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Kampus Sungai Petani

Faculty of Administrative
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TABLE OF CONTENTS:-

i-SPIKE 2021 International Exhibition & Symposium E-Proceedings

NO.	TITLE	PAGE
1.	‘Viewfinder’ Mobile Learning Application for Videography and Cinematography Based on the Rules of Perspective <i>Amir Nor Azan Samar, Harim Izzati Hamdan, Iqbal Jaapar & Muhammad Firdaus Amairudin</i>	1
2.	Systematic Alternative Fuzzy Logic Evaluator (SAFLE) for Student Performance Evaluation <i>Shirley Sinatra Gran, Tracy Adeline Ajol & Awang Nasrizal Awang Ali</i>	8
3.	360 Employees – I <i>Dayang Hazenah Awang Abdul Hamid, Nur Dina Athia Mohd Ramley, Nur Hidayah Jusoh, Nurul Husna Abd Jalil & Mohammad Firdaus Mohammad Hatta</i>	12
4.	AbMTI: Adventure Based Mental Toughness Inventory for Post Covid-19 Pandemic Era <i>Mohd Shariman Shafie, Professor Dato Dr. Md Amin Md Taff, Dr. M.Adli bin Mohd Sidi, Mohamed Azizul bin Mohamed Afandi, Dr. Omar Firdaus Mohd Said & Nik Jazwiri Johannis</i>	18
5.	AbMTM: Post Covid-19 Adventure-Based Mental Toughness Training Model <i>Mohd Shariman Shafie, Professor Dato’ Dr. Md Amin Md Taff, Assoc. Professor Dr. Zuraidah Zainol & Dr. Siti Musliha Mat Rasid</i>	23
6.	Pembentukan Modul Undi18@School untuk Pendidikan Kenegaraan dan Demokrasi kepada Belia 18-21 Tahun <i>Wan Rohila Ganti Wan Abdul Ghapar, Che Hamdan Che Mohd. Razali, Muhamad Fazil Ahmad & Abdul Rahman Abdul Latip</i>	28
7.	A Planning of Templer Forest Park and Templer Forest Reserve through Management Plan <i>Mohammad Zharif Hakimi Mohammad Mazani, Nurul Atikah Mohd Salleh, Muhammad Hafiy Safwan Sahak, Nurul Nabila Che Ahamed, Teeny Valerian, Mohamad Fathi Radhi Ishak, Nor Hanisah Mohd Hashim & Firdaus Chek Sulaiman</i>	33
8.	Administrative Model for Sekolah Agama Rakyat (SAR): Excellence Practices <i>Mohd Nasir Ayub, Nazmi @ Nazni Noordin, Mohd Zool Hilmie Mohamed Sawal & Surita Hartini Mat Hassan</i>	38
9.	ADR-Now Application: Bridging Theoretical and Practical Approach in Alternative Dispute Resolution Process and Procedures <i>Dr. Shahrizal Mohd Zin, Abdul Mu’iz Abdul Razak, Prof. Madya Dr. Nur Ezan Rahmat & Nik Hasbi Fathi</i>	43

10.	Agricultural Career Training Program for Drop Out Students through Work Based Learning <i>Marinah Muhammad, Noor Janatun Naim Jemali, Nik Raihan Nik Yusoff & Rozidaini Mohd Ghazi</i>	47
11.	An Eco-Friendly Concrete Blends from Palm Oil Boiler Ash <i>Nurrul Amilin Zainal Abidin, Zeno Michael, Mohamed Khatif Tawaf Bin Mohamed Yusof, Azmi Roslan, Siti Shahidah Binti Sharipudin, Shahrul Nizam Bin Mohammad & Ilya Izyan Binti Shahrul Azhar</i>	52
12.	An Investigation of Clothing for Elderly: Emphasizing Safety, Protection and Functional Attributes <i>Shahrizad Fitri Mustapha, Shuhaila Nahrawi, Rizal Azni Dahaman & Norzaleha Zainun</i>	57
13.	Ardu-Electrochromic Film for Home Safety And Privacy Purpose <i>Anas Akasyah Abd Patas, Nur Athirah Mohd Taib & Syahida Suhaimi</i>	65
14.	Let's Talk about the Movies: The Movie Journal <i>Associate Profesor Dr Norwati Binti Hj Roslim, Associate Profesor Dr Hj, Muhammad Hakimi Tew Abdullah, Ku Nurul Atiqah Ku Ahamad, Nur Faathinah Mohammad Roshdan, Suhaila binti Sharil & Siti 'Aishatul-Humairah Muhammad Fisol</i>	71
15.	Asymmetric Impact of The Oil Price Changes on Stocks Market for Selected Asean Countries <i>Shahiszan binti Ismail, Prof. Madya Dr. Noor Zahirah Mohd Sidek, Fauziah Mohamad Yunus, Jamilah Laidin & Nor Azira Ismail</i>	78
16.	Automated System for Concrete Damage Classification Identification Using Various Classification Techniques in Machine Learning <i>Nur Haziqah binti Mat, Athifa Aisha binti Ahmad Zahida, Siti Nurhaliza binti Abdul Malik, Nur Athirah Syuhada binti Azmadi & Syahrul Fithry bin Senin</i>	81
17.	Automatic Price Scanning System <i>Fahmi Nazreen Zakuan, Anis Diyana Rosli & Nurlida Ismail</i>	88
18.	Al Hijaei V1 <i>Yuslina Mohamed, Mesbahul Hoque, Sulaiman Ismail Nurhasma & Muhamad Saad</i>	94
19.	Infographic of Benevolence Practices: Public Sector's Myth or Reality <i>Dr Nor Zaini Zainal Abidin, Azni Syafena Andin Salamat, Syahrini. Shawalludin, Azlan Abdul Rahman & Dr Siti Norfazlina Yusoff</i>	100
20.	BIO-CHEM KIT: Understanding Biogeochemical Cycles <i>Nurul Hidayana Mohd Noor, Shawal Sahid Hamid@Hussain, Mahazril 'Aini Yaacob & Mohd Hafiz Hazwan Hashim</i>	104

21.	Biodegradable and Recycle Husk Mailer from <i>Cocos nucifera</i> <i>Anas Firdaus bin Zakaria, Nur Atirah binti Hamzah, Siti Farahin binti Abdull Patah, Wan Zuraida Wan Mohd Zain & Nur' Amira binti Hamid</i>	110
22.	Bunny's Pellet: Natural Mulberry Pellet <i>Nor Dini Rusli, Khairiyah Mat, Hasnita Che Harun, Mohd Mahmud & Syed Muhammad Al-Amsyar Syed Abd. Kadir</i>	114
23.	Cails Paper Wash <i>Aisyah Nur Izzah binti Azhar, Intan Nafissa binti Mohd Jaffri, Loris Anak Noh, Caroline Anak Kiroh & Silverina Anabelle Kibat</i>	120
24.	Capcut <i>Dr Sharifah Shafinaz Sh Abdullah, Nur Afini Azwa binti Roslan, Nur Alya Nabila binti Ashariman, Nur Mazmira binti Mohamad Zuki & Nur Nabila binti Omar</i>	124
25.	Regenerated Kenaf Core Cellulose Hydrogels and Films Prepared via Pre-Cooled Method <i>Adam Khairul Faiz, Muhammad Khairil Hakim Ismail, Hatika Kaco & Mohd Shaiful Sajah</i>	128
26.	Encapsulation of Winged Termites in Cellulose Nanofibre for the Fabrication of Cellulose Bioplastic <i>Syahidatul Nadhilah Shah Lail, Noorul Jannah Aizul Hussin, Hatika Kaco & Mohd Shaiful Sajah</i>	134
27.	Chinese Character Card Game: Learners' Attitudes and Motivation <i>Ting Hie-Ling</i>	140
28.	Coffee Capsule Vending Machine <i>Mohd Sufian Ramli, Siti Sufiah Abd Wahid, Muhammad Hasif Razak & Muhammad Hakimi Md Said</i>	146
29.	Corn-Based Bioplastic as Seedling Bag <i>Nur Nadia Nasir & Siti Amira Othman</i>	151
30.	Coupiers: Course Pre-Registration System <i>Zeti Darleena Eri, Mohd Hanapi Abdul Latif, Mohd Atif Ramlan, Ruhana Jaafar, Sharifah Nurulhikmah Syed Yasin, Hasiah Mohamed & Sarah Yusoff</i>	156
31.	Divorce Protection Takaful <i>Siti Thaqifah Ruzaidy, Siti Adibah Embong, Mohammad Firdaus Mohammad Hatta & Arlinah Abd. Rashid</i>	162
32.	Entrepreneurial Website Project "Www.Businessletter4you.Com" <i>Akmal Syaifudin bin Kaharudin, Siti Zuraina binti Gafar @ Abd Ghaffar & Juritah Misman</i>	168

33.	Early Flash Flood Detection and Avoidance System <i>Muhammad Aidil Aisar Mohd Yatim, Muhammad Khalis Zuhri Izahar, Rohaiza Baharudin & Mohd Hussaini Abbas</i>	174
34.	Ebook: Easy Research For All <i>Sylvia Nabila Azwa Ambad</i>	180
35.	e-Info_JK Formation Committee System for the School of Civil Engineering (Pka) Universiti Teknologi MARA <i>Azlinda Saadon, Musmuliadi Kamaruding, Syahrin Neizam Mohd Dzulkifli, Mazidah Mukri, Noraida Mohd Saim, Dzulaikha Khairuddin & Siti Hamidah Abdull Rahman</i>	183
36.	E-Module ABRA-Maths - Early Mathematics Learning via Mini Tennis <i>Rahela Abdul Rahim, Haslinda Ibrahim, Fauziah Baharom, Mohd. Rahizam Abdul Rahim & Syahrul Ridhwan Morazuki</i>	189
37.	Enhanced Microwave Heat Susceptor Crucible <i>Assoc. Prof. Dr. Muhammad Azwadi Sulaiman, Fathin Asila Mohd Pabli, Syifa' Muhamad Sharifuddin, Assoc. Prof. Dr. Julie Juliewatty Mohamed & Dr. Norfadhilah Ibrahim</i>	194
38.	Enhancement of Latent Fingerprint Using Dyed Eggshell Powder <i>Kavitha Rajagopal</i>	198
39.	Product Development - E-Personal Possessions Takaful (e-PPT) <i>Siti Hasnulbariah binti Ahmad Rusmili, Nor Ashikin binti Dal Nia, Dania Carmila binti Said, Mohammad Firdaus bin Mohammad Hatta & Norzanah binti Mat Nor</i>	200
40.	E-Pocket Note: An Interactive Video Learning for Effective Online Teaching and Learning Process <i>Norhayati Zamri, Nor Bahiyah Omar, Norul Akma Mansor, Liyana Ab Rahman & Farah Husna Mohd Fatzel</i>	205
41.	The Clauses SMM2 at Construction Site Board Game For (WBLFF) <i>Roseline anak Ikau, Zafikha Aida Bidin, Syamimi Liyana Amat Rais, Amira Shazlin Adnan & Mohd Khairul Fitri othman</i>	210
42.	e-Voting: Votehere4u 2.0 <i>Adib Sarkawi, Aiza Johari, Azlina Bujang & Zainon Haji Bibi</i>	215
43.	IO2TX <i>Dr Sharifah Shafinaz Sh Abdullah, Nur Afini Azwa binti Roslan, Nur Alya Nabila binti Ashariman, Nur Mazmira binti Mohamad Zuki & Nur Nabila binti Omar</i>	220

44.	Waste Segregation through Recycle and Composting Activities among the Community in Urban and Suburban Areas <i>Ts. Dr. Norhafezah binti Kasmuri & SitiNurhafizah binti Abdull Razak</i>	225
45.	Ez-Crutches 2.0: An Innovation of Assistive Device for Disabled Person <i>Suzana binti Yusof, Sharifah Shafinaz binti Sharif Abdullah, Fatimah binti Sham & Norhafizatul Akma binti Shohor</i>	231
46.	Facile-Fabricated Foamed Geopolymer Sphere for Heavy Metal Removal from Wastewater <i>Tan Tee How, Mo Kim Hung, Lai Sai Hin & Ling Tung-Chai</i>	236
47.	Finance and Me (<i>FinME</i>) – A Digital Learning Tool <i>Carolyn Ann Enchas, Shafinaz Lyana Abu Talib, Fatin Adilah Razali & Norizuandi Ibrahim</i>	242
48.	Fun with Mathematic and Origami: Water Lily Origami <i>Masnira Ramli, Wan Nurul Husna Wan Nordin, Amirah Sa'at & Nurul Fazila Lakasa</i>	246
49.	Fund for Food: A Campus Food Pantry Toolkit to Help Fight Hunger on Campus <i>Nurul Hafizah Mohd Yasin, Nurhaiza Nordin, Nurnaddia Nordin, Nik Noorhazila Nik Mud & Siti Zamanira Mat Zaib</i>	252
50.	Edible Cookie Cup: Cuppa Cookie <i>Raja Nur Hanisah Binti Raja Zainal Alam Shah, Nur Liyana A'tifah Binti Ahmad Jamalulail, Nur Farah Aqilah Binti Mohd Akram, Amera Nazirah Binti Mohd Yusoff & Noorshaadah Binti Omar</i>	257
51.	GTNLARM21 <i>Ts. Dr. Sharifah Shafinaz binti Sh Abdullah, Assoc. Prof. Ts. Dr. Zulkifli bin Mohamed , Aisyah Fitriah binti Asmala , Nur Fatimah binti Hanif & Nur Hanisah binti Mahadi</i>	262
52.	Gulali Pandan <i>Amelia binti Zaidan, Ainul Hayati binti Abdull Aziz, Nurul Syamilah binti Ismail, Noristisarah Abd Shattar & Siti Noraisah Dolah</i>	267
53.	Hill Paddy Plough <i>Jasrio Liugan, Sainah binti Melulin, Zurhizainih binti Halledy & 'Umairah Abd Khalid</i>	272
54.	Historic Interior Scheme (HIS) Conservation Framework for Heritage Museum Building in Malaysia <i>Norashikin Abdul Karim, Siti Norlizaiha Harun, Salwa Ayob & Zulkarnain Hazim</i>	275

55.	I-Poket Perumahan: Panduan kepada Newbie <i>Mahazril 'Aini Yaacob, Nurul Hidayana Mohd Noor, Hafizah Hammad Ahmad Khan, Zuraini Yaacob & Farah Amirah Fuad</i>	283
56.	Development of HVAC Virtual Laboratory (HV-Lab Version 1.0) <i>Mohd Faez bin Zainol, Ts. Shikh Ismail Fairus bin Shikh Zakaria & Dr. Muhammad Zulkarnain</i>	287
57.	i-Care2u: Easy-To-Use Application Software to Enhance Knowledge and Awareness of Malaysians towards the Rights of Persons with Disabilities <i>Muhammad Fikri Othman, Nur Ezan Rahmat, Norazlina Abdul Aziz, Nora Abdul Hak & Diyana Kamarudin</i>	293
58.	Immersive Learner's Usability and Experience through VMMBG during Covid-19 Pandemic: An Evidence of a Higher Educational Institution <i>Shahreena Daud, Idris Osman, Zarinah Abu Yazid, Norraeffa Md Taib & Amirudin Mohd Nor</i>	297
59.	VCDT: The Virtual Classroom Debate Tutorial Approach <i>Azlyn Ahmad Zawawi, Junaida Ismail, Irwana Nooridayu Mohd Hakimi Noorayuni Rusli & Intan Syahriza Azizan</i>	304
60.	Indikator Teknik Pengajaran Bahasa Arab di UiTM Menerusi Teknologi <i>Nurul Asma Mazlan, Suhaila Zailani @ Ahmad, Zamri Arifin, Mohd Faizulamri Mohd Saad & Nur Aqilah Norwahi</i>	307
61.	Inquiry-Based Reciprocal Teaching Module <i>Ting Pick Dew, Suyansah Swanto & Vincent Pang</i>	311
62.	Instant Beef Stew <i>Nursyadah binti Nordin, Norhidayah bt Abdullah & Muna Shakirah bt Mohamad</i>	316
63.	Integrated Solar-IoT Monitoring and Predictive Maintenance Systems for Irrigation (S-IoTP) <i>Hasyiya Karimah Adli, Ku Azmie Ku Husin, Khairul Nizar Syazwan Wan Salihin Wong & Muhammad Akmal Remli</i>	320
64.	IOT Based Monitoring System for Oyster Mushroom Farming Pondok Seri Permai Pasir Putih Kelantan <i>Muhd Azhar Bin Zainol, Sh Mohd Firdaus Bin Sh Abdul Nasir, Nor Suhada Binti Abdullah, Koay Mei Hyie, Siti Nur Amalina Binti Mohd Halidi, Hazimi Bin Ismail & Lesairuamin Bin Leiahs</i>	325
65.	IoT Based Water Leakage Monitoring System <i>Muhammad Azfar Shazmi Mohd Adnan & Zulkifli Mohamed</i>	334
66.	i-Tabung <i>Dayang Aniisah Mardhiyyah binti Abg Borhanuddin, Mohamad Nornashriq Irfan bin Nordin, Muhammad Akram bin Nazri, Muhammad Azwar Naim</i>	340

bin Amilan, Muhammad Fadhillah bin Mohd Zam Zam, Mohd Fazly bin Mohd Razali & Ima Ilyani binti Dato' Hj. Ibrahim

67. Kaedah Pengajaran CHM510: Dari Sudut Pandang Pelajar 343
Sheikh Ahmad Izaddin Sheikh Mohd Ghazali, Nur Nadia Dzulkifli, Nor Monica Ahmad, Jamil bin Mohamed Sapari, Ahmad Husaini Mohamed & Nurul Nadthira binti Che Awang

68. Ke Arah Kelestarian Kebun Komuniti dalam Usaha Menyantuni Golongan B40 348
Intan Syafinaz Mat Shafie, Yuslina Liza Mohd. Yusof, Nor Irvoni Mohd Ishar, Maryam Jameelah Mohd Hashim, Mohd Fairus Kholid, Muhammad Yasin Ramadhan Zahari & Sharidatul Akma Abu Seman

69. Uniquecare Takaful 353
Muhammad Sa'di Bin Mohd Saman, Nur Aimi Binti Abdul Azis, Mohammad Firdaus Bin Mohammad Hatta & Azlina Binti Hanif

70. #Kitajagakita: The Manifestation of Modern Jewellery Design 359
Mohd Faiz Jalaludin, Mohd Hakim Mohd Sharif, Adib Mohd Hasan & Muhammad Shafiq Muda

71. Kombu-Feed: A Nutritive & Prophylactic Alternative for Fish Production 363
Ruhil Hayati Hamdan, Tan Li Peng, Nora Faten Afifah Mohamed, Ain Auzureen Mat Zin & Ahmad Syazwan Samsuddin

72. Kriging Interpolated Rainfall Data in ArcGIS for a Sustainable Flood Modelling Prediction 368
Fahda Nurhani Ahmad Razan, Nur Fatin Nasuha Mhd Khatif & Ir. Nur Azwa Muhamad Bashar

73. Kuasai Rintas: Penulisan Ringkasan Bahasa Melayu Yang Lengkap 373
Gladys Sebi binti Entigar, Noor Haty binti Noor Azam, Milfadzhilah binti Mohd Jamil, Roziana binti Ahmed & Nur Elimtiaz bin Abidin

74. Landscape Architecture Design Studio-Based Using Process-Evaluation Model in Open Distance Learning 378
Masbiha Mat Isa, Alamah Misni & Faridatul Akma Ab Latif

75. LiBCO 382
Noryana binti Ahmad Khusaini, Nur Hasni binti Nasrudin, Mohd Shamsul bin Daud, Noraini binti Abd Rahman, Rosida binti Ahmad Junid & Siti Fairuz binti Ibrahim

76. Limit of Acceptable Change and Recreation Opportunity Spectrum as a Tool in Developing a Management Plan. A Study in Templer Forest Eco Park & Templer Forest Reserve 388

	<i>Syahidah Hanani Hamdan, Nur Sabrina Sabri, Muhammad Hazim Zakaria, Khairul Asri, Syanizatul Izreen Kamal, Nor Asma Safuraa Roslan, Ely Rouzee Jamaluddin & Nawfal Kamarul Bahrain</i>	
77.	Tweet It! Esl Writing Activity Module Using Twitter <i>Nurshahirah Azman & Zaemah Abd Kadir</i>	393
78.	Malaysian Secondary Boarding School Menu Planning System <i>Suliadi F. Sufahani & Anuar M. Yusof</i>	399
79.	Malaysian Studies Pocket Read <i>Ani Juaini Bahrin, Farhana Yaakub, Firdausi Sufian (Dr), Nurfaizah Abdullah & Saiful Zizi Jalil</i>	405
80.	Mathematical Thinking Enhancement Program (MaTh-EP) <i>Nurul Akmal Md Nasir, Parmjit Singh & Geethanjali Narayanan</i>	410
81.	Medicine Reminder With Low Battery Alert “MEDMINDER” <i>Syahirah Asyiqin Binti Alias, Luqman Hakim Bin Fazilah Shuhaimi, Khairin Farhana Binti Kharul Anuar, Muhammad Firdaus Bin Mangsor & Suhana Sulauman</i>	418
82.	Meow-Meow Food Dispenser Using Internet of Things (IOT) Programme <i>Nor Diyana Md Sin, Saifaris Azizi Saiful Azam, Muhamad Danial Osman, Mohamad Zhafran Hussin, Norbaiti Sidik, Khairul Kamarudin Hasan</i>	424
83.	Mesin Penapis Turpentin Turpentine Filter Machine (TFM) <i>Hairulnisak binti Merman, Muhammad Salehuddin bin Zakaria, Aiman Yusri bin Mohamad Yusoff, Aimi Atikah binti Roslan & Azian binti Tahir</i>	429
84.	Mind Your Right Booklet: Awareness on Cyber Defamation Law & Media <i>Suria Fadhillah Md Pauzi, Musramaini Mustapha, Azniza Ahmad Zaini, Suhanom Mohd Zaki & Mohd Aidil Riduan Awang Kader</i>	434
85.	Modelling the Effectiveness of Using Online Food Delivery Services Apps Among Customers in Klang Valley During Covid-19 Pandemic <i>Prof Madya. Dr Rozita Naina Mohamed, Mohd Saifullah Bin Rusli & Prof.Madya. Dr.Halimahton Borhan</i>	440
86.	The Innovation Process Modelling for Ethanol Gas Sensing Using Artificial Neural Network <i>Muhammad Afiq Wazini bin Jemani, Vicinisvarri Inderan, Syahrul Fithry bin Senin, Norain Binti Isa & Lee Hooi Ling</i>	447
87.	The Effectiveness of i-Lab v2 as a Teaching Tool for Online Distance Learning <i>Nur Zaidani Wati binti Mohd Darwis, Noor Raifana binti Ab Rahim, Narita binti Noh & Juwita binti Asfar</i>	453

88.	My Ecredit Banking Apps (MECBA) V3 <i>Wan Razazila Wan Abdullah (Dr), Enny Nurdin Sutan Maruhun (Dr), Norzarina Nordin, Sunarti Halid & Ahmad Saiful Azlin Puteh Salin (Prof. Madya Dr)</i>	459
89.	The Dynamics of MILO (Multimedia Interactive Learning Online) in Role Playing: Enhancing the Learning Process in Covid-19 Pandemic <i>Woo Pak Yuan, Nina Farisha binti Isa & Ezwani Azmi</i>	464
90.	The Continuance of External Review Information System Adoption In Malaysia <i>Mohd Norafizal Abd Aziz, Razulaimi Razali, Nik Rosli Abdullah & Shahrul Azam Abdullah</i>	470
91.	Understanding Islamic Finance Concepts through Innovative Game: Name The Riba Transaction! <i>Azilawati Banchit, Puteri Faida Alya Zainuddin & Lai Tze Wee</i>	479
92.	Natmag Cleaner (Natural Magnificent Cleaner) <i>Hani Hasriena binti Hasrin, Muhammad Firdaus bin Ahmad Nizam, Nur Amalin Batrisya binti Ujud, Deeny Robeatul Adawiyah binti Khairul Anuar & Norzalina binti Jenal</i>	484
93.	New Fundamental Theory in Solving the Royalty Payment Problem <i>Wan Noor Afifah binti Wan Ahmad & Suliadi Firdaus bin Sufahani</i>	489
94.	Notebookly (A Pageless Notebook) <i>Aimi Natasha binti Rujha, Amani binti Mohamad Soree Awankasim, Muhammad Faiz bin Abdul Hamid & Nur Dania Syahirah binti Mohd Asri</i>	492
95.	Nutritious Digital Menu System for Malaysian Religious Primary School Children: Improving Good Memories <i>Azila M. Sudin, Suliadi F. Sufahani & Mohd A.A. Abdullah</i>	495
96.	Online Games for Learning Lewis Structure <i>Wan Elina Faradilla Wan Khalid, Tuan Sarifah Aini Syed Ahmad, Nor Akmalazura Jani, Rohaiza Saat & Nurazira Mohd Nor</i>	501
97.	Optimal Charging Schedule of Electric Vehicles Using Evolutionary Programming to Minimise Costs <i>Hasmairi Mohamad, Norhasniza Md Razali, Ahmad Farid Abidin, Nur Ashida Salim & Zuhaila Mat Yasin</i>	506
98.	The Smart Attendance of Microsoft Team (SAMT 2021) in an Online Learning Classroom <i>Wan Normila Mohamad & Zahari bin Md Rodzi</i>	511
99.	Penelitian Terhadap Kepelbagaian Fungsi Bandar Kecil Terhadap Penduduk Setempat di Gemas, Negeri Sembilan <i>Natasya Farhana Nazry, Jabil Mapjabil & Farzanna Yashera Abdulla</i>	521

100.	Penentuan Kaedah Mengukur Kesanggupan Untuk Membayar (WTP) Dalam Pelancongan <i>Nabila Farysha Dering & Jabil Mapjabil</i>	525
101.	Penentuan Kecenderungan Tingkah Laku Pelancong yang Berkunjung ke Kota Kinabalu – Psikosentrik dan Alosentrik <i>Farzanna Yashera Abdulla , Jabil Mapjabil & Natasya Farhana Nazry</i>	531
102.	Penentuan Kuasa Beli Pengunjung terhadap Perkhidmatan Pelancongan Terpilih di Bandaraya Kota Kinabalu, Sabah <i>Nurul Izzah Ismail & Jabil Mapjabil</i>	535
103.	The Artificial Neuron Network for Photocatalytic Degradation of Acid Orange 7 Using Cerium Oxide (CeO ₂) <i>Wan Nur'ain Awanis binti Wan Sa'ari, Vicinisvarri Inderan, Syahrul Fithry bin Senin & Nur Fadzeelah Abu Kassim</i>	539
104.	Perception of Digital Reading Material for Academic Purposes among UMK Undergraduates <i>Noor Syamimie Mohd Nawi, Lena Ramamurthy, Syakirah Shafien, Suhaida Omar & Nik Ahmad Farhan bin Nik Azim</i>	544
105.	Perception of Language Awareness through Framagram: A Classroom Example <i>Nik Ahmad Farhan bin Azim @ Nik Azim, Lena A/P Ramamurthy, Syakirah binti Shafien, Noor Syamimie binti Mohd Nawi & Shahidatul Maslina binti Mat So'od</i>	548
106.	Perkasa @ Aps : Solusi kepada Kerapuhan Keluargayang Mempunyai Anak Cerebral Palsy <i>Wan Rohila Ganti binti Wan Abdul Ghapar, Muhamad Fazil Ahmad, Norhashimah Yahya & Rahaya Mat Jamin</i>	552
107.	Poket Peka Undang-Undang Dilettante V2:Pemberhentian Kerja <i>Suria Fadhillah Md Pauzi, Muhammad Asyraf Azni, Suriyati Ujang, Azniza Ahmad Zaini & Ida Rosnita Ismail</i>	556
108.	Power Generation Using Thermoelectric Power Generator with Parabolic Solar Concentrator <i>Aneurin Nanggar anak Nyandang, Ir. Dr. Ts. Baljit Singh A/L Bhathal Singh & Dr. Muhammad Fairuz bin Remeli</i>	562
109.	Prediction of Nanostructure of SnO ₂ Properties Using Artificial Neural Networks <i>Khadijah binti Mohd Suhami, Vicinisvarri Inderan, Syahrul Fithry bin Senin & Lee Hooi Ling</i>	565
110.	Product Development - e-Ta'awun PA Takaful+ <i>Mohd Faizan bin Mohd Afandi, Norazrisha bin Shamsuddin ,Muhamad Izmul Nizam bin Zubairi , Mohammad Firdaus bin Mohammad Hatta & Mohamad Nizam bin Jaafar</i>	570

111.	Promoting Malayan Emergency State by Using Gaming Platform as An Illustrative Medium <i>Mohammad Nor bin Anwar Hussin</i>	577
112.	ProTecME <i>Rosuzeita Fauzi, Syazwan Firdaus Abu Bakar, Roslinda Isa, Siti Nor Ismalina Isa, Diana Tasha Mohd Nazeri</i>	583
113.	Protein as the Building Blocks of Life <i>Rania Farzana binti Azmi, Azleen Nurkarmilya binti Azami, Nur Shafinaz binti Mohamad Salin & Wan Mazlina Md Saad, PhD</i>	587
114.	Pull Up Crisp Container <i>Mohamad Firdaus bin Shaari, Kamarul Asyraf bin Shamsudin & Nurul Fatihah binti Mohamad Azmi</i>	589
115.	RE Protect-i <i>Mohd Azeem bin Ahmad Zaini, Farid Akmal bin Fadzli, Mohd Saiful Izzat bin Mat Zahari, Wahida binti Ahmad & Mohammad Firdaus Mohammad Hatta</i>	592
116.	ReProDB Web Application (Research Project Database) <i>Jennifah Nordin, Afida Arapa, Ibiاناflorinciliana Niane Anthony Aning & Intan Syahriza Azizan</i>	598
117.	Rizbrunana: Advances in High-Fibre Biscuit Using Brown Rice and Banana Peel <i>Nurul Hafizah Mohd Yasin, Derweanna Bah Simpong, Nur Farihin binti Abd Hadi Khan & Mazne Ibrahim</i>	609
118.	Ready-To-Bake (RTB) Cookie Dough <i>Muna Shakirah Bt Mohamad, Norhidayah Bt Abdullah & Nursyadah Bt Nordin</i>	615
119.	RTGreenmFUND: Sejauhmanakah Keberkesanannya dalam Pengurusan Dana Ruang Terbuka Hijau Bandar <i>Nabilaa Mohamed, Thenmolli Vadeveloo, Zarina Mohd Zain & Roni Ekha Putera</i>	618
120.	TCD (Table Connector Design) <i>Ramalan Mustapha, Maziah Mahmud, Surita Hartini Mat Hassan, Siti Norma Aisyah Malkan & Nurul Hidayah Che Hassan</i>	622
121.	Self-Practice Ringkasan (SPRing): An Innovative Mobile Apps for Self-Practice <i>Asmahani Mahdi, Zubaidah Bohari, Abdul Hadi Abdul Talip, Nurul Lizzan Kamarudin & Zainon Haji Bibi</i>	629

122. Revitalising Heritage Shophouses of Kota Bharu Kelantan 633
Yasmin Mohd Faudzi, Najah Md Alwi, Nor Hafizah Anuar, Juliza Mohamad & Nik Nurul Hana Hanafi
123. Smart 3-Wheel Bike “Empower Disabled Entrepreneurs With Technology” 638
Nurnaddia Nordin, Nurhaiza Nordin & Nur Ilyana Amiira Nordin
124. Takaful Sinar Ihsan Plus 642
Nur Adibah binti Ab Aziry, Erlyn Marlina binti A.Rahman, Nurul Izzaty binti Mohamad Ridzuan & Mohammad Firdaus Mohammad Hatta
125. Smart Keychain 648
Mohd Hifadzly bin Husrin, Adeylson Ray Douni, Muhammad Azlan bin Moh Sali & Edrin Rosley
126. Secured Multi Door Access System as A Web Application 652
Nor Shamshillah Kamarzaman, Norhayati Abdul Jamil, Noraliza Azizan, Jaaz Suhaiza Jaafar & Muhamad Syafiq Ahmad Nazri
127. Standard of Care Framework for Occupier During Pandemic Covid-19 (SOCO): A Facilitation for Understanding Law Relating to Tourism Industry 657
Mohamad Sahizam Musa, Suria Fadhillah Md Pauzi, Shamsinar Abdul Rahman, Mohd Azim Zainal & Ida Rosnita Ismail
128. Development Of Sound System Level Tools “SoQMeT” 664
Muhammad Danial bin Abu Hanafiah, Muhammad Aleef bin Mohamad Yaziz, Muhammad Aiqal bin Mohd Sazali, Adhilla binti Ainun Musir, Nurulzatushima binti Abdul Karim & Daliah binti Hasan
129. Stackable Pinewood Pallet Storage Keeper (SPPiKe) 670
Nurrohana Ahmad, Hazlin Hasan, Sharifah Norhuda Syed Wahid, Mohd Aidil Riduan Awang Kader & Mastura Mohamad
130. Sustainable Hybrid G-W Filter 676
Nur Fatin Nasuha Mhd Khatif, Fahda Nurhani Ahmad Razan, Ir. Nur Azwa Muhamad Bashar & Nurakmal Hamzah
131. Takaphone Takaful 681
Muhammad Waizzulhakim bin Othamannor, Mohd Mazwan bin Mohd Jamil, Mohammad Firdaus bin Mohammad Hatta & Sharifah Faigah binti Syed Alwi
132. Stay@Rural Application 686
Muhammad Faezzul Farhan bin Yazid, Muhammad Hakim Zulqarnain bin Ajis, Mohamad Sazlyzam bin Ledei Dawin@Salim Dawin, Mohd Ashnawi bin Ab Gani & Dr. Spencer Hedley Mogindol

133. Sajadah Pillow 689
Nor Asyiqin Nadhirah binti Roslee Afendi, Sharifah Hafiza binti Abu Bakar, Nur Khaleqa Izzah binti Ikmal Hisam & Siti Hajar binti Md Shahrar

134. Pepper Casenitizer 693
Nurfatihah Syahirah binti Zaidi Rahimy, Syahira Nisha Nabila binti Mohamad Shahril, Muhammad Afiq Syahmi bin Rosli, Nur Wani Syamimi binti Yaman & Alvin Gatu

135. My_Watch - Changing the Way We Use Watches 699
Nur Athilla binti Alimin, Nur Hadirah Faqihah binti Zainudin, Siti Nadiah Afiqah binti Suhairi, Joseph Joshua Rumpungan Jr & Adrianna binti Aziz

136. Myeco Application 704
Izz Fitri bin Hairul Sham, Nur Syahirah binti Dzulkarnain , Rosseryn Soubin Lonsiong & Siti Zuraini binti Ramley Alan

137. Multipurpose Pushcart 709
Farah Adlyna Yeoh , Noor Zizy Ameleena binti Jailani , Nur Amiratul Atiqah binti Nur Azli Yaacob & Sairah Saien

138. Multipurpose Handle Stabilizer – To Help You Handle Your Life 714
Nur Athilla binti Alimin, Nur Hadirah Faqihah binti Zainudin, Siti Nadiah Afiqah binti Suhairi, Joseph Joshua Rumpungan Jr & Adrianna Aziz

139. The Travel Amenity Pod 719
Wan Nuramalin binti Wan Hussin, Nur Alissya binti Nazri, Muhammad Takbir bin Arifuddin & Ahmad Fareez bin Yahya

140. Toothbrush 2-In-1 724
Alice Evana Anak Robert, Latijah Obaun, Staffy Stephen & Christy Bidder

141. Torch Bottle 727
Muhammad Shazwan Puzi, Farzana Suaidah binti Suzaini, Nurul Aina Balqis binti Mohd Khairul Anuar & Nur Murniza binti Mohd Zaidi

142. Tourism Application - Touch 731
Siti Hafizah binti Dzulkarnain, Amira Naqiyyah binti Mustaffa Ma'arof , Nursyahidah binti Hamzah, Nur Hidayah binti Mohammad Hazlan & Boyd Sun Fatt

143. Locallah 736
Muhammad Faliq Aizat M.Amran, Nazmeen Fatima binti Istekhar Ahmad, Nur Izzati Nabilah binti Alias, Adriana binti Mohamad Faizal & Mohd Arsy Ardy bin Mohd Hardy

144. Ez-Train Mobile App 741
Siti Aishah binti Sha'ari, Alirah Itor, Muhammad Faizzudin bin Mohd Shukor, Nur Hazeera binti Madehie & Nurafiqah binti Mohamad Musa

145.	Eventgo <i>Cassandra Grace anak Hamarah, Nazira Farahin binti Nazarudin, Venessa Kumang Amen anak Victor Luna & Cindy Johnny</i>	747
146.	Duo-Bottle <i>Maybelyna Deborah Dick, Nurashikin Binti Hamzah, Jacqueline Henry & Nurafiqah Binti Mohamad Musa</i>	752
147.	4 In 1 Safety Kit <i>Nur Maisarah Afiqah binti Mazlan, Aina Afriena binti Afandi, Aida Najihah binti A.Lukman, Muhammad Irfan bin Mazlan & Nur Murniza binti Mohd Zaidi</i>	755
148.	Augmented Reality Design: The Study of Property Development Marketing Tools <i>Norzaful Anuwar bin Ahmad Najamuddin</i>	761
149.	SMART Hygiene Kit <i>Dg Kamisah Ag Budin, Jasmine Vivienne Andrew, Faiqah Mawardi, Mohammad Firdaus bin Mohamad & Dayang Haryani Diana Ag Damit</i>	765

BIO-CHEM KIT: UNDERSTANDING BIOGEOCHEMICAL CYCLES

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ABSTRACT

One way of handling significant amounts of information is through visuals. Infographics can transfer knowledge about a topic faster and more effectively than pure text. BIO-CHEM KIT is a set that uses QR codes and online quizzes in learning activities, consisting of quick and important elements on the principles of the ecology field for students, lecturers, and practitioners. The main purpose of this graphic visual is to enhance learners' basic knowledge of important biogeochemical cycles and. The innovation ideas also serve as teaching and learning materials for lecturers and students. It also benefits the practitioners in environmental administration, which use can be used as a quick reference guide. Furthermore, this innovative idea is hoped to make teaching and learning environmental courses easy, memorising, and faster especially during the online distance learning in the era of the Covid-19 pandemic.

Keywords: Biogeochemical Cycles, QR Code, Online Quiz, Teaching, Learning

INTRODUCTION

According to Smiciklas (2012), infographics can be defined as images of data and ideas that try to convey complex information to ease the process of learning and understanding. An infographic explains the complex and illuminates the obscure through illustrations, some short-written explanations, and data visualization through charts or graphs (Yuvaraj, 2017). Adams (2011) categorized infographics into three categories. First is a static infographic that presents information all at once and in its entirety. Second, motion infographics are used in cinema and presentations to present information consistently and in a sequence. The third is interactive infographics in which the information is presented according to the reader's choice. The historic record has shown that

humanity has used infographics to display information. These include cave paintings, later maps, and now charts. Moving on to 1975, while teaching at Princeton, Edward Tufte developed a seminar on statistical graphics with John Tukey, a pioneer in the field of information design. Tufte later self-published *Visual Display* in 1982, establishing himself as an infographic expert. The recent history of infographics includes the advent of charts in office-oriented software, particularly Excel and PowerPoint. This explosion of easy-to-use data visualization tools led to an expansion of infographics in academia and the popularization of business intelligence. Nowadays, of course, web-based data visualization design tools are making it easier than ever to create infographics like motion graphics, interactive infographics, and others. Figure 1 presents a summary of events leading to the origin of infographics.

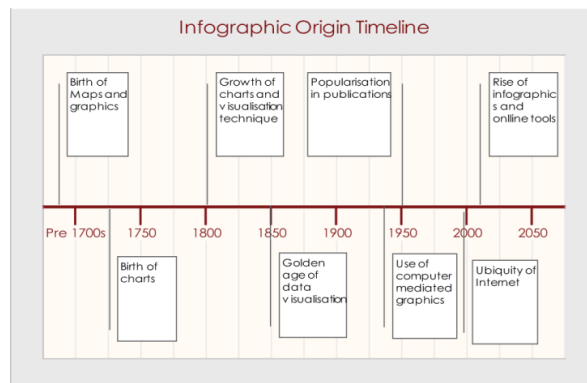


Figure 1. Origin of Infographics

The usage of an infographic could help to improve student understanding of a particular topic (Elena Gallagher et al., 2017; Thoma et al., 2018). Infographics help capture attention and make complex knowledge understandable, making them a useful teaching-learning strategy (Chicca & Chunta, 2020; Provvienza et al., 2019). According to the Cognitive Load Theory, working memory has some limitations and the usage of infographics could help to foster working memory to process the information and enhanced information retention. In addition, Dual-Coding Theory suggests that infographics could improve information retrieval (Van Merriënboer, & Sweller, 2010). However, there is limited research assessing their effectiveness. Moreover, although infographics can be effective to engage students, they are infrequently used because of educators' inexperience with this approach. To overcome those problems, a plethora of research has urged educators to employed advance and interactive teaching strategies that could enhance student participation, brainstorming, engaging, interactive, and others. Realising the difficulties facing them and solutions to their problems, the idea of BIO-CHEM KIT is introduced aims to facilitate the learning activities by using the graphic visual presentation of information and knowledge related to the subjects in a more simple, quicker, and effective way.

OBJECTIVE

BIO-CHEM KIT is designed, which combined two (2) learning methods comprising of online quiz and technology usage of QR Code to facilitate the teaching and learning process. The contents consist of the essential elements in the subject of the principles of ecology, with the simplified versions of SIX (6) main areas of the biogeochemical cycles (tectonic cycle, rock cycle, nitrogen cycle, phosphorus cycle, hydrogeological cycle, and carbon cycle) that students need to know. The online quiz is provided to test and examine the effectiveness of the infographic. Besides, innovation also injects the element of technology usage through the graphic visual presentation using the QR Code.

All the infographic data contents will be made available in the QR Code, which aims to facilitate the students and educators in their teaching and learning activities in a more simple, easy, and fun way. It also aims to help the students for easy memorising and understanding the subject through creative learning methods.

APPLICATION

BIO-CHEM KIT is introducing to first-year students of the Bachelor of Environmental Administration at the Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA (UiTM) Seremban 3 campus. It has been introduced to those who undertake the principles of ecology subject. BIO-CHEM KIT is appropriate for all levels of students in varied settings, such as in the classroom and online environments. Lecturers can use BIO-CHEM KIT as a teaching-learning strategy. BIO-CHEM KIT helps to explain complex (6) main areas of the biogeochemical cycles (tectonic cycle, rock cycle, nitrogen cycle, phosphorus cycle, hydrogeological cycle, and carbon cycle). The students are required to scan a QR code and infographics note on biogeochemical cycles can be retrieved. A simple and short essay online quiz is provided with the QR Code. Table 1 summarizes the post-test results after the application of BIO-CHEM KIT. Figure 2 displays a sample infographic “BIO-CHEM KIT.” This infographic could help the students understand the biogeochemical cycle process and its important elements. Infographics could also help focus students’ attention during reading or other assignments. For example, students could be given a short article to read and an infographic to prepare them for a group discussion.

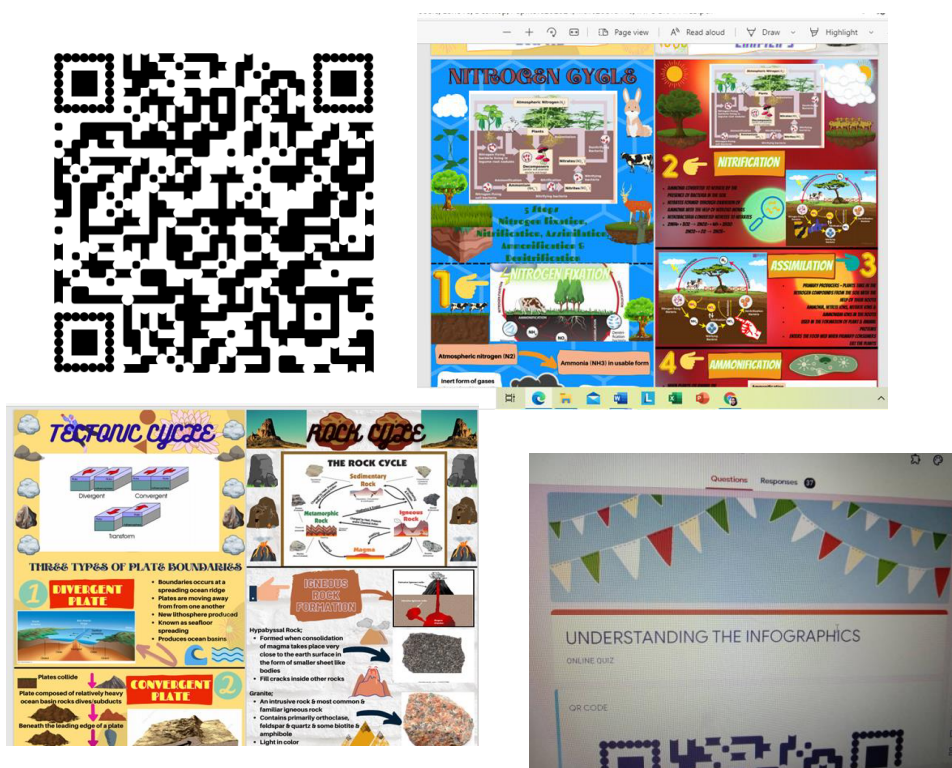


Figure 2. Sample Infographic BIO-CHEM KIT

Table 1. Online Quiz and Score Obtained

Questions	Student Score
1) Stated Three Types of Tectonic Cycles	37 Out of 38 Obtained Full Marks
2) Granite is One Example of Which Rock Cycle?	34 Out of 38 Obtained Full Marks
3) 5 Steps in Nitrogen Cycle	All of 38 Students Obtained Full Marks
4) 4 Ways of Phosphorus Cycle	All of 38 Students Obtained Full Marks
5) 5 Ways of Hydrologic Cycles	All of 38 Students Obtained Full Marks
6) 5 Ways of Hydrologic Cycles	All of 38 Students Obtained Full Marks

NOVELTY

As there are limited learning materials and references related to biogeochemical cycles in the market. This product of innovation uses creative and graphic materials to help the students and educators facilitate their learning and teaching. Since the market only produced traditional books than innovative learning materials, this innovative idea that embedded online quiz and technology elements guaranteed fun learning activities in class. As we move towards sustainable development, this product supports environmentally friendly, going paperless, and becoming a vital part of embracing Industry 4.0. Since the education system is now favouring online learning due to the impact of the Covid-19, having the complete package of learning materials makes the learning process more accessible and sustainable.

COMMERCIALIZATION

Commercialization of the results of scientific research and developments is a necessary condition for strategic development because it provides the creation of new products, expanding the range, and improving the quality of products. BIO-CHEM KIT has potential for commercialization since it can be used by environmental administration students. It is related to both lecturers' and students' needs. BIO-CHEM KIT can also be used by practitioners or educators in creating awareness of the effect of biogeochemical cycles on the eco-systems. Since there is no textbook used by the students, therefore, the potential for commercialization is high and good.

AWARDS

In the first phase, the project has obtained and won some awards in the innovation competition. For example, Infographic Kit - Biogeochemical Cycle has won diamond and special award (best presentation) during the 2019 Student Invention and Innovation Competition organized by the Faculty of Administrative Science and Policy Studies, UiTM Seremban 3. In the same year, this project also has won the silver award at the 2nd International Invention, Innovation, Technology (ITEC 2019). BIO-CHEM KIT is the advancement of the previous project in which we have to improve the innovation by including all six biogeochemical cycles and a short online quiz to test the effectiveness of the infographic.



Figure 3. Award Obtained by the First Version of the Project

CONCLUSION

Infographics provide some of the greatest opportunities for effective and efficient communication to an audience. Principles of ecology subject is an interesting subject however it involves a large number of facts and data. Thus, lecturers need to balance the information overload. Considering their potential to provide influential bursts of insight and knowledge, BIO-CHEM KIT includes an infographic with QR Code and a short online quiz to test student knowledge.

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REFERENCES

- Adams, D. (2011). What are infographics and why are they important? Retrieved from www.instantshift.com/2011/03/25/what-are-infographics-and-why-are-they-important/
- Chicca, J., & Chunta, K. (2020). Engaging students with visual stories: Using infographics in nursing education. *Teaching and Learning in Nursing*, 15(1), 32-36.
- Elena Gallagher, S., O'Dulain, M., O'Mahony, N., Kehoe, C., McCarthy, F., & Morgan, G. (2017). Instructor-provided summary infographics to support online learning. *Educational Media International*, 54(2), 129-147.
- Provvidenza, C. F., Hartman, L. R., Carmichael, J., & Reed, N. (2019). Does a picture speak louder than words? The role of infographics as a concussion education strategy. *Journal of Visual Communication in Medicine*, 42(3), 102-113.
- Smiciklas, M. (2012). *The power of infographics: Using pictures to communicate and connect with your audiences*. Que Publishing.
- Thoma, B., Murray, H., Huang, S. Y. M., Milne, W. K., Martin, L. J., Bond, C. M., ... & Chan, T. M. (2018). The impact of social media promotion with infographics and

podcasts on research dissemination and readership. *Canadian Journal of Emergency Medicine*, 20(2), 300-306.

Van Merriënboer, J. J., & Sweller, J. (2010). Cognitive load theory in health professional education: Design principles and strategies. *Medical education*, 44(1), 85-93.

Yuvaraj, M. (2017). Infographics: Tools for designing visualizing data and storytelling in libraries. *Library Hi Tech News*, 34(5), 6-9.



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