasukan.	0.941	4.255	Tinggi
Menanam Semangat Kolaboratif: Menekankan kerjasama daripada kejayaan individu.	0.923	4.265	Tinggi
Mengatasi Cabaran Bersama: Menghadapi cabaran bersama sebagai pasukan dan mengatasi rintangan dengan bersama-sama.	0.970	4.251	Tinggi

6. Kesimpulan

Institusi TVET khususnya Politeknik Malaysia merupakan salah satu tempat yang membekalkan tenaga kerja ke pasaran (Ramdan & Abd Said, 2023). Subjek sukan yang telah diajarkan kepada para pelajar di semester 1 adalah bertujuan bagi menggalakkan pelajar berpeluang bersosial sesama rakan mereka . Dengan adanya kursus kokurikulum ini, graduan yang dihasilkan oleh Politeknik Malaysia khususnya di Politeknik Kota Kinabalu mempunyai nilai tambah bukan sahaja dari segi kemahiran dalam bidang pengkhususan akademik malah kebolehan sosial dan interpersonal. Subjek sukan ini berjaya membentuk sikap kerjasama secara berkumpulan sesama pelajar. Selain itu ia juga telah membentuk nilai kepimpinan dalam diri pelajar dengan adanya aktiviti yang dijalankan di kelas. Hasil kajian mendapati semangat kolaboratif adalah inti utama yang mendapat skor paling tinggi dikalangan pelajar. Aspek ini menekankan kerjasama daripada kejayaan individu sekaligus menunjukkan kerjasama berkumpulan dapat diterapkan dalam diri pelajar.Pelajar arif bahawa kerja dan tugasan berkumpulan sebagai medium utama penilaian dalam pengajian mereka di Politeknik Kota Kinabalu (Elnie & Lynnie, 2021). Pelajar telah didedahkan dengan kemahiran kepimpinan dan semangat kerja berpasukan kerana elemen tersebut terkandung dalam penilaian. Antara penemuan penting yang diperolehi daripada kajian ini adalah subjek sukan yang diajarkan berjaya membentuk pelajar dari segi kreativiti dan penyelesaian masalah.Sumbangan ketara yang berimpak daripada nilai-nilai yang secara langsung diajarkan di dalam subjek sukan adalah membina jatidiri seorang individu dan berkebolehan dalam aspek kepemimpinan. Pelajar memiliki sifat holistik dan kritis yang mampu untuk menjadi seorang pemimpin dan seterusnya pekerja yang baik apabila mereka keluar nanti.Kemahiran kepemimpinan dan softskill perlu diterapkan pada sepanjang masa bukan sahaja pada subjek sukan malah pada kursus lain juga. Dengan ini pelajar akan menjadi orang yang berguna sekaligus menjadi aset bernilai kepada masyarakat dan negara.

Rujukan

Dobosz, R.P., & Beaty, L.A. (2010). The relationship between athletic participation and high school students' leadership ability. *Adolescence,* 34(133): 215-220.

Elnie, H.Y and Lynnie J. (2021). Students' Experience of Group Work and Group Assessment in Tertiary Education. *Jurnal Pengajian Umum Journal of General Studies (2) 2021 ISSN: 2773-5060*

Falcao, W. R., Bloom, G. A., & Sabiston, C. M. (2020). The impact of humanistic coach training on youth athletes' development through sport. *International Journal of Sports Science & Coaching*, *15*(5-6), 610-620.

Farias, C., Wallhead, T., & Mesquita, I. (2020). "The project changed my life": Sport education's transformative potential on student physical literacy. *Research quarterly for exercise and sport*, *91*(2), 263-278.

Hamzah, I. S., Zin, S. A. M., Jamal, M. B., Sarifin, M. R., & Kamarudin, L. A. (2022). The Role of Voluntary Activitiy in Nurturing Student's Soft Skills: Peranan Aktiviti Sukarela dalam Memupuk Kemahiran Insaniah Mahasiswa. *Perspektif Jurnal Sains Sosial dan Kemanusiaan*, *14*, 67-80.

Lussier, R. N., & Kimball, D. C. (2023). *Applied sport management skills*. Human Kinetics.

Maksymchuk, B., Gurevych, R., Matviichuk, T., Surovov, O., Stepanchenko, N., Opushko, N., & Maksymchuk, I. (2020). Training future teachers to organize school sport. *Revista Romaneasca Pentru Educatie Multidimensionala*, *12*(4), 310-327.

Mat, S. B., Rasyid, N. M., Abd Razak, N., & Aziz, S. A. (2022). Tahap efikasi kolektif dan kesepaduan pasukan atlet hoki remaja Malaysia. *Jurnal Penyelidikan Dedikasi*, *20*(1), 47-74.

Mohamed, M. F. (2014). Penerapan kemahiran insaniah dalam konteks membina insan berkepimpinan di kalangan pelajar melalui aktiviti kokurikulum di universiti. In *Seminar Penyelidikan Universiti Tun Hussien Onn Malaysia, October* (pp. 1-11).

Ngadiman, D. W. T., Yacoob, S. E., & Wahid, H. (2019). Tahap Harga Diri Kumpulan Berpendapatan Rendah yang Berhutang dan Peranan Organisasi dalam Sektor Perladangan. *Melayu: Jurnal Antarabangsa Dunia Melayu*, *12*(2), 238-254.

Ramdan.A & Ambotang A.S (2023). Tahap Kemahiran Industri Dalam Kalangan Pelajar-Pelajar Politeknik Kota Kinabalu, Sabah. *Kinabalu Multidisciplinary Academis Research Journal, 1st Edition, e-ISSN:2976-3606*

Robijn, W., Euwema, M. C., Schaufeli, W. B., & Deprez, J. (2020). Leaders, teams and work engagement: a basic needs perspective. *Career Development International*, *25*(4), 373-388.

Zafar, K., & Gill, S. A. (2023). Impact of Leadership Qualities on Sports Participation Among University Athletes of Lahore. *International" Journal of Academic Research for Humanities"*, *3*(1), 13-24.

Self-Calibration of a Multipurpose Hydraulic Flume

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Abstract

The accuracy of flow measurements in open-channel hydraulics is crucial for both engineering applications and educational purposes. In the *DCC40172 Structure, Hydraulics, and Water Quality Laboratory* course, the multipurpose hydraulic flume plays a vital role in teaching students about specific energy and flow types. However, the flume at Politeknik Kota Kinabalu has not undergone calibration since 2010, resulting in potential inaccuracies due to wear and deformation, particularly in its plastic Crump weir, installed in 2003. Plastic is valued for its moldability and affordability but has shown susceptibility to cracking and deformation under prolonged use. This study investigates whether alternative materials, such as wood and cement, can provide better durability and performance while maintaining the flume's operational integrity. Through self-calibration using the volume/time (V/t) method, the hydraulic performance of wood, plastic, and cement Crump weirs was assessed under various flow conditions. The findings demonstrated that despite material differences, geometric consistency was the primary determinant of accurate specific energy measurements. Alternative materials, particularly wood and cement, proved reliable, offering potential replacements for the aging plastic weir. This research underscores the importance of regular calibration and material innovation to ensure the continued functionality of hydraulic flumes, ultimately enhancing student learning outcomes and laboratory efficiency.

Keywords: - Specific Energy, Open Channel Flow, Hydraulic Calibration

1. Introduction

Precise flow measurement in open-channel hydraulics is critical for both engineering applications and academic purposes. This accuracy is particularly emphasized in courses like DCC40172 Structure, Hydraulics, and Water Quality Laboratory, where students engage in experimental analyses of specific energy and flow types to enhance their understanding of hydraulic principles (Chanson, 2004; Sturm, 2010). Multipurpose hydraulic flumes play a central role in such experiments, offering a controlled environment to simulate open-channel flows. However, the reliability of these flumes depends on their regular calibration and the integrity of their components, particularly Crump weirs.

At Politeknik Kota Kinabalu, the existing hydraulic flume has not undergone calibration since 2010 due to limited maintenance budgets, as confirmed by laboratory coordinator En. Anuar. The plastic Crump weir, installed in 2003, has shown signs of deformation and cracking, which compromises measurement accuracy. Plastic is often favored for its moldability and cost-effectiveness, but its susceptibility to wear highlights the need for exploring alternative materials like wood and cement that are durable and readily replaceable (Henderson, 1966).

This study aims to validate the use of alternative materials through a self-calibration process within the uncalibrated flume. By comparing the hydraulic performance of wood, plastic, and cement Crump weirs, this research seeks to ensure accurate flow measurement and provide sustainable solutions for laboratory equipment maintenance (Kraatz & Mahajan, 1975). Such advancements could significantly enhance the learning experience for students while promoting long-term functionality in hydraulic laboratories.

1.1 Background of Study

In hydraulic engineering, accurate flow measurement is essential for a wide range of applications, including water resource management, irrigation systems, and environmental monitoring (Abu-Taleb et al., 2017). The Crump weir, a widely used flow measurement device in open-channel flow studies, serves as a key component in educational

laboratory settings, such as the DCC40172 Structure, Hydraulics, and Water Quality Laboratory at Politeknik Kota Kinabalu. The Crump weir, with its specific geometric design, enables the determination of flow rates based on specific energy, a vital concept in understanding flow behavior in open channels (Chow, 1959).

However, like any measurement instrument, Crump weirs face the challenges of wear and degradation over time. The multipurpose hydraulic flume at Politeknik Kota Kinabalu has not undergone calibration since 2010, and one of its key components, a plastic Crump weir, has shown signs of deformation, cracking, and material degradation. These issues reduce its accuracy in flow measurements, potentially leading to discrepancies in data used for both teaching and research purposes. Plastic was originally chosen for its low cost and ease of molding, but its durability under constant hydraulic stress remains a concern (Rashid et al., 2018).

To address these issues, this study aims to explore alternative materials, such as wood and cement, to replace the existing plastic Crump weir. Wood and cement are more durable, stable, and potentially less prone to deformation under hydraulic pressures, thus ensuring more accurate and reliable flow measurements (Kumar et al., 2021). By conducting self-calibration on the hydraulic flume using the volume/time (V/t) method, this study will assess the performance of various materials in enhancing the accuracy of specific energy and flow measurements, thus ensuring the continued functionality of the laboratory equipment.

1.2 Objectives

By meeting these objectives, this study will contribute to optimizing the hydraulic performance of the flume system used in the *DCC40172 Structure, Hydraulics, and Water Quality Laboratory* and improve its application in teaching and research. The objectives of this study are outlined as follows:

1. **To assess the performance of different materials (plastic, wood, and cement) in Crump weir applications**: This objective aims to evaluate how varying material compositions impact the measurement accuracy in open-channel flow. The focus will be on the ability of each material to withstand hydraulic forces, including deformation and wear over time. This will help identify more durable materials for Crump weirs that can maintain the accuracy of flow measurements in hydraulic systems (Chow, 1959; Kumar et al., 2021).
2. **To conduct a self-calibration of the hydraulic flume**: Given that the hydraulic flume has not undergone calibration since 2010, this study aims to perform self-calibration using the volume/time (V/t) method. The goal is to verify the accuracy of flow rate measurements and to calibrate the system for current use in laboratory experiments (Abu-Taleb et al., 2017).
3. **To analyze the effect of material degradation on specific energy measurements**: This objective will investigate whether materials, particularly plastic, experience significant degradation, such as cracking or warping, which could impact the measurement of specific energy in open-channel flow systems. The study will determine how such degradation affects flow measurements and suggest material improvements for more reliable performance (Rashid et al., 2018).
4. **To determine the potential of wood and cement as alternative materials for Crump weirs**: The study will explore whether wood and cement provide better durability and performance under hydraulic pressure compared to plastic, with the goal of recommending suitable replacements for the aging plastic Crump weir currently used in the laboratory (Kumar et al., 2021).

1.3 Scope

The scope of this study is to evaluate the hydraulic performance and calibration of the multipurpose hydraulic flume used in the DCC40172 Structure, Hydraulics, and Water Quality Laboratory, focusing specifically on the Crump weir for open-channel flow measurement. The study investigates the following key areas:

1. Material Performance Evaluation: This research focuses on assessing the performance of different materials used for Crump weirs—plastic, wood, and cement—focusing on their ability to maintain accuracy in flow measurement and their susceptibility to degradation over time. The study aims to explore the use of newer materials as alternatives to the aging plastic weir, which has shown signs of cracking and deformation. By evaluating the hydraulic performance of these materials under various flow rates, the study provides insight into their potential for replacing plastic Crump weirs.

2. Self-Calibration of the Flume System: Given that the flume has not been calibrated since 2010, this research will involve the self-calibration of the hydraulic flume using the volume/time (V/t) method. This will ensure accurate flow rate measurements and the reliability of experimental results. Self-calibration is essential for maintaining consistent measurement conditions in hydraulic experiments.
3. Flow and Specific Energy Analysis: The study will also focus on analyzing the specific energy in open-channel flow and how it varies with flow rate under different weir materials. The goal is to determine how the material type affects the specific energy and flow type, including identifying subcritical and supercritical flow conditions.
4. Durability and Deformation Assessment: The research will examine whether materials such as plastic undergo significant deformation over time, potentially affecting their performance in flow measurement. This aspect is particularly important for identifying materials with higher durability and stability under varying flow conditions.

The findings of this study will inform future applications of Crump weirs in hydraulic systems, especially in laboratory and field settings, where durability, cost-effectiveness, and reliable flow measurements are crucial.

2. Literature Review

Hydraulic flumes are critical tools in water resources engineering, serving applications such as flow measurement, sediment transport analysis, and hydraulic structure testing. Among the various flume types, self-calibrating hydraulic flumes offer a promising solution to improve accuracy and efficiency while reducing the need for external calibration under diverse flow conditions. This paper investigates the self-calibration capabilities of multipurpose hydraulic flumes, emphasizing their potential to overcome limitations associated with conventional designs.

The literature highlights significant advancements in flume design, operation, and performance evaluation, particularly focusing on the integration of innovative calibration mechanisms. Despite these developments, challenges persist in achieving reliable calibration under fluctuating flow rates and non-ideal environmental conditions. This review summarizes key studies on hydraulic flume performance, calibration methodologies, and material considerations, identifying critical gaps in the context of self-calibrating designs.

Conventional hydraulic flumes, while accurate in controlled settings, often require extensive external calibration to maintain precision. Studies have extensively documented the challenges of achieving reliable flow measurement in flumes, including:

- **Al-Khateeb et al. (2010)**: Examined modifications to hydraulic structures, such as crest shapes, emphasizing their effects on flow behavior under varying conditions.
- **Wessels and Rooseboom (2009)**: Proposed methods for determining discharge coefficients for flumes in natural rivers, offering insights into geometric impacts on accuracy.
- **Sibale et al. (2023)**: Compared flume types, noting that while traditional flumes like Crump weirs achieve reasonable accuracy (±10%), more advanced designs like RBC flumes achieve ±2% accuracy.
- **AL-Naely et al. (2019)**: Explored structural modifications for energy dissipation, demonstrating the potential for enhanced flow performance through design optimization.

However, these studies primarily focused on calibrated environments, neglecting the complexities of self-calibration in dynamic and non-calibrated settings. Material selection significantly influences hydraulic flume performance. While concrete remains a reliable choice for durability, plastic and composite materials have shown promise for precise flow measurements and adaptive calibration mechanisms.

Multipurpose hydraulic flumes cater to diverse applications, including:

- **Flow Measurement and Analysis**: Enables precise discharge calculations essential for hydrological studies and infrastructure design.
- **Sediment Transport Studies**: Facilitates the examination of erosion, sedimentation, and river morphodynamics under controlled conditions.
- **Energy Dissipation Research**: Supports testing of hydraulic structures, such as weirs and spillways, to evaluate their efficiency in energy management.

- **Flood Simulation and Management**: Provides insights into flood behavior and mitigation strategies through scaled modeling.

Self-calibrating designs further enhance these applications by ensuring reliability and reducing operational complexity.

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$$A = B+C \qquad (1)$$

3. Methodology

This study evaluates the self-calibration capability of a multipurpose hydraulic flume, focusing on Crump weirs made from different materials. The methodology is designed to achieve precise flow measurement in a non-calibrated laboratory environment by employing the volume/time (V/t) method and analyzing the hydraulic performance of the flume. Below are the steps undertaken in this research:

1. Preliminary Inspection and Flume Preparation

The hydraulic flume was inspected to ensure it was suitable for testing and calibration:

- **Inspection**: Identified structural issues such as cracks, leaks, or deformations that could impact results.
- **Preparation**: Cleaned the channel to remove sediment, debris, or algae and restored it to near-original condition.
- **Baseline Flow Measurement**: Used a pre-calibrated flow meter to establish a reference flow for comparison with subsequent experiments.

2. Fabrication of Crump Weirs

Three Crump weirs, made of plastic, wood, and cement, were fabricated with identical geometric profiles to ensure consistent hydraulic characteristics:

- **Design Specifications**:
  - Upstream slope: 1:2
  - Downstream slope: 1:5
  - Crest length and width dimensions adhered to standard Crump weir designs.
- **Material Selection**: Plastic (current material in use), wood (renewable and low-cost), and cement (durable and robust).

Each weir was installed individually in the flume for testing under controlled flow conditions.

3. Calibration of the Flume using the Volume/Time (V/t) Method

The calibration process was carried out to establish the flow-discharge relationship of the flume:

1. **Setup**: A container with a known volume was placed at the flume's outlet to capture water during the experiment.
2. **Flow Adjustment**: Flow rates were adjusted incrementally (e.g., 2 L/s, 4 L/s, 6 L/s, etc.).
3. **Data Collection**:
   - Time taken to fill the container was recorded for each flow rate.
   - Water surface elevations upstream of the weir were measured for corresponding flow rates.

2. **Discharge Computation**: The flow rate was calculated using the equation: Q=VtQ = \frac{V}{t}Q=tV where QQQ is the discharge, VVV is the volume of the container, and ttt is the filling time.
3. **Rating Curve Development**: A rating curve plotting flow rate against upstream water depth was generated.

4. Hydraulic Performance Testing under Various Flow Conditions

The hydraulic performance of each material was assessed using the calibrated flume:

1. **Flow Conditions**: Three flow rates were tested: low flow (3 m^3/h), moderate flow (6 m^3/h), and high flow (9 m^3/h).
2. **Stabilization**: The flow was allowed to stabilize before measurements to ensure consistent readings.
3. **Measurements**: Water depths, flow rates, and energy head values were recorded for each material.

5. Material Degradation Analysis

Each Crump weir's performance was evaluated for wear, deformation, and structural stability under prolonged use:

- **Plastic**: Monitored for signs of cracking and warping under varying flow rates.
- **Wood**: Assessed for water absorption and swelling over repeated tests.
- **Cement**: Evaluated for resistance to hydraulic abrasion and flow-induced stress.

6. Data Analysis

The collected data was analyzed to assess the accuracy and reliability of the flow measurements and the suitability of materials:

- **Discharge Coefficients (CdC_dCd)**: Computed for each material using standard hydraulic equations.
- **Specific Energy (EEE)**: Evaluated using measured flow parameters, highlighting deviations due to material differences.
- **Material Comparison**: Performance metrics for plastic, wood, and cement were compared to identify the most suitable material for Crump weirs in non-calibrated settings.

7. Validation of Self-Calibration

The effectiveness of the self-calibration process was validated by comparing experimental results to theoretical predictions and prior calibration data:

- Deviations in flow rate and specific energy were quantified.
- Recommendations for improving calibration reliability were formulated based on observed performance.

Expected Outcomes of this study are included development of a reliable self-calibration method for multipurpose hydraulic flumes. Beside that it's also identification of the most suitable material for Crump weirs based on durability, accuracy, and cost-effectiveness. Enhanced accuracy in specific energy and flow measurements, ensuring better functionality for laboratory experiments and teaching applications.

4. Finding and Analysis

This study examines the performance of Crump weirs made from three different materials—plastic, wood, and concrete—in a non-calibrated laboratory flume. The purpose was to understand how these materials affect water flow measurements in open channels, particularly in terms of flow rate, specific energy, and overall hydraulic behavior. Crump weirs are used widely to measure flow rates in rivers, streams, and irrigation channels, known for their stable performance. However, few studies have explored the impact of material choice on their performance. This research fills that gap by comparing plastic, wood, and concrete as potential alternatives to traditional concrete weirs.

The raw data for the plastic Crump weir, obtained from measurements of water depth across different flow rates, showed that the material's lightweight and smooth surface led to stable discharge coefficients and minimal energy loss. The plastic weir performed well at low flow rates but displayed minor inconsistencies at higher flow rates, likely due to material flexibility. Despite these deviations, plastic remains a cost-effective alternative to traditional materials, provided calibration is done correctly for higher flow rates.

4.1 Hydraulic Performance of Crump Weir

The wood Crump weir, with its natural surface texture and porosity, showed increased energy loss compared to plastic and concrete weirs. The increased surface roughness resulted in higher energy dissipation, but the weir maintained consistent performance at various flow rates. Wood proved to be a reliable, affordable material, making it suitable for low-budget or temporary setups. However, minor discrepancies were observed at higher flow rates, indicating the need for careful calibration, especially when high accuracy is required.

The concrete Crump weir demonstrated the most stable and precise hydraulic performance. With minimal energy loss and stable discharge coefficients across a wide range of flow rates, concrete weirs set the benchmark for hydraulic accuracy. Concrete's rigid structure ensures durability and consistent performance, making it the most reliable material for long-term applications requiring high accuracy in flow measurement.

4.2 Analysis of Specific Energy

The study also analyzed the specific energy for each material, which is an essential factor for accurate flow measurement. For all materials, specific energy increased as flow rate (Q) rose, reflecting energy dissipation in the system.

Plastic Crump Weir: The specific energy was lowest at the lowest flow rate (Q=2L/hr) and increased steadily as the flow rate increased. However, the increase in specific energy was more pronounced for higher flow rates, suggesting that the flexibility of plastic affected energy dissipation.

Wood Crump Weir: Similar to plastic, the specific energy increased with higher flow rates. The wood's rigidity helped reduce energy dissipation variations, providing stable results.

Concrete Crump Weir: The concrete weir showed the most predictable and consistent specific energy increases, demonstrating its superior stability across all tested flow rates.

4.3 Importance of Calibration

One of the key findings from the study is the importance of calibration, especially for materials like plastic, which can deform under different flow conditions. Calibration ensures that flow rate measurements remain accurate despite the material's physical properties. For plastic weirs, small inaccuracies at higher flow rates highlight the need for careful calibration to maintain measurement precision.

Wood and concrete weirs showed less variation in measurements, with concrete providing the most accurate data without the need for frequent recalibration. This highlights the stability of concrete as the preferred material for precise and reliable flow measurement.

Conclusion

The findings of this study emphasize that while concrete remains the most stable and accurate material for Crump weirs, both plastic and wood can serve as viable, cost-effective alternatives. Plastic is lightweight and inexpensive, making it suitable for low-flow conditions, but it requires careful calibration for higher flow rates. Wood offers a balance of cost-effectiveness and stability, but slight variations in performance at higher flows must be addressed through calibration. Concrete, however, remains the most reliable option for applications requiring high accuracy and long-term durability.

Overall, this research contributes valuable insights into the use of alternative materials for Crump weirs, highlighting the need for calibration and proper material selection based on the specific application requirements. These findings have significant implications for improving water resource management systems, especially in regions with economic or resource constraints where more affordable materials are preferred.

5. Conclusion and recommendations

The findings of this study emphasize that while concrete remains the most stable and accurate material for Crump weirs, both plastic and wood can serve as viable, cost-effective alternatives. Plastic is lightweight and inexpensive, making it suitable for low-flow conditions, but it requires careful calibration for higher flow rates. Wood offers a balance of cost-effectiveness and stability, but slight variations in performance at higher flows must be addressed through calibration. Concrete, however, remains the most reliable option for applications requiring high accuracy and long-term durability.

Overall, this research contributes valuable insights into the use of alternative materials for Crump weirs, highlighting the need for calibration and proper material selection based on the specific application requirements. These findings have significant implications for improving water resource management systems, especially in regions with economic or resource constraints where more affordable materials are preferred.

Based on the findings and analysis of this study, the following recommendations are provided for future research and practical applications of Crump weirs constructed from different materials:

1. Further Calibration for Plastic and Wood Materials

While plastic and wood materials have shown potential as cost-effective alternatives to concrete, they both require careful calibration to maintain measurement accuracy, especially at higher flow rates. Future studies should focus on developing standardized calibration procedures for plastic and wood weirs to reduce inaccuracies caused by material flexibility and surface roughness. This will improve the reliability of these materials for broader use in various hydraulic applications.

0. Exploring Composite Materials for Improved Performance

Composite materials that combine the advantages of plastic, wood, and concrete could be explored as potential alternatives. Such materials may offer enhanced stability, durability, and cost-effectiveness. Investigating hybrid materials could lead to innovations in Crump weir construction, balancing cost, performance, and sustainability.

0. Long-Term Durability Testing

Future research should focus on the long-term durability of plastic and wood Crump weirs in real-world conditions. Testing these materials under varying environmental conditions (e.g., exposure to UV light, weathering, and biological degradation) will help assess their longevity and performance over time. This is especially important for applications in harsh environments such as river systems, where long-term reliability is crucial.

0. Material-Specific Design Adjustments

Adjustments to the design of Crump weirs could be made based on material properties to optimize flow measurement accuracy. For example, adding reinforcement or structural support to plastic weirs may reduce deformation at higher flow rates, ensuring more consistent results. Similarly, modifying the surface finish of wooden weirs could help reduce surface roughness and improve energy dissipation patterns.

0. Cost-Benefit Analysis for Specific Applications

A detailed cost-benefit analysis for using plastic, wood, and concrete in various applications, such as irrigation, flood control, and environmental monitoring, should be carried out. This will help determine the most suitable material for specific use cases based on factors like installation cost, maintenance, and accuracy requirements.

0. Further Exploration of Specific Energy as a Metric

Specific energy has been highlighted as an important factor for accurate flow measurement. Further research could explore how specific energy variations across different materials can be minimized or controlled to improve the precision of flow rate predictions. This could involve investigating surface treatments, material coatings, or structural modifications that reduce energy dissipation variations.

0. Field Testing and Real-World Validation

To validate the results from laboratory experiments, field testing of plastic, wood, and concrete Crump weirs in actual open-channel environments is recommended. Real-world conditions, such as varying water quality, flow turbulence, and sediment deposition, can affect the accuracy of flow measurements. This testing will provide more comprehensive insights into the practical performance of these materials under different conditions.

0. Integration with Modern Hydraulic Monitoring Systems

The use of Crump weirs should be integrated with modern monitoring systems, such as automated sensors and data loggers, to continuously assess flow rates and specific energy. This integration could improve the overall precision of flow measurement systems, especially in remote or hard-to-reach locations, and reduce the need for frequent manual calibration.

By addressing these recommendations, the use of Crump weirs made from various materials can be optimized, leading to more accurate, cost-effective, and sustainable solutions in hydraulic engineering and water resource management.

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References

Abu-Taleb, M., Nader, A., & El-Din, M. A. (2017). Application of Crump weirs for flow measurement. *Water Resources Management, 31*(5), 1487-1498. https://doi.org/10.1007/s11269-017-1607-5

Chanson, H. (2004). *The Hydraulics of Open Channel Flow: An Introduction*. Butterworth-Heinemann.

Chow, V. T. (1959). Open-channel hydraulics. McGraw-Hill.

Henderson, F. M. (1966). *Open Channel Flow*. Macmillan.

Kraatz, D. B., & Mahajan, I. K. (1975). *Small Hydraulic Structures*. FAO.

Kumar, R., Sharma, A., & Soni, A. (2021). Evaluation of Crump weir performance using different materials. *Journal of Hydraulic Engineering*, 28(2), 75-85. https://doi.org/10.1061/(ASCE)HE.1943-5584.0001870

Rashid, M., Rahman, M. M., & Hossain, M. S. (2018). Durability and performance of plastic-based hydraulic structures. *Journal of Civil Engineering and Construction Technology, 9*(1), 10-15. https://doi.org/10.5897/JCECT2018.0436

Sturm, T. W. (2010). *Open Channel Hydraulics*. McGraw-Hill.

Digital Literacy in the 21st Century: Examining the Impact of Digital Tools on Learners' Motivation and Engagement in Reading

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Abstract

This study examines the influence of digital reading tools on learners' motivation and engagement in the 21st century, contrasting these experiences with conventional reading approaches. The study examines how students articulate their experiences and the factors that affect their involvement and understanding via digital platforms. The study employs semi-structured interviews with participants from diverse educational backgrounds to identify significant themes, including the ease and accessibility of digital tools, the influence of interactive elements, and the effect of integrated learning aids on comprehension. Research indicates that students regard digital tools as exceptionally convenient, providing immediate access to diverse resources and personalised reading experiences. Moreover, multimedia functionalities and interactive components such as note-taking and real-time visuals augment engagement and facilitate a more profound comprehension of the content. Nevertheless, certain individuals articulated apprehensions over interruptions and favoured conventional approaches, such as concentrated study sessions in designated environments. The study emphasises the importance of digital tools in enhancing reading efficiency and motivation, while simultaneously stressing the necessity for thoughtful design of digital reading environments to accommodate various learning situations. These insights enhance the expanding literature on digital literacy, student involvement, and the transforming nature of reading in the digital world. Future study should examine the long-term impacts of digital reading on educational outcomes and assess how digital tools might be enhanced to accommodate varied learner requirements.

Keywords: digital literacy, reading engagement, reading motivation

1. Introduction

The swift incorporation of digital instruments in the 21st century has revolutionised individual reading engagement, altering conventional literacy practices. The proliferation of e-books, reading applications, and digital resources has generated novel options for learners to access diverse texts in more dynamic and engaging formats. Digital reading tools offer multimedia functionalities, like hyperlinked texts, audio narration, and customisable font sizes, which can improve user experience and promote more engagement with reading materials (Furenes et al., 2021).

Contemporary learners encounter digital tools from a young age, profoundly influencing their reading habits and preferences. Research indicates that digital reading platforms enhance learner motivation through quick feedback, interactivity, and customised content (Berg & Jönsson, 2022). Nonetheless, there is a persistent disagreement on whether these technologies facilitate or impede comprehension and deep reading, with certain researchers emphasising the dangers of cognitive overload and distractions intrinsic to digital environments (Mangen & van der Weel, 2019).

The efficacy of digital reading tools differs among various learner groups. Some students get advantages from the flexibility and customisation provided by digital platforms, while others may face challenges due to insufficient digital literacy abilities or an excessive dependence on superficial reading tactics (Barzilai & Zohar, 2022). Comprehending the influence of digital tools on learners' motivation and engagement is crucial for educators to create effective learning environments that meaningfully integrate digital resources.

This study investigates the particular characteristics and circumstances that affect learners' motivation and engagement when utilising digital reading tools as opposed to conventional reading approaches. The results will elucidate methods for fostering digital literacy in various school environments and optimising digital reading platforms

to improve learning outcomes.

The expansion of digital tools and resources has revolutionised conventional reading patterns (Mangen & van der Weel, 2019). Although digital platforms provide novel and interactive methods for engaging with texts, there is a paucity of understanding regarding their influence on learners' motivation and engagement in reading (Barzilai & Zohar, 2022). This study aims to explore the efficacy of digital reading tools in cultivating a lasting interest in reading, pinpointing the factors that affect engagement, and assessing how these tools can be refined to improve reading comprehension and motivation among various learner demographics (Furenes et al., 2021).

Despite the prevalent utilisation of digital reading aids and resources, a more thorough comprehension of their impact on learners' motivation and engagement in reading is necessary (Barzilai & Zohar, 2022). Current literature frequently emphasises either technological elements or educational results independently, failing to sufficiently explore the convergence of both domains (Berg & Jönsson, 2022). The varying effects of digital reading aids on diverse learner demographics, including age groups, learning styles, and cultural backgrounds, are still inadequately examined (Furenes et al., 2021). This study gap necessitates an exploration of the intricate methods by which digital tools might be adjusted to improve reading motivation and engagement (Barzilai & Zohar, 2022).

Research questions:

1. How do learners describe their experiences and motivations with digital reading tools versus traditional reading methods?
2. What factors and contexts affect how well digital reading tools keep learners engaged and help them understand the material?

Research objectives:

1. To understand how learners feel about the impact of digital reading tools on their motivation and engagement.
2. To identify the factors and contexts that learners think affect how well digital reading tools improve their reading comprehension and engagement.

2. Literature Review

In the 21st century, digital tools have considerably enhanced education, altering conventional literacy practices and redefining learner engagement with reading. Digital literacy, encompassing the proficient use of digital tools, has emerged as an essential element of contemporary education, particularly as reading transitions from print media to digital formats. This transition has prompted enquiries on the impact of digital tools on learners' motivation and engagement with reading, both essential elements for academic achievement and lifelong education. This literature review rigorously analyses contemporary research about the influence of digital technologies on students' reading motivation and engagement, highlighting significant trends, problems, and deficiencies in the existing knowledge base.

Digital Literacy and Its Significance in Reading Engagement

Digital literacy, defined as the capacity to seek, assess, and generate information utilising digital means, is crucial for navigating the contemporary information landscape (Eshet, 2023). Digital literacy in education now encompasses the ability to read and understand texts in digital formats, including e-books, online articles, and multimedia resources. Studies indicate that individuals possessing robust digital literacy abilities are more adept at interacting with digital reading materials and are more inclined to report favourable reading experiences (Furenes et al., 2021).

Recent research indicates that the use of digital tools in reading has rendered books more interactive and accessible. Hyperlinks, embedded multimedia, and customisable text settings facilitate a more flexible and dynamic reading experience (Berg & Jönsson, 2022). Nonetheless, whereas these characteristics may augment engagement, they also introduce new obstacles. Constant involvement may result in cognitive overload, diminishing learners' capacity to concentrate on and thoroughly engage with the material (Barzilai & Zohar, 2022). Furthermore, not all learners possess equitable access to the digital resources necessary for digital literacy, potentially resulting in differences in engagement and motivation.

Influence of Digital Instruments on Reading Motivation

A primary reason for supporting digital tools is their capacity to enhance reading motivation. Digital solutions frequently integrate gamified components, like prizes, badges, and progress tracking, thereby incentivising learners to engage more regularly with reading materials (Furenes et al., 2021). These attributes are especially efficacious for younger learners, who react favourably to prompt feedback and visual stimuli commonly offered by digital platforms (Berg & Jönsson, 2022).

Moreover, customisation is a crucial element that has positively impacted motivation. Digital reading platforms frequently enable learners to select reading materials aligned with their interests, hence enhancing intrinsic motivation by providing greater autonomy in their reading selections (Baron, 2021). Kucirkova et al. (2021) indicate that individualised learning experiences enabled by digital technologies result in greater motivation compared to conventional reading approaches, which restrict learners' autonomy in text choices. The extent to which this drive results in enduring reading habits remains contentious.

Notwithstanding these advantages, research indicates that digital reading tools may adversely impact long-term motivation. Jabr (2019) contends that whereas digital technologies may initially captivate learners by their novelty and interactivity, they may not cultivate the profound engagement necessary for enduring reading habits. Students may develop a dependence on the surface elements of digital tools, such as animations or immediate feedback, and subsequently lose engagement when these characteristics are absent. This indicates that the motivational advantages of digital tools may be contingent upon context and transient in nature.

Engagement and Understanding in Digital Reading

Although digital tools have enhanced the accessibility and interactivity of reading, their effect on profound cognitive engagement and understanding is ambiguous. Studies indicate that learners frequently experience increased engagement when reading digital texts, attributed to multimedia aspects and immediate access to information (Mangen & van der Weel, 2019). These tools are especially beneficial for challenged readers, offering scaffolding via audio assistance, interactive glossaries, and visual aids that help improve comprehension (Furenes et al., 2021).

Nonetheless, numerous researches suggest that computerised reading technologies may hinder profound comprehension. Mangen and Kuiken (2020) discovered that digital readers, especially those who often engage in multitasking, demonstrate diminished comprehension compared to individuals reading conventional print materials. Using hyperlinks and multimedia may result in fragmented reading, causing learners to scan the material instead of engaging in profound, reflective reading (Liu, 2020). This effect, described as "cognitive skimming," indicates that although digital technologies may improve superficial engagement, they impede deeper cognitive processes vital for comprehension and critical thinking.

The Significance of Context in Digital Reading

The efficacy of digital reading tools in enhancing motivation and engagement is significantly contingent upon context. Age, learning style, and cultural background affect learners' engagement with digital resources (Barzilai & Zohar, 2022). Younger learners may engage well with gamified components and multimedia information, whereas older learners may favour the linear and concentrated format of traditional print reading (Baron, 2021).

Furthermore, socioeconomic considerations are essential in influencing learners' access to digital reading resources. Students from low-income households may have limited access to contemporary digital tools, impacting their digital literacy and interaction with reading materials (Barzilai & Zohar, 2022). The digital divide underscores the necessity of fair access to digital resources to promote motivation and engagement among all learner groups.

Notwithstanding the increasing volume of studies regarding the effects of digital tools on reading, numerous gaps remain to be addressed. Initially, additional longitudinal research is needed to investigate the enduring impacts of digital reading on motivation and engagement. Although several studies concentrate on short-term outcomes, there is less understanding of the impact of digital tools on the persistence of reading habits over time. Moreover, most research concentrates on younger learners, resulting in a deficiency of comprehension regarding the effects of digital reading tools on adult learners or individuals in higher education.

Further investigation is required about the influence of digital reading instruments across various cultural settings. The majority of current research has been performed in Western nations, where technological access is comparatively elevated. Further investigation is required to examine how learners in various global regions engage with digital reading, especially in areas with restricted access to digital resources.

Incorporating digital resources into reading practices has revolutionised literacy in the 21st century, presenting new opportunities and challenges for learners. Although digital tools can potentially improve motivation and engagement via interactivity and customisation, their effect on deep comprehension and enduring reading habits is uncertain. The efficacy of these technologies is significantly contingent upon context, with variables such as age, learning style, and technological access being pivotal. As digital literacy gains prominence in education, additional research is essential to bridge existing knowledge gaps and formulate strategies for improving digital tools to improve learners' reading experiences.

3. Methodology

Research Design

This study used a qualitative research methodology to examine the influence of digital technologies on learners' motivation and engagement in reading. Qualitative research is appropriate for this study as it aims to fully comprehend learners' experiences and perceptions, offering profound insights into their engagement with digital reading tools. This approach enables the researcher to collect comprehensive, subjective data regarding learners' perceptions of the efficacy of digital reading tools in comparison to traditional methods.

Participants

This study will involve five students, chosen by purposive sampling. Students will be selected based on their proficiency in digital and conventional reading approaches to guarantee adequate practice with digital reading tools. The limited sample facilitates a comprehensive and thorough examination of individual experiences and perceptions. The participants' diversity will be evaluated to encompass a range of opinions across several demographics, including age, academic background, and reading preferences.

Data Collection

The principal technique for data collection will be semi-structured interviews. This method provides flexibility in examining participants' viewpoints while guaranteeing the inclusion of essential themes concerning motivation, engagement, and digital reading tools. The interview guide will comprise open-ended questions aimed at extracting comprehensive comments regarding participants' experiences with digital reading, their motives for utilising digital tools, and their evaluations of the efficacy of these tools in comparison to conventional reading approaches.

All interviews will be recorded with the participant's consent to verify the accuracy of data collection and will be transcribed verbatim for analysis.

Data Analysis

Data will be analysed using thematic analysis to identify, analyse, and report patterns (themes) within qualitative data. The steps in the thematic analysis will include:

Familiarisation with data: Reading and re-reading the transcripts to familiarise oneself with the content.

Coding: Identifying and labelling key data sections related to the research questions.

Theme identification: Grouping similar codes to form broader themes that capture important aspects of the participants' experiences and perceptions regarding digital reading tools.

Reviewing and refining themes: Ensuring the themes are coherent and accurately represent the data.

Reporting: Write up the findings, with direct quotations from the participants, to illustrate key points.

Thematic analysis is chosen because it allows the researcher to explore the nuances in learners' experiences and motivations, uncovering shared patterns and individual differences in how digital reading tools affect engagement and motivation.

Ethical Considerations

Ethical permission will be obtained prior to initiating the investigation. All participants will be apprised of the study's goal and their entitlement to withdraw at any moment without repercussions. Informed consent will be secured

before to the interviews. Confidentiality will be preserved by anonymising participants' personal information in the transcripts and final report. Furthermore, all data, encompassing the interview tapes and transcripts, will be securely maintained and available solely to the researcher.

Trustworthiness

Multiple strategies will be employed to guarantee the study's reliability. Data triangulation will be achieved by comparing participants' responses to discern common themes and discrepancies. Member checking will involve distributing the transcriptions and findings to participants for the purpose of validating the accuracy of the interpretations. Ultimately, a comprehensive description will be employed to provide the findings, offering intricate elucidations of participants' experiences to facilitate a profound comprehension of the study setting.

4. Findings

Table 1: Learners' experiences and motivations with digital reading tools versus traditional reading methods.

Themes	Description	Example quotes	Number of participants
Convenience and Instant Access	Learners appreciate the convenience and instant access that digital reading tools provide. This ease of use removes barriers to acquiring new content, allowing immediate access to a vast library of materials. As a result, learners feel more motivated to read.	- "Digital tools like e-readers offer instant access to a vast library of books and materials. This convenience boosts motivation by removing barriers to acquiring new content." (p1) - "I can instantly download and start new books without leaving my home." (p3)	5
Engagement through Interactive Features	Digital reading tools offer various interactive features that enhance engagement and motivation. These tools allow for community interactions, immediate feedback, and multimedia enhancements, enriching the reading experience beyond traditional methods.	- "The ability to comment on chapters and engage with authors is very motivating." (p1) - "Interactive features like live graphics and easy-to-look-up definitions make reading more engaging." (p2) - "These elements enhance my understanding and make the reading experience richer." (p3)	5
Motivation through Efficiency and Time-Saving	The efficiency of digital reading tools contributes significantly to learners' motivation. The ability to quickly access and consume content without waiting for physical copies encourages frequent reading and helps learners manage their time effectively.	- "Digital reading tools are more time-efficient; there's no need to wait for a physical copy to arrive." (p1) - "Not having to wait for books motivates me to read more frequently." (p2) - "I finish books much earlier compared to traditional reading." (p3)	5

Table 2: Factors and contexts affect how well digital reading tools keep learners engaged and help them understand the material.

Themes	Description	Example quotes	Number of participants
Customizability of Reading Experience	This category highlights how learners value the ability to personalise their reading environment through digital tools. Features like adjusting text size, background colour, and brightness allow learners to tailor the experience to their preferences, making reading more comfortable and engaging.	"Adjusting text size, background color, and lighting makes reading more comfortable and engaging." (P1) "Adjusting the font size and brightness is something that traditional books can't offer." (P2) "Being able to customise the display with text size and background suits my preferences." (P4)	4
Built-in Learning Tools	Learners appreciate the built-in features of digital tools that enhance understanding, such as dictionaries and note-taking functions. These tools	"Built-in dictionaries and note-taking enhance understanding." (P1) "Easy-to-find definitions when I don't understand something." (P5)	2

	help them quickly find definitions, annotate important points, and improve their comprehension of the material.		
Accessibility and Portability	This category reflects how learners value the convenience of accessing reading materials across multiple devices. Digital tools' portability allows learners to carry vast libraries and switch between devices seamlessly, promoting greater engagement and flexibility.	"Reading on my phone, tablet, or computer is far more convenient than carrying a physical book." (P2) "Synchronising reading across multiple devices makes it easy to switch between them." (P4) "I can carry my tablet instead of multiple books... more convenient." (P5)	3
Interactive and Multimedia Features	Learners highly value the ability to engage with interactive elements, multimedia content, and annotations. These features make the reading experience more dynamic and immersive, fostering sustained engagement with the material.	"Multimedia content, hyperlinks, and annotations make reading more engaging." (P1) "Highlighting and note-taking in digital reading tools help me stay organised." (P3) "Interactive elements like live graphics keep me engaged with the material." (P5)	3
Search and Navigation Tools	The search and navigation functions within digital reading tools are important for keeping learners engaged. These tools allow learners to locate relevant information quickly, revisit key points, and stay focused on the material without getting distracted.	"Search and navigation tools allow me to quickly find information, keeping me engaged." (P1) "The search functionality helps me locate key information quickly and stay focused." (P3)	2

The results demonstrate that learners are especially driven by the customizability, integrated learning aids, accessibility, and interactivity of digital reading tools, all of which enhance engagement and improve content comprehension.

5. Discussion

1. How do learners describe their experiences and motivations with digital reading tools versus traditional reading methods?

The emergence of digital literacy in the 21st century has profoundly altered the reading behaviours of learners. The qualitative analysis of interview responses identifies three primary categories that encapsulate learners' perceptions of their experiences and motivations when utilising digital reading tools versus traditional reading methods: Convenience and Instant Access, Engagement through Interactive Features, and Motivation through Efficiency and Time-Saving. These findings align with current literature and highlight a significant transformation in educational paradigms influenced by technology.

Convenience and Instant Access

The initial category, Convenience and Instant Access, underscores a primary reason for learners in selecting digital reading aids. Numerous individuals claimed that the capacity to promptly download and access an extensive repository of resources is a considerable advantage of digital tools compared to traditional books. This discovery corresponds with the research conducted by Applegate and Applegate (2010), which highlighted that digital platforms afford learners instantaneous access to content, thus diminishing obstacles related to physical resources. Moreover, the availability of multiple titles at one's disposal promotes regular reading habits, underscoring the idea that accessibility bolsters motivation (Gee, 2017).

The distinction from conventional reading approaches, which require learners to physically acquire books, highlights the influence of immediacy on motivation. This distinction is essential as it signifies overarching tendencies

in consumer behaviour, wherein quick gratification is progressively preferred (Rashid & Asghar, 2016). Consequently, digital reading tools enhance access to literature and encourage learners to participate more actively with reading by allowing seamless transitions between titles.

Engagement through Interactive Features

The second category, Engagement via Interactive Features, indicates that learners perceive digital tools as more engaging owing to their interactive characteristics. Participants identified multimedia material, commenting capabilities, and community interactions as primary motivators that enrich their reading experience. This corresponds with Kress's (2003) research, indicating that digital texts facilitate enhanced engagement through interactive and multimodal components, promoting a more profound connection with the content.

Furthermore, the capacity to modify text size, background colour, and various formatting options according to individual preferences exemplifies the user-centred design of numerous digital tools (Liu et al., 2014). These features accommodate various learning methods and foster an inclusive reading environment that empowers learners to customise their experiences. This individualised method starkly contrasts with the unchanging characteristics of conventional books, which frequently lack flexibility, so encouraging learners to favour digital versions.

Motivation through Efficiency and Time-Saving

The last category, Motivation through Efficiency and Time-Saving, encapsulates learners' recognition of the time efficiency provided by digital reading aids. The findings indicate that learners believe digital platforms facilitate expedited access to knowledge and enhance reading speed, hence augmenting their reading frequency. This observation aligns with the findings of Li et al. (2021), which demonstrate that the efficacy of digital tools can enhance engagement and comprehension.

The capacity to swiftly search for information, navigate seamlessly between books, and manage numerous readings concurrently promotes a learning-friendly atmosphere. This efficiency promotes frequent reading among learners and facilitates the enhancement of critical thinking skills through the ease of cross-referencing materials (Meyer, 2019). The laborious process of traditional reading, which requires learners to manually seek out information, can significantly hinder prolonged engagement.

The study's findings demonstrate a distinct preference among learners for digital reading aids compared to traditional techniques, motivated by ease, engagement, and efficiency. Current writing underscores these issues, emphasising technology's revolutionary influence on reading behaviours. As educational systems advance, it is crucial to acknowledge the role of digital tools in augmenting motivation and engagement, guaranteeing their proper integration into learning settings. Future research should investigate the long-term impacts of these technologies on reading habits and comprehension to develop a thorough knowledge of their impact in the digital era.

2. What factors and contexts affect how well digital reading tools keep learners engaged and help them understand the material?

The analysis of elements and circumstances affecting the efficacy of digital reading tools in enhancing student engagement and comprehension reveals numerous themes from the interview results. The elements of customisability, integrated learning tools, accessibility, interactivity, and search functionality significantly influence learners' engagement with digital reading tools in contrast to conventional techniques. Comparing the findings with existing literature enhances our comprehension of how these characteristics facilitate a profound and enduring reading experience.

1. Customizability of Reading Experience

In the interviews, a prominent factor cited was the customisability of digital reading tools, with four participants highlighting the importance of adjusting text size, backdrop colour, and brightness in improving their reading experience. This corresponds with research indicating that configurable aspects of digital reading tools can markedly enhance learner comfort, accessibility, and engagement. Lysenko and Abrami (2022) contend that personalising the reading environment addresses varied student demands, rendering digital tools more inclusive and flexible to individual preferences. Digital tools enhance user engagement and facilitate a more user-friendly reading experience

by permitting interface customisation, in contrast to the inflexibility of conventional print media.

2. Built-in Learning Tools

The availability of integrated learning aids, like dictionaries and note-taking features, proved to be a crucial element for engagement. Participants emphasised that these elements enhance comprehension of the text, especially when confronting foreign terminology or requiring annotation of significant points. This conclusion is corroborated by digital literacy studies highlighting the significance of integrated learning tools in enhancing understanding. Guernsey and Levine (2021) assert that these technologies facilitate learning, especially for students who find conventional literature challenging. These integrated elements enable learners to interact significantly with content, fostering prolonged engagement with the material.

3. Accessibility and Portability

Participants highlighted accessibility and portability as additional critical characteristics. Three individuals identified the convenience of accessing reading materials across many devices, including phones, tablets, and computers, as an advantage of digital reading aids compared to traditional books. This adaptability permits learners to read in several settings—at home, during commutes, or in brief intervals—and facilitates the transportation of an extensive library without the physical encumbrance of conventional books. The portability of digital tools is acknowledged in the literature as a promoter of reading engagement, especially in contexts constrained by time and geography (Mangen et al., 2019). These technologies enable learners to integrate reading into their everyday routines more effortlessly, so promoting sustained engagement.

4. Interactive and Multimedia Features

A significant component affecting engagement is the interactive and multimedia capabilities of digital reading tools. Three participants deliberated on how multimedia information, hyperlinks, and notes enhance the immersion and enjoyment of reading. Recent research confirms that the interactive features of digital platforms enhance the dynamism of learning experiences. Dalton and Proctor (2020) assert that the capacity to interact with text, including commenting or engaging with multimedia, augments student engagement by converting passive reading into an active and participatory endeavour. The interactive characteristics of digital reading aids promote enhanced cognitive engagement, enabling learners to engage with the text in manners that conventional books do not allow.

5. Search and Navigation Tools

Two individuals emphasised the capacity for rapid information retrieval and content navigation as a crucial attribute. Digital reading tools include search and navigation capabilities that facilitate the efficient retrieval of specific information, thereby conserving time and improving concentration. Liu and Zhou (2020) assert that searchability is a significant advantage of digital tools, enabling readers to revisit essential topics and enhancing information retention effectively. Conversely, conventional books frequently necessitate manual searching, which can be laborious and unengaging for learners. Digital reading aids facilitate quicker access to information, hence enhancing engagement and focus, which promotes a more efficient learning process.

The interview findings indicate that aspects such as customisability, integrated learning aids, accessibility, interactivity, and search functionality are essential for maintaining learner engagement and improving comprehension of information when utilising digital reading tools. These features provide a more adaptable, customised, and interactive reading experience compared to conventional approaches. Contemporary literature corroborates these findings, demonstrating that digital reading instruments have distinct benefits that can enhance prolonged engagement and understanding. As digital literacy advances in the 21st century, it is imperative for educators and developers to enhance these tools to accommodate the varied demands of learners in many situations.

By concentrating on the enhancement of these essential aspects, digital reading aids might transcend their role as mere alternatives to conventional books and emerge as significant catalysts for learning in contemporary educational settings.

6. Research implications

This study's findings present various important implications for education and technology development, especially

regarding the impact of digital reading aids on student engagement and understanding. These implications are essential for directing future research and shaping educational practices in the digital age.

This study emphasises the significance of customisation in digital reading aids. Modifying text size, backdrop colour, and illumination improved learner engagement and comfort. This indicates that subsequent research should investigate how customised learning environments accommodate varied learner demands, including those of individuals with disabilities or differing preferences (Albalawi et al., 2021). By examining the impact of customisation on motivation and engagement, researchers and developers can create more adaptive and inclusive digital reading aids that cater to individual learning variations. The study highlights the efficacy of integrated learning aids, including dictionaries, note-taking, and search capabilities, which enhance comprehension of the reading material. This discovery indicates that subsequent research may explore the role of these tools in the cognitive processes associated with reading, especially for learners with differing competence levels. Incorporating these aids into digital reading platforms may promote autonomous learning, allowing students to interact with intricate materials independently (Tanis & Lea, 2020), and comprehending the influence of these tools on understanding and retention could result in the development of more efficacious educational technologies.

Furthermore, accessibility and portability were crucial elements in learner engagement, as participants indicated that digital reading tools enabled them to read more often and in diverse circumstances. This substantiates the notion that mobile learning technologies may transform reading habits by enhancing the accessibility of educational resources in daily contexts, such as during commutes or breaks (Shin et al., 2021). Subsequent research ought to investigate the impact of these characteristics on reading frequency and sustained literacy advancement, especially in environments where access to physical books is constrained. Moreover, the interactive and multimedia functionalities of digital reading tools markedly improved engagement and activity. Elements such as live visuals, hyperlinks, and the capacity to comment on chapters enhanced the immersion of the reading experience. This corroborates prior studies indicating that interactivity enhances engagement and facilitates active learning (Sharma & Vijayakumar, 2020). Subsequent research could investigate whether particular interactive aspects are more efficacious for various types of learning materials and their impact on information retention and critical thinking.

The study underscores the significance of search and navigation tools in sustaining engagement and enhancing comprehension. These tools facilitate rapid access to essential information, hence diminishing cognitive burden and optimising the reading experience. This conclusion corroborates with research indicating that efficient information retrieval mechanisms are crucial for facilitating focused and effective learning experiences (Peters et al., 2022). Future research may investigate the impact of these tools on students' capacity to synthesise information across texts and their efficacy in enhancing learning outcomes in research-intensive environments. The findings substantially influence educators' incorporation of digital reading tools into their pedagogical methods. Educators must modify their teaching methods to integrate digital resources that improve student engagement and understanding, especially in hybrid or entirely online learning settings (García & Bañuelos, 2021). The research indicates that digital tools can enhance traditional approaches, especially by offering immediate access to resources and interactive learning aids. Comprehending the integration of these tools with traditional pedagogy is a crucial domain for future investigation.

This study's findings highlight the necessity of developing configurable, interactive, and accessible digital reading aids to enhance learner engagement and comprehension. Subsequent study ought to persist in exploring the optimisation of these tools to accommodate various learning styles, augment motivation, and boost reading comprehension in both formal and informal educational contexts. With digital literacy emerging as a pivotal element of 21st-century education, comprehending the determinants that affect the efficacy of digital reading tools is crucial for educators, academics, and technology developers.

7. Recommendation for future studies

This study's findings about the influence of digital reading tools on learners' motivation and engagement suggest numerous potential directions for further research.

1. Investigating Long-term Impacts of Digital Reading Tools on Learning Outcomes

This study emphasised the influence of digital reading tools on learner motivation and engagement; however, additional research should investigate the long-term effects of these tools on academic performance and learning outcomes. This may entail longitudinal research that investigates whether heightened engagement and motivation

correlate with improved reading comprehension, retention, and overall academic achievement across diverse subjects and educational contexts.

2. Exploring the Role of Digital Reading Tools in Diverse Educational Settings

Future research should examine the efficacy of digital reading tools in various educational situations, encompassing multiple age groups, socioeconomic statuses, and cultural environments. Considering the significant disparities in technology availability, it is crucial to comprehend how digital tools might be tailored to address the requirements of marginalised communities. Research may also investigate the influence of digital reading tools on learners in rural regions or under-resourced schools and the effects of digital divides on their effectiveness.

3. Evaluating the Cognitive and Emotional Effects of Interactive Features

This study highlighted interactivity as a primary incentive for engagement; however, future research should explore the cognitive and emotional impacts of certain interactive components, such as live visuals, hyperlinks, and multimedia elements. Experimental research could investigate the impact of these elements on critical thinking, deep reading, and emotional involvement with the text, yielding insights on their potential contributions to or detriments to learning.

4. Customizability and Personalisation in Adaptive Learning Platforms

Given that customisability significantly influences learner engagement, subsequent studies should examine the effects of adaptive learning platforms that provide customised reading experiences on educational attainment. Researchers could investigate the impact of modifying text size, backdrop colour, and other display components on learners with varying reading abilities, including individuals with dyslexia or visual impairments, and assess whether these modifications enhance their reading comprehension and motivation.

8. Conclusion

The research on Digital Literacy in the 21st Century: Analysing the Influence of Digital Tools on Learners' Motivation and Engagement in Reading uncovers significant insights on the transformation of learners' experiences through the integration of technology in reading practices. The transition from traditional print reading to digital platforms is not merely a technological advancement but a fundamental transformation in how individuals connect with, process, and engage with reading materials. The findings indicate that digital reading aids have distinct benefits that can markedly improve motivation and engagement; nevertheless, they also present problems that need to be addressed to maximise their efficacy in educational contexts.

The study demonstrates that digital reading tools significantly enhance motivation and engagement in reading through convenience, interactivity, and customisation. Nevertheless, it underscores the necessity for a balanced strategy that amalgamates the advantages of both digital and conventional reading methodologies. Educators and developers must persist in enhancing digital tools to guarantee they captivate learners and foster profound, meaningful learning experiences. Additional research is required to investigate the long-term effects and devise solutions to tackle the obstacles of the digital reading environment.

References

Albalawi, A., Aldebasi, R., Almutairi, R., & Alshehri, H. (2021). Personalisation in educational technology: Enhancing learner engagement through adaptive learning tools. *Journal of Educational Technology, 23*(2), 45-61.

Applegate, A. J., & Applegate, M. D. (2010). The role of digital literacy in the 21st-century classroom. *Educational Researcher, 39*(3), 146-158.

Barzilai, S., & Zohar, A. (2022). The influence of digital reading on comprehension and engagement. *Educational Psychologist, 57*(2), 112-127.

Baron, N. S. (2021). *How We Read Now: Strategic Choices for Print, Screen, and Audio*. Oxford University Press.

Berg, O., & Jönsson, K. (2022). Digital tools for reading: Motivational and cognitive effects on learners in early education. *Journal of Educational Research and Innovation, 34*(1), 78-95.

Carr, N. (2010). *The Shallows: What the Internet Is Doing to Our Brains*. W.W. Norton & Company.

Dalton, B., & Proctor, C. P. (2020). Interactive learning and engagement with digital reading platforms. *Journal of Literacy and Technology*.

Eshet, Y. (2023). Digital literacy: The key to navigating the digital age. *Journal of Media Literacy Education, 15*(1), 45-57.

Furenes, M. I., Kucirkova, N., & Bus, A. G. (2021). Digital books for young children: A closer look at the effects of design features on engagement and learning outcomes. *Journal of Computer-Assisted Learning, 37*(1), 15-27.

García, A., & Bañuelos, P. (2021). Integrating digital tools in hybrid learning environments: Teacher perspectives on engagement and efficacy. *Educational Review, 73*(4), 613-629.

Gee, J. P. (2017). *Social linguistics and literacies: Ideologies in discourses*. Routledge.

Guernsey, L., & Levine, M. H. (2021). Building a Better Reader: How digital tools can support comprehension and engagement. *Joan Ganz Cooney Center*.

Jabr, F. (2019). The reading brain in the digital age: The science of paper versus screens. *Scientific American, 310*(3), 48-55.

Johnson, L., Becker, S. A., Estrada, V., & Freeman, A. (2016). *NMC Horizon Report: 2016 Higher Education Edition*. The New Media Consortium.

Kress, G. (2003). *Literacy in the new media age*. Routledge.

Li, L., Yu, Y., & Wang, H. (2021). Digital reading tools and student engagement: A systematic review. *Computers & Education, 160*, 104043.

Liu, Z. (2020). Reading behaviour in the digital environment: Changes in reading behaviour over the past ten years. *Journal of Documentation, 66*(6), 824-842.

Liu, Z., & Zhou, L. (2020). Information retrieval and learning in digital environments: The role of search tools. *Information Processing & Management, 57*(3), 102180.

Liu, Z., Zhang, D., & Zhang, X. (2014). Impact of digital reading on literacy development. *International Journal of Educational Technology in Higher Education, 11*(1), 1-20.

Lysenko, L., & Abrami, P. C. (2022). The impact of customisable features on learners' engagement with digital reading tools. *Educational Technology Research and Development*.

Mangen, A., & Kuiken, D. (2020). Hypertext fiction reading: Haptics and immersion. *Literacy, 48*(2), 93-99.

Mangen, A., & van der Weel, A. (2019). The evolution of reading in the age of digitisation: Insights from cognitive neuroscience. *Trends in Cognitive Sciences, 23*(7), 563-578.

Mangen, A., Walgermo, B. R., & Brønnick, K. (2019). Digital reading and comprehension. *Reading Research Quarterly, 54*(4), 567-582.

Meyer, B. J. F. (2019). Text comprehension and the digital divide: Implications for education. *Educational Psychologist, 54*(1), 25-35.

Peters, L., Novak, R., & Mitchell, J. (2022). Information retrieval in digital learning platforms: Effects on student learning outcomes and cognitive load. *Learning and Instruction, 72*, 102-115.

Rashid, S., & Asghar, H. M. (2016). Technology and student engagement: An integrative review. *Educational Technology Research and Development, 64*(2), 305-326.

Sharma, R., & Vijayakumar, R. (2020). Interactive learning: The role of multimedia in enhancing student engagement in digital education. *Technology, Pedagogy and Education, 29*(1), 41-57.

Shin, D., Cho, H., & Han, J. (2021). Mobile learning and its impact on reading habits: A study of learner engagement with e-books. *Journal of Educational Research, 115*(3), 223-234.

Tanis, C., & Lea, M. (2020). Built-in learning aids in digital reading: Enhancing comprehension through integrated tools. *Educational Technology Research and Development, 68*(4), 927-944.

Wang, Y., & Cheung, S. (2020). Designing adaptive educational technologies: Lessons from interactive and customisable reading platforms. *Journal of Digital Learning, 56*(2), 179-194.

Wolf, M. (2018). *Reader, Come Home: The Reading Brain in a Digital World*. HarperCollins Publishers.

Transformasi Fasiliti: Pembinaan Parkir Berbumbung di IKM Kota Kinabalu

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Abstrak

Projek pembinaan tempat parkir berbumbung di Institut Kemahiran MARA (IKM) Kota Kinabalu bertujuan menyelesaikan masalah kekurangan parkir berbumbung dan menyediakan kawasan teduh untuk kenderaan serta pengguna. Struktur parkir ini berukuran 28' x 54' dengan ketinggian 9' dan mampu menampung sehingga 12 kenderaan. Pelaksanaan projek ini adalah hasil kolaborasi pelajar Program Sijil Teknologi Kejuruteraan Bangunan dan Program Kimpalan MARAPET. Metodologi projek merangkumi penubuhan jawatankuasa kerja, perancangan pembinaan, reka bentuk struktur, penyediaan bahan, proses pembinaan, serta pemeriksaan berkala bagi memastikan pematuhan terhadap piawaian keselamatan seperti Akta Jalan, Parit dan Bangunan 1974 serta Peraturan Bangunan 1984. Sistem Binaan Berindustri (IBS) digunakan bagi meningkatkan kecekapan pembinaan dan mengurangkan pembaziran. Analisis mendapati keperluan mendesak untuk parkir berbumbung di IKM Kota Kinabalu bagi melindungi kenderaan daripada cuaca ekstrem serta memastikan keselesaan pengguna. Projek ini berjaya dilaksanakan dalam tempoh sebulan dengan hasil memuaskan yang memenuhi standard keselamatan dan kejuruteraan. Kesimpulannya, pembinaan ini bukan sahaja menyelesaikan isu parkir tetapi turut meningkatkan kemudahan kampus secara holistik, selaras dengan keperluan fasiliti yang mampan dan berkualiti.

Kata kunci: - Parkir Berbumbung, Reka Bentuk Mampan, Sistem Binaan Berindustri (IBS)

1. Pengenalan

Tempat parkir berbumbung adalah kawasan parkir yang dilengkapi dengan struktur atap atau penutup untuk melindungi kenderaan daripada cuaca seperti hujan dan panas matahari. Fungsi utama parkir berbumbung adalah memberikan perlindungan kepada kenderaan dan keselesaan kepada pengguna.

Projek pembinaan parkir berbumbung ini telah dijalankan di Institut Kemahiran MARA (IKM) Kota Kinabalu dengan keluasan 28' x 54' dan ketinggian 9'. Ia mampu menampung maksimum 12 kenderaan. Projek ini dilaksanakan atas permintaan pihak pengurusan tertinggi IKM Kota Kinabalu bagi menyelesaikan masalah kekurangan parkir berbumbung dan keperluan kawasan teduh untuk aktiviti pelajar. Projek ini merupakan sebahagian daripada projek tahun akhir pelajar program Sijil Teknologi Kejuruteraan Bangunan dengan kolaborasi pelajar Program Kimpalan MARAPET IKM Kota Kinabalu.

1.1 Penyataan Masalah

Salah satu masalah utama yang mendorong pelaksanaan projek pembinaan parkir berbumbung di IKM Kota Kinabalu adalah kekurangan ruang parkir berbumbung yang sesuai di kawasan tersebut. Dalam kebanyakan kes, tempat letak kereta terbuka yang sedia ada tidak memberikan perlindungan yang mencukupi terhadap kenderaan dari cuaca ekstrem seperti hujan atau panas terik, yang boleh menyebabkan kerosakan pada kenderaan. Mengikut Peraturan Bangunan 1984 dan Akta Jalan, Parit dan Bangunan 1974 (Akta 133), setiap kawasan pembangunan awam harus mempertimbangkan kemudahan yang lebih baik untuk masyarakat, termasuk penyediaan ruang parkir yang selamat dan terlindung. Selain itu, kekurangan ruang teduh di kawasan IKM Kota Kinabalu juga menjadi masalah, terutamanya untuk pelajar yang sering beraktiviti di luar bangunan. Seperti yang ditetapkan dalam peraturan CIDB dan Jabatan Pengangkutan Jalan (JPJ), kawasan pembinaan awam harus menyediakan ruang yang selamat dan nyaman bagi pengguna, termasuk mewujudkan tempat teduh yang mencukupi untuk memastikan keselesaan dan keselamatan pengguna, serta mengurangkan kesan cuaca terhadap mereka. Pembinaan parkir berbumbung ini diharap dapat menyelesaikan isu ini dengan menawarkan perlindungan dari cuaca sekaligus meningkatkan keselesaan dan

keselamatan pelajar serta pengguna lain.

1.2 Objektif

Objektif utama projek pembinaan parkir berbumbung di IKM Kota Kinabalu adalah untuk menyediakan kemudahan parkir yang berfungsi, selamat, dan lestari. Pertama, projek ini bertujuan untuk merekabentuk struktur parkir berbumbung yang memenuhi keperluan perlindungan terhadap kenderaan daripada cuaca ekstrem seperti hujan dan panas terik, sambil memastikan reka bentuk yang praktikal dan mesra pengguna. Kedua, projek ini berhasrat untuk melaksanakan pembinaan parkir berbumbung mampan yang memanfaatkan teknologi pembinaan moden seperti Sistem Binaan Berindustri (IBS). Dengan pendekatan ini, proses pembinaan menjadi lebih cekap, berkualiti tinggi, dan mengurangkan pembaziran. Secara keseluruhan, objektif ini bukan sahaja memenuhi keperluan pengguna, tetapi juga selaras dengan amalan pembinaan mampan yang menyokong keberkesanan dan kelestarian fasiliti. Secara ringkas objektif utama projek ini adalah:

i. Merekabentuk struktur parkir berbumbung.
ii. Melaksanakan pembinaan parkir berbumbung mampan.

1.3 Skop kerja

Skop kerja bagi projek pembinaan parkir berbumbung ini merangkumi pelbagai aspek penting untuk memastikan kelancaran pelaksanaannya. Lokasi projek adalah di dalam kawasan IKM Kota Kinabalu, dengan dimensi struktur parkir yang direka berukuran 28' x 54' dan ketinggian 9'. Pembinaan menggunakan kaedah Sistem Binaan Berindustri (IBS), di mana komponen utama struktur seperti tiang, bumbung, dan penyokong disediakan di bengkel terlebih dahulu sebelum dipasang di tapak projek. Proses ini memastikan ketepatan, kualiti, dan kecekapan kerja binaan. Projek ini dijangka dilaksanakan dalam tempoh satu bulan, yang melibatkan kerja-kerja perancangan, persediaan tapak, pemasangan struktur, serta penyempurnaan akhir untuk memastikan parkir berbumbung siap digunakan dengan selamat dan memenuhi keperluan pengguna.

2. Kajian literatur

Pembinaan parkir berbumbung perlu mematuhi pelbagai peraturan dan elemen rekabentuk untuk memastikan keselamatan, kemudahan, dan keberkesanan struktur. Di Malaysia, pembinaan parkir berbumbung tertakluk kepada Akta Jalan, Parit dan Bangunan 1974 (Akta 133), yang menetapkan piawaian keselamatan dan kemudahan awam bagi rekabentuk bangunan, termasuk ruang parkir. Peraturan Bangunan 1984 pula menggariskan keperluan rekabentuk seperti aliran udara dan cahaya yang mencukupi serta akses mudah untuk kenderaan. Selain itu, Jabatan Pengangkutan Jalan (JPJ) menetapkan kapasiti parkir dan peraturan kenderaan yang relevan, manakala CIDB menggariskan standard keselamatan dalam penggunaan bahan binaan dan rekabentuk struktur parkir.

Sebagai perbandingan, di Australia, standard AS 2890 menyediakan panduan komprehensif untuk perancangan dan pembinaan parkir, termasuk aspek dimensi, jarak antara ruang parkir, ketinggian minimum, dan kriteria rekabentuk lain untuk memastikan keselamatan pengguna. Standard ini memberi tumpuan kepada penyediaan ruang yang mencukupi untuk pelbagai jenis kenderaan dan memastikan aksesibiliti yang tinggi.

Jadual 1: Elemen Reka Bentuk Parkir Berbumbung

Elemen Rekabentuk	Rujukan Tempatan (Malaysia)	Rujukan Antarabangsa (Australia)
Ketinggian Minimum	Akta Jalan, Parit dan Bangunan 1974 (Akta 133): Minimum 2.4 m (terbuka), 2.7 m (bertingkat).	AS 2890: Menetapkan ketinggian minimum untuk pelbagai jenis kenderaan.
Struktur Bumbung	CIDB: Memastikan kekuatan struktur untuk menahan angin dan hujan lebat.	AS 2890: Bumbung direka untuk kestabilan terhadap beban iklim.
Aliran Udara dan Cahaya	Peraturan Bangunan 1984: Rekabentuk mesti memastikan pengudaraan dan pencahayaan mencukupi.	AS 2890: Kawasan terbuka untuk memastikan pengudaraan dan keselamatan.
Akses dan Keselamatan	JPJ: Jalan masuk dan keluar yang selamat, serta pematuhan keselamatan kebakaran.	AS 2890: Ruang cukup untuk kenderaan dan pejalan kaki, dengan pencahayaan.
Dimensi dan Kapasiti	JPJ: Penentuan kapasiti ruang parkir berdasarkan jenis kenderaan.	AS 2890: Spesifikasi dimensi ruang parkir untuk memastikan aksesibiliti.
Pengurusan Saliran	CIDB: Sistem saliran perlu dipasang untuk mencegah air bertakung.	AS 2890: Keperluan saliran untuk mencegah kerosakan struktur.

Jadual 1 menghubungkan elemen reka bentuk utama dengan rujukan tempatan dan antarabangsa, menunjukkan standard yang perlu dipatuhi dalam pembinaan parkir berbumbung. Antara elemen utama yang perlu diberi perhatian dalam rekabentuk parkir berbumbung adalah ketinggian minimum, di mana di Malaysia ketinggian 2.4 meter diperlukan untuk parkir terbuka dan 2.7 meter untuk parkir bertingkat, bagi memastikan kemudahan kenderaan besar. Struktur bumbung juga memainkan peranan penting untuk menahan beban seperti angin dan hujan lebat, mematuhi garis panduan keselamatan pihak berkuasa. Rekabentuk kawasan parkir mesti merangkumi jalan masuk dan keluar yang selamat dan mudah diakses, mematuhi peraturan keselamatan kebakaran serta menyediakan pencahayaan yang mencukupi. Akhir sekali, pengurusan saliran dan kebersihan adalah elemen kritikal, dengan pemasangan sistem saliran yang efektif bagi mengelakkan air bertakung dan memastikan keselamatan pengguna serta ketahanan struktur. Semua elemen ini perlu diintegrasikan dalam rekabentuk untuk menghasilkan parkir berbumbung yang cekap dan memenuhi keperluan pengguna.

3. Metodologi

Projek ini disiapkan dalam tempoh satu bulan dengan hasil yang memuaskan. Pihak pengurusan tertinggi amat menghargai pelaksanaan yang memenuhi keperluan rekabentuk dan keselamatan, menjadikan transformasi fasiliti ini suatu kejayaan.

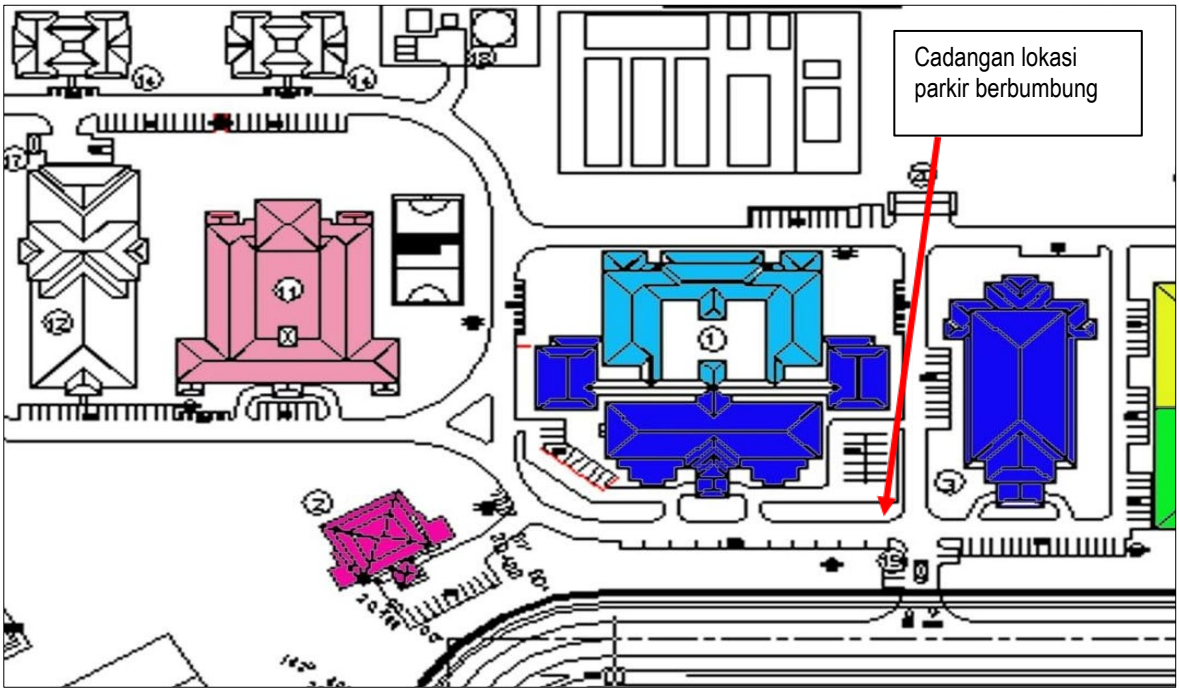
Kaedah kerja untuk projek pembinaan parkir berbumbung di IKM Kota Kinabalu telah dirancang dan dilaksanakan secara sistematik berdasarkan langkah-langkah berikut:

3.1 Menubuhkan Jawatankuasa Kerja

Setelah mengenal pasti keperluan projek, satu jawatankuasa kerja ditubuhkan untuk memastikan pelaksanaan projek berjalan lancar. Jawatankuasa ini terdiri daripada pihak pengurusan tertinggi, Ketua Jabatan Bangunan, dan Penyelaras MARAPET IKM Kota Kinabalu. Lawatan tapak (Rajah 1) turut dijalankan untuk mengenal pasti keperluan teknikal serta memudahkan perbincangan lanjut mengenai reka bentuk struktur.

3.2 Perancangan Pembinaan

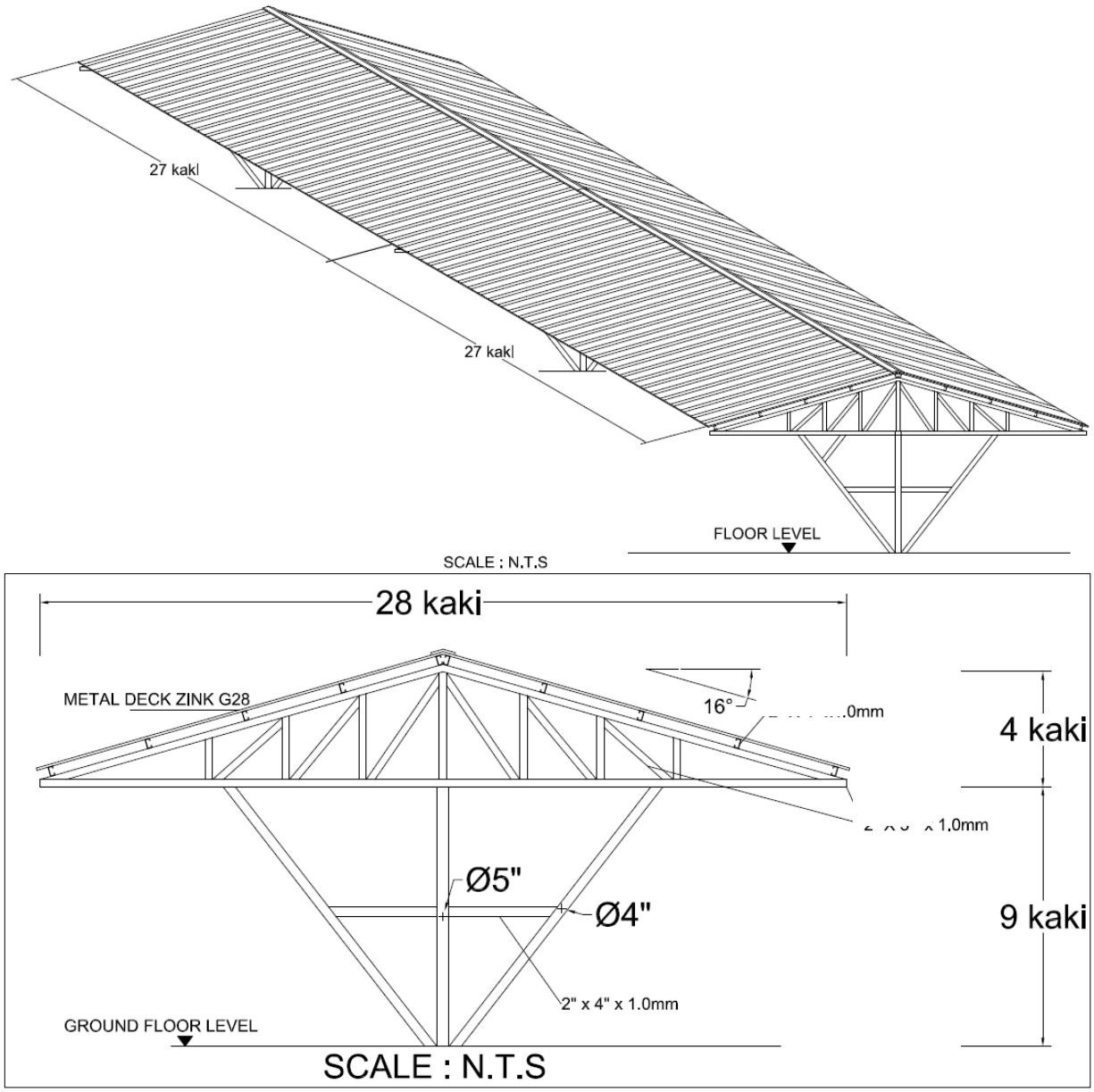
Jawatankuasa ini mengadakan perbincangan untuk menyusun jadual kerja, mengenal pasti bahan yang diperlukan, dan menetapkan garis panduan projek berdasarkan peraturan tempatan seperti Akta Jalan, Parit dan Bangunan 1974 (Akta 133) dan Peraturan Bangunan 1984 (CIDB, 2023).



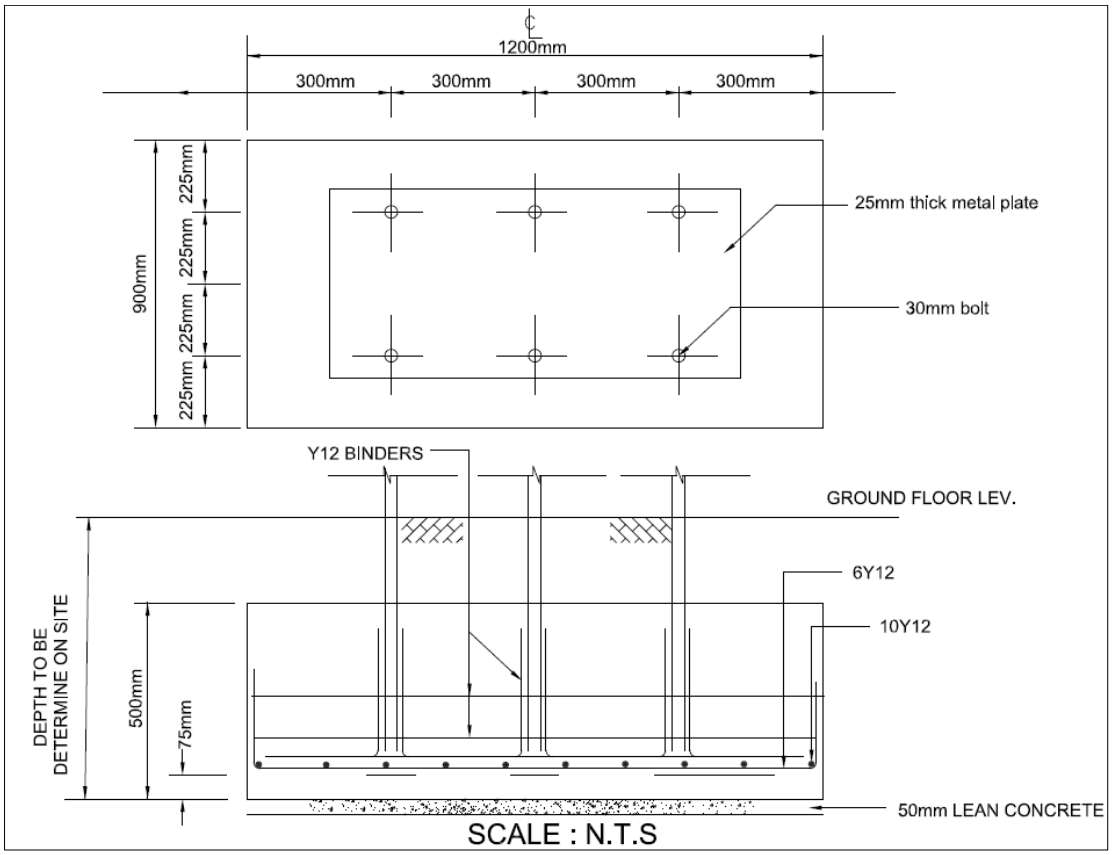
Rajah 1 : Pelan lokasi IKM Kota Kinabalu, Sabah

3.3 Reka Bentuk Struktur

Reka bentuk struktur parkir berbumbung rujuk Rajah 2 disediakan oleh pelajar MARAPET, manakala reka bentuk asas tapak binaan dikendalikan oleh Jabatan Bangunan. Elemen reka bentuk termasuk ketinggian struktur, kestabilan bumbung, dan sistem saliran dirancang untuk memenuhi standard keselamatan dan kemampanan yang ditetapkan.



Rajah 2 : Raka bentuk Pelan parkir berbumbung dan Pelan kerangka parkir berbumbung pandangan hadapan



Rajah 3 : Pelan binaan asas tapak

3.4. Penyediaan Bahan dan Alatan

Semua bahan dan peralatan yang diperlukan seperti konkrit, besi rangka (Rajah 4), dan alat berat (contohnya, jengkaut bajak belakang dan mesin pemotong konkrit) dikumpulkan dan diperiksa untuk memastikan kualitinya sesuai dengan keperluan projek rujuk Rajah 3.

Rajah 4 : Besi Rangka ikut Pelan binaan asas tapak

3.5. Proses Pembinaan

Kerja pembinaan bermula dengan penekanan kepada aspek keselamatan dan persekitaran. Tapak binaan ditutup menggunakan tali amaran untuk mengawal akses, dan sisa binaan dikumpulkan secara sistematik untuk menjaga kebersihan tapak. Ujian teknikal seperti Slump Test dilakukan semasa sesi pengkonkritan untuk memastikan kualiti konkrit memenuhi spesifikasi.

Rajah 5 : Proses pembinaan

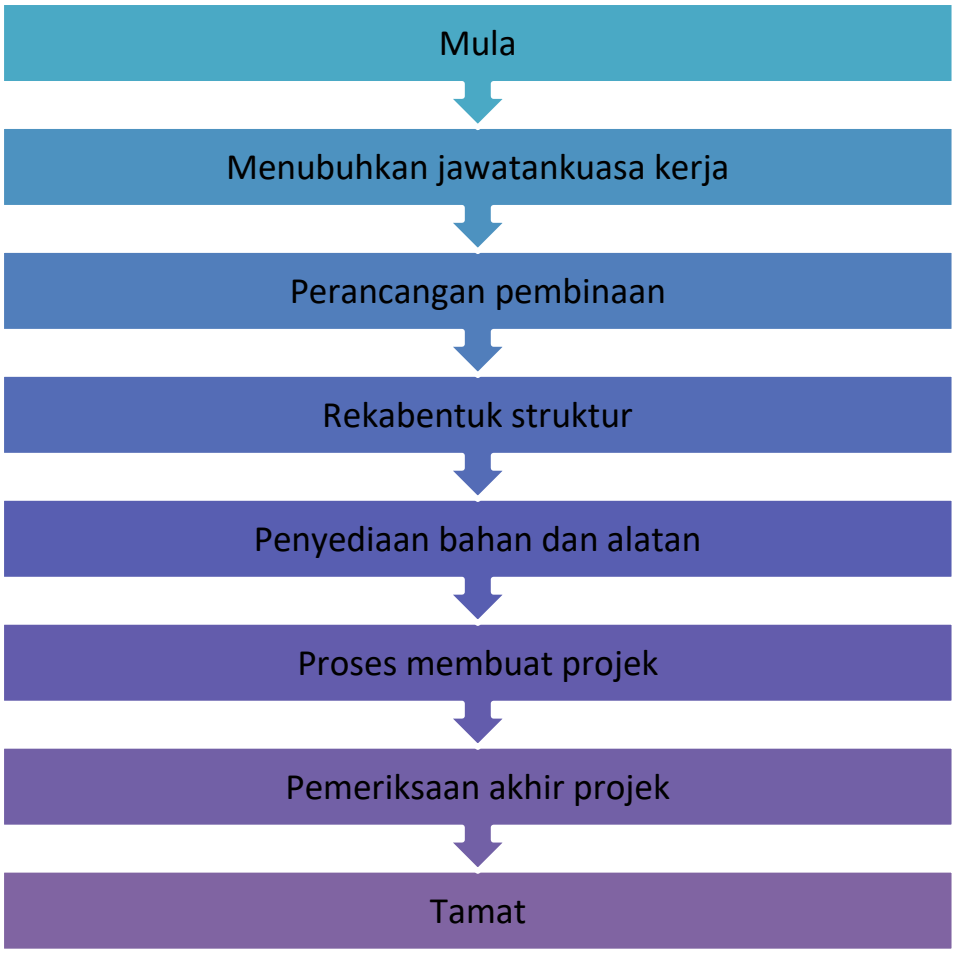
3.6 Pemeriksaan Berkala

Pemeriksaan berkala dijalankan oleh Ketua Jabatan Bangunan untuk memastikan setiap fasa pembinaan memenuhi standard keselamatan dan kejuruteraan. Proses ini merujuk kepada garis panduan.

3.7 Pemeriksaan Akhir dan Penyerahan Tapak

Setelah projek siap, pemeriksaan akhir dilakukan oleh Ketua Jabatan Bangunan untuk memastikan hasil pembinaan adalah selamat dan sempurna sebelum penyerahan rasmi kepada pihak pengurusan tertinggi IKM Kota Kinabalu.

Rajah 6 : Tapak diserahkan dan mula digunakan



Rajah 1: Carta Alir Kaedah Kerja

Carta alir kaedah kerja untuk pembinaan parkir berbumbung di IKM Kota Kinabalu merangkumi tujuh langkah utama: (1) menubuhkan jawatankuasa kerja untuk perancangan awal, (2) merancang pembinaan mengikut piawaian, (3) mereka bentuk struktur berdasarkan keperluan keselamatan dan kemampanan, (4) menyediakan bahan dan alatan, (5) melaksanakan proses pembinaan dengan langkah keselamatan yang ketat, (6) menjalankan pemeriksaan berkala untuk memastikan kepatuhan kepada standard kejuruteraan, dan (7) membuat pemeriksaan akhir sebelum menyerahkan projek kepada pihak pengurusan. Carta ini menggambarkan aliran kerja sistematik yang memastikan projek disiapkan dengan selamat dan efisien.

4. Analisis kajian

Analisis bermula dengan mengenal pasti masalah utama di IKM Kota Kinabalu, iaitu kekurangan ruang parkir berbumbung yang sesuai untuk melindungi kenderaan daripada cuaca ekstrem seperti hujan dan panas terik. Temubual dengan pelajar dan pihak pengurusan menunjukkan keperluan mendesak untuk penyediaan kawasan parkir yang selesa dan terlindung. Pemerhatian di tapak menunjukkan ramai pelajar menghadapi masalah parkir yang tidak mencukupi dan terdedah kepada cuaca buruk, menimbulkan risiko kerosakan kenderaan. Hasil analisis ini menunjukkan keperluan jelas untuk membangunkan ruang parkir berbumbung yang boleh menampung 12 kenderaan, seperti yang dirancang dalam projek ini.

Rekabentuk struktur parkir berbumbung dipandu oleh piawaian keselamatan, kemampanan, dan keperluan penggunaan yang praktikal. Berdasarkan panduan Akta Jalan, Parit, dan Bangunan 1974 serta Peraturan Bangunan 1984, rekabentuk ini memastikan ketinggian yang mencukupi untuk kenderaan, sistem saliran yang berkesan, dan struktur bumbung yang tahan terhadap beban angin dan hujan. Temubual dengan Ketua Jabatan Bangunan dan penyelaras MARAPET menunjukkan bahawa mereka bentuk struktur parkir ini melibatkan kolaborasi dalam

merancang komponen seperti asas tapak, sistem saliran, dan bahan binaan yang sesuai untuk memastikan keselamatan pengguna dan keberkesanan jangka panjang. Objektif ini berjaya dicapai dengan analisis keperluan yang mendalam dan rekabentuk struktur yang mematuhi peraturan keselamatan serta kemudahan awam. Penyertaan pelbagai pihak seperti Jabatan Bangunan dan MARAPET IKM Kota Kinabalu memastikan rekabentuk yang holistik dan berkesan dalam menyelesaikan masalah kekurangan parkir berbumbung di kampus.

5. Kesimpulan

Setelah kerja pembinaan selesai, Ketua Jabatan Bangunan memastikan hasil kerja memenuhi standard keselamatan dan kualiti sebelum membuat serahan tapak kepada pihak pengurusan tertinggi IKM Kota Kinabalu. Pihak pengurusan amat berpuas hati dengan hasil kerja yang dihasilkan.

Projek pembinaan parkir berbumbung ini bukan sahaja menyelesaikan masalah kekurangan tempat parkir tetapi juga menyediakan kawasan teduh yang bermanfaat untuk pelajar melaksanakan aktiviti. Projek ini adalah bukti komitmen IKM Kota Kinabalu dalam meningkatkan fasiliti dan kemudahan untuk warga kampus.

Pembinaan parkir berbumbung memerlukan pematuhan terhadap peraturan dan garis panduan yang ditetapkan oleh pihak berkuasa. Ini termasuk peraturan keselamatan bangunan, ketinggian minimum untuk parkir, reka bentuk struktur yang sesuai, serta sistem saliran yang berkesan. Pembelajaran daripada negara-negara seperti Australia dapat memberikan panduan tambahan dalam membangunkan parkir berbumbung yang efisien dan selamat, sesuai dengan keperluan IKM Kota Kinabalu.Acknowledgment

Rujukan

CIDB Malaysia. (2010). *Implementation of IBS in Malaysia: Benefits and Challenges*. Kuala Lumpur: Construction Industry Development Board.

Universiti Teknologi Malaysia. (2018). *Evaluating the Impact of Campus Facilities on Student Satisfaction*. Skudai: UTM Press.

Ministry of Energy, Green Technology, and Water Malaysia. (2015). *Sustainable Waste Management in Construction Projects*. Putrajaya: KeTTHA.

Concrete Society. (2019). *Concrete Workability and Slump Test in Construction Projects*. London: The Concrete Society.

DOE Malaysia. (2016). *Climate-Responsive Parking Design: A Case Study of Covered Parking Structures in Southeast Asia*. Kuala Lumpur: Department of Environment Malaysia.

WANDERTABLE: A CONCEPTUAL MULTIFUNCTION PICNIC TABLE

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Abstract

This project integrates design and woodworking to develop a multifunctional picnic table named Wandertable. A table is a versatile piece of furniture with various functions, types and sizes. Picnicking, a social activity enjoyed with family or friends, often requires a table for placing items, food, or performing activities. The challenge of finding a table in the market which is equipped with storage units and adjustable top inspired the creation of Wandertable. Its built-in storage unit allows users to conveniently store items, minimizing the need for additional storage boxes. The foldable and extendable top optimizes table functionality, while foldable legs ensure adaptability to different conditions. A standout feature of Wandertable is the Chevron-patterned top surface, crafted from recycled pallet wood, complemented by an acrylic storage cover for an elegant aesthetic. Additionally, this table serves multiple purposes at home, functioning as a side table, coffee table, or children's table. With overall dimensions of 54.5 (height) x 48.1cm (width) x 55.5cm (length), Wandertable is both practical and versatile. Product evaluations highlighted its practicality, durability, and portability as key strengths. Suggested improvements include adding foldable tabletops and wheels for enhanced mobility. Overall, Wandertable successfully redefines the standard picnic table, offering multifunctionality and practicality for both outdoor and residential use.

Keywords: multifunctional furniture, adjustable table design, recycled material, portable picnic table

1. Introduction

Tables are a fundamental type of furniture, valued for their wide range of applications, from dining and working to social activities like picnicking. Picnics, in particular, are enjoyable outdoor gatherings that require functional and portable furniture. However, conventional picnic tables often lack storage options and adaptability, making them less convenient for users who need to transport multiple items or accommodate varying conditions. This gap in the market inspired the creation of Wandertable, a conceptual multifunctional picnic table designed to address these challenges.

Wandertable incorporates practical features such as built-in storage unit, an adjustable top, and foldable legs, offering flexibility and convenience for outdoor activities. Its unique Chevron-patterned surface, crafted from recycled pallet wood, adds aesthetic appeal, while the use of acrylic for the storage cover enhances durability and elegance. Additionally, the table's compact size and multifunctionality make it suitable for indoor use as a side table, coffee table, or children's table. This project highlights the potential to transform everyday furniture into versatile solutions that cater to diverse needs in both outdoor and residential settings.

2. Literature Review

2.1 Multifunctional furniture design

Multifunctional furniture serves multiple purposes, making it ideal for small spaces or versatile needs. This type of furniture is especially valuable in modern living spaces where efficiency and versatility are prioritized. By combining different functions, such as a table built-in storage or a chair that doubles as a step stool, designers meet the needs of users with limited space for specific requirements (Husein, 2021).

2.2 Portable and outdoor furniture

Outdoor furniture faces unique challenges compared to indoor furniture. It must withstand weather conditions and be easy to move. Designers focus on durability, using materials like treated wood or metal, and on portability, ensuring

pieces are lightweight or foldable for easy transport. This makes them suitable for activities like picnics or camping (Designing Idea, n.d.).

2.3 Innovative storage solutions in furniture

Integrating storage into furniture helps declutter spaces. Examples include beds with drawers underneath or coffee tables with hidden compartments. These designs provide practical storage without sacrificing style or space (Rame, et. al. 2023). Combining storage functionality with aesthetic appeal ensures the furniture is both practical and stylish.

2.4 Material usage in furniture design

The choice of materials plays a significant role in furniture design, affecting both functionality and appearance. Recycled materials, such as pallet wood, offer unique textures and patterns while promoting sustainability. Additionally, combining materials, such as using acrylic, adds durability and contemporary touch (Simpo Living, n.d.).

2.5 User-centered design

User-centered design focuses on creating products tailored to the needs and preferences of users. In furniture design, this involves considering factors like ergonomics, ease of use, and multifunctionality. By understanding how furniture is used in real-life scenarios, designers can make improvements that enhance functionality and convenience. User-centered design ensures that the furniture not only meets practical needs but also provides an enjoyable and seamless experience (Jonsson, et.al., 2013).

3. Methodology

The process of developing Wandertable started with the design phase. The goal was to create a multifunctional picnic table with features like a storage unit, an adjustable top, and foldable legs. The tabletop was designed with a Chevron pattern made from recycled pallet wood to enhance its aesthetic appeal. Detailed technical drawings were created to define the dimensions (54.5cm height x 48.1cm width x 55.5cm length) and layout of all components, ensuring practicality and ease of use.

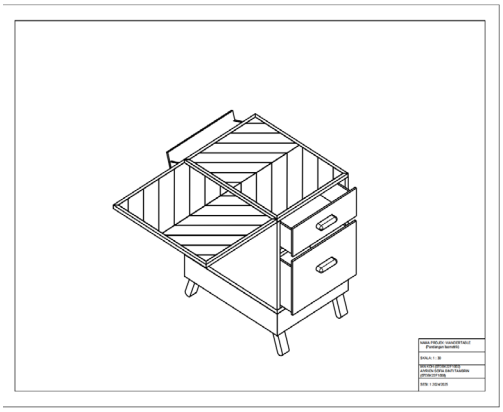

Figure 1: Isometric drawing of Wandertable

The manufacturing phase began with selecting suitable materials. Pallet wood was used exclusively for the tabletop to achieve the Chevron design, while other parts were made from durable and lightweight materials to ensure

portability.

Figure 2: The making of the table body and top components

Acrylic was chosen for the storage unit cover due to its clarity, strength, and sleek look. The construction involved cutting and shaping the pallet wood, assembling it into Chevron-patterned top, and attaching it to the frame. Hinges were installed to make the table legs foldable. The adjustable tabletop and storage unit were integrated as per the design specifications.

Figure 3: Finishing process

After the product was completed, it was evaluated by gathering feedback from potential users. Public feedback focused on aspects such as functionality, portability, and design aesthetics.

4. Result and Analysis

Figure 4: The finished product

Figure 5: The finished product

The final product, Wandertable, successfully achieved its design goals of being a multifunctional and portable picnic table. The table features a Chevron-patterned top made from recycled pallet wood, an integrated storage unit with an acrylic cover, and foldable legs with an adjustable top.

These features allow the table to serve various purposes, such as a picnic table, side table, or children's table. With dimensions of 54.5cm in height, 48.1cmini width, and 55.5cm in length, the table is compact and practical for both outdoor and indoor use.

Public feedback was gathered to evaluate the product's functionality and design. Users praised the practicality and portability of the table, as well as the aesthetic appeal of the Chevron-patterned tabletop. However, some suggestions were provided for improvement, including adding wheels to enhance mobility and refining the folding mechanism for smoother operation.

Overall, the feedback highlighted the product's strengths in combining functionality, versatility, and visual appeal. The analysis of the feedback confirmed that the table met its primary objectives, while suggested improvements offered valuable insights for potential future enhancements.

5. Conclusion

The Wandertable project demonstrates how design and functionality can be combined to create innovative and versatile furniture. By addressing specific needs such as portability, integrated storage, and adjustable features, the table offers practical solutions for outdoor and indoor use. The Chevron-patterned tabletop, made from recycled pallet wood, adds unique aesthetic element, aligning with the project's goal of blending form and function.

Public feedback confirmed the product's strengths, including its practicality, portability, and visual appeal, while also providing valuable suggestions for improvement. These insights emphasize the importance of user-centered design in enhancing functionality and usability. The project successfully delivers a multifunctional table that meets its intended purposes and lays a foundation for future improvements, ensuring it remains adaptable to various user needs and environments.

References

Designing Idea. (n.d.). *35 Types of Outdoor Furniture (Materials & Buying Guide).* Retrieved from https://designingidea.com/types-of-outdoor-furniture/

Husein, H.A. (2021). Multifunctional Furniture as a Smart Solution for Small Spaces for the Case of Zaniary Towers Apartments in Erbil City, Iraq. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 12*(1), 12A1H, 1-11. http://TUENGR.COM/V12/12A1H.pdf DOI:10.14456/ITJEMAST.2021.8

Jonsson, O., Östlund, B., Warell, A. & Dalholm, E. (2013). *Experiences of a User-Centred Research Approach involving Old People in Early Phases of Design; Reflections from Furniture Manufacturers*. 10th European Academy of Design Conference – Crafting the Future.

Rame, R., Purwanto, P. & Sudarno, S. (2023). Transforming the Furniture Industry in The Digital Age. *Jurnal Riset Teknologi Pencegahan Pencemaran Industri. 14*. 53-69. 10.21771/jrtppi.2023.v14.no3.p53-69.

Simpo Living. (n.d.). *The Impact of Material Thickness and Weight on Outdoor Furniture Design*. Retrieved from https://www.simpoliving.com/impact-material-thickness-weight-outdoor-furniture/?

Challenges in Integrating AI into ESL Teaching: A Teacher-Centric Perspective

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Abstract

This study examines the challenges English as a Second Language (ESL) educators face when integrating Artificial Intelligence (AI) tools into their teaching practices. Despite AI's potential to revolutionize language learning through personalized instruction, instant feedback, and enhanced resource accessibility, its implementation is hindered by significant barriers. This study aims to bridge the gap between technological innovation and practical application by tackling these issues and offering actionable recommendations to enhance ESL teaching practices. Using a teacher-centric qualitative approach, the study identifies key issues, including limited access to AI tools due to financial and technological constraints, inadequate professional training for educators, and ethical concerns such as data privacy and AI bias. Additionally, pedagogical misalignments between AI applications and curriculum goals complicate adoption. These challenges are exacerbated by students' over-reliance on AI, which reduces critical thinking and authentic language application. The findings underscore the need for targeted teacher training programs, improved digital infrastructure, and the development of curriculum-aligned, culturally inclusive AI tools. Addressing these barriers requires collaboration among educators, policymakers, and AI developers to ensure ethical and effective AI integration.

Keywords: ESL education, Artificial Intelligence, teacher challenges, AI integration barriers

1. Introduction

The rapid integration of artificial intelligence (AI) into education has significantly transformed traditional teaching methodologies. In English as a Second Language (ESL) classrooms, AI-driven tools such as chatbots, adaptive learning platforms, and automated grading systems can potentially enhance language acquisition and teaching efficiency (Smith et al., 2021). These tools enable personalised learning, instant feedback, and greater access to resources, which is particularly beneficial in diverse and resource-limited ESL contexts (Jones & Lee, 2020). However, integrating AI into ESL teaching remains complex and challenging despite its advantages.

One notable challenge is that teachers need more practical training in AI tools. Research by Nguyen et al. (2022) highlights that many ESL teachers feel underprepared to integrate AI due to limited professional development opportunities. Additionally, the technological infrastructure required for AI tools is often unavailable in low-income regions, creating disparities in AI adoption (Kumar & Davis, 2021). Furthermore, ethical concerns such as data privacy, AI bias, and algorithm transparency remain unresolved, posing risks to educators and learners (Chen & Zhang, 2020).

The need for alignment between AI tools and specific ESL teaching objectives is a significant barrier from a pedagogical perspective. For instance, Lee (2023) observed that many AI-driven applications focus on grammar and vocabulary but fail to address communicative competence, a core goal of ESL instruction. Similarly, teachers report difficulty balancing AI's automation with the human interaction necessary for effective language learning (Brown & Taylor, 2022).

Understanding these challenges is crucial for effectively implementing AI tools and ensuring they meet the needs of educators and learners alike. Existing studies emphasise the benefits of AI in education, such as improved learning outcomes and efficiency (Smith et al., 2021; Chen & Zhang, 2020), but few examine the practical barriers teachers face in real-world settings. Addressing these issues requires an in-depth exploration of ESL teachers' experiences with AI to identify areas for improvement and inform teacher-centric solutions development.

This study explores the challenges ESL teachers face when adopting AI technologies in their teaching practices.

By analysing these challenges, the study aims to bridge the gap between technological innovation and practical application in ESL education, providing actionable recommendations for educators, policymakers, and developers. Integrating AI technologies in ESL education is promising, but challenges impede its widespread adoption. Recent studies underscore these obstacles, highlighting the importance of addressing them to fully harness AI's potential in transforming ESL teaching.

A key challenge is the need for more reliable AI tools tailored to the diverse needs of ESL learners. For instance, while AI offers personalised learning opportunities, teachers need help accessing high-quality tools aligned with curriculum goals (Ahmed, 2024). Insufficient training exacerbates the problem, as many educators must prepare to integrate AI effectively into their teaching practices (Zainuddin et al., 2024). This knowledge gap limits the ability of educators to leverage AI tools to their fullest potential.

Another pressing issue is the ethical dimension of AI use, particularly concerning data privacy and potential algorithmic biases. For example, studies show that AI systems can perpetuate inequalities if not carefully designed and monitored (Abimbola et al., 2024). Additionally, the relevance of AI-generated content remains a concern, as these tools may need to account for cultural and linguistic diversity, leading to a mismatch in learner needs (Dziubata, 2024).

Despite these barriers, the potential benefits of AI in enhancing engagement, personalisation, and efficiency in ESL education are widely recognised (Sharifuddin & Hashim, 2024). Addressing these challenges through improved access, targeted teacher training, and ethical safeguards can unlock AI’s transformative potential.

Existing research on AI in education predominantly emphasises its technical capabilities and potential benefits. However, there is limited focus on the lived experiences of ESL teachers, particularly their struggles with adopting AI technologies. Most studies examine AI integration from a learner's perspective or within broader educational contexts, leaving a gap in understanding ESL teachers' specific challenges.

This study addresses this gap by providing insights into ESL educators' practical difficulties while integrating AI into their teaching practices. It aims to inform teacher-centred solutions development and bridge the divide between AI innovation and its practical application in ESL education. Therefore, this study aims to investigate the challenges teachers have encountered when integrating AI into English language teaching.

2. Literature Review

Challenges of Integrating AI in ESL Teaching Practices

Integrating Artificial Intelligence (AI) into English as a Second Language (ESL) education offers immense potential for enhancing teaching methodologies and personalising learning experiences. However, its implementation needs to be improved, and challenges limit its effectiveness in diverse educational contexts. Recent research has highlighted several barriers, from technical limitations and pedagogical misalignments to ethical and cultural concerns, that hinder the full realisation of AI's potential in ESL education.

One significant challenge in integrating AI into ESL teaching is inadequate technical infrastructure. Studies have revealed that many institutions need better internet connectivity, outdated hardware, and limited access to AI tools, particularly in resource-constrained settings. These limitations exacerbate inequities, leaving underprivileged schools and learners at a disadvantage. For instance, Zainuddin et al. (2024) emphasised the pervasive technological gaps that hinder the adoption of AI-based tools in classrooms, while Ahmed (2024) underscored similar issues in the Nigerian context, highlighting the digital divide as a critical barrier to equitable access to AI resources.

Educator readiness and training pose another challenge. Many ESL teachers need more skills and confidence to integrate AI tools into their teaching practices effectively. Research by Dziubata (2024) identified limited AI literacy among teachers as a significant impediment, calling for robust professional development programs to equip educators with the technical and pedagogical knowledge required to utilise AI effectively. Such training is necessary for even the most advanced AI tools to achieve their intended impact as educators struggle to align them with existing curricula and teaching methods.

Ethical and privacy concerns further complicate the integration of AI in ESL education. AI-powered tools often involve collecting and processing student data, raising questions about data security, consent, and potential biases in algorithmic decision-making. Kovalenko and Baranivska (2024) highlighted the need for clear ethical guidelines to address these concerns, emphasising the importance of transparent data practices and equitable AI applications. The

absence of robust ethical frameworks risks undermining trust in AI tools and deterring widespread adoption.

Pedagogical misalignment also challenges the effective use of AI in ESL teaching. Teachers often need help integrating AI tools into traditional teaching practices while maintaining the interpersonal elements crucial for language acquisition. Mananay (2024) pointed out that many AI tools need to be designed to accommodate the diverse needs of ESL learners, resulting in a lack of customisation that limits their utility. This misalignment often leads to suboptimal learning outcomes and dissatisfaction among educators and students.

Student resistance and engagement issues are additional hurdles in adopting AI in ESL education. Moulieswaran and Kumar (2023) found that students often view AI-powered applications as less effective than traditional teacher-led instruction. Concerns about the quality of AI-generated feedback, particularly in areas like grammar correction and pronunciation, contribute to this scepticism. Moreover, students need to gain familiarity with AI technologies to avoid resistance, reducing the effectiveness of these tools in promoting language learning.

Cultural and linguistic inclusivity remains critical in developing and deploying AI tools for ESL education. Kovalenko and Baranivska (2024) noted that many AI systems must account for learners' diverse cultural and linguistic backgrounds, limiting their relevance and applicability. For AI to be truly effective in ESL contexts, it must be designed to accommodate the unique linguistic needs of learners from varied cultural settings, ensuring that all students benefit equally from its capabilities.

Addressing these challenges requires targeted solutions and collaborative efforts. Investing in digital infrastructure is essential to bridge the technological gap and ensure equitable access to AI resources. Ahmed (2024) recommended public-private partnerships to improve internet connectivity and provide schools with the necessary hardware. In parallel, professional development programs are needed to enhance teachers' AI readiness. Dziubata (2024) advocated for comprehensive training initiatives to equip educators with the skills to integrate AI tools into their teaching practices seamlessly.

Ethical considerations must also be addressed by establishing clear guidelines for the responsible use of AI in education. Kovalenko and Baranivska (2024) emphasised the importance of data security, algorithmic transparency, and equitable practices in fostering trust and ensuring ethical AI implementation. Developing culturally and linguistically inclusive AI tools can also enhance their effectiveness in diverse ESL classrooms. Customisation options catering to varied learner needs can help align AI tools with pedagogical goals, as Mananay (2024) suggested.

In conclusion, while AI holds immense potential to transform ESL education, its integration presents significant challenges. Addressing these barriers requires concerted efforts from educators, policymakers, and technology developers. Investing in infrastructure, training, and ethical frameworks and developing inclusive and adaptable AI tools can realise the promise of AI in ESL education, creating more effective and equitable learning environments.

3. Research Methodology

3.1 Research Design

This study employed a qualitative research design to explore the challenges encountered by English language teachers in integrating Artificial Intelligence (AI) into English as a Second Language (ESL) teaching practices. A qualitative approach was chosen to provide an in-depth understanding of the participants' experiences, perspectives, and challenges in using AI technologies in their classrooms.

3.2 Participants

The participants comprised 17 English language teachers teaching diploma programs in polytechnics across Malaysia. These teachers were selected through random sampling techniques to ensure diversity and reduce selection bias. Each participant had more than 12 years of teaching experience, bringing a wealth of expertise and nuanced insights into the challenges of integrating AI into their teaching practices.

3.3 Data Collection Instrument

The primary data collection instrument was open-ended questions administered to the participants. This format allowed for the collection of rich, descriptive data, enabling participants to freely express their experiences, challenges, and opinions regarding AI integration in their teaching practices. The open-ended nature of the questions facilitated a deeper exploration of complex issues that may not have been captured through closed-ended questions.

3.4 Data Analysis

The collected data were analysed using thematic analysis. This method was chosen for its ability to identify, analyse, and interpret patterns or themes within qualitative data. The thematic analysis provided a structured approach to organising the data while allowing for the flexibility to capture the complexities of participants' experiences. The analysis involved several steps: familiarising with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report.

3.5 Procedure

Sampling: Participants were selected randomly from a pool of eligible English language teachers in polytechnics across Malaysia.

Data Collection: Open-ended questions were distributed to the participants, and responses were collected through interviews and written submissions.

Data Preparation: Responses were transcribed and organised systematically to facilitate analysis.

Data Analysis: Thematic analysis was conducted in multiple stages, from coding to theme identification and refinement.

Ethical Considerations: Participants were informed about the purpose of the study, and their consent was obtained before participation. Confidentiality and anonymity were maintained throughout the research process.

4. Result And Discussion

4.1 Access and Equity Issues

Challenges arise from unequal access to AI tools due to financial, technological, or infrastructural limitations.

"Not all students have access to AI tools." (P1)

"Slow or unstable internet connections limit usage." (P3)

"The cost of AI tools and compatible devices is prohibitive for some." (P4)

"Most AI tools have limited features for the free version, making it difficult to utilise the tools to the fullest." (P5)

4.2 Over-Reliance on AI by Students

Students excessively depend on AI, leading to reduced critical thinking, problem-solving abilities, and real-world application of language skills.

"They are over depending on AI and fail to function without it." (P2)

"Relying solely on AI for language learning might limit students' ability to handle spontaneous, unscripted conversations in real-life situations." (P4)

"Students likely use AI to bypass learning, and plagiarism is a big concern." (P6)

4.3 Skill Deficiency in AI Usage

Students need help using AI tools effectively due to weak prompts, unclear goals, or low language proficiency.

"Students are weak at crafting effective prompts." (P2)

"They type back the instruction given to them hoping AI could solve it all." (P5)

"Students with low language proficiency and cognitive levels find it hard to use AI effectively." (P6)

4.4 Teacher-Related Challenges

Teachers need more expertise, training, and resources, making AI integration difficult.

"Lecturers themselves are not fully equipped with knowledge in using AI, so we usually use traditional methods

in teaching." (P3)

"One of the biggest challenges is the need for technical expertise. Those who are not familiar with AI may find it difficult to integrate this technology into their teaching practices." (P5)

"We need support and training to get started with AI integration." (P7)

5. Technical and Resource Constraints

Limitations due to inadequate infrastructure or lack of advanced devices required for AI usage.

"Slow internet connection and expensive devices make it hard to integrate AI into teaching." (P1)

"AI tools often require expensive or advanced devices to function optimally." (P7)

4.5 Pedagogical Concerns

Description: Difficulties in balancing AI with traditional teaching methods and concerns about AI's limitations in replicating human interaction or emotional engagement.

"Difficulty balancing AI tools with traditional teaching methods." (P4)

"AI tools may oversimplify complex language concepts." (P6)

"Although AI can simulate conversations, the level of interaction is still quite basic compared to real human conversation." (P7)

4.6 Curriculum Alignment

Ensuring AI tools fit curriculum objectives and support meaningful learning without oversimplification.

"Ensuring AI tools align with curriculum goals is challenging." (P3)

"It's difficult to find tools that suit both teaching and learning objectives." (P6)

Integrating artificial intelligence (AI) into English as a Second Language (ESL) teaching presents multifaceted challenges that educators must navigate to enhance learning outcomes effectively. Recent studies have identified key obstacles, including access and equity issues, student over-reliance on AI, skill deficiencies in AI usage, teacher-related challenges, technical constraints, pedagogical concerns, and curriculum alignment.

Access to AI tools is uneven among students, often due to financial constraints and technological disparities. Many learners need more devices or stable internet connections, particularly in under-resourced regions, limiting their ability to benefit from AI-enhanced learning (Koumpouros, 2024). Additionally, the high cost of AI applications and the limited functionality of free versions exacerbate these inequities, creating a digital divide that hinders comprehensive AI integration in ESL education.

The increasing dependence on AI tools among students raises concerns about the potential decline in critical thinking and problem-solving skills. More reliance on AI can lead to superficial learning, as students may use these tools to bypass active engagement with language practice, resulting in challenges when handling spontaneous, unscripted conversations in real-life situations (Baron, 2023). This behaviour underscores the necessity for balanced AI integration, where technology is a supplementary aid rather than a replacement for traditional learning methods.

Students often need to improve effectively utilising AI tools, stemming from weak prompt-crafting abilities and unclear objectives. Low language proficiency impedes productive AI use, highlighting the importance of digital literacy training emphasising meaningful engagement with AI technologies (Hooda et al., 2022). Educators play a pivotal role in bridging this gap; however, many face challenges acquiring the requisite expertise.

Teachers need help integrating AI into their teaching practices due to insufficient training and support. Many educators continue to rely on traditional methods, not out of preference but because of a need for more professional development opportunities focusing on AI integration (Knight et al., 2018). The rapid evolution of AI technologies necessitates ongoing training to ensure educators remain adept at leveraging these tools effectively.

Technical constraints, such as unstable internet connections and the need for advanced, often expensive devices, further complicate AI adoption in ESL teaching. These limitations are particularly pronounced in resource-constrained environments, where inadequate infrastructure hampers the seamless integration of AI tools (Koumpouros, 2024).

Addressing these issues requires substantial institutional investment in both technology and infrastructure.

Pedagogical concerns revolve around balancing AI tools with traditional teaching methods. While AI can offer personalised learning experiences, it may also oversimplify complex language concepts and lack the emotional intelligence inherent in human instruction (Hooda et al., 2022). The current capabilities of AI in simulating authentic human interaction are limited, underscoring the irreplaceable value of human educators in fostering comprehensive language skills.

Aligning AI tools with established curriculum goals presents additional challenges. Educators often need to identify AI applications that support meaningful learning with oversimplification, necessitating collaboration between educators, developers, and policymakers to create tools that are pedagogically sound and curriculum-aligned [(Knight et al., 2018).

While AI holds significant potential to transform ESL teaching, its integration is fraught with challenges that require a multifaceted approach. Addressing access and equity issues, preventing over-reliance, enhancing digital literacy, providing comprehensive teacher training, improving technical infrastructure, considering pedagogical implications, and ensuring curriculum alignment are critical steps toward effective AI integration in ESL education. By tackling these challenges, educators can harness AI's capabilities to enrich language learning experiences while maintaining the essential human elements of teaching.

5. Implications of the Research

The findings of this research highlight critical implications for educators, policymakers, and AI developers. Addressing the challenges in integrating AI into ESL teaching requires a multifaceted approach to ensure equitable access and practical usage. For educators, professional development is crucial. Training programs should focus on equipping teachers with technical skills to integrate AI tools into their practices while maintaining a balance with traditional methods. This includes fostering digital literacy among teachers and students to maximise AI's potential in supporting meaningful learning.

Policymakers need to prioritise bridging the digital divide. Investment in affordable devices, robust internet infrastructure, and subsidised access to AI tools is essential to enable equitable opportunities for all learners. Tailored support for under-resourced schools and regions can mitigate disparities and enhance access to technology.

AI developers must collaborate with educators to design tools aligned with curriculum goals and pedagogical standards. Tools should address complex language learning needs, provide personalised feedback, and integrate features that promote critical thinking and authentic communication skills. Finally, institutional strategies should encourage ethical AI use, preventing over-reliance and plagiarism. By addressing these implications, stakeholders can foster a more inclusive and effective integration of AI in ESL education, benefiting teachers and learners.

6. Recommendation for Future Research

Future research should explore strategies for effectively training teachers to integrate AI into ESL teaching while balancing traditional methods. Investigations into the long-term impacts of AI use on students' critical thinking, problem-solving, and communicative skills are also essential. Additionally, studies focusing on developing affordable, curriculum-aligned AI tools for under-resourced contexts could address access and equity issues. Research should also examine ethical concerns, such as plagiarism and over-reliance on AI, proposing frameworks for responsible use. Finally, interdisciplinary collaboration between educators, AI developers, and policymakers is recommended to ensure that AI solutions are pedagogically sound and contextually relevant.

7. Conclusion

This research highlights teachers' multifaceted challenges in integrating AI into ESL teaching, including access issues, over-reliance on AI, skill deficiencies, teacher preparedness, technical constraints, pedagogical concerns, and curriculum alignment. Addressing these challenges requires a balanced approach that combines technology with traditional teaching methods, supported by training, infrastructure improvements, and equitable access to resources. Collaboration among educators, policymakers, and AI developers is critical to ensure effective, ethical, and meaningful AI integration. By addressing these barriers, AI can enhance ESL education while preserving the critical role of teachers in fostering student engagement, critical thinking, and authentic language development.

References

Abimbola, C., Eden, C. A., Chisom, O. N., & Adeniyi, I. S. (2024). Integrating AI in education: Opportunities, challenges, and ethical considerations. *Magna Scientia Advanced Research and Reviews, 6*(1), 12–25.

Ahmed, U. (2024). Harnessing digital transformation with AI to improve the teaching and learning of English as a second language in Nigeria. *International Journal of Literature, Language and Linguistics, 15*(2), 78–91.

Baron, N. S. (2023). *How ChatGPT robs students of motivation to write and think for themselves*. The Conversation.

Brown, J., & Taylor, S. (2022). Balancing automation and interaction in AI-driven ESL teaching tools. *Journal of Language Education and Technology, 15*(3), 45–62.

Chen, Y., & Zhang, L. (2020). Ethical concerns in AI applications for language learning: Privacy, bias, and transparency. *International Review of Educational Technology, 28*(4), 112–130.

Dziubata, Z. (2024). Application of AI technologies in teaching ESL and ESP at agro-technical higher educational institutions. *Педагогічний дискурс, 5*(2), 34–48.

Hooda, M., Sharma, S., & Kaur, G. (2022). *Benefits and challenges in implementing artificial intelligence in ESL classrooms: A systematic review.* Semantic Scholar.

Jones, R., & Lee, H. (2020). The role of AI in resource-limited ESL contexts: Opportunities and challenges. *TESOL Quarterly, 54*(2), 233–250.

Knight, S., Shum, S. B., & Littleton, K. (2018). The role of artificial intelligence in education: Current challenges and opportunities. *International Journal of Artificial Intelligence in Education, 28*(1), 256–273.

Koumpouros, Y. (2024). Revealing the true potential and prospects of augmented reality in education. *Smart Learning Environments, 11*(1), 1–15.

Kovalenko, I., & Baranivska, N. (2024). Integrating artificial intelligence in English language teaching: Exploring the potential and challenges of AI tools in enhancing language learning outcomes and personalized education. *European Socio-Legal & Humanitarian Studies, 9*(2), 45–60.

Kumar, A., & Davis, P. (2021). Digital disparities: Challenges of AI adoption in under-resourced ESL environments. *Education and Technology Research, 10*(1), 78–93.

Lee, C. (2023). AI tools in ESL education: Addressing gaps in communicative competence development. *Language Teaching Innovations, 20*(1), 35–50.

Mananay, J. A. (2024). Integrating artificial intelligence (AI) in language teaching: Effectiveness, challenges, and strategies. *International Journal of Learning, Teaching and Educational Research, 23*(5), 112–128.

Moulieswaran, N., & Kumar, N. S. (2023). Investigating ESL learners' perception and problem towards artificial intelligence (AI)-assisted English language learning and teaching. *World Journal of English Language, 13*(3), 45–58.

Nguyen, T., Brown, M., & Lin, S. (2022). Professional development for AI integration in ESL classrooms: A teacher's perspective. *Journal of Educational Practice and Research, 19*(3), 67–85.

Sharifuddin, N. S., & Hashim, H. (2024). Benefits and challenges in implementing artificial intelligence in education (AIED) in ESL classroom: A systematic review (2019–2022). *International Journal of Academic Research in Business and Social Sciences, 14*(4), 56–72.

Smith, A., Patel, R., & Green, D. (2021). AI in education: Enhancing learning outcomes in ESL classrooms. *International Journal of Educational Technology, 25*(2), 98–115.

Zainuddin, N. M., Bukhari, N. A., & Mohamad, M. (2024). Implementation of artificial intelligence (AI) as a pedagogical tool in tertiary ESL classroom: Teachers' perspectives. *International Journal of Academic Research in Business and Social Sciences, 14*(5), 78–95.

KAJIAN PENCAPAIAN PROGRAMME EDUCATIONAL OBJECTIVES (PEO) PROGRAM DIPLOMA AKAUNTANSI POLITEKNIK KOTA KINABALU

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Abstrak

Matlamat program Diploma Akauntansi (DAT) Politeknik Kota kinabalu (PKK) disasarkan berdasarkan kepada empat (4) matlamat pendidikan program (PEO) yang telah ditetapkan oleh Jabatan Pendidikan Politeknik dan Kolej Komuniti (JPPKK) dalam struktur program DAT. Pencapaian program perlu diukur bagi tujuan penambahbaikan kualiti agar program DAT kekal relevan kepada pelbagai lapisan pemegang taruh program. Justeru itu, matlamat kajian ini adalah untuk mengumpul data berkenaan dengan pencapaian PEO program DAT yang dilaksana di PKK. Kajian dilaksana berdasarkan kepada garis panduan pelaporan kajian pencapaian PEO yang diwartakan oleh pihak JPPKK. Skop kajian melibatkan alumni ambilan pelajar Jun 2014 hingga Dis 2018 serta majikan mereka. Dapatan kajian pada keseluruhannya memberikan bukti-bukti positif pencapaian PEO program dengan purata min berada pada kedudukan >3 bagi kesemua PEO. Dapatan ini menyimpulkan bahawa, program DAT yang dilaksanakan di PKK telah berjaya menghasilkan tenaga kerja separa professional dalam bidang perakaunan yang diyakini oleh majikan.

Kata kunci: Program Diploma Akauntasi, Programme Educational Objectives, PEO

1. Pengenalan

Pihak pengurusan akademik Politeknik Kota Kinabalu sentiasa berusaha untuk memastikan agar kualiti perkhidmatan khususnya dalam pemberian perkhidmatan pendidikan TVET dalam pelbagai bidang yang ditawarkan berada pada tahap cemerlang. Di peringkat jabatan, Jabatan Perdagangan (JP) Politeknik Kota Kinabalu (PKK) berusaha secara berterusan demi merealisasi visi dan misi PKK dapat dicapai. Justru itu, kajian-kajian keberkesanan program-program pendidikan yang ditawarkan perlu dilaksana pada julat masa yang relevan bagi menilai semula serta menambahbaik keperluan-keperluan serta kelemahan-kelemahan yang ada agar program-program yang ditawarkan kekal relevan dengan kehendak semasa.

Program Diploma Akauntansi (DAT) PKK adalah 1 daripada 3 program yang ditawarkan oleh JP PKK. Sebagai politeknik tunggal yang menawarkan program DAT di seluruh Negeri Sabah dan utara Negeri Sarawak, program ini sentiasa mendapat sambutan dengan jumlah pengambilan pelajar baru antara yang tertinggi di Malaysia dalam kalangan politeknik yang menawarkan program sama. Maka dengan itu, tanggungjawab bagi memastikan program ini kekal relevan kepada pemegang-pemegang taruh amat signifikan kepada PKK. Oleh yang demikian, warga pendidik Program DAT Politeknik Kota Kinabalu dengan ini mengambil inisiatif melaksana kajian berkenaan dengan pencapaian matlamat pendidikan program (PEO) DAT di PKK, dengan harapan agar hasil dapatan kajian dapat digunakan sebagai sumber rujukan kepada proses penambahbaikan kualiti yang berterusan serta pemantapan polisi-polisi pada masa yang akan datang.

PEO adalah matlamat yang telah disasarkan kepada program-program latihan pendidikan yang ditawarkan di Malaysia. PEO bagi tiap-tiap program yang ditawarkan adalah unik kepada program tersebut masing-masing. Hasil pembelajaran (Learning Outcome, (LO)) di peringkat kursus (CLO) dan seterusnya diperingkat program (PLO) bagi setiap program adalah direka khusus bagi mencapai PEO program. Pencapaian PEO hanya dilakukan setelah 5 tahun seseorang pelajar menamatkan program yang diambil. Justeru itu, skop alumni yang terlibat perlu dikenalpasti dengan sewajarnya sebelum kajian pencapaian PEO ini dilaksana. Untuk itu, langkah awal telah diambil dengan tujuan mengesan alumni-alumni graduan DAT PKK melalui pensyarah-pensyarah yang telah bertanggungjawab sebagai penasihat akademik kepada kumpulan alumni ini. Perbincangan selanjutnya akan melihat dengan lebih teliti pada skop kajian pencapaian PEO ini.

2. Skop Kajian

Kajian pencapaian PEO ini adalah berdasarkan pada struktur program DAT yang berkuatkuasa bermula pada tahun 2014 hingga tahun 2018. Program DAT PKK telah menggunakan struktur program DAT yang baru bermula sesi ambilan Jun 2019. Maka dengan itu, kohort pelajar yang terlibat dalam kajian ini adalah pelajar dari kohort Jun 2014 hingga Dis 2018. Jumlah alumni DAT terlibat sekitar 742 orang. Berdasarkan kepada struktur program DAT yang terlibat, berikut adalah PEO yang dikaji;

Jadual 1: PEO program DAT

PEO	Matlamat/ Aspek
1	Pengetahuan dan kecekapan teknikal dalam bidang perakaunan selari dengan keperluan industri. *Knowledge and technically competent in accounting discipline in line with the industry requirement.*
2	Berkesan dalam komunikasi dan menunjukkan kualiti kepemimpinan yang baik dalam organisasi. *Effective on communication and demonstrate good leadership quality in an organization.*
3	Mampu menyelesaikan masalah dalam situasi-situasi perniagaan dengan secara innovatif, kreatif dan beretika melalui pendekatan yang mapan. *Capable to solve problems in business situations innovatively, creatively and ethically through sustainable approach.*
4	Mampu menunjukkan kemahiran keusahawanan dan menyedari keperluan pembelajaran sepanjang hayat untuk peningkatan kerjaya. *Able to demonstrate entrepreneurship skills and recognize the need of lifelong learning for successful career advancement.*

3. Metodologi Kajian

Secara umumnya kajian ini adalah kajian kuantitatif dengan menggunakan data yang dikumpul menggunakan instrumen kajian berbentuk soal-selidik yang disebar kepada alumni melalui platform 'Google Form'. Data kajian yang dikumpul kemudiannya dianalisa secara deskriptif bagi mendapatkan kesepakatan yang sesuai dengani matlamat kajian ini. Perbincangan lebih terperinci berkaitan metodologi kajian ini akan dilapor dalam sub topik selanjutnya.

3.1 Perancangan Kajian

Kajian ini dirancang berdasarkan kepada garis panduan kajian PEO oleh pihak Jabatan Pendidikan Politeknik dan Kolej Komuniti (JPPKK). Antara kehendak garis panduan bagi kajian ini adalah agar kajian tidak semata-mata bergantung pada maklumbalas alumni sahaja. Garis panduan turut menyasarkan kepada maklumbalas daripada pihak majikan bagi menyokong dapatan hasil maklumbalas alumni. Oleh yang demikian, kajian ini dirancang kepada 3 fasa seperti yang berikut;

Jadual 2: Fasa Kajian

Fasa	Keterangan
I	. Pengumpulan data pencapaian PEO hasil maklumbalas alumni. i. Mengenalpasti data majikan alumni berdasarkan maklumbalas alumni.
II	. Menyampaikan link instrumen kepada majikan. i. Menghubungi majikan alumni bagi mendapatkan maklumbalas pencapaian PEO alumni.
III	. Analisa data kajian pencapaian PEO alumni dan majikan i. Pelaporan kajian

Data perhubungan majikan alumni hanya dapat diperoleh melalui intrumen soal selidik kepada alumni. Fasa I dan II akan dibincang secara meluas dalam subtopik yang berikutnya, manakala fasa III akan dibincangkan dalam topik 4 dan 5.

3.2 Populasi Kajian

3.2.1 Fasa I

Polulasi kajian bagi fasa I melibatkan alumni dari kohot ambilan Jun 2014 hingga Dis 2018. Bagi tujuan menghubungi dan menyampaikan instrument kajian kepada populasi ini, langkah-langkah di dalam Jadual 3 telah

diambil.

Jadual 3: Langkah-langkah pelaksanaan fasa I

Langkah	Pelaksanaan
1	Mengenalpasti penasihat akademik bagi kelas dalam kohot terlibat
2	Penasihat akademik mengesan bekas pelajar / alumni dibawah jagaan masing-masing melalui sama ada i) no. Telefon aktif, ii) Media Sosial seperti FB, Group Whatapps dan sebagainya dan iii) e-mail pelajar.
3	Ahli kumpulan-kerja menyampaikan link instrumen kajian berpandukan pada capaian hubungan alumni dari kaedah 2 di atas.

Sebagai pemudahcara kepada kajian, warga pendidik DAT PKK, telah membentuk satu kumpulan-kerja secara 'ad hoc' dengan tujuan khusus mendapatkan data kajian. Kumpulan-kerja ini kemudiannya dibahagikan kepada dua sub kumpulan bagi tujuan pengumpulan data fasa I. Jadual berikut melaporkan jumlah pelajar bagi setiap kelas berdasarkan kohot serta agihan pada kumpulan-kerja yang dibentuk.

Jadual 4: Jumlah Populasi Kajian berdasarkan kelas dan penasihat akademik

Kohot	Penasihat Akademik	Jumlah Alumni	Kumpulan-kerja
Jun 2014	Anbukarasu & Darvina	69	A
Dis 2014	Nirazmilah & Wan Noraza	67	
Jun 2015	Masraya & Ruhaznawati	75	
Dis 2015	Siti Hafsah & Neswati	54	
Jun 2016	Binuwil, Alexander & Siti Safurah	99	
Dis 2016	Saima & Anna Zareena	80	B
Jun 2017	Darvina, Farhana & Rosmalaily	88	
Dis 2017	Binuwil & Wan Norazah	68	
Jun 2018	Masraya/ Masliza & Azuyaria	85	
Dis 2018	Nirazmilah & Ruhaznawati	57	

Kumpulan kerja yang dibentuk adalah seperti yang berikut;

Jadual 5: Sub-kumpulan kerja kajian

Sub kumpulan kerja	Pensyarah terlibat
A	Siti Safurah binti Haji Ahmad (Ketua), Wan Norazah binti Wan Mahmud @ Mamat, Nirazmilah binti Sulaiman, Alexander Jiran, Neswati binti Arjikal, Anbukarasu A/L Paramasivam
B	Darvina binti Omar (Ketua), Saima binti Saleng, Rosmalaily binti Zainul Abidin, Binuwil Ajani, Azuyaria binti Mat Puzi

3.2.2 Fasa II

Hasil dapatan fasa I, 127 majikan telah dikenalpasti dan data perhubungan majikan alumni ni telah diperolehi. Populasi majikan alumni ini kemudiannya diagihkan kepada pensyarah-pensyarah DAT untuk dihubungi secara rasmi melalui telefon dan link diberikan kepada mereka melalui e-mail rasmi. Pensyarah turut dipertanggungjawab untuk mendapatkan kerjasama dari populasi majikan alumni agar kajian mendapat maklumbalas sebanyak mungkin.

3.2.3 Kaedah Persampelan

Kajian ini mengarah kepada suatu populasi dalam skop kajian yang jelas. Justeru kaedah persampelan yang digunakan adalah persampelan terarah (directive) bagi kedua-dua fasa I dan II. Populasi kajian bagi fasa II ditentukan dengan membuat saringan terhadap dapatan hasil maklumbalas alumni di fasa I. Tiada peratusan khusus ditetapkan oleh pihak JPPKK berkenaan dengan maklumbalas, namun demikian kajian menyasarkan 25% dari populasi pelajar pada tahap minimum. Kajian turut menjangka akan kesukaran mendapatkan maklumbalas daripada majikan alumni berdasarkan kepada pengalaman dari program-program lain. Namun, dengan kaedah berhubung terus dengan penyelia alumni ditempat bekerja, kajian ini mengharapkan sekurang-kurangnya 10% daripada populasi majikan alumni

dikenalpasti dapat memberikan maklumbalas.

3.3 Intsrumen Kajian

Pada dasarnya instrumen kajian direka berdasarkan kepada 4 PEO yang dikaji. Setiap pencapaian PEO ini diukur dengan menggunakan 4 atau 5 item secara purata. Item ini telah dibincangkan bersama dengan ahli kumpulan-kerja dan disemak oleh Dr. Chong Fung Yen @ Adelina Chong, seorang pensyarah JP yang turut berperanan sebagai salah seorang penyelaras bagi program kajian PEO bagi PKK. Berikut adalah instrumen yang dibangunkan mengikut fasa I dan II.

3.3.1 Alumni (Fasa I)

Instrumen kajian bagi fasa I dimulai dengan item-item yang direka untuk mengumpul data demografi populasi. Bahagian ini dikelas pada maklumat demografi peribadi dan pekerjaan. Bahagian ini juga dibangunkan secara khusus untuk mendapatkan data perhubungan majikan populasi alumni.

a. Demografi

Jadual 6: Peribadi (Jawapan singkat dan pilihan tunggal)

No.	Item
1.	Nama (*Name*)
2.	Nombor Telefon (*Contact Number*)
3.	Alamat Email (*Email Address*)
4.	Jantina (*Gender*)
5.	Keturunan (*Race*)
6.	Tahun Graduasi (*Year of Graduation*)
7.	Status Pekerjaan (*Employment status*)

Jadual 7: Pekerjaan (Jawapan singkat dan pilihan tunggal)

No.	Item
1.	Sektor (*Sector*)
2.	Jawatan (*Job Desination*)
3.	Majikan terkini (*Current Employer*)
4.	Nama penyelia (*Name of immediate supervisor*)
5.	Nombor telefon penyelia (*Immidiate supervisor contact number*)

b. PEO

Maklumbalas pencapaian PEO 1 hingga 4 oleh alumni DAT PKK diukur dengan menggunakan skala Likert 5 peringkat seperti berikut:

	1	**2**	**3**	**4**	**5**	
Sangat tidak setuju/ *Strongly disagree*	○	○	○	○	○	**Sangat setuju/ *Strongly Agree***

Jadual 8: PEO 1

No.	Keterangan item
1	Pengetahuan dan kemahiran saya dalam bidang perakaunan adalah setara dengan keperluan-keperluan industri. *I am competent in knowledge and skills in accounting discipline in-line with industry requirements.*
2	Saya sedang bekerja dalam suatu pekerjaan atau suatu industri berkait bidang dipelajari *I am working in a job or an industry of my study discipline / field.*
3	Pengetahuan yang dipelajari di Politeknik diaplikasi dalam jawatan sekarang. *The knowledge that I have learned in polytechnic is applied in my current position.*

4	Saya telah mengambil latihan /kursus-kursus untuk mengemaskini pengetahuan dan kemahiran-kemahiran yang berkait dengan pekerjaan saya. *I have undergone training / courses to upgrade my knowledge and skills which are related to my job.*
5	Saya mempunyai pengalaman berkongsi pengetahuan dan kemahiran saya dengan orang lain (Dalam atau luar organisasi.) *I have experienced of sharing my knowledge and skills with the others (internal/ external organization).*

Jadual 9: PEO 2

No.	Keterangan item
1	Kemahiran Komunikasi penulisan dan pertuturan saya setara dengan keperluan-keperluan industri *I am competent in spoken and written communication in-line with industry requirements.*
2	Saya berpengalaman dalam aktiviti-aktiviti komunikasi seperti menulis kertas cadangan/pelaporan, pembentangan, menjadi panel dan sebagainya *I have experience in communication activities such as proposal/report writing, presentation, being a panel or speaker etc.*
3	Saya memegang jawatan dan tanggungjawab/tugas penting dalam organisasi saya *I am holding an important position and responsibilities in my organization.*
4	Saya mempunyai orang bawahan dalam penyelian saya. *I have subordinate under my supervision.*
5	Saya terlibat dalam pasukan yang mengurus projek berkaitan pekerjaan saya *I have involved in a team that manage a special project related to my job.*

Jadual 10: PEO 3

No.	Keterangan item
1	Saya berkeupayaan menyelesaikan masalah-masalah dalam urusan perniagaan secara inovatif, kreatif dan beretika melalui pendekatan yang mapan. *I am capable to solve problems in business situations innovatively, creatively and ethically through sustainable approach.*
2	Saya telah menyumbang suatu idea baru dalam penambahbaikan organisasi atau penyelesaian masalah. *I contributed a new idea for organization improvement or to solve problem.*
3	Saya terlibat dalam proses pembuatan keputusan dalam organisasi saya. *I have been involved in the decision-making process in my organization.*
4	Saya terlibat dalam kajian dan pembangunan dalam apa-apa projek pemasaran/ produk/ perkhidmatan/ sistem dalam organisasi saya. *I have been involved in the research and development of any marketing/ products/ services/ systems/ technical project in my organization.*

Jadual 11: PEO 4

No.	Keterangan item
1	Saya berkeupayaan menunjukkan kemahiran keusahawanan dan mengenalpasti keperluan pembelajaran sepanjang hayat untuk kemajuan kerjaya yang berjaya. *I am able to demonstrate entrepreneurship skill and recognize the need of lifelong learning for a successful career advancement.*
2	Saya selalu terlibat dalam aktiviti-aktiviti keusahawanan. *I have been involved in entrepreneurship activities.*
3	Saya memiliki / merancang untuk memiliki sijil professional berkait dengan kelayakan akademik dan deskripsi pekerjaan saya.

	I have / I plan to have a professional certificate related to my academic qualification and job description.
4	Saya sedang/ akan menghadiri kursus-kursus tambahan untuk kemajuan kerjaya/ pencapaian peribadi/ Penambahbaikan taraf hidup dan sebagainya. *I am attending/ I will attend additional courses for my career advancement/ self-achievement/ life improvement etc.*

3.3.2 Majikan Alumni (Fasa II)

Instrumen kajian bagi fasa II lebih fokus kepada rekabentuk pengukuran pencapaian PEO di mana item yang dibangun adalah khusus untuk menyokong item dengan nombor yang sama pada instrumen kajian di fasa I. Sebagai contoh item no 1 bagi PEO di fasa I seperti berikut:

"Pengetahuan dan kemahiran saya dalam bidang perakaunan adalah setara dengan keperluan-keperluan industri."

disokong oleh pernyataan dalam item no 1 bagi fasa II:

"Graduan program DAT yang sedang bekerja/ pernah bekerja di organisasi saya mempunyai pengetahuan dan kemahiran perakaunan selari dengan keperluan organisasi saya"

Keselarian item bagi kedua-dua fasa ini perlu agar dapatan bagi fasa II (maklumbalas majikan alumni dapat menyokong dapatan hasil maklumbalas alumni di fasa I. Bahagian demografi bagi populasi majikan alumni DAT PKK adalah seperti bahagian a) di bawah.

a. Demografi

Jadual 12: Perniagaan (Jawapan singkat dan pilihan tunggal)

No.	Item
1.	Nama syarikat (Company's n*ame*)
2.	Sektor perniagaan (*Business sector*)
3.	Lokasi kawasan perniagaan (*Business regional location*)
4.	Tahun Beroperasi (*Year in operation*)

b. PEO

Maklumbalas pencapaian PEO 1 hingga 4 oleh majikan alumni DAT PKK diukur dengan menggunakan skala Likert 5 peringkat seperti berikut:

	1	**2**	**3**	**4**	**5**	
Sangat tidak setuju/ *Strongly disagree*						**Sangat setuju/ *Strongly Agree***

Jadual 13: PEO 1

No.	Keterangan item
	Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya….(item 1 hingga 5) *DAT program (currently working with) / (employed by) my organization.....(item 1 until 5)*
1	mempunyai pengetahuan dan kemahiran perakaunan selari dengan keperluan organisasi saya. *possesses the accounting knowledge and skill in line with my organization's requirements.*
2	boleh beradaptasi dengan perubahan-perubahan keperluan organisasi saya. *able to (adapt) / (adopt) to changes in my organization's requirements.*
3	memerlukan (latihan / kursus) khusus perakuanan lanjutan untuk dapat lebih menyesuaikan dengan keperluan organisasi saya. *require further **specialize** accounting (training) / (courses) to better suit my organization's requirements.*
4	berupaya bekerja secara berdikari dengan pengawasan yang minima. *able to work independently with minimize supervision.*

5	berupaya berkongsi pengetahuan dan kemahiran perakaunan dalam organisasi saya. *able to share accounting knowledge and skill within my organization.*

Jadual 14: PEO 2

No.	Keterangan item
	Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya…. (item 1 hingga 3) *DAT program (currently working with) / (employed by) my organization.... (item 1 until 3)*
1	bercakap dan menulis dengan berkesan selari dengan keperluan organisasi saya. *speak and write effectively in line with my organization's requirements.*
2	menjelaskan kerja/ tanggungjawab/ idea dengan cara yang boleh saya faham dan terima. *explain their works/ responsibilities/ ideas in the way that I can understand and accept.*
3	mengurus atau membantu pengurusan dalam peranan penyeliaan dengan berkesan. *managed or assist the management in supervisory roles effectively.*
4	Saya percaya graduan program DAT (sedang bekerja/ pernah bekerja) dengan organisasi saya untuk memegang (jawatan / tanggunjawab) penting dalam operasi organisasi saya. *I trust DAT program graduate (currently working) / (employed by) my organization to hold important (position) / (responsibilities) in my organization's operation.*
5	Saya tiada halangan untuk melantik graduan program DAT (sedang bekerja/ pernah bekerja) di organisasi saya untuk mengurus projek penting. *I have no hesitation to appoint or involve DAT program graduate (currently working) / (employed by) my organization to manage any important project.*

Jadual 15: PEO 3

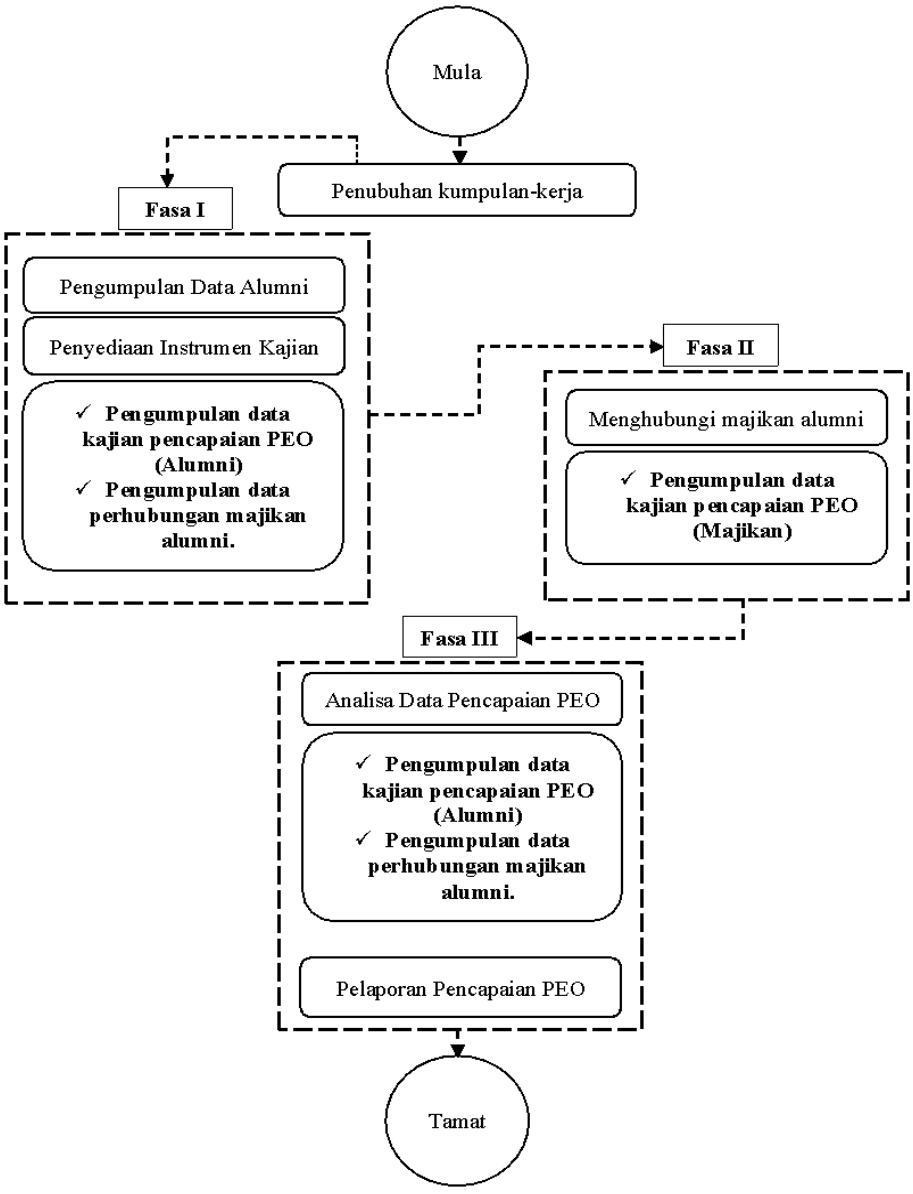
No.	Keterangan item
	Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya…. (item 1 hingga 5) *DAT program (currently working with) / (employed by) my organization.... (item 1 until 5)*
1	secara aktif terlibat dalam situasi penyelesaian masalah dan pembuatan keputusan dalam organisasi saya. *actively involved in problem solving and decision-making situations in my organization.*
2	sentiasa menyumbang idea baru dalam organisasi saya. *always contribute new ideas in my organization.*
3	sentiasa menyumbang idea yang wajar/ rational/ bolehcapai dalam organisasi saya. *always contribute feasible (doable/ rational) ideas in my organization.*
4	secara aktif terlibat dengan kajian atau pembangunan pemasaran/ produk/ perkhidmatan/ system projek teknikal dalam organisasi saya. *is actively involve with research or development of any marketing/ products/ services/ systems/ technical project in my organization.*

Jadual 16: PEO 4

No.	Keterangan item
	Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya…. (item 1 hingga 4) *DAT program (currently working with) / (employed by) my organization.... (item 1 until 4)*
1	bertindak secara optimis (bersikap positif) dalam mana-mana situasi dalam organisasi saya. *behave in an optimistic (react positively) trait in many situations in my organization.*
2	sentiasa berupaya mengenalpasti peluang yang baik dalam mana-mana situasi dalam organisasi saya. *always managed to identify good opportunity in any given situation in my organization.*

3	menunjukkan kerelaan untuk mengambil peranan atau tanggungjawab baru dalam organisasi saya. *demonstrate the willingness to take up new positions or responsibilities in my organization.*
4	Saya percaya pada potensi graduan program DAT (sedang bekerja/ pernah bekerja) di organisasi saya untuk Berjaya dalam kerjaya di masa hadapan. *I believe in the potential of DAT program graduate (currently working) / (employed by) my organization to have a successful career advancement in the future.*

Rajah1 berikutnya menunjukkan jejak aliran kerja kajian pencapaian PEO DAT PKK bermula dari pada penubuhan kumpulan kerja hingga ke fasa-fasa seterusnya.



Rajah 1: Carta alir kerja kajian

3.4 Kaedah analisis data

Sesuai dengan objektif kajian yang fokus kepada prestasi pencapaian PEO program DAT PKK, kajian ini hanya melihat dan mebincangkan berkenaan dengan pelaporan statistik deskriktif serta min hasil maklumbalas alumni serta majikan. Kajian tidak dilanjutkan kepada korelasi dan kesan antara data demografi dengan min pencapaian PEO yang diukur. Kajian korelasi antara pengukuran PEO melalui maklumbalas alumni dan majikan turut sukar dilaksana kerana kadar respon daripada pihak majikan alumni dijangka adalah rendah. Topik 4 melaporkan dapatan kajian.

4. Dapatan dan Perbincangan

Topik ini melapor serta menjelaskan dapatan hasil maklumbalas alumni DAT PKK serta maklumbalas dari pihak majikan sesuai dengan metodologi dan perancangan kajian. Perbincangan dimulai dengan statistik demografi responden alumni DAT PKK dan dilanjutkan kepada perbincangan berkenaan dengan min pengukuran pencapaian PEO DAT oleh alumni dan majikan (statistik deskriptif).

4.1 Statistik Demografi

Bagi fasa I, 158 responden alumni (21% dari populasi) telah mengambil bahagian dengan melengkapkan intrumen soal selidik yang telah diedarkan. Jumlah responden berdasarkan tahun konvokesyen adalah seperti berikut:

Jadual 17: Pecahan Responden mengikut tahun konvokesyen

Tahun Konvokesyen	Jumlah	Peratus
2016	1	1%
2017	13	8%
2018	14	9%
2019	48	30%
2020	19	12%
2021	63	40%
Jumlah	158	100%

Berdasarkan kepada statistik responden, jelas kajian mengalami kesukaran untuk mencapai pelajar yang telah lama menamatkan pengajian di PKK. Hanya pelajar sekitar 20% responden dari kalangan mereka yang telah tamat pengajian dan berkonvokesyen dari tahun 2016 ke 2018. Jadual berikut menunjukkan statistik demografi responden alumni dalam kajian ini:

Jadual 18: Statistik Demografi responden

Aspek	Jantina		Status Pekerjaan		Sektor Pekerjaan		Perjawatan	
	Lelaki	Perempuan	Dengan Majikan	Sendiri	Kerajaan	Swasta /Sendiri	Dalam Bidang	Luar Bidang
Jumlah	39	119	142	16	22	136	107	51
Peratusan	25%	75%	90%	10%	14%	86%	68%	32%

Majoriti responden adalah daripada kalangan jantina perempuan. Perkara ini adalah normal berdasarkan kepada norma pengambilan pelajar program DAT di PKK di mana nisbah pelajar perempuan kepada pelajar lelaki bagi suatu kelas adalah sekitar 6:4 atau 7:3. Dari aspek status pekerjaan, 90% daripada responden bekerja dengan majikan manakala selebihnya bekerja sendiri. 86% alumni berkhidmat dalam sektor swasta atau bekerja sendiri berbanding hanya 14% sahaja berkhidmat dalam sektor awam. Dari aspek perjawatan yang melihat sama ada alumni DAT PKK bekerja dalam bidang perakaunan atau tidak, peratusan responden menunjukkan bahawa 68% alumni bekerja dalam bidang perakaunan.

4.2 Min Skor pencapaian PEO

Data pencapaian bagi setiap PEO yang telah diperoleh melalui maklumbalas alumni dan majikan alumni telah dianalisa dan interpretasi skor min dapatan analisa dijelaskan berdasarkan kepada jadual interpretasi skor min berikut;

Jadual 19: Interpretasi Skor Min

Skor Min	Interpertasi Skor Min
1.00 – 2.33	Rendah
2.34 – 3.66	Sederhana
3.67 – 5.00	Tinggi

Jadual 20: Min Skor PEO 1 (Alumni dan Majikan)

No.	Keterangan item	Min	
		Alumni	Majikan
1	Pengetahuan dan kemahiran saya dalam bidang perakaunan adalah setara dengan keperluan-keperluan industri. *Graduan program DAT yang sedang bekerja/ pernah bekerja di organisasi saya mempunyai pengetahuan dan kemahiran perakaunan selari dengan keperluan organisasi saya*	4.09	4.21
2	Saya sedang bekerja dalam suatu pekerjaan atau suatu industri berkait bidang dipelajari *Graduan program DAT yang sedang bekerja/ pernah bekerja di organisasi saya boleh beradaptasi dengan perubahan-perubahan keperluan organisasi saya.*	3.84	4.47
3	Pengetahuan yang dipelajari di Politeknik diaplikasi dalam jawatan sekarang. *Graduan program DAT yang sedang bekerja/ pernah bekerja di organisasi saya memerlukan (latihan / kursus) khusus perakuanan lanjutan untuk dapat lebih menyesuaikan dengan keperluan organisasi saya.*	3.94	4.00
4	Saya telah mengambil latihan /kursus-kursus untuk mengemaskini pengetahuan dan kemahiran-kemahiran yang berkait dengan pekerjaan saya. *Graduan program DAT yang sedang bekerja/ pernah bekerja di organisasi saya berupaya bekerja secara berdikari dengan pengawasan yang minima.*	3.56	4.53
5	Saya mempunyai pengalaman berkongsi pengetahuan dan kemahiran saya dengan orang lain (Dalam atau luar organisasi.) *Graduan program DAT yang sedang bekerja/ pernah bekerja di organisasi saya berupaya berkongsi pengetahuan dan kemahiran perakaunan dalam organisasi saya.*	3.94	4.26
	Purata Min	**3.87**	**4.29**

Jadual 20 menunjukkan skor min PEO 1 bagi alumni dan majikan. Berdasarkan kepada jadual ini, kedua-dua adalah pada tahap tinggi iaitu 3.87 dan 4.29. Melihat kepada pencapaian item PEO 1 secara individu, hanya item no. 4 alumni yang tidak berada pada tahap tinggi. Ini menunjukkan bahawa sebilangan responden tidak merasakan perlu untuk mengambil latihan atau kursus bagi peningkatan kemahiran perakaunan sedia ada. Skor tertinggi bagi alumni adalah bagi item 1 mencadangkan bahawa graduan DAT PKK yakin bahawa kemahiran yang dipelajari melalui program DAT adalah setara dengan keperluan industri. Dapatan ini disokong oleh skor min tertinggi bagi majikan pada item 4 yang mencadangkan bahawa majikan yakin terhadap keupayaan alumni DAT PKK untuk bekerja dengan pengawasan yang minima.

Jadual 21: Min Skor PEO 2 (Alumni dan Majikan)

No.	Keterangan item	Min	
		Alumni	Majikan
1	Kemahiran Komunikasi penulisan dan pertuturan saya setara dengan keperluan-keperluan industri *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya bercakap dan menulis dengan berkesan selari dengan keperluan organisasi saya.*	4.21	4.38
2	Saya berpengalaman dalam aktiviti-aktiviti komunikasi seperti menulis kertas cadangan/pelaporan, pembentangan, menjadi panel dan sebagainya *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya menjelaskan kerja/ tanggungjawab/ idea dengan cara yang boleh saya faham dan terima.*	3.66	4.52
3	Saya memegang jawatan dan tanggungjawab/tugas penting dalam organisasi saya *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya mengurus atau membantu pengurusan dalam peranan penyeliaan dengan berkesan.*	3.91	4.48
4	Saya mempunyai orang bawahan dalam penyelian saya.	2.64	4.48

	Saya percaya graduan program DAT (sedang bekerja/ pernah bekerja) dengan organisasi saya untuk memegang (jawatan / tanggunjawab) penting dalam operasi organisasi saya.		
5	Saya terlibat dalam pasukan yang mengurus projek berkaitan pekerjaan saya *Saya tiada halangan untuk melantik graduan program DAT (sedang bekerja/ pernah bekerja) di organisasi saya untuk mengurus projek penting.*	3.43	4.38
	Purata Min	**3.57**	**4.45**

Min skor bagi alumni (3.57) berada pada tahap sederhana berbanding kepada skor min majikan (4.45) yang berada kepada tahap tinggi. Perbezaan dapatan ini adalah dipengaruhi oleh faktor taburan responden yang lebih menjurus kepada kohot yang agak baru menamatkan pengajian (rujuk jadual 21) di mana alumni DAT dalam kumpulan ini tidak memegang peranan sebagai seorang penyelia (item no. 4) dan kurang terlibat dalam pasukan yang menguruskan projek penting (item no. 5). Skor min yang tinggi untuk majikan alumni DAT mencadangkan kerelaan majikan untuk memberi peranan penting dalam pengurusan operasi organisasi kepada alumni DAT PKK.

Jadual 22: Min Skor PEO 3 (Alumni dan Majikan)

No.	Keterangan item	Min	
		Alumni	Majikan
1	Saya berkeupayaan menyelesaikan masalah-masalah dalam urusan perniagaan secara inovatif, kreatif dan beretika melalui pendekatan yang mapan. *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya secara aktif terlibat dalam situasi penyelesaian masalah dan pembuatan keputusan dalam organisasi saya.*	3.92	4.38
2	Saya telah menyumbang suatu idea baru dalam penambahbaikan organisasi atau penyelesaian masalah. *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya sentiasa menyumbang idea baru dalam organisasi saya.*	3.73	4.19
3	Saya terlibat dalam proses pembuatan keputusan dalam organisasi saya. *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya sentiasa menyumbang idea yang wajar/ rational/ bolehcapai dalam organisasi saya.*	3.68	4.19
4	Saya terlibat dalam kajian dan pembangunan dalam apa-apa projek pemasaran/ produk/ perkhidmatan/ sistem dalam organisasi saya. *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya. secara aktif terlibat dengan kajian atau pembangunan pemasaran/ produk/ perkhidmatan/ system projek teknikal dalam organisasi saya.*	3.35	3.86
	Purata Min	**3.67**	**4.16**

Skor min bagi PEO 3 adalah berada pada tahap tinggi bagi kedua-dua alumni (3.67) dan majikan (4.16). Pada peringkat item secara individu, alumni dan majikan kedua-duanya mencatatkan skor tertinggi bagi item no. 1 (3.92; 4.38). Dapatan ini mencadangkan bahawa graduan program DAT PKK mempunyai asas kemahiran berfikir, menyelesaikan masalah dan membuat keputusan secara wajar dan mapan. Skor min terendah bagi PEO 4 adalah 3.35 bagi item no. 4 alumni. Sekali lagi dapatan rendah ini adalah disebabkan oleh taburan responden yang lebih berat kepada kumpulan alumni yang masih baru dalam alam pekerjaan.

Jadual 23: Min Skor PEO 4 (Alumni dan Majikan)

No.	Keterangan item	Min	
		Alumni	Majikan
1	Saya berkeupayaan menunjukkan kemahiran keusahawanan dan mengenalpasti keperluan pembelajaran sepanjang hayat untuk kemajuan kerjaya yang berjaya. *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya bertindak secara optimis (bersikap positif) dalam mana-mana situasi dalam organisasi saya.*	3.58	4.33
2	Saya selalu terlibat dalam aktiviti-aktiviti keusahawanan. *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya sentiasa berupaya mengenalpasti peluang yang baik dalam mana-mana situasi dalam organisasi saya.*	3.11	4.33
3	Saya memiliki / merancang untuk memiliki sijil professional berkait dengan kelayakan akademik dan deskripsi pekerjaan saya. *Alumni program DAT (sedang bekerja/ pernah bekerja) di organisasi saya menunjukkan kerelaan untuk mengambil peranan atau tanggungjawab baru dalam organisasi saya.*	3.70	4.38
4	Saya sedang/ akan menghadiri kursus-kursus tambahan untuk kemajuan kerjaya/ pencapaian peribadi/ Penambahbaikan taraf hidup dan sebagainya. *Saya percaya pada potensi graduan program DAT (sedang bekerja/ pernah bekerja) di organisasi saya untuk berjaya dalam kerjaya di masa hadapan.*	3.44	4.48
	Purata Min	**3.46**	**4.38**

Skor min PEO 4 adalah sederhana bagi alumni (3.46) dan tinggi bagi majikan (4.38). Melihat kepada skor min item alumni secara individu, alumni DAT PKK sedikit kurang menjurus kepada keusahawanan (item no. 1 dan 2) tetapi lebih menjurus ke arah pembelajaran sepanjang hayat (item no. 3 dan 4) atau menyambung pengajian ke peringkat lebih tinggi. Skor min PEO 4 majikan yang berada pada tahap tinggi mencadangkan bahawa majikan berkeyakinan terhadap keupayaan alumni DAT PKK untuk terus maju dalam kerjaya.

5. Kesimpulan

Secara keseluruhannya, dapatan data kajian pengukuran pencapaian PEO program pengajian Diploma Akauntansi di Politeknik Kota Kinabalu mencadangkan bahawa objektif program adalah tercapai. Keupayaan Bahagian Kurikulum (BK) Jabatan Pendidikan Politeknik dan Kolej Komuniti (JPPKK) dan institusi PKK dalam menyedia kurikulum dan seterusnya menghasilkan graduan berpengetahuan, berkemahiran teknikal dan berkemahiran insaniah secara seimbang khususnya dalam bidang perakaunan adalah konsisten dan mapan, sesuai dengan kehendak industri serta pemegang taruh yang lain. Namun demikian, ini tidak bermaksud bahawa ruang penambahbaikan adalah kecil dan tidak signifikan. Perubahan-perubahan keperluan industri dalam bidang perakaunan akan sentiasa berlaku. Justeru itu, adalah menjadi harapan bahawa data dapatan dalam kajian pencapaian PEO program DAT PKK ini dapat membantu proses penambahbaikan kepada pelaksanaan program DAT pada masa hadapan.

Rujukan

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WOTES

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