MINISTRY OF HIGHER EDUCATION

Redesigning Assessment for Holistic Learning

A quick guide for higher education

Redesigning Assessment for Holistic Learning: A quick guide for higher education

ISBN: 978-967-12151-4-2

Perpustakaan Negara Malaysia
Cataloguing-in-Publication Data

Academic Enhancement and Leadership Development Centre (ADeC), University of Malaya
Redesigning Assessment for Holistic Learning: A quick guide for higher education
Academic Enhancement and Leadership Development Centre (ADeC), University of Malaya
ISBN: 978-967-12151-4-2

Printed by
University of Malaya Press
University of Malaya
50603 Kuala Lumpur
Malaysia

Table of Contents

Acknowledgements

We would like to express our greatest appreciation and gratitude to all experts, contributors, writers and participants of RAHOLE 2017 conference who have contributed to the publication of this guidebook.

Committees

Our special thanks goes to RAHOLE 2017 committees whose commitments, contributions and supports have made Redesigning Assessment for Holistic Learning (RAHoLE) Conference 2017 a fabulous success!

General Chair	: Dato' Professor Dr. Awag Bulgiba Awg Mahmud
Co-Chair	: Dato. Aishah Abu Bakar (Ministry of Higher Education, MOHE)
	Professor Dr. Fauza Ab Ghaffar (University Malaya, UM)
Director	: Dr. Farrah Dina Yusop
Registration & Finance	: Norazura Hassim
	Syarila Nurasma Ahmad
Logistic & Placement	: Mohd Hairolnezam Kahmis
	Ummu Saadah Zubir
Program committee	: Dr. Amira Sariyati Firdaus
	Dr. Zahiruddin Fitri Abu Hassan
	Dr. Mahmoud Danaee
	Dr. Nur Azzah Hamzaid
	Yap Min Chen
Technical & Photo / Videography	: Mohd Hakimi Sharuddin
	Muhammad Zaiamri Zainal Abidin
	Norazrulazam Pauzee
Souvenirs & Promotions	: Ferlynda Fazleen Jamaludin
Copyediting	: Muhammad Aiman Abdul Halim
Secretariat	: ***MOHE***
	Dr. Nazli Mahdzir
	Rahayu Ab. Rashid
	Wan Zainuddin Ali Aspar
	Ain Najihah Azmi
	Nor Adnan Salim
	UM
	Dr. Tengku Adeline Adura Tengku Hamzah
	Dr. Zati Hakim Azizul Hasan
	Zulhilmi Abdul Rahman
	Muhammad Afiq Dzulkifli
	Nurul Salwani Mohamad Saadan
	Siti Khadijah Binti Mohamad Hussain
	Muhammad Hakim Kamaruzaman
	Kalai Arasu a/l Devaraja
	Mohd Syazwan
	Rowena a/p Moses

Content editors

Fauza Ab. Ghaffar
Farrah Dina Yusop

Language editors

Dr. Farrah Dina Yusop
Muhammad Aiman Abdul Halim

Experts

Our sincere appreciation to following experts for their invaluable insights, guidance and contributions towards the structure and content of this book.

Prof. Dato' Dr. Mohamed Amin Embi, Teaching & Learning Innovation, Universiti Kebangsaan Malaysia, m.amin@ukm.edu.my

Assoc. Prof. Dr. Alyani Ismail, Department of Computer and Communication, Universiti Putra Malaysia, alyani@eng.upm.edu.my

Assoc. Prof. Dr. Ainol Madziah Zubairi, Kulliyyah of Education, International Islamic University Malaysia, ainol@iium.edu.my

Assoc. Prof. Dr. Raihanah Mohd Mydin, School of Language Studies and Linguistic, Universiti Kebangsaan Malaysia, raihanah@ukm.edu.my

Dr. Fatimah Hashim, Formerly Professor at the Faculty of Education, University of Malaya. fatim3377@yahoo.com.

Dr. Renuka V Sathasivam, Faculty of Education, University of Malaya, renukasivam@um.edu.my

Dr. Mohd Shahril Nizam Shaharom, Faculty of Education, University of Malaya, nizamsaril@um.edu.my

Mr. Norjoharuddeen Mohd Nor, Faculty of Education, University of Malaya, norjo@um.edu.my

Farrah Dina Yusop, Faculty of Education, University of Malaya. farah@um.edu.my

Contributors and Writers

To all contributors and writers of this book, thank you so much for sharing your insights, experiences and actual practices in implementing innovative and alternative assessments to make your students' learning more holistic and meaningful. May your sharing inspire others to diversify their assessment approaches for the benefit of the nation.

Chapter 1: Self-based Assessments

Dr. Amira Sariyati Firdaus, Faculty of Arts and Social Sciences, University of Malaya (amira_firdaus@um.edu.my). Amira was the inaugural head and coordinator of UM ADeC's Emerging Scholars Leadership Advancement (EmeraLd) programme from 2014-2017. Amira is also a senior lecturer at the Department of Media Studies, Faculty of Arts and Social Sciences, UM, and Head of UM ADeC's Unit for Leadership and Wellbeing.

Assoc. Prof Norasmatul Akma Ahmad, Faculty of Dentistry, University of Malaya (akma@um.edu.my). A lecturer and restorative consultant in UM Dental Faculty and UM Specialist Centre. She is actively engaged in clinical teaching, internal and external research collaborations and examinations. Currently involved in the curriculum development of both undergraduates and postgraduates programme. Her publications mainly in the area of tooth wear and dental education.

Assoc. Prof. Alina Shamsuddin, Faculty of Technology Management and Business, University Tun Hussein Onn Malaysia (alina@uthm.edu.my). She is an expert on educational quality assessment and assurance, with many years of experience as an auditor for the Malaysian Quality Agency (MQA). Her research encompasses higher education quality assurance and reforms, effective teaching and learning, as well as innovative technology adoption for SMEs. She is currently the Deputy Director of Center of Academic Development, UTHM.

Dr. Renuka V. Sathasivam, Faculty of Education, University of Malaya, (renukasivam@um.edu.my). She is a senior lecturer in the Department of Mathematics and Science Education. Her areas of expertise include school-based assessment, assessment literacy, science teaching methods and science cognition. She has done many research in classroom assessment particularly in Assessment for Learning (AfL) approaches and has won several awards in this field.

Dr. Paula Hodgson, Centre for Learning Enhancement and Research, The Chinese University of Hong Kong (phodgson@cuhk.edu.hk). Working in universities in Hong Kong for over two decades, she has extensive experiences and research in innovative teaching and assessment in higher education. Addressing the ever-changing education environment, she was the keynote speaker and highlighted the significance of design thinking and emerging technologies in higher education at the RAHoLE Conference 2017.

Dr. Jacob John Chiremel Chandy, Faculty of Dentistry, University of Malaya (drjacob@um.edu.my). He has been keenly participating in the faculty curriculum and education reforms agenda as an active member of the University of Malaya Faculty of Dentistry curriculum planning, implementation, and assessment team. At the RAHoLE 2017 Conference, the faculty team headed by him won the most impactful award for their presentation on "professional behaviour among dental students: comparing self and peer vs teacher assessment in improving student performance".

Mrs. Hasmaini Hashim, Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka (hasmainie76@gmail.com). Hasmaini is a lecturer at Bukit Beruang Community College of Ministry of Higher Education. She is an experienced lecturer of Information Technology and Electrical Installation. She received her Bachelor of Electrical Engineering (Communication) and Masters of Technical and Vocational Education from UTHM. She received her Master of Electronic Engineering (Electronic Systems) from UTeM.

Chapter 2: Group-based Assessments

Dr. Nur Azah Hamzaid, Faculty of Engineering, University of Malaya (azah.hamzaid@um.edu.my). Dr Azah is UM's Head of Research Training Unit at the Academic Enhancement and Leadership Development Centre (ADeC). Her experience includes managing research projects as well as knowledge-transfer, capacity building and community engagement programmes. Dr. Azah holds a PhD in biomedical engineering and is an emerging expert on high technology prosthetic limbs and neuroprosthetics.

Dr. Fatimah Hashim. Former professor at the Faculty of Education, University of Malaya (fatim3377@yahoo.com). Her specialization includes second language teacher learning, language programme evaluation, and innovation in language teaching contexts. Her extensive experience as a teacher, teacher-trainer and curriculum developer in English as a second language extends to countries in the Middle East, Sri Lanka and Thailand to name a few.

Dr. Debra Sim Si Mui, Faculty of Medicine, University of Malaya, (debrasim@um.edu.my). Debra is a professor at the department of Pharmacology. She played a pivotal role in the introduction of problem-based learning (PBL) in the university's MBBS programme in1999/2000, and has since been actively involved in the training of students and tutors in PBL locally and abroad.

Dr. Adelina Asmawi, Faculty of Education, University of Malaya (adelina@um.edu.my). She was Deputy Dean of Undergraduate Studies and Quality Manager at the Faculty of Education, UM (2014-2017). A recipient of UM Excellence Award for Teaching 2017, she also received silver and bronze medals for her research in E-graphics book in 2017. She is the editor of Thesis Easy (2018), The Art of Creative Research (2017), and author of The Art of Reflective Practice (2016) and The Art of Teaching English (2014).

Dr. Foong Chan Choong, Faculty of Medicine, University of Malaya (foongchanchoong@um.edu.my). He is a senior lecturer at the Medical Education and Research Development Unit (MERDU), Faculty of Medicine, University of Malaya. He obtained his PhD in the field of science education. His innovations in education have obtained recognitions at the university and international levels.

Jasmine Selvarani Emmanuel, School of Humanities and Social Sciences, Wawasan Open University (jasmineemmanuel@wou.edu.my). Jasmine has worked in various leadership capacities in both the public and private educational systems for the past 35 years. Currently, she is the Deputy Dean of the School of Humanities and Social Sciences at Wawasan Open University, Penang. Her research interests include adult learning, lifelong learning, open educational resources and holistic assessment.

Nik Nadia Nik Nazri, Faculty of Medicine, University of Malaya (niknadia91@um.edu.my). She is a research assistant at the Faculty of Medicine as well as a postgraduate student at the Faculty of Language and Linguistics, University of Malaya. She was a UM TESL graduate and has been involved in various performances and voluntary programmes relating to English literature and the teaching of English at high school level.

Assoc. Prof. Dr. Noor Maizura Mohamad Noor, Department of Computer Science, University Malaysia Terengganu (maizura@umt.edu.my). She is a senior lecturer in Faculty of Informatics and Applied Mathematics. Her recent research work focuses on improving organizational decision-making practices through the use of technologies. This includes research interests in the design, development and evaluation of decision support systems for analyzing and improving decision processes.

Dr. Donnie Adams, Faculty of Education, University Malaya (donnieadams@um.edu.my). Dr. Donnie Adams is a senior lecturer at the Institute of Educational Leadership, UM. He is a recipient of UM's Bright Sparks scholarship and a recipient of University of Malaya's Excellence Award 2016: PhD Completion in Less than 3 Years. He is the Editor-in- chief for the International Online Journal of Educational Leadership (IOJEL).

Humamuddin Abu Samah, Institute of Educational Leadership, University of Malaya (humamuddin@mara.gov.my). He is a senior English lecturer at Kolej Profesional MARA Indera Mahkota Kuantan, completed his Master in Educational Leadership and now pursuing his PhD at Institute of Educational Leadership, University of Malaya.

Syafizza Norida A. Samat, Institute of Educational Leadership, University of Malaya (syafizza.samat@gmail.com). Syafizza Norida is a Head of Department and a senior mathematics lecturer at Kolej Profesional MARA Indera Mahkota, Kuantan. She completed her Master in Educational Leadership with Distinction and is currently pursuing her PhD at the Institute of Educational Leadership, University of Malaya.

Rokiah Muda, Faculty of Accountancy, Universiti Teknologi MARA, Terengganu (rokiahmu@tganu.uitm.edu.my). She is a senior lecturer at the Faculty of Accountancy. Her area of interests include costing, management accounting, strategic management and quality management. She has almost 23 years of experience teaching students in Diploma in Accountancy and Bachelor of Accountancy programmes. She is also actively involved in internal and external auditing and reviewing.

Nur Raihana Mohd Sallem, Faculty of Accountancy, Universiti Teknologi MARA, Terengganu (nurra018@tganu.uitm.edu.my). She is a senior lecturer at Faculty of Accountancy since 2010. Her areas of interest are taxation and financial management. Besides teaching, she is also the Head of Student Leadership Unit from 2015 until now. She is actively involved in students' activities.

Wan Karomiah Wan Abdullah, Faculty of Computer Science And Mathematics, Universiti Teknologi MARA, Terengganu (wkaromiah@tganu.uitm.edu.my). She is a senior lecturer of statistics at UiTM Cawangan Terengganu since 1992.

Dr Noor Liza Adnan, Faculty of Accountancy, Universiti Teknologi MARA, Terengganu (noorliza@tganu.uitm.edu.my). She is an accounting lecturer at UiTM Cawangan Terengganu since 1992. She specialized in the areas of management accounting (especially in the behavioural aspect), ethics and organizational behaviour. Her interest is in the area of creative writing and early childhood education.

Ms Vinothini a/p Vasodavan, Faculty Of Education, University of Malaya (vino1905@gmail.com). Presently, she is a PhD candidate in Department of Curriculum and Instructional Technology. She is working with LeapEd Services Sdn. Bhd. in facilitating education transformation in Malaysian schools through Yayasan AMIR Trust Schools Programme through a Public-Private Partnership with the Ministry of Education Malaysia.

Ms. Agelyia Murugan, AIMST University Malaysia (agelyia@aimst.edu.my). She is currently a part-time PhD TESL candidate at Universiti Sains Malaysia. She has been an English language lecturer for the past 10 years (2006-2016) at UiTM Pulau Pinang. Currently, she is lecturing at AIMST University. Her research interest is in the field of Mobile Assisted Language Learning and has driven her to create an app for AIMST English programme which won a bronze medal at PECIPTA 2017 and a gold medal at K-INOVASI 2017.

Dr. Unaizah Hanum Obaidellah, Faculty Computer Science and Information Technology, University of Malaya (unaizah@um.edu.my). Dr Unaizah is a senior lecturer at the Faculty of Computer Science & Information Technology. She obtained her PhD in Cognitive Science. Her research interest on programming education focuses on ways to improve programming skills and literacy among computer science major through the study of student's behavior and cognitive abilities.

Junaidah Md Din, Center of Tamhidi, Universiti Sains Islam Malaysia (junemddin@usim.edu.my). She is a senior English teacher at Tamhidi Centre, Universiti Sains Islam Malaysia (USIM). She specializes in foundation legal English and Malaysian University English Test (MUET). Prior to joining USIM, she was an MLVK corporate trainer, an English teacher at Cambridge EFL Centre and Smart Reader Centre. Since the past few year, she starts to embark in educational research focusing on testing and teaching issues.

Dr. Nurul Atira Khairul Anhar Holder, Faculty of Medicine, University of Malaya (nurul_atira@um.edu.my). She was a medical graduate from Newcastle University, UK. Currently, she is both an education project officer and a researcher in Faculty of Medicine, University of Malaya. Her work revolves mostly on student support, personal and professional development (PPD) and evaluations. She also has keen interest in creative writing and humans' psychology.

Chapter 3: Performance-based Assessments

Assoc. Prof. Dr. Jaafar Jantan, Faculty of Applied Science, University Teknologi MARA (jjnita@salam.uitm.edu.my). He is currently an academic fellow at the Institute of Leadership and Development, UiTM. This passionate 21st century educator is currently the only recipient of the prestigious Anugerah Akademik Negara in the category of teaching of Pure Sciences in 2010. Currently, as the founder of iCGPA, he facilitates and provides motivational lectures and curriculum re-designing hand-holding sessions to faculty members around the country in aiding Shift 1 transformation and iCGPA implementation.

Assoc. Prof. Dr. Ainol Madziah Zubairi, Kulliyyah of Education, International Islamic University Malaysia (ainol@iium.edu.my). She is a senior lecturer and the coordinator of the Testing and Assessment in Higher Education Research Unit (TasHE) at the Kulliyyah of Education, IIUM. She is also a Master Trainer for Learning Assessment in AKEPT, Ministry of Higher Education.

Mr Norjoharuddeen Mohd Nor, Faculty of Education, University of Malaya (norjo@um.edu.my). He is a lecturer of mathematics education and has been involved in the training of in-service and pre-service mathematics teachers. His major area of research is mathematics teaching, learning and assessment and use of digital technology in the mathematics classroom.

Assoc. Prof. Dr. Mariam Taib, School of Fundamental Sciences, Universiti Malaysia Terengganu (mariam@umt.edu.my). She is a Biochemistry lecturer and Deputy Director in Centre for Academic Planning, Development & Quality. She is also part of the UMT OBE team that is actively involved in handholding sessions for better teaching and learning with other UMT lecturers. Passionate in teaching and learning, she is keen to learn more to make teaching and learning more meaningful.

Dr. Nur Hana Hamzaid, Healthcare Sciences, Universiti Kebangsaan Malaysia (hanahamzaid@ukm.edu.my). She has been involved in teaching and learning for nutrition and dietetics program for more than 10 years. Her passion in this field has been identified since her early career years where she likes to introduce and incorporate authentic learning in her classroom. She has recently won 2 bronze and 1 silver medal for her new teaching approaches in her field.

Dr. Nurhanis Syazni Roslan, Department of Medical Education, Universiti Sains Malaysia (nurhanis_syazni@usm.my). She is a Medical Education lecturer and was responsible in introducing professionalism assessment for clinical students in USM. She received a gold medal and bronze medal for her work on 'Simplified Engagement Thematic of Professionalism Scale' (STEPS) and is actively involved in Personal and Professional Development program for medical students.

Assoc. Prof. Dr. Amiza Mat Amin, School of Food Science and Technology, Universiti Malaysia Terengganu (ama@umt.edu.my). She is a Dean in School of Food Science and Technology. She has been Malaysian Qualification Agency panel assessor since 2008. She is also a member of OBE Task Force in UMT and has been appointed by Malaysian Ministry of Higher Education as iCGPA Technical Committee member. She is involved in training of OBE and iCGPA to lecturers at UMT and national level.

Dr. David Yoong, Faculty of Languages and Linguistics, University of Malaya (davidyoong@um.edu.my). Dr David Yoong specialises in the study of linguistic constructs of reality. He is also Deputy Dean of Research and Development at the Faculty of Languages and Linguistics. His areas of research specialisation include discourse and critical discourse analyses.

Dr. Noor Akmal Shareela Ismail, Department of Biochemistry, Universiti Kebangsaan Malaysia (nasismail@ukm.edu.my). She is a senior lecturer in Faculty of Medicine who is passionate in improving teaching and learning methods in Medical Biochemistry as well as in personal and professional advancement among medical students. She has won several prizes in international and local conferences based on her achievements in medical education.

Mrs. Nor Adila Ahmad, Department of Mathematics, Computer & Science, Politeknik Sultan Azlan Shah (dylahmad89@gmail.com). She has received several gold and silver medals in research and innovation expositions through the development of mobile app for student assessment. She is also involved in syllabus formulation for degree student for Advance Calculus subject which are currently used in all Malaysian polytechnics.

Assoc. Prof. Dr. Azita Laily Yusof, Faculty of Electrical Engineering, Universiti Teknologi MARA (azita968@salam.uitm.edu.my). She is a senior lecturer at the Department of Communication Engineering, Universiti Teknologi MARA (UiTM). She is also a coordinator of integrated Cumulative Grade Point Average (iCGPA) and Holistic Success Module (HSM) Certified Master Moderator at Faculty of Electrical Engineering (FKE). She has received an award for her work on academic journal publications.

Siti Janariah Jantan, Department of Mathematics, Science and Computer, Politeknik Sultan Azlan Shah (PSAS), Behrang, Perak (siti_janariah@psas.edu.my). She obtained her Degree in Civil Engineering and Master in Technical and Vocational Education from UTHM. She is currently involved in several researches ranging from educational research and social sciences. She won gold award in H-Innovation day UKM 2017 on I-DE- AR "Innovative Differential Equation using Augmented Reality".

Dr. Lim Hooi Lian, School of Educational Studies, Universiti Sains Malaysia (hllim@usm.my). Her specialization area is in educational measurement and evaluation. She actively involves in professional development program for USM academic staffs. Her research focus includes development of assessment framework and assessment tools for school and university level.

Chapter 4: Portfolio-based Assessments

Dr. Zahiruddin Fitri Abu Hassan, Faculty of Built Environment, University of Malaya (zahiruddin@um.edu.my). He is a Lecturer in Building Surveying at the University of Malaya, Kuala Lumpur. His expertise and research is in building pathology, concrete durability and construction technology. As an avid e-learning advocate, his interest lies in computer tinkering and exploration of new software and web 2.0 tools for education. His passion led the university to appoint him as the Head of e-Learning at the Academic Enhancement & Leadership Development Centre (ADeC).

Assoc. Prof. Dr. Joharry Othman, Kulliyah of Education, International Islamic University Malaysia (drjoe@iium.edu.my). He is attached with the Department of Educational Psychology and Counselling, Kulliyah of Education, IIUM. He is both a trainer and content expert in the field of Educational Assessment, having worked with various governmental bodies (MPM, LPM), and private universities (UTAR, UNITAR, UTP). His current interest is Electronic Portfolio.

Prof. Dr. Siow Heng Loke, School of Graduate Studies, Asia e University (hengloke.siow@aeu.edu.my). He is currently the Dean of the School, in-charge of the doctoral research programmes. Prior to joining the university, he was at the University of Malaya for over 27 years with the last appointment as a professor and a Deputy Dean (Higher Degrees) at the Faculty of Education.

Assoc. Prof. Dr. Sheila Cheng, School of Management, Asia e University (sheila.cheng@aeu.edu.my). She is currently the Head of Assessment Centre at Asia e University. She has vast experience in programme administration and actively involved in international institutional partnership collaboration. She played a key role in several university's projects including the Accreditation of Prior Experiential Learning (APEL) assessment.

Dr. Syamsul Nor Azlan Mohamad, Faculty Of Education, University Teknologi MARA (syams1911@salam.uitm.edu.my). He is a Head of Assessment and Evaluation in Universiti Teknologi MARA. An expert in Educational Technology and Assessment, he is actively engaged with KPM, KPT, MDEC, public and private universities. His current focus is on alternative assessment, ePortfolio integration and iCGPA.

Dr. D'oria Islamiah Rosli, Faculty of Education, Universiti Tun Hussein Onn Malaysia (doria@uthm.edu.my). She is currently the Head of Training Academic Development Department at the Centre for Academic Development and Training (CAD). Her research focuses on Cognitive Awareness and User Interface Design as to bridge the gap between human and machine interaction. She is also a member in the Malaysia e-Learning Council for Public Universities (MEIPTA) and Malaysian Centre for e-Learning (MyCeL).

Angela Rumina Leo, Lecturer in Education (TESL), Faculty of Education and Social Sciences, Management and Science University (MSU) (angelarumina@gmail.com). She is a teacher educator & researcher at the Department of Education in MSU. With almost a decade of professional experience at several international institutions as a lecturer in English studies, she is now actively working on the redesigning of higher education in Malaysia. Her research interest lies in the area of assessment, curriculum development, creative teaching, educational psychology, and linguistics.

Chapter 5: Technology-based Assessments

Dr. Farrah Dina Yusop, Faculty of Education, University of Malaya (farah@um.edu.my). She is a scholar-researcher-practitioner in instructional design, higher education, social media, and mobile learning. She has published more than 20 high impact journals and recipient of the University's Excellent Lecturer 2017, Outstanding Journal Article Award 2015, and Outstanding Journal Article Award 2015 from the Association for Educational Communications and Technology (AECT), USA, among others.

Zaid Ali Alsagoff, International Medical University (zaid.alsagoff@gmail.com). Zaid Ali Alsagoff is a Learning Innovation Specialist with over 15 years of experience in tertiary and corporate education. He is the founder and CEO of AQL Learning Innovation Consultancy, which provides training and consultancy in learning innovation, drawing, visual note-taking, gamification, educational technology, memory improvement, speed/smart reading and thinking skills.

Assoc. Prof. Dr. Raihanah Mohd Mydin, School of Language Studies and Linguistic, Universiti Kebangsaan Malaysia (raihanah@ukm.edu.my). She is the deputy director at the Center for Teaching and Learning Technologies. She has published extensively in the areas of literary studies. She is passionate about learner empowerment and the 21st century educator. She was the recipient of the Anugerah Akademik Negara 2013 for the teaching category.

Roziela Mohamed Sharib, Department of Mathematics Science And Computer, Politeknik Sultan Azlan Shah (roziela.sharib@gmail.com). She has 5 years of experience in the engineering industry as Development and Production Engineer. She has spent almost 7 years teaching computer engineering, computer, mathematics and engineering science subject for Polytechnic Diploma.

Normawati Abdul Rahman, Department of Mathematic Science and Computer, Politeknik Sultan Azlan Shah (normawati@psas.edu.my). She is a lecturer and Graduate Engineer, registered under Board of Engineers Malaysia. With almost 10 years of teaching experience in civil engineering & engineering science, computer and mathematics, she had participated in international conference in Engineering Technology, Vocational Education and Social Science. She also won gold award in H-Innovation day UKM on QR Code MLC.

Hisyam Sani Idris, Department of Mathematics, Science & Computer, Politeknik Sultan Azlan Shah (hisyamsani.idris@gmail.com). He is a lecturer and Graduate Engineer, registered under Board of Engineers Malaysia. He is a former electrical engineer with almost 10 years teaching experience in electrical & electronic engineering, engineering science, computer and mathematics. His research interests include implementation of technology teaching aids alternative to the conventional pedagogical method. His latest achievement was a gold award in H-Innovation day UKM on QR Code MLC.

Puteri Sofia Amirnuddin, Taylor's Law School, Faculty of Business and Law, Taylor's University (puterisofia.amirnuddin@taylors.edu.my). She is currently a law lecturer and Programme Director for Master of Laws at Taylor's University. Her passion in teaching is evident as she was awarded with 'Exemplary Meritorious Award Staff' (EMAS) in October 2017. In addition, she has won a gold medal and 'Most Innovative Award' at the Redesigning Assessment and Holistic Learning Conference 2017 and has also won a silver medal at the International University Carnival on E-Learning Conference 2017 on her methods of teaching law.

Dr. Anuar Mohd Yusof, Faculty of Creative Technology, Universiti Malaysia Kelantan (anuarmy@umk.edu.my). He is a Senior Lecturer of Multimedia and E-learning Coordinator in Universiti Malaysia Kelantan. His research interest lies in the areas of mobile apps, edutainment and courseware technologies. Recently, he received gold award in KNOVASI 2018 at UKM for his project 'Developing Skill-based Courses for Massive Open Online Course: "MOOC in MOOC" Technique'.

Dr. Annafatmawaty Ismail, Department of Commerce, Politeknik Premier Ungku Omar (annafatmawaty@puo.edu.my). She is a lecturer and Innovation Coordinator at the Department of Commerce. Her research primarily focuses on Entrepreneurship Education, Entrepreneurial Intention, and teaching innovation. She also actively engages in social entrepreneurship activities with students and communities.

Teh Ya Yee, Victoria University Undergraduate Programme, Sunway College (yayeet@sunway.edu.my). She is a lecturer of Business Management and Entrepreneurship. She works actively with a team that focuses on developing students' employability skills through team based activities, business projects and experiential exercises. She has a keen interest in promoting students' learning through cooperative learning activities and using contemporary assessment methods.

Mahani Mohamad, Centre of English Language Studies, Universiti Sultan Zainal Abidin (UniSZA), Kuala Terengganu, Malaysia (mahani@unisza.edu.my). She is passionate about teaching and learning using technology in the classroom and beyond. A former teacher and now a lecturer teaching multimedia English and public speaking, she is promoting educational tools to help enhance teaching and learning of English language. Currently, she is the head of Modern Languages and Communication Studies Centre, UniSZA.

Assoc. Prof. Dr. Rosseni Din, Faculty of Education, Universiti Kebangsaan Malaysia (rosseni@ukm.my). She was a computer consultant and analyst before embarking on a career in education as a computer science teacher before joining UKM in the field of Design & Development Research and Educational Technology. Currently, she leads the Personalized Education research group to support the use of ICT in engaging learners through personalized learning using the integrated meaningful hybrid e-learning model.

Nabilah Othman, Faculty of Education, Universiti Kebangsaan Malaysia (UKM) (cik.nabilah001@gmail.com). She is a PhD student at the Faculty of Education, UKM. She received her Master of Education from Universiti Kebangsaan Malaysia in the area of Resource and Information Technology. She is the manager of The Journal of Personalized Learning since 2016.

Peer and Self-assessment

Amira Firdaus (UM)

Alina binti Shamsuddin (UTHM)

Hasmaini binti Hashim (UTEM)

Jacob John (UM)

Norasmatul Akma binti Ahmad (UM)

Nurul Atira (UM)

Paula Hodgson (The Chinese University of Hong Kong)

Renuka V. Sathasivam (UM)

1. Definition

Peer and Self-assessment

- According to peer assessment expert, Topping (1998), peer assessment is "an arrangement in which individuals consider the amount, level, value, worth, quality, or success of the products or outcomes of learning of peers of similar status" (p. 250). It involves "a set of activities through which individuals make judgements about the work of others ... Beyond making judgements, students may provide feedback and conference about the work they analyse; peer assessment is an umbrella term, encapsulating a number of related activities." (Reinholz, 2016).

- Self-assessment refers to "the involvement of leaders in making judgements about their own learning, particularly about their achievements and the outcomes for their learning." (Boud & Falchicov, 1989). It is "an essential element of learning" wherein students are able to "evaluate their own progress" (Cox, Imrie & Miler, 2014, p. 167).

1. Definition

Operationalized Definition

- Peer assessment* as explored in this book refers to formative assessment practices in which students provide feedback on other students' work, often with ideas and strategies for improvement. Peer Assessment engages students in activities such as:
    - Highlighting positive aspects of their peers' learning
    - Noting areas for improvement in their peers' work
    - Giving constructive comments on how their peers' may improve their work

*Some other definitions may differentiate between 'peer assessment' and 'peer feedback', wherein 'peer assessment' is considered a summative assessment practice in which students give marks to other students, while 'peer feedback' is considered as formative assessment in which students provide feedback without marks.

- Self-assessment as explored in this book is a form of formative assessment that engages students own ability to reflect on the learning process, judge their progress and take action on feedback from peers and instructors. Self-assessment encourages students to:
    - Assess their own learning
    - Evaluate their own work
    - Monitor their own progress
    - Regulate their own learning activities and tasks
    - Seek peer and instructor feedback

2. Principles / characteristics of peer and self-assessments

- For educators, peer and self-assessment need to be carefully planned:
  - Define assessment objectives clearly.
  - Ensure (check) alignment between assessment criteria and objective of assessment.
  - Design assessment criteria in a way that students will clearly understand it.
  - Assess quality of student feedback.

- For students, peer and self-assessment should include:
  - Reflecting upon current work or learning.
  - Providing feedback for current improvement.
  - Thinking about future work or learning.
  - Offering feed-forward for future improvement.

3. Case studies

CASE STUDY 1: What does self-reflection have anything to do with my professionalism?

SCAN ME!

SUBJECT AREA

Health Sciences

RESEARCHERS

Nurul Atira Khairul Anhar, Chan Choong Foong
University of Malaya, Kuala Lumpur, Malaysia

ISSUE

- Cultivating professionalism is more than just delivering a lecture. Therefore, in the professionalism remediation, we emphasize self-reflection so that they can appreciate and internalise the values of professionalism. Interactive lectures and discussions exposed students to types and process of available reflections and on how to reflect.

INNOVATIVE APPROACH / INTERVENTION

- Students were asked to reflect upon their professionalism and write a reflective essay. In addition, they are also involved with fieldwork where students are required to interview patients, healthcare professionals and academic staffs on their views on professionalism and their experiences. Lastly, students were then required to submit a written report in describing their findings, feelings and reflections after completing on their fieldwork experience.

3. Case studies

DESCRIPTION OF APPROACH

- Interactive mini lectures and discussions exposed students to the various types and processes of reflections and on how to reflect.
- Students were taught on the processes of reflection and engaged in a discussion on the importance and the need of constant reflection.
- During the programme, students were required to write a reflective essay and involved with fieldworks for instance, interviewing patients, healthcare professionals, and academic staff about their view on professionalism and their experiences.
- Once the fieldwork completed, students were required to submit a written report in describing their findings, feelings and reflections.

RELATED LEARNING OUTCOMES

PO3 – Social skills and responsibility; PO4 – Ethics and values; PO5 – Communication

3. Case studies

CASE STUDY 2: An adaptive self-assessment approach for engaging massive open online course (MOOC) learners

SCAN ME!

SUBJECT AREA

Mandarin as second language

RESEARCHERS

Hasmaini Hashim, Sazilah Salam, Siti Nurul Mahfuzah Mohamad
Universiti Teknikal Malaysia Melaka (UTeM), Melaka, Malaysia

ISSUE(S)

- In MOOC assessment, the issue is, there was a reduction of interest and activity of students during the session of the course.
- One of the most challenging problems in MOOCs is that it is infeasible for the teaching staffs to grade all the assignments in such a large scale.

INNOVATIVE APPROACH

- Adapt self-assessment approach for engaging Massive Open Online Course (MOOC) learning in the second language.
- Propose and implement self-assessment that considers learners requirement or adaptive to learners characteristics.

3. Case studies

DESCRIPTION OF APPROACH

- The study was conducted using two separate samples which involve two cohorts of students that took a Mandarin course via MOOC: Cohort 1 consists of 403 students in Semester 1 2015/2016, Cohort 2 consists of 338 students in Semester 2 2015/2016, Cohort 3 consists of 327 students in Semester 1 2016/2017, while Cohort 2 consists of 262 students in Semester 2 2012/2017.
- For Cohort 1, the MOOC assessment design consists of 40 e-activities (with online quizzes, essay writing, self-video presentation and audio listening assessment). For Cohort 2 and 3, the MOOC assessment design which consists of 45 e-activities. For Cohort 4, the MOOC assessment design was further improved which consists of 55 e-activities (additional forum e-activities).
- Activities element in this assessment methods are: (i) quizzes, (ii) listening assessment, (iii) forum, (iv) mid-term and (v) project.
- For the project, students are required to prepare & upload an essay written in Chinese characters, and a self-video presentation of the essay.
- Assessment was divided into three phases; (i) Phase 1 (Implementation): establish learning outcomes or goals, (ii) Phase 2 (Implementation): gather evidence and (iii) Phase 3 (Revise): analyse & interpret and make decision & change.

RELATED LEARNING OUTCOMES

PO1 – Knowledge; PO2 – Practical skills; PO5 – Communication

3. Case studies

CASE STUDY 3: Professional behaviour among dental students: comparing self and peer vs. teacher assessments in improving student performance

SUBJECT AREA

Health Sciences; Dentistry

SCAN ME!

RESEARCHERS

Jacob John, Prof Roslan Saub, Shani Ann Mani, Norasmatul Akma Ahmad
University of Malaya, Kuala Lumpur, Malaysia

ISSUE(S)

- Dentistry graduates are deemed ill-prepared for the real world, despite possessing exceptional knowledge and technical skills, because they cannot get very far without a good understanding of the professional and ethical standards.
- Teachers and students often struggle with this concept because much of the professional and ethical standards are part of the "hidden curriculum".

INNOVATIVE APPROACH

- This project guides students through this curriculum bottleneck by taking them through a battery of formative-self and –peer assessment process.

3. Case studies

DESCRIPTION OF APPROACH

- Students attend a lecture on Code of Professional Conduct and Ethics & Jurisprudence
- Prior to the first semester, a questionnaire on Professional Behavior (e.g. work habit; interpersonal attributes; and global items) was administered to a test group. The questionnaire was designed to provide indirect exposure to "hidden" curriculum.
- Following the questionnaire, the self and peer assessment in addition to being assessed by a teacher.
- At the end of the first semester, students were given feedback on their peer and self assessment
- Students were then asked conduct self-reflection on the assessment exercise
- A second round of assessment on Professional Behavior was conducted.
- Teachers' scores were lower than self and peer scores. Scores increased significantly for "work habit", and the item showed significant variation between the two phases. On the other hand, the "interpersonal attributes" and "global item" has no difference so we need to confirm the validity of the "work habit" assessment.

RELATED LEARNING OUTCOMES

PO3 – Social skills & responsibility; PO4 – Ethics & values; PO5 - Communication

3. Case studies

CASE STUDY 4: Assessing work ethic of science students in group assignment for a university course: A preliminary study on perceived fairness

SUBJECT AREA

All subjects; Sciences

RESEARCHERS

Ngeow Yeok Meng, Tamil Arasi a/p Muniandy
Universiti Tunku Abdul Rahman (UTAR), Perak, Malaysia

ISSUE(S)

- Short semester of seven weeks has always been a challenge to most lecturers in UTAR to ensure there is teamwork and collaborative learning.
- It is often difficult to ascertain the determinant factors for students to contribute actively to the team.
- It is also difficult for lecturers to fairly assess students' work ethics in their group work.

INNOVATIVE APPROACH / INTERVENTION

- We study the learning processes for improved student engagement with the intention to instil a sense of belonging to the newly established group, and sense of responsibility towards course work.
- We record how students feel and commit to group interaction throughout the seven weeks of interactions, and how they blend personality and individual learning style intentionally to achieve their shared common goal.

3. Case studies

DESCRIPTION OF APPROACH

- Contrary to conventional peer assessment that requires collective consensus, this study uses constructivism approach of keeping track of selected social media (either Facebook or WhatsApp) to illustrate how students make sense of their individual contribution to group assignment.
- Pre- and post-test are complemented by selected personal interviews to find out how students decide on the level of participation in group assignment tasks.
- It documents experiential learning processes for collaborative learning, and creative ways to enhance teamwork for a common goal.
- It examines whether trust and sense of belonging, reciprocally strengthen work ethics.

RELATED LEARNING OUTCOMES

PO3 – Social responsibility; PO4 – Ethics & values; PO5 – Communication; PO6 – Problem solving

3. Case studies

CASE STUDY 5: Medical biochemistry: Enhancing achievement of learning outcomes through self-based and group-based assessments

SUBJECT AREA

Medicine; Health sciences; Medical biochemistry

RESEARCHERS

Noor Akmal Shareel Ismail, Khairuzin Tajul Arifin, Ekram Alias, Tan Jen Kit, Mohd Hanafi Ahmad Damanhuri, Norwahidah Abdul Karim, Goon Jo Aan, Zakiah Jubri@Mohd Zubri, Suzana Makpol, Yasmin Anum Mohd Yusof

Universiti Kebangsaan Malaysia (UKM), Selangor, Malaysia

ISSUE(S)

- Conventional teaching and learning methods in Medical Biochemistry are not fully effective in achieving course objectives.

INNOVATIVE APPROACH / INTERVENTION

- We utilized an interactive peeragogical and heutagogical learning approach to help students achieve learning outcomes through authentic and purposeful learning.
- We utilize various online platforms for students to acquire knowledge and engage in team-based learning.
- Assessment is conducted throughout the entire process, where at the end of each session, students do their own reflection and improve themselves.
- The interactive learning approaches have helped students to boost their confidence level and improve critical thinking, crucial elements for success in the clinical year.

3. Case studies

DESCRIPTION OF APPROACH

- First year medical students are grouped into small groups consisting of 8 to 10 students.
- Each team of students go through up to six interactive learning activities (depending on the module being taught):
  - Meet-the-expert
  - Online quizzes
  - Team-based learning
  - Objective Structured Practical Examination (OSPE)
  - Digital canvas (Padlet)
  - Interactive whiteboards
- Firstly, learning materials (e.g. videos, reading materials, notes) are uploaded into the university's Learning Management System (LMS).
- Next, each student constructs an individual mind map and shares it with the class via a digital canvas (e.g. Padlet).
- Each group then plays a game either through an online quiz or OSPE, depending on the particular module's learning outcome.
- During a meet-the-expert session, a clinical case is provided and students discuss the case's cause, effect and case management.
- Students use interactive whiteboards (e.g. Doceri, Educreations) to explain their answers and share among peers.
- At the end of each session, students reflect on their own performance.
- Lecturers then provide feedback to conclude the interactive learning loop.
- When students make use of feedback to make changes to his or her work, students move a step closer to achieving the day's learning aim, making in an authentic and purposeful learning.

RELATED LEARNING OUTCOMES

PO1 – Knowledge; PO2 – Practical skills; PO6 – Problem solving; PO7 – Information management.

3. Case studies

CASE STUDY 6: Cartoon strips: Can they be used as assessment

SUBJECT AREA

Social science/humanities theory; educational theory

RESEARCHERS

Renuka V. Sathasivam

Universiti Malaya, Kuala Lumpur, Malaysia

SCAN ME!

ISSUE(S)

- It is often difficult to capture student attention during theory-based classes
- Written assignments give room to students to "cut-and-paste" without internalizing the material they refer.

INNOVATIVE APPROACH / INTERVENTION

- Creating cartoon strips force students to move out of their comfort zone and create a produce that requires higher order thinking skills (HOTS).
- Rubrics allow students to actively participate in the assessment process.
- Students are encouraged to take ownership of their own learning through peer assessment and self-assessment, and to become autonomous and lifelong learners.

3. Case studies

DESCRIPTION OF APPROACH

- Students in an educational theories class are asked to illustrate a cartoon strip illustrating a selected theorist's contribution to the educational field.
- Students' cartoon strips developed their creative skills as well as enhanced their communicative competencies.
- Students subsequently presented their cartoon strips to assessors comprising of their peers.
- The peer assessment process was conducted with the assistance of a rubric. The rubric allowed for the assessment process to proceed more meaningfully as peer assessors were able to focus their feedback on the requirement of the assessment.

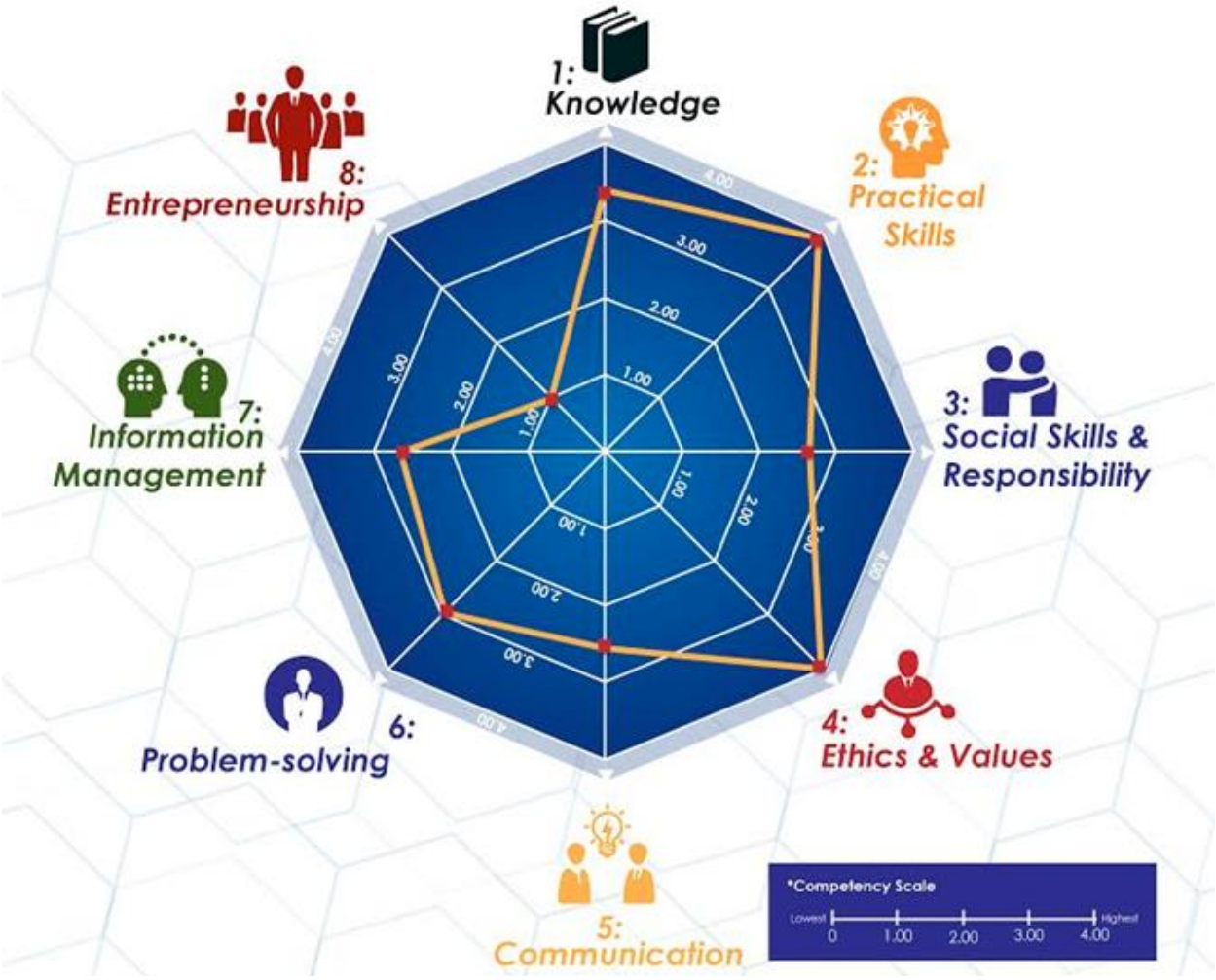
CATEGORY	POOR	FAIR	GOOD	EXCELLENT
Content	Shows many unimportant content and information is incomplete. Very difficult to understand the content.	Shows some important content, but highlights unimportant points. Rather difficult to understand the content.	Shows most of the important content, however, at least one conflict/discrepancy is noticed. Rather easy to understand the content.	Shows content that are relevant and very accurate. Very easy to understand the content.
Team work	Team work was not visible. No collective effort was seen.	Team work was slightly visible; however, no collective effort was seen.	Team work was visible and collective effort was seen.	Team work was very visible and team mates helped out each other throughout.

Figure 1: Assessment rubric for educational theorist cartoon strip

RELATED LEARNING OUTCOMES

PO1 – Knowledge; PO5 – Communication; PO6 – Problem solving

4. Related Learning Outcomes (LOs)



http://jpt.mohe.gov.my/images/yootheme/icgpa.png

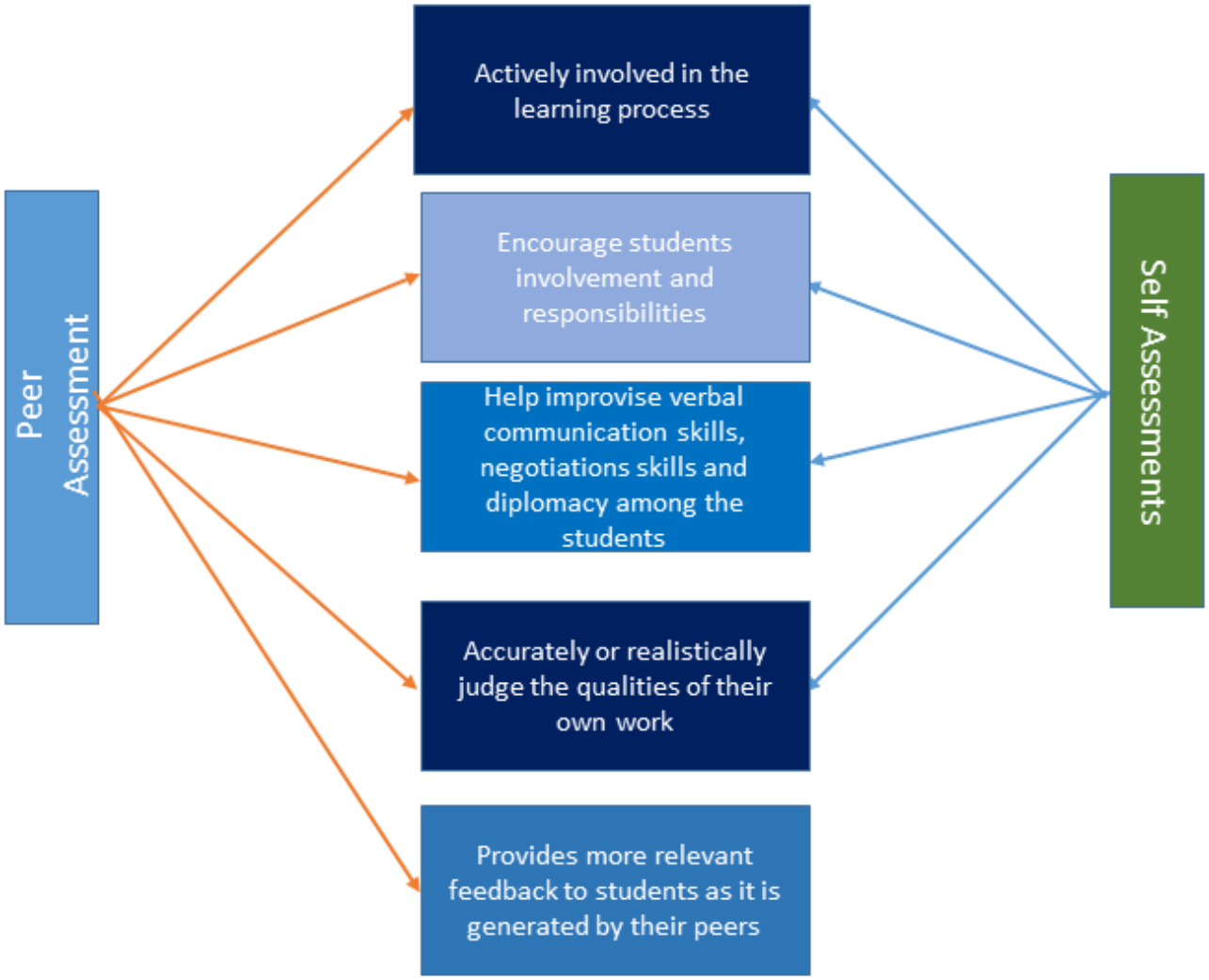
4. Related Learning Outcomes (LOs)

CASE NO.		PO1 Knowledge	PO2 Practical skills	PO3 Social skills and responsibility	PO4 Ethics & values	PO5 Communication	PO6 Problem-solving	PO7 Information management	PO8 Entrepreneurship
1.	What does self-reflection have anything to do with my professionalism?			/	/	/			
2.	An adaptive self-assessment approach for engaging massive open online course (MOOC) learners	/	/			/			
3.	Professional behavior among dental students: Comparing self and peer vs. teacher assessments in improving student performance			/	/	/			
4.	Assessing work ethic of science students in group assignment for a university course: A preliminary study on perceived fairness			/	/	/	/		
5.	Medical biochemistry: Enhancing achievement of learning outcomes through self-based and group-based assessments	/	/				/	/	
6.	Cartoon strips: Can they be used as assessment								

5. Advantages of peer and self-assessments

1. Peer and Self-assessment promotes students' active involvement in the learning process.
2. The expectations arising from assessing oneself and one's peers fosters a sense of responsibility
3. Carrying out peer assessment improves students' verbal communication skills, negotiation skills and diplomacy among students.
4. The process of assessment trains students to judge the quality of their own and their peers' work more realistically.
5. Peer Assessment can provide more relevant feedback to students who value their peers' opinions.

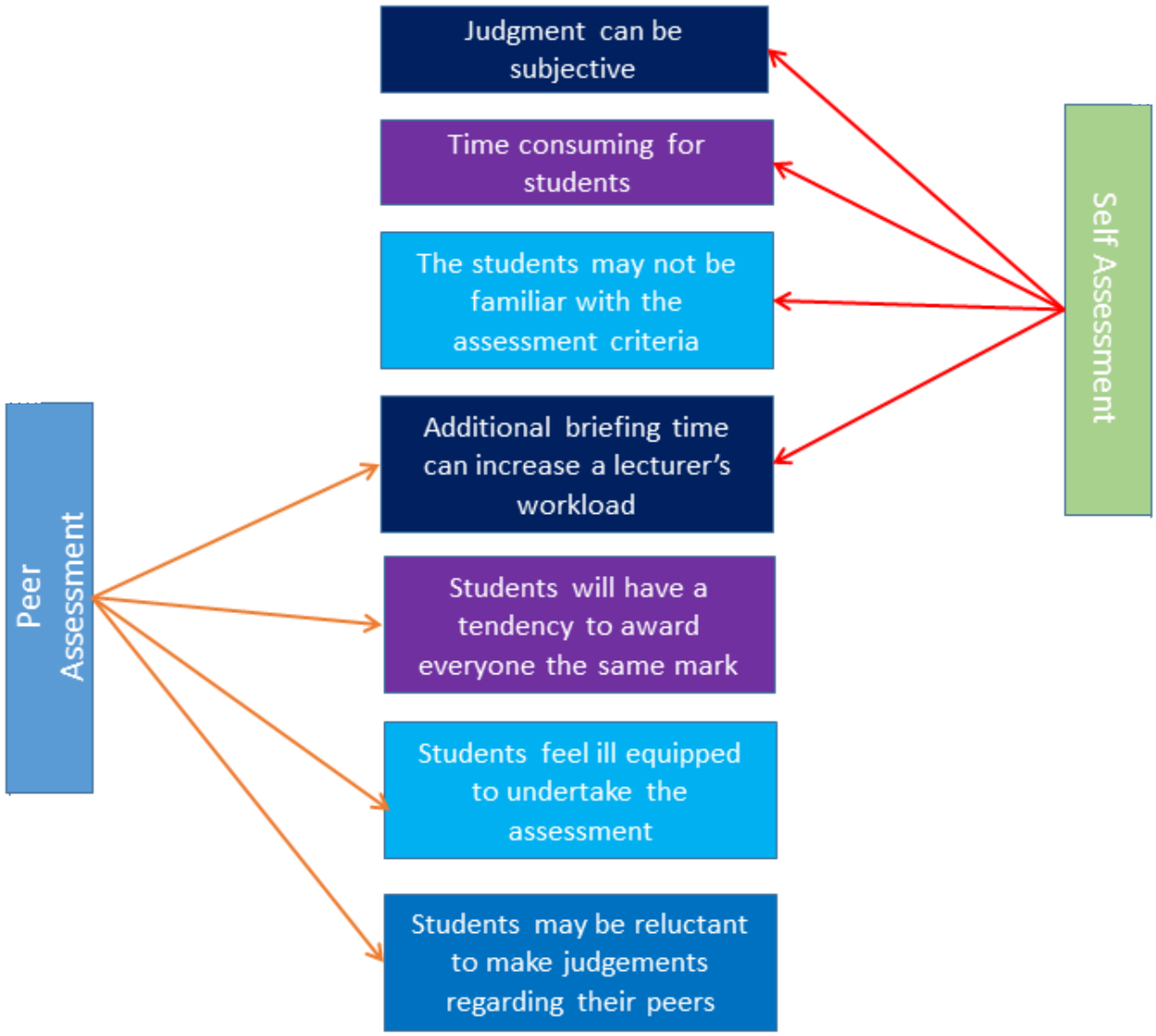
5. Advantages of peer and self-assessments



6. Limitations of peer and self-assessments

1. Students' judgement can be subjective when carrying out assessment.
2. Both peer and self-assessment can be time consuming for students.
3. Students may not be familiar with assessment criteria.
4. Additional planning and briefing for peer and self-assessment increases lecturers' workload.
5. Students have the tendency to award everyone the same mark when conducting peer assessment.
6. Students may feel ill-equipped to perform assessment on their peers.
7. Students can be reluctant to make judgement regarding their peers.

6. Limitations of peer and self-assessments



7. Things to consider when implementing peer and self-assessments

- **Assessment criteria** must be clarified, for example by providing a valid rubric, checklist, illustrations, etc.
- **Assessment briefing/training** sessions should be carried out before implementing peer or self-assessment to ensure students understand the assessment process and criteria (e.g. via discussion, providing examples of good and bad practices).
- **Students' capabilities** for performing peer and self-assessment should be taken into consideration (e.g. course level, student background)
- The **learning environment** needs to be safe and conducive for students to feel comfortable with peer and self-assessment.
- **Assessment session** should be appropriately scheduled based on the purpose of the assessment, e.g. self-reflection can be done outside of classroom.
- **Feedback** should be given to students regarding their peer and self-assessments
- **Assessment results** should only be shared in a thoughtful manner, for example, cumulative results can be shared but individual students' reflections/results should not be shared without consent.
- **Feedforward** during the assessment process can be used for future enhancement of students' existing strengths and improvement of past weaknesses.

8. References

Andrade H and Valtcheva A (2009). Promoting learning and achievement through self assessment, theory into practice, Vol 48 pp 12-19.

iCGPA Rubric Learning Outcomes Assessment Guide (2016). Ministry of Higher Education Malaysia. http://jpt.mohe.gov.my/images/yootheme/icgpa.png

Boud, D., Cohen, R., & Samson, J. (2014). Peer Learning in Higher Education: Learning from and with Each Other: Taylor & Francis.

Castelli, P. A. (2011). An integrated model for practicing reflective learning. Academy of Educational Leadership Journal, 15, 15.

Cox, K., Imrie, B. W., & Miller, A. (2014). Student assessment in higher education: A handbook for assessing performance. Routledge.

Reinholz, D. (2016). The assessment cycle: a model for learning through peer assessment. Assessment & Evaluation in Higher Education, 41(2), 301-315. doi:10.1080/02602938.2015.1008982

Topping, K. (1998). Peer Assessment Between Students in Colleges and Universities. Review of Educational Research, 68(3), 249-276. doi:10.3102/00346543068003249

9. Summary

Peer and self-assessment is a highly student-centered approach to assessment. Although assessment is conventionally considered as the responsibility and sole right of the teacher, if done correctly, student-led assessments has much to contribute to the teaching and learning process. Students develop and practice fair judgement and a sense of responsibility for their peers' and their own learning.

Furthermore, this participatory and collaborative form of assessment-for-learning engages 21st century students in a way that is familiar and similar to their everyday life. 21st century young adults regularly reflect upon their experiences and share their reflections with others via social media, a practice related to self-assessment. They are frequently evaluated content produced by others through "liking", "rating", and "reviewing" in social media.

As Malaysian higher education moves towards a more holistic model of education aimed at developing balanced and entrepreneurial graduates, peer and self-assessment will help hone students' analytical and reflective skills as well as their communication skills. Peer and self-assessment will hone students' evaluation and social abilities beyond the classroom, and more importantly instill in students the importance of fair judgement and acknowledgement of the responsibility that comes along with passing judgement, for a more equitable society.

Group-based Assessment

Nur Azah Hamzaid (UM)
Debra Sim Si Mui (UM)
Adelina Asmawi (UM)
Fatimah Hashim (Industry)
Vinothini Vasodavan (UM)
Agelyia a/p Murugan (AIMST)
Nik Nadia Nik Nazri (UM)
Foong Chan Choong
Noor Akamal Shareela Ismail (UKM)
Jasmine Selvarani Emmanuel (WOU)
Noor Liza Adnan (UiTM)
Noor Liza Adnan (UiTM)
Rokiah Muda (UiTM)
Nur Raihana Mohd Sallem (UiTM)
Wan Karomiah Wan Abdullah (UiTM)
Noor Maizura Mohamad Noor (UMT)
Donnie Adams (UM)
Humamuddin Abu Samah (UM)
Syafizza Norida A Samat (UM)
Unaizah Obaidellah (UM)
Junaidah Md Din (USIM)

1. Definition

Group Assessment

- Group assessment is defined as that which assesses the work of a formal learning group, established to complete a specific task, either during a class or over a period of time outside of the class.
- Group-based assessment is where every effort is made to parse out the performance of the individual to infer his or her underlying abilities as they are observed in the group setting (Poehner, 2009).
- Group-based assessment (GBA) includes in-class group learning, peer assessment, and peer and instructor feedback (Bicen & Laverie, 2009).

Working Definition

Group-based assessments are useful when considering the need to assess team work or collaborative skill among group members. The collaborative skill required here includes the level of involvement, communication, leadership, quality of contribution among peers, negotiation skill, and ability to influence others.

2. Principles / characteristics of group-based assessments

- The group referred here often means a small group of usually between two and six students, formed to discuss a particular issue or perform a particular task. The group may be formed by either self-selection or being assigned by the instructor.
- The assessed group work must be carefully planned and the assessment strategy clearly presented to students.
- Assessment of group work should be conducted in such a way that it provides evidence of individual contribution and achievement in line with Quality Assurance Agency (QAA) precepts on assessment of students.
- Assessment should take into account the process as well as the product of the group work.
- The marks and weighting allocated to the group product and the individual contribution should be clearly specified in the assessment criteria. To motivate individual students and discourage the free-rider phenomenon, it is important to assess individual contributions and understanding, as well as group products and processes. In addition to evaluating the work of the group as a whole, individual students should be asked to demonstrate their learning. This can be done via independent write-ups, weekly journal entries, content quizzes, etc.
- Marking criteria, including tutor and self/peer assessment criteria where appropriate, should be clearly articulated and provided to the group prior to the start of the group.

3. Case studies

CASE STUDY 1: Manifesting the Understanding of 'Integration': Assessing Biomechatronics through Group Exhibition

SUBJECT AREA

Biomechatronics Engineering

SCAN ME!

RESEARCHERS

Nur Azah Hamzaid

Faculty of Engineering, University of Malaya, Kuala Lumpur

ISSUE

- Opportunities for students to 'learn by doing' in a theoretical lecture-based course is usually limited, especially when the knowledge content is complex and heavy. Lecturers usually will resort to pen-and-paper based assessment to capture their understanding, which may not be effective.

INNOVATIVE APPROACH / INTERVENTION

In this group exhibition project, students were assigned roles to play from the different engineering domains. Based on their natural interest towards a certain field, they would choose to play their role as either a mechanical engineer, an electronics engineer, a control engineer, a biomedical engineer or a mechatronics engineer.

3. Case studies

The domain-based group would be their 'Expert Group'. They were then introduced to their 'Company Group' where the different experts would be working together on a single project. The project is to develop a solution in the form of a prototype for people with disabilities in performing their daily activities. At the end of the semester, they exhibit their prototypes to the public while explaining their individual roles and contribution and how their expertises were integrated into the final solution prototype. The project exhibited would then be assessed by different experts from each engineering field and marks were given for the group component as well as the individual component.

DESCRIPTION OF APPROACH

- Group exhibition project: 30% of final mark
- Week 1: Students were assigned roles to play as engineers from different engineering domains, i.e. EITHER mechanical engineering, electrical engineering, control engineering and biomedical engineering (their Expert Group).
- Week 2- 13: Students then get into 'Company Groups' that comprises of one mechanical engineer, one electrical engineer, one control engineering and one biomedical engineering each. The project is to collaboratively develop a prototype of a device to help people with disabilities.
- Throughout the semester, students consult the course lecturer in doing the assignment. Quality feedback and support is provided informally and appropriately.

3. Case studies

- Week 14: They exhibit their prototypes to the public while explaining & demonstrating their individual roles and contribution and how their expertise was integrated into the final solution prototype.
- Week 14: The project exhibited were assessed by different engineering experts (from different engineering backgrounds);.
- Marks were given for the group report (10%), prototype exhibition (10%) and individual role component (10%), making up 30% in total.

RELATED LEARNING OUTCOMES

PO2 – Knowledge; PO3 – Social skills and responsibility; PO6 - Problem solving.

3. Case studies

CASE STUDY 2: JAZZ UP your Poster Presentation with Augmented Reality

SUBJECT AREA

English for Professional Purposes (EPP)

RESEARCHERS

Agelyia A/P Murugan
AIMST University Malaysia

SCAN ME!

ISSUE(S)

- The students, being Generation Z, needs to embrace social learning environments that enable them as students to be hands-on and directly involved in the learning process. Lecturer need to transform the classes into highly engaging sessions that would motivate the students' interest towards learning English Language.

INNOVATIVE APPROACH

- A technique to engage the students to do their poster presentation by integrating technological tools was adopted. They were given choices to use any Augmented Reality (AR) applications and also DIY Hologram to make the presentation more interactive and engaging. Lecturers from all the faculties were invited to come and view the students' poster presentation, which was held at the university hall foyer.

3. Case studies

DESCRIPTION OF APPROACH

- Students were given 2 weeks to prepare the poster with some briefing on the augmented reality methods and also videos on the introduction on how to prepare a DIY Hologram.
- AR methods are capable to assist teaching and learning that directly involve the students interacting with 3D models via AURASMA. With the use of AURASMA and DIY Hologram, it is proven that these techniques motivated students and captured their attention towards the lesson. These also helped them to understand their content knowledge better.
- During the poster presentation, the students were evaluated according to the rubrics that are focused on Higher Order Thinking Skills. The rubrics consist of Delivery of Content Knowledge (25%), Language (25%), Technological Method (25%) and Communications Skills (25%).
- Questionnaire was distributed to find out the perspective of the students on the method and assessment used during the poster presentation.
- Most students preferred the method and the assessment used for this assignment. Students are confident and motivated to use the language during their poster presentation.

RELATED LEARNING OUTCOMES

PO2 – Knowledge; PO5 – Communication.

3. Case studies

CASE STUDY 3: Malaysian Food and Culture Fest: A WOU group assessment experience

SCAN ME!

SUBJECT AREA

Comparative religions
/ cross-cultural intelligence

RESEARCHERS

Jasmine Selvarani Emmanuel, Chng Lay Kee, Michelle Loh Woon Har
Wawasan Open University

ISSUE(S)

- The students in these courses had little knowledge of each other's culture and religion. This assessment was a hands-on learning experience of cultural and religious awareness for them.

INNOVATIVE APPROACH

- To organize the Malaysian Food and Cultural Fest, students were asked to set up hawker style booths that were decorated in tandem with each festival theme that represented the main festivals celebrated by the people in Malaysia including the Peranakan culture, Deepavali, Vaisakhi, Christmas, Chinese New Year and Hari Raya Aidilfitri.

3. Case studies

DESCRIPTION OF APPROACH

- Students had to put up for sale, food that was usually served during these festivals and write about the cultural history of the food, cultural event or festival. The students also came clad in traditional attires. A total of sixty students participated in this project.

- For this project, the assessment for the project was broken into the initial proposal (5%), implementation of the project (15%), oral presentation (10%) and a reflective essay (5%).The total was 35% of the 50% coursework marks.

RELATED LEARNING OUTCOMES

PO3 – Social skills and responsibility; PO5 – Communication; PO8 – Entrepreneurship.

3. Case studies

CASE STUDY 4: Group-Based Assessment: Using Multimedia Presentation to Promote Collaborative E-Learning

SCAN ME!

SUBJECT AREA

Educational Leadership

RESEARCHERS

Donnie Adams, Humamuddin Abu Samah, Syafizza Norida A. Samat

University of Malaya

ISSUE(S)

- Higher education is more than just about learning tangible and measurable skill to measure not only what students learn, but also their propensity to learn.

INNOVATIVE APPROACH / INTERVENTION

- The GBA is a didactical model consists of eight steps that integrate multimedia presentation with peer assessment to foster collaborative e-learning. In this approach, students are active participants in the assessment process which includes in-class group learning, peer assessment, and peer and instructor feedback. The proposed didactical model foster communication and collaboration among students, encourage creativity, motivation, and dynamism of the e-learning process for both lecturers and students.

- The GBA Didactical Model can be conducted in small and mid-size classes.

3. Case studies

DESCRIPTION OF APPROACH

- The innovative GBA didactical model consists of eight steps that utilize SPECTRUM, an e-Learning Management System into the learning process.

- Students produced multimedia presentations uploaded into YouTube, which promotes sharing of knowledge beyond the classroom.

Step 1	• Instructor discussed the course learning outcomes with students.
	• Students were informed of the expected output of a multimedia presentation at the end of the course.
	• Students were briefed on the criteria in the evaluation rubric
	  ○ Knowledge and understanding of Leadership Theories
	  ○ Independent Research and use of Data
	  ○ Multimedia Application and Presentation
	  ○ Collaboration and Teamwork.
	• Students were introduced to the GBA procedure on the multimedia presentation
	• Students were introduced to types of collaborative e-learning activities in Spectrum, a Learning Management System (LMS).

Step 2	• Students were formed into heterogeneous groups based on their nationalities, working experience, current employment. • Maximum 5 students to a group.
Step 3	• Face to face (F2F) sessions emphasized on discussions and collaborative group work using interactive blended learning approaches (Chat, Discussion; Forum; Presentation; E-learning) via Spectrum. • Students swapped their roles (for every F2F throughout the semester - e.g., leader, writer, and presenter).

3. Case studies

Step 4	• The next step is the GBA process. • Group-based case study activities were conducted. • Topics were related to the course, e.g. theories, models, facts, comparison etc. • Interactions to complete the activity (Chat, Discussion, Forum) were done via Spectrum. • Instructor gave verbal feedback to each group (e.g. how they can improve their work) for benchmarking/modification purpose.

Step 5	• Groups modified their case study analysis based on instructor's verbal feedback.
	• Groups created a 3 to 5 minutes multimedia presentation of their case analysis such as;
	  • Life action audio visual or
	  • animation/visual graphic with voice-recorded audio narration or
	  • animation / visual graphic with music and subtitles, without voice narration.
	• Interactions to complete the presentation were done via collaborative e-learning using Spectrum, Google Drive, WhatsApp.

Step 6	• Groups submitted the multimedia presentations to the instructor in the next class. • Groups were given the evaluation rubric and briefed on the GBA process. • Teams present their multimedia presentations.
Step 7	• Two stage assessments were employed for the multimedia presentations. • Formative (e.g., qualitative assessment via verbal feedback by Instructor and students). • Summative (e.g., quantitative assessment using evaluation rubric by Instructor and students).

3. Case studies

Step 8	• Instructor assesses all the evaluation rubrics and grades all multimedia presentations.

* Feedback through e-mail was given at Step 7.

** The rubric for the assessment was broken into five main domain; (1) Knowledge of Leadership Theory/Theories, (2) Independent Research and use of Data, (3) Multimedia Application, (4) Presentation, and (5) Collaboration and Teamwork. Five marks were allocated for each domain. The following formula was used:

$$\text{Total marks: } \frac{\_\_\_\_\_}{25} \times 40 = \_\_\_\_\_$$

RELATED LEARNING OUTCOMES

PO4 – Ethic and values; PO5 – Communication; PO6 – Problem solving.

3. Case studies

CASE STUDY 5: Gamification of Education: Assessment on Knowledge and Behaviour through Socrative

SUBJECT AREA

Medicine

RESEARCHERS

Nurul Atira Khairul Anuar Holder, Foong Chan Choong, Nik Nadia Nik Nazri
University of Malaya

ISSUE(S)

- Paper-based assessments are unable to provide instant assessment results to enhance student learning when peer tutoring sessions are implemented. Student autonomy and motivation are essential in improving their academic performance.

INNOVATIVE APPROACH / INTERVENTION

- Socrative was used as an online platform for students to answer and discuss the questions. Students received instant results and used real-time item analysis in facilitating the discussion. Students also used Socrative to give anonymous feedback to each other on strengths and ways to improve for the next session (e.g. “I hope all students will be punctual”).

3. Case studies

DESCRIPTION OF APPROACH

- Each student designs a set of single best answer questions. The questions are compiled into an online quiz using Socrative. In other words, they contribute questions to test each other. Students organise the session. After students completed the quiz, scores are received and the discussion is assisted by the real-time item analysis. Students complete an online feedback to assess their quality of the session.
- The feedback is then discussed among all the students and they will collectively decide what improvements should be made for the next session. Upon completion of the session a more detailed report provided by Socrative for each individual showing their performance in each item were emailed. This information would aid them in monitoring their own progress and what would need to be improved in the future.

RELATED LEARNING OUTCOMES

PO3 – Social skills and responsibility.

3. Case studies

CASE STUDY 6: Assessment of Cognitive Level in Database Subject using Problem-based Learning Approach

SUBJECT AREA

Computer Science and Database

RESEARCHERS

Noor Maizura Mohamad Noor, Rosmayati Mohemad, Faizah Aplop
Universiti Malaysia Terengganu

ISSUE(S)

- Database is a challenging subject among students because it needs an abstract understanding of several theories, concepts and technical processes. Learning process using traditional lecture mode is not adequate to produce graduates with knowledge of theory and technical skills.

INNOVATIVE APPROACH / INTERVENTION

- Students taught using problem-based learning (PBL) will retain more knowledge and demonstrate greater critical thinking skill. In addition, assessment integrates seamlessly with PBL. Oral presentation and quizzes are the types of assessment which have been used in PBL in order to provide students an opportunity to practice their communication skills while presenting findings to their peers and groups, as well as to evaluate their cognitive level.

3. Case studies

DESCRIPTION OF APPROACH

Ladder 1:

- The students are assigned roles and work in groups to identify the learning issues using 3 Active Thinking Points (identification of the facts, idea generation and identification of learning issues). Appoint a chairperson, a secretary/scribe, a facilitator, an observer and member.
    - The chairperson moderates the discussion, encourages participation of all members, and maintains good group dynamics.
    - The secretary/scribe takes the notes/points raised by all members, helps the members to order or link their points, and participates as far as possible in the group discussion.
    - The facilitator facilitates the discussion session, asks open questions, encourages participation of all members, maintains good group dynamics, evaluate group performance and supports the role of chairperson.
    - The observer observes and reports the learning session.
    - The member actively participates the discussion session, listen actively to each other's' contribution, ask open questions, share information with each other.

Ladder 2:

- The students embark on self-directed learning activities based on triggers. The process includes reading, watching videos, summarizing the unit and searching for additional and supporting learning materials.

3. Case studies

Ladder 3:

- The students will have to conduct several meetings, report the results of their self-directed learning to the group and prepare for the presentation at Ladder 4. Students are required to fill up the FILA table. Students may revisit the previous ladders in order to refine the outcomes of the group learning.

Ladder 4:

- The students will have to present the outcomes of their learning. The evaluation is based on cognitive assessment. The presentation can be in many forms. It could be a parallel presentation, single presentation or a forum discussion.

Ladder 5:

- The final stage of learning for the unit. At this level the students will fill in the reflection section in FILA table provided. The reflection covers the learning experiences from Ladder 1 to Ladder 4 and overall learning process.

RELATED LEARNING OUTCOMES

PO5 – Communication; PO6 – Problem solving; PO7 – Information management.

3. Case studies

CASE STUDY 7: VidCase: An Alternative Assessment Method for the Millennial Students

SUBJECT AREA

Accounting

RESEARCHERS

Noor Liza Adnan, Rokiah Muda, Nur Raihana Mohd Sallem, Wan Karomiah Wan Abdullah, Siti Rokyah Md Zain

Universiti Teknologi MARA (Terengganu)

ISSUE(S)

- There is a need to fairly assess students' analytical and creative skills; and allows the students to enjoy the assessment tasks.

INNOVATIVE APPROACH / INTERVENTION

- VidCase (Video Case Study) solves a mystery of a case study using video presentation. It requires a case study that covers the syllabus content and leaves a mystery to be solved. Students are to work in a group of 10 to 12. They need to act and record the solution in a 45-minutes video which is to be presented in front of five jurors. Besides the marks earned, winners are also to be awarded based on a few criteria.

3. Case studies

DESCRIPTION OF APPROACH

- Students are divided into small group of 10 to 12. Each group will be provided with a case study that has been written in accordance to the syllabus content, but containing a mystery to be solved.
- The solution of the case mystery should lie in the syllabus content, hence would require the students to understand what they learn in class. Therefore, they need to read, understand and identify the mystery in the case study and come out with possible solutions.
- Students are required to act out and capture the scenes of the case study and its solution in a 45-minute video. The video will then be presented on a particular day, named the Movie-Day, in attendance of five jurors who will rate and assess each video.
- Besides the marks earned, winners are also to be awarded based on a few criteria, like Best Movie Award, Best Scriptwriter and Best Director.

RELATED LEARNING OUTCOMES

PO6 – Problem solving; PO7 – Information management.

3. Case studies

CASE STUDY 8: Collaborative Assessment Survey (CAS): A Measure of Group Teamwork

SUBJECT AREA

Education, counseling

RESEARCHERS

Vinothini Vasodavan, Dorothy DeWitt, Norlidah Alias

Department of Curriculum and Instructional Technology, Faculty of Education, Universiti Malaya

ISSUE(S)

- In the 21st century, employers require their employees to be able to work in teams. In order to do this, they need to be able to collaborate as a team on their tasks. Teamwork is an important skill for building interpersonal skills for employability. According to Malaysia Higher Education Blueprint (2015), there is a mismatch in the supply and demand of graduates, with employers reporting that graduates lack the requisite knowledge, skills, and attitudes. At the same time, there does not seem to be many tools to effectively assess teamwork.

3. Case studies

INNOVATIVE APPROACH / INTERVENTION

- Collaborative Assessment Survey (CAS) instrument to measure team collaborative was designed. The assessment was developed based on 5 Likert-scales with total of 29 items, divided into 7 components: member characteristics, process and structure, environment, communication, purpose, process, and resources. The assessment was administrated upon accomplishment of a collaborative group task using different type of collaborative tools such as discussion forum and wikis.

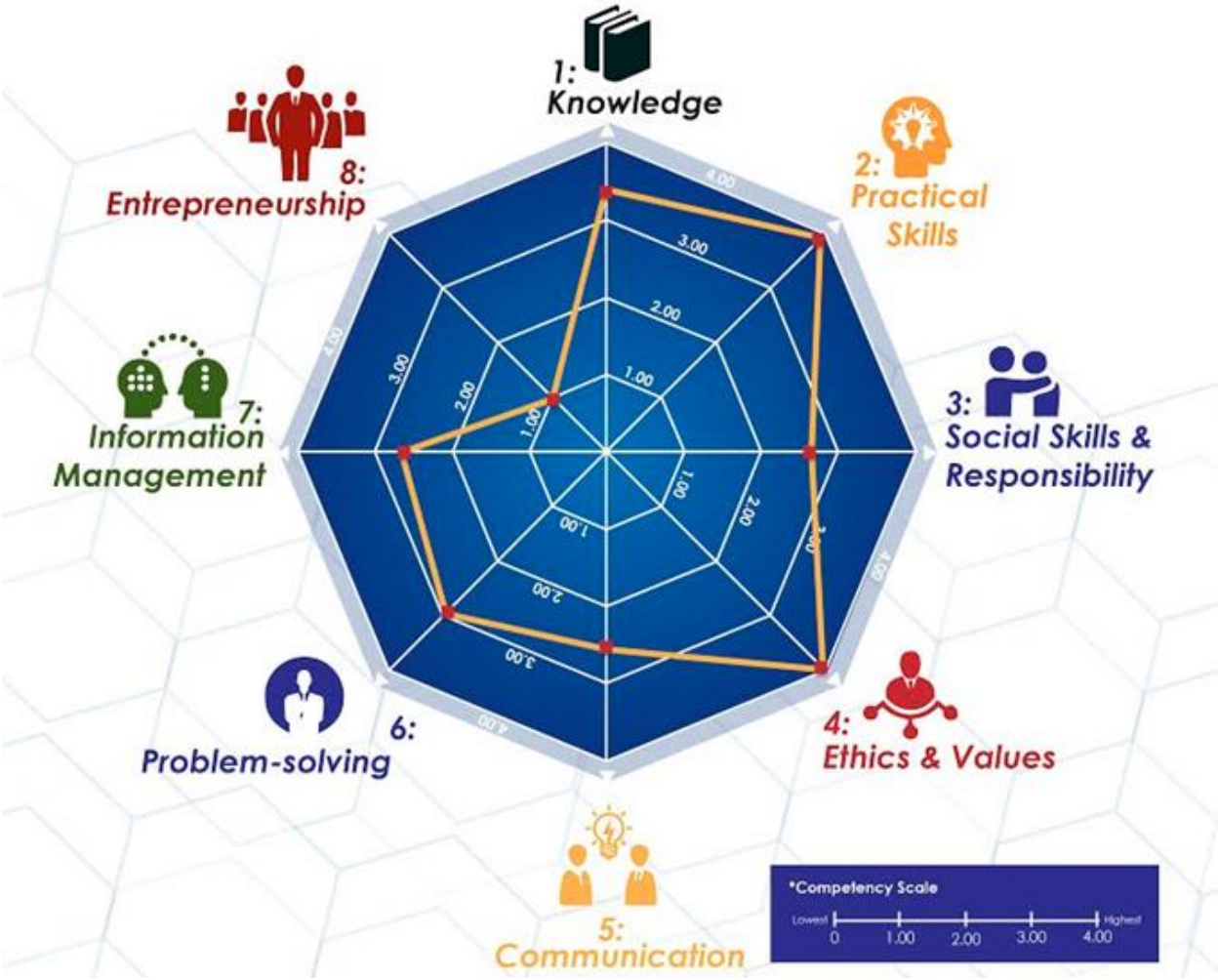
DESCRIPTION OF APPROACH

- Implement a collaborative group task by using online collaborative tools such as wikis and discussion forum
- Upon completion of a collaborative group task, all the members in the group were asked to evaluate their members by scoring using the (CAS).
- All the scores were recorded and analysed to determine each individual's score by converting into percentages
- Finally, each student will do self-assessment by reflecting on their individual performance after taking into consideration the comments from their peers.

RELATED LEARNING OUTCOMES

PO2 – Knowledge; PO5 – Communication; PO6 – Problem solving.

4. Related Learning Outcomes (LOs)



http://jpt.mohe.gov.my/images/yootheme/icgpa.png

4. Related Learning Outcomes (LOs)

CASE NO.		PO1 Knowledge	PO2 Practical skills	PO3 Social skills and responsibility	PO4 Ethics & values	PO5 Communication	PO6 Problem-solving	PO7 Information management	PO8 Entrepreneurship
1.	Manifesting the Understanding of 'Integration': Assessing Biomechatronics through Group Exhibition			/			/		
2.	JAZZ UP your Poster Presentation with Augmented Reality					/			
3.	Malaysian Food and Culture Fest: A WOU group assessment experience			/		/			/
4.	Group-Based Assessment: Using Multimedia Presentation to Promote Collaborative E-Learning				/	/	/		
5.	Gamification of Education: Assessment on Knowledge and Behaviour through Socrative			/					
6.	Assessment of Cognitive Level in Database Subject using Problem-based Learning Approach					/	/	/	
7.	VidCase: An Alternative Assessment Method for the Millennial Students						/		

5. Advantages of group-based assessments

1. Group based assessment makes learning more relevant, interesting and enjoyable. Subsequently, students are encouraged to willingly put in extra effort to become deep learners and to be better at managing people. As a result, quality and balanced graduates will be produced. Potential employers will benefit from well-balanced graduates.
2. Encourages reflective practice for both students and lecturers and allow lecturers to assess attitudes, reflection, thinking processes of students and integration of complex skills.
3. Enables lecturers to monitor the development of collaborative learning over time.
4. Appropriate assessment would produce students who are competent, creative, motivated, and self-regulated.
5. Working in group for a particular assessment promotes sharing of knowledge beyond the classroom.
6. It transforms classrooms into rich, student-focused, and interactive knowledge environment.
7. Students are encouraged to apply proactive ways and strategies in working together.
8. Group-based assessment has good potential in empowering students to think differently, to think creatively and reflect on their own values.

6. Limitations of group-based assessments

1. Time management is crucial in a particular group based assessment. Timeline should be clearly communicated among group members and the lecturer.
2. Crafting effective triggers or problems for PBL might require several considerations in terms of practicality, time limit, and suitability to the project.
3. Lecturers need to be skilled in providing, encouraging and sustaining motivation and engagement.
4. There is a risk of assessment being subjective due to different students having different attitudes, beliefs and approaches in doing tasks.
5. Peer influence and friendship may affect the scoring.
6. Students may cheat and create own 'gang' against other members.
7. The free-rider syndrome might affect the group dynamics and thus the assessment should be able to address this.
8. Group-based assessment can be time consuming. The groups need to be continuously monitored and provided with feedback and assistance.
9. Element of conflict within groups can affect the morale and cause members to withdraw in some ways.

7. Things to consider when implementing group-based assessments

- Explain to the groups why working in groups is worth the while and the challenges.
- Provide clear expectations for group members, by setting ground rules.
- Increase individual accountability by combining group assessments with individual assessments.
- Teach students conflict-resolution skills and reinforce them by discussing hypothetical team conflict scenarios.
- Assess group processes via regular reports, self-evaluation, peer evaluation, as well as with other external assessors.
- As the assessment method can be very fluid in nature, the students need to know that the basic rule, deadlines and expectations do not change in the middle of the semester without their consent. Changes in rules and expectations can be very disruptive as it affects their planning and their time management, as they may also be taking other courses in the same semester.
- One must distinguish individuals' abilities from what they are able to do when working with others on the grounds that the group setting only obscures the true focus of assessment, which is the individual (Webb, 1992).

8. References

Baladouni, V. (2013). How to Reduce Echo in a Room. Retrieved 21 November 2017, from www.apartmenttherapy.com

Beetham, H. (2013). Rethinking Pedagogy for a Digital Age: Designing for 21st Century Learning (2nd ed.). London & New York: Routledge.

Bicen, P & Laverie, D.A (2009) Group-Based Assessment as a Dynamic Approach to Marketing Education, Journal of Marketing Education Vol 31 (2)

Bomia, L., Beluzo, L., Demeester, D., Elander, K., Johnson, M., & Sheldon, B. (1997). The impact of teaching strategies on intrinsic motivation. Champaign, IL: ERIC Clearinghouse on Elementary and Early Studenthood Education.

Brown, H. D. (2001). Teaching by Principles: An Interactive Approach to Language Pedagogy (2nd ed.). New York: Pearson Education.

Carter, T. L. (2008-2009). Millennial expectations, constructivist theory, and changes in a teacher preparation course. SRATE Journal, 18(1), 25-31.

Cauley, K., & McMillan, J. H. (2010). Formative assessment techniques to support student motivation and achievement. Journal of Educational Strategies, Issues and Ideas, 83(1), 1-6.

Curtis, S. M. (2011). Formative assessment in accounting education and some initial evidence on its use for instructional sequencing. Journal in Accounting Education, 29, 191-211.

Desy, J. R., Reed, D. A., & Wolanskyj, A. P. (2017). Milestones and Millennials: A perfect pairing—competency-based medical education and the learning preferences of Generation Y. Mayo Clinic Proceedings, 92(2), 243-250.

Duch, B. J., Groh, S. E., & Allen, D. E. (2001). The power of problem-based learning. Sterling, VA: Stylus.

Flowerdew, J., & Miller, L. (2005). Second Language Listening: Theory & Practice. UK: Cambridge University Press.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: potential of the concept, state of the evidence. Review of Educational Research, 74, 59-109.

Healy, M., McCutcheon, M., & Doran, J. (2014). Student views on assessment activities: Perspectives from their experience on an undergraduate programme. Accounting Education: An International Journal, 23(5), 467-482.

8. References

Henrie, C. R., Halverson, L. R., & Graham, C. R. (2015). Measuring student engagement in technology-mediated learning: A review. Computers & Education, 90, 36-53.

Hulme, A. K., Norris, L., & Donohue, J. (2015). Mobile Pedagogy for English Language Teaching: A guide for Teachers. London: British Council, The Open University.

Ibrahim, M. A., Tamjid, M. M., & Yaman, M. N. M. (2015). 11 Tahun Tamhidi Menerajui Kurikulum Berteraskan Integrasi Ilmu Naqli & Aqli: Tinjauan Terhadap Enrolmen Pelajar. Paper presented at the Konvesyen Sains Islam 2015, Universiti Sains Islam Malaysia.

Little John, A., & Pegler, C. (2007). Preparing for Blended e-Learning. London & New York: Routledge.

Michael, V., Hosford-Dunn, H., & Roesler, R. J. (2008). Audiology, The Auditory Brainstem Response. New York: Thieme Medical Publishers.

Mizuno, K., Tanaka, M., Fukuda, S., Imai-Matsumura, K., & Watanabe, Y. (2011). Relationship between cognitive function and prevalence of decrease in intrinsic academic motivation in adolescents. Behavioral and Brain Functions, 7(1), 4.

MOHE. (2015). Malaysia Education Blueprint 2015-2025 (Higher Education). Retrieved 18 November 2017, from https://www.um.edu.my/docs/default-source/about-um_document/media-centre/um-magazine/4-executive-summary-pppm-2015-2025.pdf?sfvrsn=4

National Survey of Student Engagement Report (2006). Retrieved 18 November 2017, from http://nsse.iub.edu/NSSE_2006_Annual_Report/docs/NSSE_2006_Annual_Report.pdf

Smith, S. J. (2002). Which Material Will Most Efficiently Reflect Sound? Available online. Retrieved from cssf.usc.edu Directory: History/2002/Projects File: J0239.pdf

Poehner, M, (2009) Group Dynamic Assessment: Mediation for the L2 Classroom, TESOL QUARTERLY Vol. 43, No. 3

Webb, N. (1992) Collaborative group versus individual assessment in mathematics: Group processes and outcomes. National Centre for Research on Evaluation, Standards and Student Testing.

9. Summary

Group based assessment is a collaborative learning that involve group work. Assessing group product as a whole as well as individual will engage learners to actively participate in a group. The aim is to prepare learners in work life. Through this method, students are able to develop both communication and interpersonal skills. Participating in group work will help students to clearly articulate idea while avoiding miscommunication. Collaborative learning also promotes diversity and exchange of ideas.

Performance-based Assessment

Jaafar Jantan (UITM)
Ainol Madziah Zubairi (IIUM)
Norjoharuddeen Mohd Nor (UM)
Mariam Taib (UMT)
Nur Hana Hamzaid (UKM)
Lim Hooi Lian (USM)
Nurhanis Syazni Roslan (USM)
Ainnur Eiza Azhar (UITM)
Amiza Mat Amin (UMT)
David Yoong (UM)
Noor Akmal Shareela Ismail (UKM)
Nor Adila Ahmad (PSAS)

1. Definition

Performance-based Assessment

- Performance-based assessment is a form of assessment that moves away from the traditional paper-and-pencil assessment. It is based on clearly defined task that the students need to perform in a context that mimics the workplace (authentic). The task must be able to elicit the students' knowledge, skills, attributes or attitudes. As the assessment of performance is subjective, a predetermined criterion (rubric) is necessary in order to guide the assessor in rating the task reliably (Hibbard, 1996).

- Performance-based assessments are useful in that they:
  - are application of knowledge and skills in real world context.
  - motivate students to become autonomous learners.
  - involve creation of performance and products.
  - stimulate soft skills upon task execution.

2. Principles / characteristics of Performance-based assessments

- Complex task: Involving higher order learning domain (cognitive, affective and psychomotor).
- Authentic: Mimicking the real world context.
- Alignment: Relating to learning outcome.
- Well-defined rubric: Guiding assessor to rate performance. Ideally shown to the students to fulfil the expectation.
- Process or/and product- oriented.

3. Case studies

CASE STUDY 1: SOLO-Based Task to Diagnose Adult Learners' Statistical Literacy in the 21st Century

SCAN ME!

SUBJECT AREA

Statistical literacy

RESEARCHERS

Lim Hooi Lian, Wun Thiam Yew, Chew Cheng Meng

School of Educational Studies, Universiti Sains Malaysia, Penang, Malaysia

ISSUE

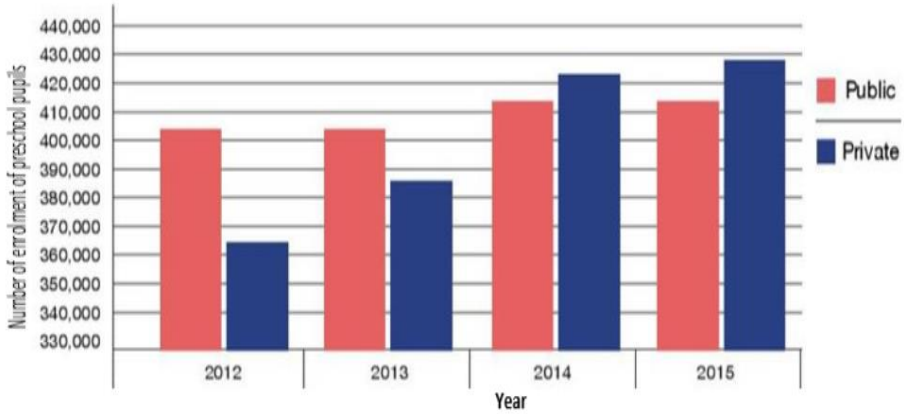
- The recent previous studies revealed that statistical literacy level of Malaysian students is still unsatisfactory in general. Hence, the needs of developing a sound diagnostic tool to systematically identify students' weaknesses and strengths are crucial.

INNOVATIVE APPROACH / INTERVENTION

The SOLO (Structure of the Observing Learning Outcome) model is designed mainly to classify the quality of structure responses in a variety of disciplines from primary to tertiary education. The categorization of structure response with increasing level of abstraction makes it suitable to be a diagnostic tool. The characteristic of four levels of structure response, namely unistructural, multistructural, relational and extended abstract can be adapted to provide a useful template of generalized task that lead the adult learner from the basic skills of data retrieval to the advance skills of critical analysis.

3. Case studies

DESCRIPTION OF APPROACH



The bar graph above shows the public and private preschool enrolment rate from 2012 to 2015.

Level	Example of Task	Description
Unistructural	How many students enrolled in private preschool in 2012?	Only single relevant feature of bar graph is required to give response. The skill involved is rudimentary as students just identify the notable data points.
Multistructural	How does the number of enrolment of students in public preschool change from 2012 to 2015?	Several points of data need to take into consideration to give response without making a whole generalization. The trends of data points are recognized.
Relational	How does the relationship between the number of enrolment of students in private preschool change with the number of enrolment of students to public preschool from 2012 to 2015?	The information in bar graph is inter-related and integrated. Comparison need to make between the two data set to establish the causality.
Extended abstract	"In 2020, we aim that all Malaysian children will receive their education in public preschool." What do you think about this statement? Explain your answer.	The data set might be generalized in a new and more abstract situation. The data set is evaluated based on their own explanatory hypotheses and prediction to reach the logical and critical conclusion.

3. Case studies

- The structure response of the four levels increases in complexity in terms of capacity of information required and relationship of information. The higher the level of structure response, the larger amount of information and the integrated of information are needed.

RELATED LEARNING OUTCOMES

PO6 – Problem solving.

3. Case studies

CASE STUDY 2: Assessing Core Manipulative Skills in a Biochemistry Lab Practical Test

SCAN ME!

SUBJECT AREA

Biochemistry lab test

RESEARCHERS

Mariam Taib, Azila Adnan, Hazlina Ahamad Zakeri, Muhamad Fairus Noor Hassim, Aziz Ahmad

School of Fundamental Sciences, Universiti Malaysia Terengganu. Malaysia

ISSUE(S)

- Biochemistry course has been in the curriculum for the Bachelor of Science (Biological Science) programme in UMT since 2001. Lab practical class is one of its important components. For almost 15 years, students' performance in the lab was assessed using their lab reports.
- This resulted in many students did not know how to perform basic core manipulative skills in Biochemistry such as serial dilution and construction of standard curve when they undertook their final year projects (FYP).

INNOVATIVE APPROACH

- To overcome this problem, and together with the enforcement of Constructive Alignment through iCGPA in 2015, the assessment was directed to performance-based, through lab practical test.

3. Case studies

DESCRIPTION OF APPROACH

- Four tasks were given in an hour. The tasks require application of knowledge, skills and strategies for execution.
- The learning outcome measured was solely the MQF2-Technical Skills, which include P2 (Guided Response) and P3 (Mechanism). Students were assessed based on the process of completing the tasks and also the final products, through observation and product submission.
- A rubric was used, with two sub-attributes and five descriptors:

Sub-attributes	Very poor	Poor	Satisfactory	Good	Very good
	1	2	3	4	5
The ability to execute the task (use of appropriate equipment/ instrument/ procedures as instructed in the manual)	Cannot even identify the appropriate procedures	Can identify but cannot use the appropriate procedures	Can use the appropriate procedures but with lack of confidence	Can use the appropriate procedures with confidence	Expert in using the appropriate procedures
The ability to acquire/ produce results/ outputs (physical product/ skill that is tangible	Fail to produce the required results/ products	Able to produce the required results/ products but with low quality/ precision	Able to produce the required results/ products with acceptable quality/ precision	Able to produce the required results/ products with good quality/ precision	Able to produce the required results/ products beyond the quality/ precision required

Table 1: Rubric for Lab Practical Test for Biochemistry Course - Practical Skill (PLO2)

RELATED LEARNING OUTCOMES

PO2 – Practical skills.

3. Case studies

CASE STUDY 3: Semi-Reality Simulated Patient (SRSP) Assessment Technique in Enhancing Students' Learning Experience for Medical Nutrition Therapy for Picky-Eater Children with Special Health Care Needs

SCAN ME!

SUBJECT AREA

Medical nutrition therapy, children

RESEARCHERS

Nur Hana Hamzaid, Roslee Rajikan, Suhaina Sulaiman, Zahara Abd Manaf
Faculty of Health Sciences, Universiti Kebangsaan Malaysia

ISSUE(S)

- Case-study labs under medical nutrition therapy topics were commonly conducted through case presentation between students and the preceptor/lecturer. This method, however, is less effective when applied to children related nutrition therapy cases because no children are directly involved in the assessment process. Therefore the SRSP assessment method is aimed to increase the effectiveness of teaching and learning assessment process focusing on children-related nutrition therapy cases.

INNOVATIVE APPROACH

- The Semi-Reality Simulated Patient assessment technique (SRSP) was developed. It is an authentic assessment which combines the essence of simulated patient assessment and virtual reality assessment technique in catering to this issue while culturing the design thinking.

3. Case studies

DESCRIPTION OF APPROACH

The SRSP key stakeholders:

- The 'Wee-Judges'.
- Children age 3-6 with normal development.
- Normal-eater and picky-eater.

Steps:

1. Case studies were given prior to the lab.
2. The 'wee-judges' go for an on-site visit where students were to briefly interview about their food preferences.
3. Students cook & presented their cooked meal to the 'wee-judges' based on their calculated requirement assessed by evaluator (faculty). Here the students were to convinced the 'wee-judges' to eat the prepared meal based on the nutritional value of the meal.

4. The SRSP assessment is competition-based.
    - The 'wee-judges' evaluated the food based on their preferences on the appearance (i.e., Which food I feel like eating first?) and taste (i.e., Which food taste the best?) using pictorial rubric.
    - The winner of the competition later received a token prepared by the 'wee-judges' (e.g. novel thank you card).

RELATED LEARNING OUTCOMES

PO4 – Ethics & values; PO5 – Communication; PO7 – Information management.

3. Case studies

CASE STUDY 4: Simplified Thematic Engagement of Professionalism Scale (STEPS): A Performance Based Assessment to Nurture Professionalism Growth in Clinical Year

SUBJECT AREA

Professionalism assessment,
workplace-based assessment

SCAN ME!

RESEARCHERS

Nurhanis Syazni Roslan, Muhamad Saiful Bahri Yusoff, Ahmad Fuad Abdul Rahim
Universiti Sains Malaysia, Kubang Kerian, Malaysia

ISSUE(S)

- Realizing that professionalism definition is influenced by cultural aspect and social contract, School of Medical Sciences USM began the initiative of assessing professionalism by conducting a study on understanding professionalism in Malaysian context.

INNOVATIVE APPROACH / INTERVENTION

Based on the obtained data, Simplified Thematic Engagement of Professionalism Scale (STEPS) was developed using multiple short encounters format which confers many advantages, especially in terms of sampling and promoting professionalism growth.

3. Case studies

DESCRIPTION OF APPROACH

- STEPS assessment is conducted as workplace based or 'in-vivo' assessment.
- It was proposed that STEPS will be either faculty or students driven in order to make it constructive and authentic.
- Two STEPS forms were embedded in the logbook of each clinical posting to allow the assessment to be carried out in any workplace context such as bedside teaching, outpatient, tutorials or even group work.

FORMATIVE COMPONENT *(Please tick)*

7	EXEMPLARY	Exceptional and outstanding professional conduct.
6	ABOVE EXPECTATION	Demonstrated performance beyond the expected level.
5	MET EXPECTATION	Demonstrated performance at par with the expected level.
4	INEXPERIENCED	Unintentional unprofessional conduct.
3	BELOW EXPECTATION	Intentional unprofessional conduct with apparent intended corrective action.
2	UNDESIRABLE	Intentional unprofessional conduct with no apparent intended corrective action.
1	INTOLERABLE	Repetitive or serious unprofessional conduct that imposes harm with no apparent intended corrective action.

LEVEL	ATTRIBUTES	1	2	3	4	5	6	7	N/R
PERSONAL	Committed to personal and professional codes								
	Showed competence to provide care								
	Demonstrated respect and good communication								
	Displayed leadership and teamwork								
PROFESSION	Met commitments and dedication								
	Maintained patient confidentiality								
	Dealt with professional dilemma effectively								
	Committed to self-directed learning								
PATIENT	Listened actively to patient								
	Showed empathy and compassion								
	Recognized patient's sensitivity								
	Respected patient's needs and decision								
	Acknowledged own limitation								
PUBLIC	Used health resource appropriately								
	Committed to societal welfare								

Figure 1: The formative components in STEPS.

SIMPLIFIED THEMATIC ENGAGEMENT OF PROFESSIONALISM SCALE (STEPS) *(Academic copy)*

UNIVERSITI SAINS MALAYSIA

Evaluator: _____

Student: _____ Student ID: _____

CONTEXT *(Please Tick)* Year: 3 ☐ 4 ☐ 5 ☐

	Large Group Presentation	☐	Small Group Tutorial	☐	Group Work ☐
	Ward	☐	Outpatient	☐	Others ☐

Feedback given to the student Yes ☐ No ☐ Student signature:

SUMMATIVE COMPONENT *(Please fill in and return to Academic Office)*

1	2	3	4	5	6	7	8	9
Unsatisfactory			Satisfactory			Excellent		

Comments: _____

Evaluator signature:

Figure 2: The summative components in STEPS.

RELATED LEARNING OUTCOMES

Social responsibility, ethics and professionalism, teamwork

3. Case studies

CASE STUDY 5: Implementation of Practical Work in Engineering Study

SUBJECT AREA

Mini project, drive test measurement.

SCAN ME!

RESEARCHERS

Ainnur Eiza Azhar, Azita Laily & Norsuzila

Faculty of Electrical Engineering, Universiti Teknologi MARA Shah Alam

ISSUE(S)

- Following mini project session, students are expected to work in groups to conduct drive test measurement and prepare report.

INNOVATIVE APPROACH / INTERVENTION

- The drive test uses NEMO Drive Test Tool. It is a well-known device that the telecommunication industries use to measure coverage, signal strength and interference in both indoor and outdoor environments. Students need to explore their own data collected during the drive test measurement as shown in Figure 1.1 and 1.2.

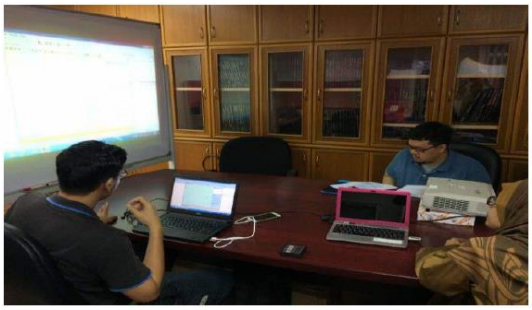


Figure 1.1: Group discussion session

Figure 1.2: Students' activity during drive test measurement

3. Case studies

DESCRIPTION OF APPROACH

Task:

The students were given manual featuring the methodology tasks to be performed based upon time as shown in Figure 1.3. For effectiveness of the mini project implementation, students must obtain skills not only assessing through practical skills, but also on the teamwork.

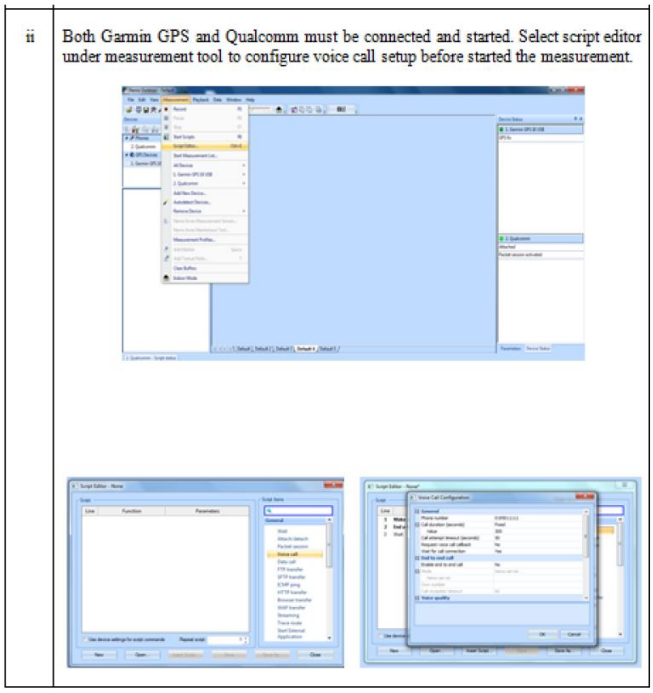


Figure 1.3: Sample of mini project manual

DESCRIPTION OF APPROACH

Performance Evaluation:

- Rubrics have been developed for evaluation purpose.

RELATED LEARNING OUTCOMES

PO2 – Practical skill; PO 5 – Communication; PO 6 – Problem solving.

3. Case studies

CASE STUDY 6: Assessment of Practical Competency in Food Microbiology Course

SUBJECT AREA

Food microbiology, practical competency

SCAN ME!

RESEARCHERS

Amiza Mat Amin

Universiti Malaysia Terengganu, Terengganu, Malaysia

ISSUE(S)

- Assessment of a practical test in food microbiology course was designed to ensure that the students are competent in performing basic food microbiological techniques including using a compound light microscope and performing aseptic techniques.

INNOVATIVE APPROACH / INTERVENTION

- Once the tasks or questions for practical test were prepared, a rubric was generated to assess the students' performance for each task. The students' practical competency for each task was assessed by the lecturer or his assistants by observation at a designated working station.

3. Case studies

DESCRIPTION OF APPROACH

1. Three tasks were designed and 4 stations were set up for each task.
2. The assessment must be meaningful, instructive and able to detect areas of concern.
3. Analytical rubric (Table 1 & Table 2) for each task has been designated and assessment attributes have been firstly generated, followed by attribute gradations.
4. Articulating the gradations of the rubric was quite challenging.
5. Recommended thinking of the words to create the gradations are "yes", "yes - but", "no-but", and "no".
6. Assessment was carried out by observation.
7. It was found that 97% of students were competent in practical test (obtained scores higher than 50%).

	Attribute	Poor	Fair	Good
Question 1 Using a compound light microscope, please identify the bacteria on the slide given to you in terms of shape and either it is gram positive or gram negative.	Adjustment of the magnification of microscope by using the objective lenses from low to high magnification and use oil immersion	Adjustment of the magnification of microscope by using the objective lenses from low to high magnification and use oil immersion are poorly demonstrated	Adjustment of the magnification of microscope by using the objective lenses from low to high and use oil immersion are moderately demonstrated	Adjustment of the magnification of microscope by using the objective lenses from low to high magnification and use oil immersion are demonstrated properly
	Adjustment of the iris diaphragm properly and effectively	Adjustment of the iris diaphragm is poorly demonstrated	Adjustment of the iris diaphragm is performed, but not proper/effective	Adjustment of the iris diaphragm is demonstrated properly and effectively
	Able to identify both the shape of microbe and its gram staining	Unable to identify both the shape of microbe and its gram staining	Able to identify either the shape of microbe or its gram staining	Able to identify both the shape of microbe and its gram staining

Table 1: Analytical rubric

3. Case studies

	Attribute	Poor	Fair	Good
Question 2 **You are given a nutrient agar (NA) and a bottle of bacteria culture. Perform a correct streaking technique in order to get a single colony from the culture.**	Sterilization of inoculation loop by flaming it and it was cooled briefly before use	Improper sterilization of inoculation loop and it was not cooled briefly before use	Improper sterilization of inoculation loop or it was not cooled briefly before use	Proper sterilization of inoculation loop by flaming it and it was cooled briefly before use
	Performed the streaking using proper aseptic technique	Aseptic technique was poorly demonstrated during streaking	Aseptic technique was partially demonstrated during streaking	Aseptic technique was properly demonstrated during streaking
	Performed the *streaking* technique properly	Streaking technique was poorly demonstrated	Streaking technique was partially demonstrated	Streaking technique was properly demonstrated
Question 3 **Perform the correct technique of sub-culturing with the broth culture given to you.**	Sterilization of inoculation loop by flaming it and cooled it briefly before use	Improper sterilization of inoculation loop and it was not cooled briefly before use	Sterilization of inoculation loop was partially done or was partially cooled briefly before use	Proper sterilization of inoculation loop by flaming it and cooled it briefly before use
	Sub-culturing using aseptic technique	Asceptic technique was poorly demonstrated during sub-culturing	Aseptic technique was partially demonstrated during sub-culturing	Aseptic technique was properly demonstrated during sub-culturing

Table 2: Analytical rubric

RELATED LEARNING OUTCOMES

PO 6 – Problem solving.

3. Case studies

CASE STUDY 7: Managing and accounting for learning outcomes

SUBJECT AREA

Curriculum design,
learning outcomes management.

SCAN ME!

RESEARCHERS

David Yoong

University of Malaya, Kuala Lumpur, Malaysia

ISSUE(S)

- Having served as a programme coordinator, I noticed that many of my colleagues had problems in preparing and aligning their students' learning outcomes.
- Misalignment of learning outcomes causes students not to know what they are being assessed for, and how they are being assessed.

INNOVATIVE APPROACH / INTERVENTION

- I developed a recursive system to help colleagues overcome alignment problems. The system has several steps.

3. Case studies

DESCRIPTION OF APPROACH

Step 1: Map the assessment components.

- The example below shows how the CLOs, PLOs, and assessment techniques align with one another in one of my courses.
- Information is disseminated to students at the beginning of course.
- It is best to provide students with best examples, together with rubrics.

Important timeline of assessment

What students are supposed to learn

What students must do

Why is this CLO is important

How students are assessed

Research proposal submission (40 marks - 30%) – Deadline: Week 15	
COURSE LEARNING OUTCOMES Students should be able to prepare systematic research proposals (CLO) - Total: 30/30% Purpose: Research proposals are important to secure grants and to solicit approval from an ethics body among others. Learning how to prepare research proposals will improve the candidate's success rate of proposal acceptance.	TASK INSTRUCTIONS • Students are required to prepare a systematic written research proposal • Length: 2,500-3,000 words • The research proposal should be an original piece of research involving primary data collection • The proposal must have i) a working title, ii) cogent problem statements with identifiable gaps, iii) a clear research purpose and questions, iv) a review of relevant literature, v) relevant methods and a discussion of methodology, vi) references. • State your name, ID number and assignment title ASSESSMENT CRITERIA • Provide related problem statements based on real social issues related to the research's objectives (PO7) (5 marks) • Develop appropriate research questions (PO3) (5 marks) • Review related literature (PO7) (10 marks) • Plan your research methods for data collection and analysis and consider their advantages and disadvantages (PO6) (15 marks) • Communicate appropriately with clarity (PO5) (5 marks)

3. Case studies

Step 2: Develop a learning infrastructure around the assessments and carry out assessments.

- Activities that stimulate learning e.g. group discussions, problem solving tasks and debates are carried out in class and in online environments.

Step 3: Inform students of their scores timely.

- It is imperative that students receive feedback, as soon as possible (at most 2 weeks after date of assessment).
- In my class, I provide quantitative and qualitative feedback.

Step 4: Analyse the scores to see if the problem lies with the curriculum execution.

- Granular data from Step 2 is aggregated using spreadsheet to answer these questions:
  - Has the course been successful in terms of having students passing it, and at what level?
  - What components need more attention?
- Feedbacks from stakeholders (industry members, students) are then carried out to see how the assessments can be further improved.
- After post-mortem analysis, the information is used to feed into Step 1 again.

RELATED LEARNING OUTCOMES

Problem solving & scientific skills

3. Case studies

CASE STUDY 8: Medical Biochemistry: Enhancing Achievement in Learning Outcomes through Performance-based Assessments

SUBJECT AREA

Formative assessment, interactive learning

SCAN ME!

RESEARCHERS

Noor Akmal Shareela Ismail

Pusat Perubatan Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

ISSUE(S)

- Conventional teaching and learning method in Medical Biochemistry was reported to be less effective in achieving its objectives, therefore interactive learning serves as a nuanced approach to enhance the learning outcomes among students.

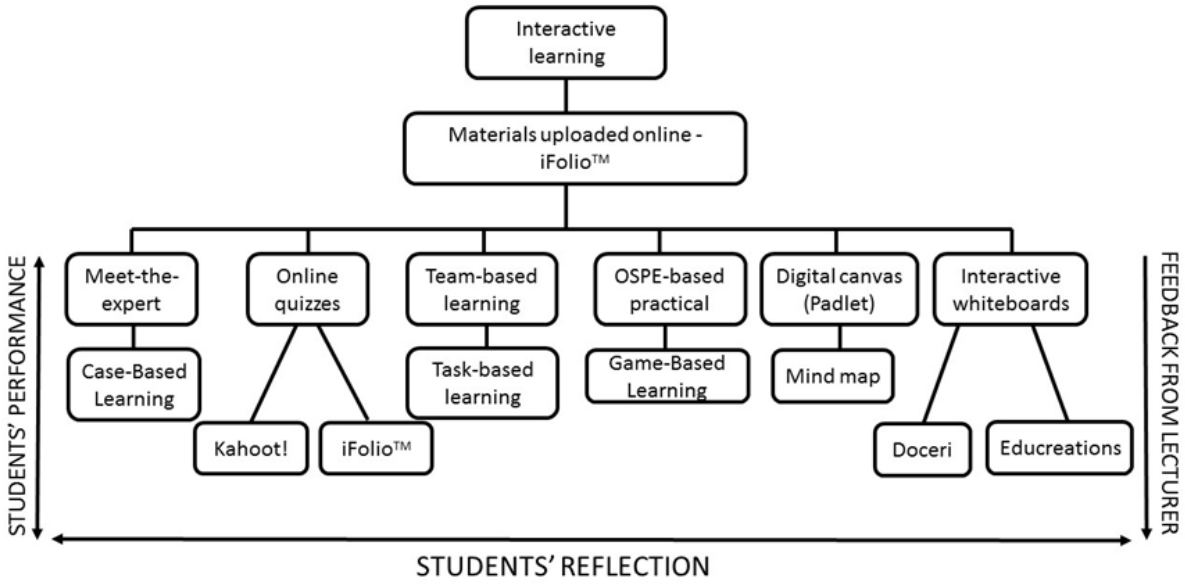
INNOVATIVE APPROACH / INTERVENTION

- We are testing students' comprehension towards Medical Biochemistry through various online platforms such as: online quizzes (Kahoot! and iFolio), Objective Structured Practical Examination (OSPE)-based practical session, team-based learning, Educreations and Padlet.
- Subsequently, the learning outcomes are holistically assessed through performance-based assessments.

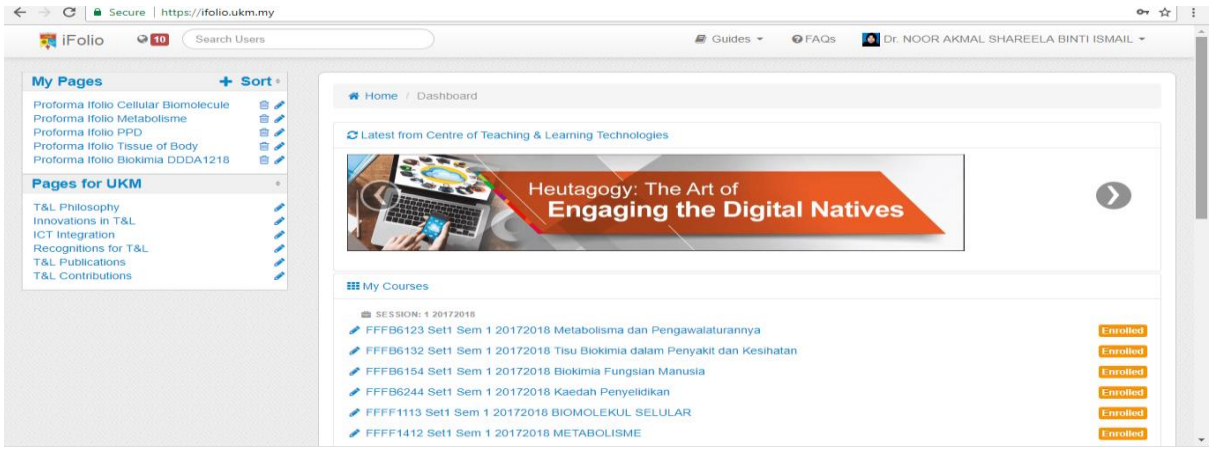
3. Case studies

DESCRIPTION OF APPROACH

Step 1: Translate real-case scenario into interactive learning.



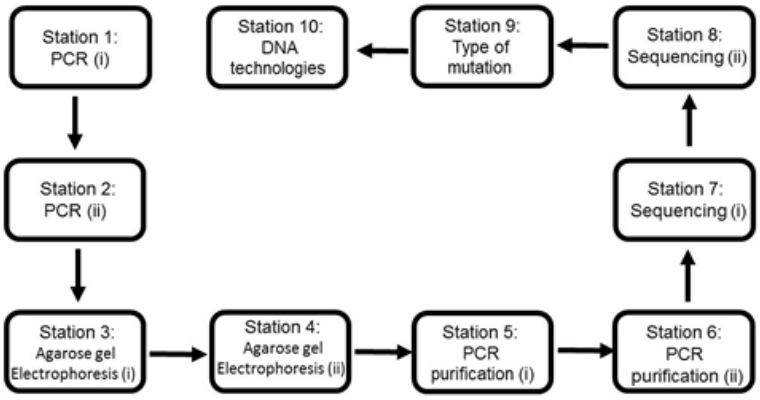
Step 2: Learning materials are uploaded on the in-house online platform iFolio. This consists of videos, reading materials and notes.



3. Case studies

Step 3: An individual mind map must be constructed by each student and will be uploaded on Padlet.

Step 4: Interactive session, each group will complete tasks through online quizzes during class or OSPE-based practical.



Step 5: Feedback from the lecturers to end the loop of interactive learning.

Continuous feedback is important for improvement in order to produce graduates who are reflective, thinking critically, good team player and assertive in communication.

RELATED LEARNING OUTCOMES

PO5 – Communication; PO6 – Problem solving; PO7 – Information management.

3. Case studies

CASE STUDY 9: Applying performance based assessment on Ordinary Differential Equation using Augmented Reality (I-DE-AR)

SUBJECT AREA

Ordinary differential equation, augmented reality

SCAN ME!

RESEARCHERS

Nor Adila binti Ahmad, Siti Janariah binti Jantan, Azia Idayu binti Awang
Politeknik Sultan Azlan Shah, Perak, Malaysia

ISSUE(S)

- Students who learn ordinary differential equations are dependent on memorized procedures to solve problems, follow a similar pattern of learning in Pre-calculus Mathematics, and follow model procedures given in the textbook or by a teacher.
- Students seem quite unable to relate their well-developed manipulative skills to realistic context problems to the real-world situations.

INNOVATIVE APPROACH / INTERVENTION

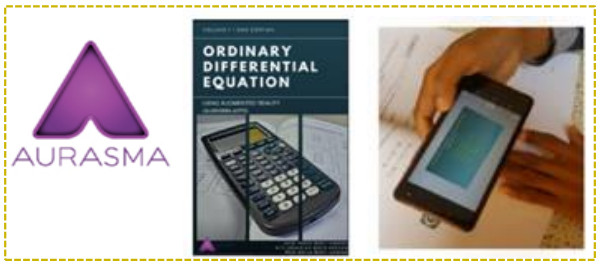
- We developed a tool to expose the students to previous knowledge, hint to solve and the example to find solution, named (I-DE-AR).

3. Case studies

DESCRIPTION OF APPROACH

Step 1: Expose students to theory of ordinary differential equation (ODE) using module and I-DE-AR.

- Students will be taught the theory and types of first order differential equation by using module I-DE-AR.
- A few simple questions will be given to strengthen the theory.



Step 2: Students will be given task to solve engineering application concerning differential equations.

- Students will be given authentic tasks that relate to real life and job scope.
- The tasks include group discussion, presenting and applying the theory in engineering.
- Students will be exposed to Rubric Table to make them aware of the ability needed in order to achieve to good score.

3. Case studies

Step 3: Interpreting Students' Performance by using rubric that matches with the LOD.

- In time the discussion was held, lecturers will observe their verbal communication, writing communication, leadership and teamwork by using rubric table as shown on Table 1 and Table 2.

NO	CRITERIA (Leadership)	0	1-2	3-4	5-6	7-8	9-10
		Tidak memuaskan	Memerlukan penambahbaikan	Memuaskan	Sederhana	Baik	Cemerlang
1	Kepercayaan dan keyakinan diri (L1)	Tidak mempunyai keyakinan diri langsung dalam membuat pertimbangan terhadap semua analisis penyelesaian	Mempunyai keyakinan diri yang sangat rendah dalam membuat pertimbangan terhadap semua analisis penyelesaian	Mempunyai keyakinan diri yang rendah dalam membuat pertimbangan terhadap semua analisis penyelesaian	Mempunyai keyakinan diri yang sederhana dalam membuat pertimbangan terhadap semua analisis penyelesaian	Mempunyai keyakinan diri yang tinggi dalam membuat pertimbangan terhadap semua analisis penyelesaian	Mempunyai keyakinan diri yang sangat tinggi dalam membuat pertimbangan terhadap semua analisis penyelesaian
		Tidak mempunyai langsung rasa percaya terhadap terhadap idea sendiri dan orang lain semasa analisis penyelesaian	Mempunyai rasa percaya yang sangat rendah terhadap idea sendiri dan orang lain semasa analisis penyelesaian	Mempunyai rasa percaya yang rendah terhadap idea sendiri dan orang lain semasa analisis penyelesaian	Mempunyai rasa percaya yang sederhana terhadap idea sendiri dan orang lain semasa analisis penyelesaian	Mempunyai rasa percaya yang tinggi terhadap idea sendiri dan orang lain semasa analisis penyelesaian	Mempunyai rasa percaya yang sangat tinggi terhadap idea sendiri dan orang lain semasa analisis penyelesaian
		Tidak menghargai langsung kemampuan diri sendiri dan orang lain semasa sesi perbincangan kumpulan	Sangat memandang rendah kemampuan diri sendiri dan orang lain semasa sesi perbincangan kumpulan	Memandang rendah kemampuan diri sendiri dan orang lain semasa sesi perbincangan kumpulan	Memandang kemampuan diri sendiri dan orang lain secara sederhana semasa sesi perbincangan kumpulan	Memandang tinggi kemampuan diri sendiri dan orang lain semasa sesi perbincangan kumpulan	Memandang sangat tinggi kemampuan diri sendiri dan orang lain semasa sesi perbincangan kumpulan
2	Kejujuran (L2)	Tidak mempunyai langsung sifat kejujuran semasa sesi perbincangan kumpulan	Memiliki sifat kejujuran yang sangat rendah semasa sesi perbincangan kumpulan	Memiliki sifat kejujuran yang rendah semasa sesi perbincangan kumpulan	Memiliki sifat kejujuran yang sederhana semasa sesi perbincangan kumpulan	Memiliki sifat kejujuran yang tinggi semasa sesi perbincangan kumpulan	Memiliki sifat kejujuran yang sangat tinggi semasa sesi perbincangan kumpulan
3	Dorongan (L3)	Tidak mempunyai motivasi dan dorongan pada diri sendiri	Memiliki motivasi dan dorongan yang sangat rendah dalam menyelesaikan analisis dalam soalan	Memiliki motivasi dan dorongan yang rendah dalam menyelesaikan analisis dalam soalan	Memiliki motivasi dan dorongan yang sederhana dalam menyelesaikan analisis dalam soalan	Memiliki motivasi dan dorongan yang tinggi dalam menyelesaikan analisis dalam soalan	Memiliki motivasi dan dorongan yang sangat tinggi dalam menyelesaikan analisis dalam soalan

Table 1

3. Case studies

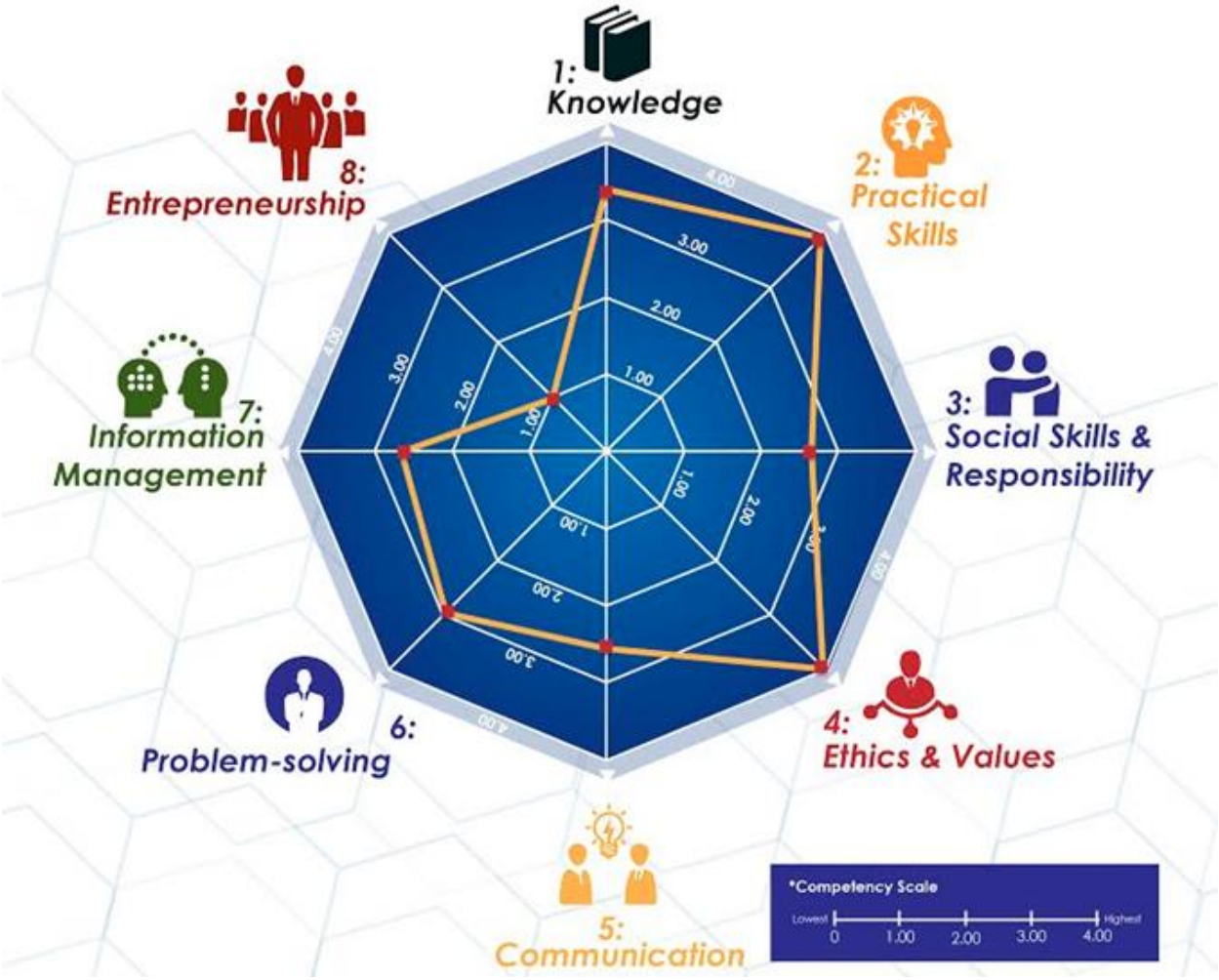
	CRITERIA (Teamwork skills)	0	1-2	3-4	5-6	7-8	9-10
		Tidak memuaskan	Memerlukan penambahbaikan	Memuaskan	Sederhana	Baik	Cemerlang
4	Saling membantu (TWS1)	Tidak menunjukkan sifat saling membantu	Sangat kurang membantu rakan sekelas dalam perbincangan	Kurang membantu rakan sekelas dalam perbincangan	Jarang membantu rakan sekelas dalam perbincangan	Kerap membantu rakan sekelas dalam perbincangan	Sangat kerap membantu rakan sekelas dalam perbincangan
		Tiada inisiatif langsung untuk membantu	Mempunyai sangat kurang inisiatif untuk membantu	Mempunyai inisiatif yang memuaskan untuk membantu	Mempunyai inisiatif yang sederhana untuk membantu	Mempunyai inisiatif yang tinggi untuk membantu	Mempunyai inisiatif yang sangat tinggi untuk membantu
5	Perkongsian idea (TWS2)	Tidak mahu langsung berkongsi idea	Sangat kurang berkongsi idea dengan orang lain	Kurang berkongsi idea dengan orang lain	Jarang berkongsi idea dengan orang lain	Kerap berkongsi idea dengan orang lain	Sangat kerap berkongsi idea dengan orang lain
		Tiada idea yang dikongsikan pada perbincangan	Idea yang dikongsikan adalah tidak bernas dan tidak kritis, hanya terhad pada topik perbincangan tertentu sahaja	Berkongsi idea yang kurang bernas dan kurang kritis, terhad pada topik perbincangan tertentu sahaja	Berkongsi idea yang agak bernas dan kurang kritis dalam kebanyakan topik perbincangan	Berkongsi idea yang bernas dan kritis dalam semua topik perbincangan	Berkongsi idea yang sangat bernas dan kritis dalam semua topik perbincangan
6	Bekerjasama (TWS3)	Tidak mahu langsung bekerjasama dengan orang lain	Tidak cenderung bekerjasama dengan semua rakan sekelas semasa perbincangan kumpulan	Cenderung untuk bekerjasama dengan beberapa rakan tertentu sahaja semasa perbincangan kumpulan	Cenderung untuk bekerjasama secara umum dengan semua rakan semasa perbincangan kumpulan	Cenderung untuk bekerjasama secara erat dengan semua rakan sekelas semasa perbincangan kumpulan	Cenderung untuk bekerjasama dengan sangat erat dan profesional dengan semua rakan sekelas semasa perbincangan kumpulan

Table 2

RELATED LEARNING OUTCOMES

Verbal communication

4. Related Learning Outcomes (LOs)



http://jpt.mohe.gov.my/images/yootheme/icgpa.png

4. Related Learning Outcomes (LOs)

Methods	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
Medical Biochemistry					/	/	/	
Semi-reality Simulated Patient (SRSP)				/	/		/	
Presentation and Discussion					/			
Drive Test Measurement	/	/			/	/		/
Structure of the Observing Learning Outcome (SOLO)						/		
Laboratory Session		/						
Written Assessment (Research Proposal)			/		/	/	/	
Simplified Thematic Engagement of Professionalism Scale (STEPS)			/	/	/			

4. Related Learning Outcomes (LOs)

CASE NO.		PO1 Knowledge	PO2 Practical skills	PO3 Social skills and responsibility	PO4 Ethics & values	PO5 Communication	PO6 Problem-solving	PO7 Information management	PO8 Entreprenuership
1.	SOLO-Based Task to Diagnose Adult Learners' Statistical Literacy in the 21st Century						/		
2.	Assessing Core Manipulative Skills in a Biochemistry Lab Practical Test		/						
3.	Semi-Reality Simulated Patient (SRSP) Assessment Technique in Enhancing Students' Learning Experience for Medical Nutrition Therapy for Picky- Eater Children with Special Health Care Needs				/	/		/	
4.	Simplified Thematic Engagement of Professionalism Scale (STEPS): A Performance Based Assessment to Nurture Professionalism Growth in Clinical Year			/	/	/			
5.	Implementation of Practical Work in Engineering Study					/	/		/
6.	Assessment of Practical Competency In Food Microbiology Course						/		

4. Related Learning Outcomes (LOs)

CASE NO.		PO1 Knowledge	PO2 Practical skills	PO3 Social skills and responsibility	PO4 Ethics & values	PO5 Communication	PO6 Problem-solving	PO7 Information management	PO8 Entrepreneurship
7.	Managing and accounting for learning outcomes						/		
8.	Medical Biochemistry: Enhancing Achievement in Learning Outcomes through Performance-based Assessments					/	/	/	
9.	Applying performance based assessment on Ordinary Differential Equation using Augmented Reality (I-DE-AR)					/			

5. Advantages of applying performance based assessments

The advantages of performance-based assessment towards education and community:

General Advantages:

1. The early exposure to the real-world problem (authenticity) may allow student to be more prepared in stepping into the working world.
2. May provide student with clearer view of assessed components.
3. Can enhance student in an active learning.
4. Encourage the development and enhancement of soft skills upon task execution.
5. Can promote student creativity.
6. Can be less subjective when rubrics are used.
7. May stimulate 'thinking on their feet' skill among students.
8. May allow faculty to have a clearer picture on student's understanding.
9. May be useful to faculty in assessing the process of application of knowledge into practice.
10. Can serve as an on-site feedback to students.

5. Advantages of applying performance based assessments

A. In Semi-Reality Simulated Patient (SRSP) assessment techniques,

1. The students are able to effectively apply the knowledge learned in lab settings, while acquiring the skills needed in becoming a professional health practitioner. With the guide from preceptor/lecturer, techniques in conveying theory into practice were also established.
2. This SRSP assessment technique is suitable in any discipline that involves the participation of children. This technique is good in giving opportunities to the students to practice their knowledge, communication skill and professionalism. Students also enjoy this SRSP assessment technique.

B. In Innovative Differential Equation using Augmented Reality (AR),

1. Performance-based assessment can be applied in various teaching and learning session as it can be applied using many other AR based application that can be downloaded through play store and apple store. The possibilities are limitless as it is up the educator to apply the concept in their lectures to make it interesting and facilitate their students.
2. Innovative Differential Equation using Augmented Reality(AR) will produce 'print AR' which can be used by publishers to supplement and update information in textbooks or in other print materials (Hawkinson, 2014).

5. Advantages of applying performance based assessments

C. In Simplified Thematic Engagement of Professionalism Scale (STEPS),

1. Formative component has been designed to ease effective feedback practice using feed up (Where am I going?)– feedback (How am I going?) – feed forward (Where to next?) framework (Hattie and Timperley, 2007). This has improved the gaps in feedback practice where almost 90% of the students obtained meaningful feedback for their professionalism growth. STEPS has also serve as a censoringtool for early detection of students with professionalism problem.
2. STEPS format can be replicated in other academic disciplines where assessment constructs are multi-dimensional and students' assessment in real-life situations is very important such as in nursing and engineering.
3. STEPS has the potential to be used as 360 degree assessment where different assessors (including patient, peers and allied health members) can be engaged to assess and give feedback on students professionalism.

D. Structured of Observed Learning Outcome (SOLO)-based task,

1. Is structured in hierarchical manner, in order to help educators to identify the specific statistic concept that the student has not mastered. SOLO also helps in detecting possible causes to the students' problems in mastering statistical concepts.
2. The SOLO-based task allows the educators to administer it in different formats, either in computer-based, written test or interviews.
3. The SOLO-based task not only provides useful information that enables the educators and students to have a better understanding of their statistical literacy (e.g. point analysis, trend analysis and message analysis), it also leads the students to easily detect their strengths and weaknesses.

5. Advantages of applying performance based assessments

E. Interactive Learning,

1. comprises of 1)met-the-expert, 2) Online quizzes, 3) Team-based learning, 4) Objective Structured Practical Examination (OSPE) based practical, 5) Digital canvas (padlet) and 6) Interactive whiteboards
2. can be applied in various academic disciplines depending on the number of content experts. If the faculty only have just ONE content expert, team-based learning and online quizzes can be fully utilised as a tool in interactive learning (Ismail, 2016). Feedback loop is crucial in making learning better. OSPE-based practical is more applicable in replacing wet laboratory where students can perform both practical and application sessions without going into the lab (Ismail et al. 2017).
3. Parallel to the fourth industrial revolution that relates with new and emerging technology such as machine learning, 3D printing, big data and intelligent robotics will definitely influence the future jobs (Hellebrand, 2017). This is parallel to the principles in Education 4.0, where with good and innovative education; we can produce graduates with higher marketability.

6. Limitations of performance based assessments

1. There are some minor obstacles to making LOOP more ubiquitous. These include creating an awareness of the benefits of LOOP among the general academic community, and finding ways to simplify the process of conceptualizing the management of learning outcomes. These are solvable issues that would take some time and funding to address.
2. Content knowledge in terms of the complexity of concept assessed
3. Clear classification of response into the four levels when implementing in qualitative procedures, such as interview
4. Provide the clear and detail descriptions of the structural organization of statistics knowledge at each level
5. Students were found not assertive enough to participate in the discussion. This is because they found lack of information / reputable resources. Therefore, during the first interactive session, they are taught on how to find information only pertinent to the learning outcomes.
6. Time consuming
7. Not suitable for big classes
8. Dealing with children are sometimes quite challenging. They are unpredictable especially in giving cooperation that are needed. Therefore, interview session with the children or the parents prior to the practical session is helpful in getting the most information about the children preferences. The use of simple words are also helpful in getting the children participate in the assessment session.

7. Things to consider when implementing performance-based assessments

Before the course begins:

- Determine the course learning outcomes (CLOs) and programme learning outcomes (PLOs) in a course before the course begins.
- Use the feedback from the curriculum review to improve areas of assessments.
- The assessment should be as authentic as possible; i.e. based on real-world issues.
- Ensure that appropriate assessment techniques are used to capture learning data.
- Align CLOs and PLOs with the assessment techniques, ensure that all declared CLOs and PLOs are accounted for i.e. the distribution of scores are clearly stated.
- Consult the MQF for appropriate action verbs in the CLOs and PLOs.
- Ensure that assessments are not over-burdening students, so take into account of the Student Learning Time and Credit Hours, and do not over-declare CLOs and PLOs .
- Develop detailed and specific rubrics.
- Develop the learning infrastructures around the assessments.

7. Things to consider when implementing performance-based assessments

During the course:

- Provide students with as much details as possible of the assessment expectations at the start of the course.
- Provide best examples/model answers.
- Provide assessment rubrics to students.
- Consider having industry members and/or clients as assessors for related CLOs and PLOs for authentic assessment.
- Set the stage for stimulating learning and conduct lots of students-centred hands-on activities.
- Ensure that assessments are spaced out appropriately throughout the course to avoid causing unnecessary stress on students.
- Ensure that students get quality feedback – preferably both quantitative and qualitative feedback.
- Gather responses from students and clarify any query they may have; this will enhance their learning experience.

At the end of the course:

- Aggregate the scores and map the scores to the respective CLOs and PLOs; this helps in accounting for iCGPA.
- Gather feedback from industry members and students.
- Determine areas for improvement in the assessments and curriculum.
- Use the information to improve the assessment and curriculum.

8. References

Hattie, J., & Timperley, H. (2007). The power of feedback. Review of educational research, 77(1), 81-112.

Hawkinson, K., & Zamboni, B. D. (2014). Adult baby/diaper lovers: an exploratory study of an online community sample. Archives of sexual behavior, 43(5), 863-877.

Hibbard, M. K. (1996). Performance-Based Learning and Assessment. A Teacher's Guide. Hellebrand, H-M. (2016). An Exponential World: Nature, Patterns, and How to Leverage Them. The Palgrave Handbook of Managing Continuous Business (Transformation) pp 95-113, SpringerLink, USA.

Ismail, N.A.S. (2016) Effectiveness of Team-Based Learning in teaching Medical Genetics to Medical Undergraduates. 2016. Malays J Med Sci. Mar; 23(2): 73–77.

Ismail N.A.S., N.F. Abdul Sani, J.K. Tan, E. Alias, M.H. Ahmad Damanhuri, K. Tajul Arifin, N. Abdul Karim, J.A. Goon, Z. Jubri, S. Makpol, Y.A. Mohd Yusof (2017). The Effectiveness of Objective Structured Performance Evaluation (OSPE)-Based Setting versus Conventional Practical in Enhancing Knowledge Among Medical Students. EDULEARN17 Proceedings. 9th International Conference on Education and New Learning Technologies.3-5 July, 2017. Barcelona, Spain. 4868-4872.

Swanson, D. B., Norman, G. R., & Linn, R. L. (1995). Performance-Based Assessment: Lessons From the Health Professions. Educational Researcher, 24(5), 5–12. http://doi.org/10.2307/1177072

9. Summary

Performance base assessment allows students to apply their knowledge in a real-world context. It is performance target where the intended learning outcomes are according to genres of performance. Task assigned allows student to demonstrate their skills as well as strategies. This help develop the holistic students and employable graduates.

Three elements instructor should consider for the implementation of this assessment which are before the course, during the course and after the course.

The following are three element instructors should consider to implement a successful assessment which includes

- Before the course
  - ✓ The instructor should determine the CLO to ensure the student will not be burden by the task.
- During the course
  - ✓ Provide in depth details and guidelines to stimulate learning process
- End of the course
  - ✓ Retrieve feedback from industry or community related to the performance of the students.

Portfolio-based Assessment

Zahiruddin Fitri Abu Hassan

Joharry Othman (IIUM)

Sheila Cheng (AEU)

Syamsul Nor Azlan Mohamad (UITM)

D'oria Islamiah Rosli (UTHM)

Angela Rumina Leo (MSU)

1. Definition

Portfolio-based Assessment

- A portfolio is "a purposeful collection of student work that exhibits the student's efforts, progress and achievements in one or more areas. The collection must include student participation in selecting contents, the criteria for judging merit and evidence of student self-reflection" (Paulson, Paulson & Meyer, 1991, p60).
- A portfolio can be viewed from two perspectives: a product and a process. "As a product, it holds the work records and documents a learner has produced during a course or program, and represents an edited collection of their learning achievements. As a process-oriented tool, it enables learners to monitor their own learning systematically, by reflecting upon their learning experience" (Teaching @UNSW, 2017).

Operationalized Definition

- A collection of purposeful, cumulative and progressive learner's work: digital or non-digital, over a period of time through flexible learning (formal, informal and non-formal learning) by reflecting and ensuring that learning has taken place.

2. Principles of Portfolio-based Assessments

- **Principle #1: Learning Outcomes**

  Students are guided by clearly articulated individual, course, programmatic, or institutional outcomes in their collection, selection, reflection upon, and presentation of "artefacts" (various electronic documents) in the e-portfolio.

- **Principle #2: Digital Environments**

  Students develop digital literacies in composing, collaborating, and record-keeping, and consider the rhetorical implications of circulating e-portfolios to both public and private audiences.

- **Principle #3: Virtual Identities**

  Students represent themselves through personalized information that conveys a web-savvy and deliberately constructed ethos for various uses of the e-portfolio. Students manage those identities by having control over artifacts and who sees them through privacy and access tools.

- **Principle #4: Authentic Audiences**

  Students engage in audience analysis of whom intend to read their portfolio/e-portfolios, not only to accommodate faculty, but also employers, issuers of credentials, family, friends, and other readers. Students coordinate access to their e-portfolios with faculty, programs, the institution, and other readers.

2. Principles of Portfolio-based Assessments

- **Principle #5: Reflection and E-portfolio Pedagogy**

  Students create "reflective artefacts" in which they identify and evaluate the different kinds of learning that their e-portfolios represent. In particular, students may explain how various forms of instructive feedback (from faculty, Writing Centers, peers, and other readers) have influenced the composition and revision of their various e-portfolio artefacts, making teaching methods and learning contexts more transparent to their readers.

- **Principle #6: Integration and Curriculum Connections**

  Students link artefacts in a flexible structure that synthesizes diverse evidence and ideas, invites linear or non-linear ways to read and evaluate e-portfolios, and makes connections to portfolio-related evidences and relationships distributed across the Internet. Students may therefore use linking to represent how e-portfolio artefacts inter-relate with other courses in the larger context of whole-curriculum learning.

- **Principle #7: Stakeholders' Responsibilities**

  Students receive the necessary support from faculty, program directors, and university administrators who not only use e-portfolios for assessment purposes and program improvement, but also keep informed about what resources are essential for implementing, maintaining, and accessing e-portfolios.

- **Principle # 8: Lifelong Learning**

  Students are able to adapt their e-portfolios for various purposes/uses beyond their academic careers, enabling their various readers, in turn, to track their learning longitudinally.

3. Case studies

CASE STUDY 1: An Alternative Way in Assessing Portfolios Based on Saaty's Analytic Hierarchy Process (AHP)

SCAN ME!

SUBJECT AREA

Management Sciences

RESEARCHERS

Sheila Cheng, Heng Loke Siow

Asia e University

ISSUE

- Attempts at proposing a qualitative approach in assessing experiential portfolios.

INNOVATIVE APPROACH / INTERVENTION

- An alternative way of assessing the portfolio, modelling the pairwise comparison matrix from Thomas L. Saaty's (1980 & 1990) Analytic Hierarchy Process (AHP).
- AHP is a systematic tool to analyse decision making problems based on Mathematics and Psychology. It provides a rational framework, relates elements to overall goals, and helps decision makers find the best decision which suits their goals.

3. Case studies

DESCRIPTION OF APPROACH

- Adapting from the AHP's nine-point scale pairwise comparison matrix, the portfolio which may consist of only or combination of formal, informal and non-formal learning is considered as one factor while the benchmark against the CLOs, the other factor, a ten-point scale is developed to help the Assessor to evaluate the degree of similarity and accuracy of portfolio to the CLOs.

Saaty's pairwise comparison matrix :		Proposed Portfolio Assessment			
Scale value Sij relating i to j	Meaning	Scale value Sij relating i to j	Meaning	Quantum of similarity to CLOs	Grading
		0	NONE	0%	F
1	i is as important as j	1	CLOSE	20%	E
3	i is moderately more important than j	3	SIMILAR	40%	D
5	i is strongly more important than j	5	ALIKE	60%	C
7	i is very strongly more important than j	7	SAME	80%	B
9	i is extremely more important than j	9	EXACTLY	100%	A

Note: Where i and j are two different factors. E.g. two different job offers. Scale values 2, 4, 6 and 8 lie midway between the definitions for their nearest values given above.

RELATED LEARNING OUTCOMES

PO1- Knowledge; PO2- Practical Skills; PO5 - Communication; PO6 – Problem Solving; PO7 – Information Management

3. Case studies

CASE STUDY 2: Implementation of Patchwork Assessment for Learning

SUBJECT AREA

Education & Social Sciences

SCAN ME!

RESEARCHER

Angela Rumina Leo

Management & Science University

ISSUE(S)

- Student's ownership of their own learning.
- The need to redefine the nature of assessments in higher education based on further realization that the world is looking forward to future-ready graduates with rich employability skills.

INNOVATIVE APPROACH

- The "patchwork", an assessment approach based on the four dimensions of productive pedagogy; "intellectual quality", "relevance", "social support", and recognition of "difference".

DESCRIPTION OF APPROACH

- Winter (2003) stated, "the essence of a patchwork is that it consists of a variety of small sections, each of which is complete in itself, and that the overall unity of these component sections, planned in advance, is finalized retrospectively, when they are 'stitched together'." Refer to Figure 1.

3. Case studies

- The patchwork assessment constitutes of three integrated parts; namely academic literacy, feedback, and reflection.
- In patchwork assessments, academic literacies are exercised and assessed through completion of a variety of small task segment, varied in style and genre.
- Feedback on the other hand, serves as a conversation that tracks the process of improved comprehension over time.
- Reflection is a final retrospective commentary, written as a result of self-evaluation of the tasks and analysis of the peer feedbacks through critical reflexivity; in addition to the reviewed and edited assignments before submission.

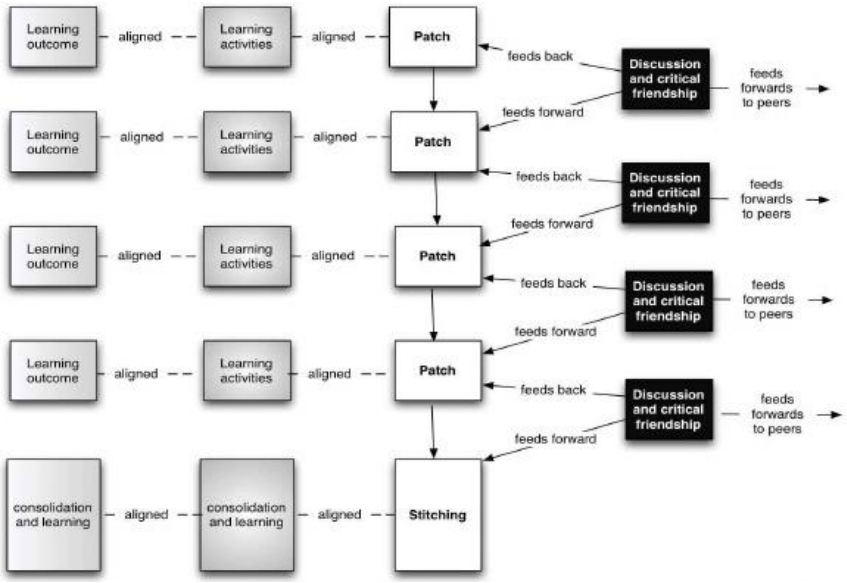


Figure 1: Social & Reflective Layer of Patchwork.

RELATED LEARNING OUTCOMES

PO2 – Practical skills; PO3 – Social Skills & Responsibility; PO5 – Communication; PO6 – Problem solving; PO7 – Information Management

3. Case studies

CASE STUDY 3: Multi-dimensional Assessment Design for Undergraduate Building Pathology Course

SUBJECT AREA

Building Pathology

RESEARCHER

Zahiruddin Fitri Abu Hassan
Universiti Malaya

ISSUE

- Challenges in getting the students to connect prior knowledge from previous courses with the current module.
- Building students' portfolio beyond the text based output into video presentation that best demonstrate the aspects of knowledge the students need to build.

INNOVATIVE APPROACH / INTERVENTION

- Designing learning experience for students to build up communication skill alongside the cognitive and psychomotor aspect of the course using various assessment methods.
- The use of video portfolio to capture different angles of defect manifestation in the built environment.

3. Case studies

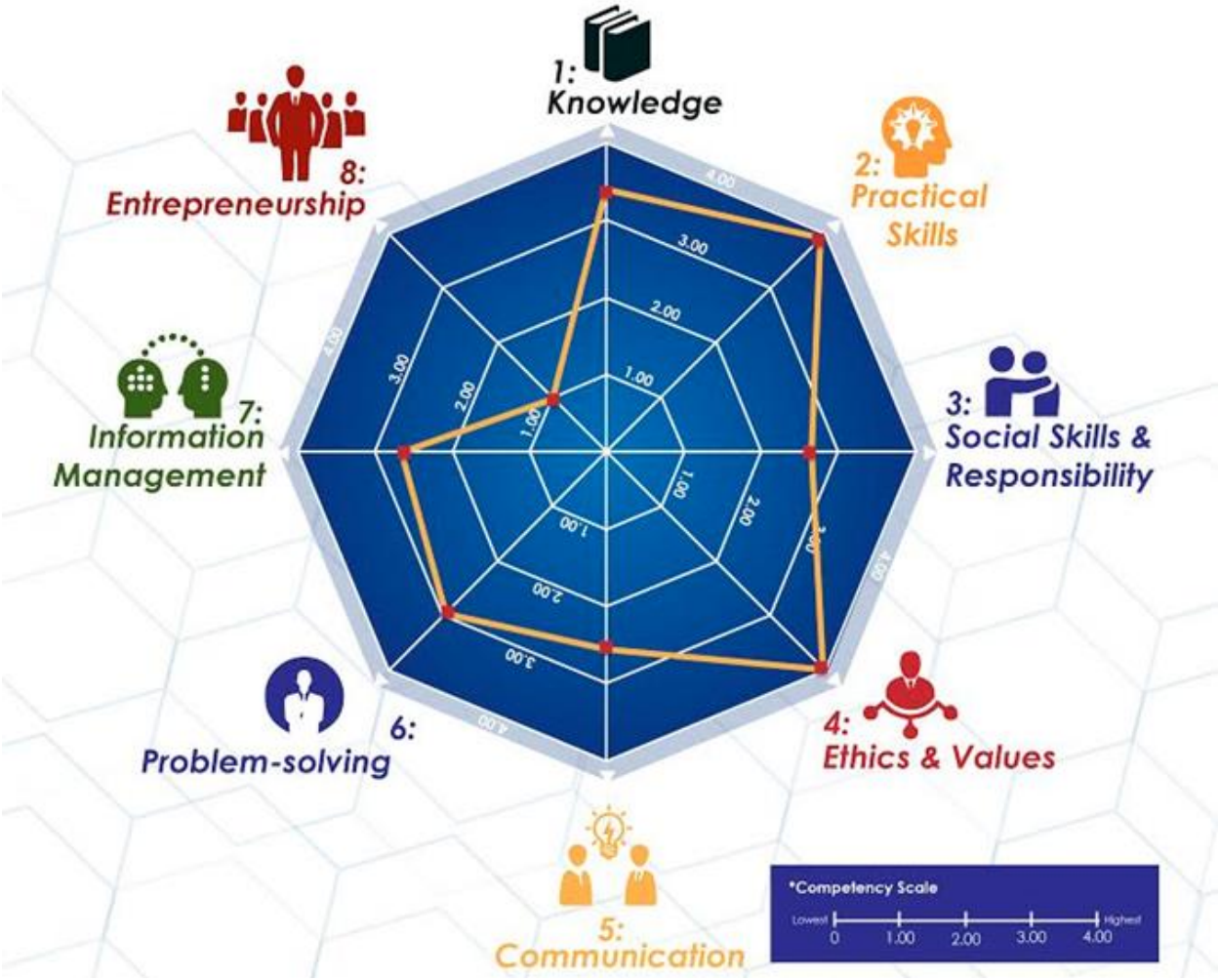
DESCRIPTION OF APPROACH

- Students are informed and introduced to the educational principles behind learning activities that they are not accustomed to. This is to reduce the anxiety level and assure students that the activities were designed to achieve the specific outcomes of the course.
- One of the assessment activity is the defect portfolio video presentation. The purpose of using video for this assessment is because building defect and degradation often manifest itself through a multitude of different causes, and the effects are sometimes different depending on the context of which the defects are situated.
- A 3-dimensional analysis is always needed, i.e. appreciation of the design, the construction method and the context of the degradation mechanism.
- The analysis is to be presented by the students using the format of a video. The advantage of using videos is that students can show the defects from different angles and tell a history of the defects being presented.
- The information gathered and interpreted from a visual inspection is the main skill a professional building surveyor possesses. It is crucial the students can develop this skill very early on.
- Video also allows the student to practice their communication skills and the video portfolio is a ready-made e-Portfolio item through which the student can market themselves to potential employers.

RELATED LEARNING OUTCOMES

PO1- Knowledge; PO2- Practical Skills; PO5 - Communication; PO6 – Problem Solving; PO7 – Information Management

4. Related Learning Outcomes (LOs)



http://jpt.mohe.gov.my/images/yootheme/icgpa.png

4. Related Learning Outcomes (LOs)

CASE NO.		PO1 Knowledge	PO2 Practical skills	PO3 Social skills and responsibility	PO4 Ethics & values	PO5 Communication	PO6 Problem-solving	PO7 Information management	PO8 Entrepreneurship
1.	An Alternative Way in Assessing Portfolios Based on Saaty's Analytic Hierarchy Process (AHP)	/	/			/	/	/	
2.	Implementation of Patchwork Assessment; for Learning		/			/	/		
3.	Multi-dimensional Assessment Design for Undergraduate Building Pathology Course	/				/		/	

5. Advantages of portfolio-based assessments

1. It is generic and structured in nature and could be applied to any specialization of disciplines.
2. By utilizing a collection of evidence in learning, portfolios assist learners to self-evaluate while stimulating their meanings and experiences.
3. The individual portfolio may be presented as proof of learning and as reference for future employment. With evidences of recognitions and achievements carried along by graduates, these would provide some ease for stakeholders when hiring potential employees.
4. e-Portfolio assessment encourage active and formative as well as summative learning as it is also adapted to online modes of interaction and collaboration.
5. Students become not only engaged builders of new knowledge but also involve in becoming active lifelong learners thus taking control of their own learning.

6. Limitations of portfolio-based assessments

1. There is a need to have access to a computer with adequate software.
2. Before the implementation of e-portfolio, the students will need to be empowered with online skills to help them manage the resources.
3. Motivation have to be sustained despite distractions from the computing environment as well as the surrounding.
4. Readiness to engage in online conversation as a method of learning can be a challenge to students.
5. Awareness and realization of the students as to the importance of having an online portfolio; ensuring success have to be retained for a considerable amount of time.

7. Things to consider when implementing portfolio-based assessments

- **Learning Objective:**

  Using Bloom, Simpson, Krathwall Taxonomy as a guide to measure learning outcome; the learners should be tested according to the set of objectives that can measure their knowledge and ability.

- **Problem-Focused:**

  Plan authentic question based on real-world situations. Usually in project-based activities, the facilitator will design a question based on a problem in the real environment. Thus, some important aspects related to the outcome such as problem triggers, learning context, prior knowledge and skills that enable the learners to gain experience in project-based learning should be taken into consideration.

- **Hands-on activities:**

  Students are directly involved in the planning process and activities that comprises students' analytical skills, creativity, critical thinking, problem-solving and ICT skills due to prior task or assignment. These skills help learners to experience raised self-reflection, stimulated creativity, improved active learning, increased peer communication and improvised facilitator-student relations.

- **Reflect and Assess:**

  Allow students to communicate with peers to reflect on their learning. In addition, reflecting and assessing help learners improve the quality of the tasks, raising interaction and exchange among them, and further reflecting on their own learning. These learning effect is valuable for the academic growth and progress.

7. Things to consider when implementing portfolio-based assessments

- **Decision-Making:**

  Allow students to apply decision-making based on findings. The tasks were formulated to test and evaluate the learners in decision making with several or numerous findings around them. The complexity of the activity allows the learners to produce different solutions and assumptions that restrict them to make a solid decision. This process involves active exploration to identify and construct new knowledge.

- **Leadership and teamwork skill:**

  Work as a unit and accomplish the task given by showing their capability as a leader and members. The best criteria for project-based activity is the adaptation of social learning concept that can encourage the learners to develop their roles as a leader and a teammate in a group. It requires an agreed upon decision and full support from all parties concerned; from the top management to the support staff. It needs to be made known to all relevant parties.

8. References

Arnold, L. (2009) Patchwork Media & Patchwork Media – Bringing Assessment & Learning Together [Presentation] Retrieved from https://www.slideshare.net/lydiaarnold/patchwork-approaches-harper-adams-2009

Barnett, R (1992) Improving Higher Education, Buckingham, Open University Press.

Barrett, H. C. (2007). Researching electronic portfolios and learner engagement: The REFLECT Initiative. Journal of Adolescent & Adult Literacy, 50(6), 436–449. http://doi.org/10.1598/JAAL.50.6.2

Beck, R. J., Livne, N. L., & Bear, S. L. (2005). Teachers' self assessment of the effects of formative and summative electronic portfolios on professional development, 28(3), 221-244. European Journal of Teacher Education, 28(3), 221–244. http://dx.doi.org/10.1080/02619760500268733

Deng, Y. (2017). Fuzzy analytical hierarchy process based on canonical representation on fuzzy numbers. Journal of Computional Analytical & Applications, 22(2), 201-228.

Gardner, H. (2006) Multiple Intelligences: New Horizons, Basic books, USA.

Higher Education Academy (2016) Framework for Transforming Assessment in Higher Education. Available from: https://www.heacademy.ac.uk/sites/default/files/downloads/transforming-assessment-in-he.pdf

Lorenzo, G., & Ittleson, J. (2005, February 1). EDUCAUSE. Retrieved (n.d.), from https://library.educause.edu/resources/2005/1/demonstrating-and-assessing-student-learning-with-eportfolios

Mathivathanan, D., Govindan, K., &Haq, A. N. (2017). Exploring the impact of dynamic capabilities on sustainable supply chain firm's performance using Grey-Analytical Hierarchy Process. Journal of Cleaner Production, 147, 637-653.

Mir, S. A., & Padma, T. (2017). Evaluation and prioritization of rice production practices and constraints under temperate climatic conditions using Fuzzy Analytical Hierarchy Process (FAHP). Spanish Journal of Agricultural Research, 14(4), 0909.

Paulson, L. F., Paulson P. R., & Meyer C. (1991). What makes a portfolio a portfolio? Educational Leadership. 48(5), 60-63.

Principles and Practices in Electronic Portfolios: Conference on College Composition and Communication, November 2007, Revised March 2015 [Submitted by the CCCC Taskforce on Best Practices in Electronic Portfolios and adopted by the CCCC Executive Committee on November 19, 2007. Revised in March 2015

Ramsden, P (1992) Learning to Teach in Higher Education, London, Routledge.

Rorty, R (1979) Philosophy and the Mirror of Nature, Princeton, Princeton University Press.

Rust, C (2002) The impact of assessment on student learning, Active Learning in Higher Education, 3 (2) 145-158.

Saaty, T.L.(1980). "The Analytic Hierarchy Process." McGraw-Hill, New York.

Saaty, T. L. (1990). How to make a decision: the analytic hierarchy process. European journal of operational research, 48(1), 9-26.

Sewell,M. Marczak, M. & Horn, M. (n.d.) The use of portfolio assessment in evaluation.The University of Arizona. Retrieved from: http://methodenpool.uni-koeln.de/portfolio/USE%20OF%20PORTFOLIOS%20IN%20EVALUATION.htm

Scoggins, J. and Winter, R. (1999) The patchwork text: a coursework format for education as critical understanding. Teaching in Higher Education 4 (4): 485–499.

Teaching @UNSW (2017, July 7). Assessing by Portfolio. Assessment Toolkit Retrieved (n.d.), from https://teaching.unsw.edu.au/assessing-portfolio

Vygotsky, L (1962) Thought and Language, New York, Wiley.

Wetzel, K., & Strudler, N. (2005). The Diffusion of Electronic Portfolios In Teacher Education. Journal of Research on Technology in Education, 38(2), 231-243. doi:10.1080/15391523.2005.10782458

Winter, R (2003) Contextualizing the Patchwork Text: addressing problems of coursework assessment in higher education. Innovations in Education and Teaching International 40 (2): 112-122.

Samples of E-Portfolio being used in the classroom:

https://pathbrite.com/drjoe/folio

https://pathbrite.com/course/PxgT-PMaPhgP/edp3501

https://pathbrite.com/course/PxgT-PMoPP6P/edp3501

https://pathbrite.com/course/PxgT-PMlPvRP/edp3501k

https://pathbrite.com/course/PxgT-PMlPLTP/edp4390k

https://pathbrite.com/course/PxgT-PMCPbTP/edp1101k

9. Summary

It is hoped that having a clear purpose and realization of the importance and benefits of a portfolio; electronic or otherwise, institutions of higher learning in Malaysia may seriously adopt and use it for the betterment and improvement of student learning, impactful instructor instruction, and program effectiveness. E- Portfolio is considered performance based assessment while it falls under the scope of alternative assessment. And when 'real life' tasks are suitably incorporated in it, then this constitutes authentic assessment as well.

It is high time that Malaysian educators and academics alike, embrace this challenging shift towards fulfilling MOE's aspiration to prepare today's graduates with the necessary 21st century skills. Once this kind of assessment is successfully introduced and practiced as part of the "assessment for learning" methodology, then our tertiary education will have ample evidence to assure that both 'assessment of learning' (AoL) and also 'assessment for learning' (AfL) is being practiced. This in turn would make it possible and easier to achieve "constructive alignment" at higher levels of cognitive achievement and standards.

On a final note; the emphasis on producing more creatively, critically, and innovatively thinking graduates would be better realized, not just for the sake of all stakeholders, but also for potential employers who are demanding quality graduates. Thus these noble pursuit is the way forward to redesign assessment for improved and holistic learning.

Technology-based Assessment

Farrah Dina Yusop
Zaid Alsagoff
Puteri Sofia Amirnuddin
Raihanah Mohd Mydin
Roziela Mohamed Sharib
Hisyamsani Idris
Normawati Abdul Rahman
Annafatmawaty Ismail
Teh Ya Yee
Mahani Mohamad
Nabilah Othman
Rosseni Din
Anuar Mohd Yusof

1. Definition

Technology-based Assessment

- Technology-based assessment is adaptation of online and technology-based testing that are engaging, interactive, and better reflect the world students live in every day (Pearson Education, 2017).

- The term 'Technology-Based Assessment' (TBA) as used in this book refers to the use of electronic – both offline and online systems, applications and software to:
    - Assess students' progress, work and performance.
    - Assess students individually and in groups.
    - Enable peer and self-assessment.
    - Enable real-time and automated feedback.
    - Improve the efficiency, variety, flexibility and quality of implementing assessment.

2. Principles / characteristics of Technology-based Assessments

- TBA involves the use of various digital devices such as desktops, laptops, portable and/or smart communication devices including smart mobile phones, iPads or through the use of electronic gaming devices.

- For educators, TBA can be utilized in:
  - Constructing their assessment tasks.
  - Delivering assessment tasks to relevant students.
  - Recording and providing feedback and grades to students.
  - Recognizing students' understanding and abilities on tested materials.

- For students, TBA is helpful in:
  - Analysing students' responses.
  - Providing feedback on the quality and relevance of their responses.

- TBA can use a multitude of formats, including:
  - Text documents and/or portable document formats.
  - Multimedia formats such as sound, video or images.
  - It can also involve complex simulations or games.

- TBA can also be undertaken by students individually, in small and/or large groups.

- TBA can be conducted in synchronous or asynchronous environments depending on the purposes and needs.

3. Case studies

CASE STUDY 1: QR Code Manual Laboratory Card (MLC)

SUBJECT AREA

Engineering; Science; Labwork

SCAN ME!

RESEARCHERS

Hisyamsani Idris and Normawati Abdul Rahman
Politeknik Sultan Azlan Shah, Perak, Malaysia

ISSUE

- The use of QR Code has actually been widely used in various fields. However, QR Code is less used in educational institution in the country. Polytechnic itself aims to produce not only k-workers that are skilful, but also competent in using technology.

INNOVATIVE APPROACH / INTERVENTION

- The QR Code MLC is purposely invented for improving the conventional style of manual lab sheet as continuous assessment for the engineering science course DBS 1012 in polytechnics. This incorporates the latest technology in teaching approach (m-learning) that encourage student to actively participate during laboratory work session. The learning materials embedded in QR code followed the sequence of laboratory process step by step in QR codes or all in one sheet. The innovation enables a fast, suitable, effective, and user friendly mode for student to access and utilise mobile learning in conducting laboratory work using QR Code.

3. Case studies

DESCRIPTION OF APPROACH

- Students are required to install QR code scanner and Google Sheet apps in their mobile devices before laboratory session.
- Students need to download a set of QR code which represents one lab work sheet, via e-learning portal (CIDOS), WhatsApp group or any other file sharing platform.

- All group members have their own task which involves using phone as a QR code display, scanning the QR code, using the laboratory equipment and viewing information such as instructions, diagrams, tables, tutorials and demonstration videos. Students will record the experimental result online.
- Real-time data monitoring is done by lecturer to ensure the results reflect the correct experimental procedures.

RELATED LEARNING OUTCOMES

PO6 – Problem solving.

3. Case studies

CASE STUDY 2: MyFIGo - My Fun and Interesting Google Classroom

SUBJECT AREA

Engineering; Science; Labwork

SCAN ME!

RESEARCHERS

Roziela Mohamed Sharib

Politeknik Sultan Azlan Shah, Behrang

ISSUE(S)

- Traditional methods result in less active participation from the students.
- On-paper continuous assessments such as quizzes, tests and theoretical exercises need to be marked manually which delay the process of evaluating the progress and growth of the students in the course.

INNOVATIVE APPROACH

- MyFIGo is applied to DBS1012 Engineering course in Politeknik Sultan Azlan Shah. It is an integrated application that utilizes Google Classroom as the main platform and developed using various web 2.0 tools. With this approach, it allows educators and students to reflect and create a continuous improvement plan from any unsatisfactory result.

3. Case studies

DESCRIPTION OF APPROACH

- In MyFIGo, lecturers will upload their lecture notes in advance by using:
  - Google Slides for slide presentations,
  - YouTube for videos, and
  - PDF files for handouts.
- Forums and group discussions are created by using Padlet. Quizzes, tests and reinforcement exercises were generated by using BookWidget, which is the extension application in Google Classroom. These questions are in the form of multiple choices and structures.
- Lab works will be given to students in groups via Google Classroom with the Google Docs lab instructions as their template.
- Students will submit their reports which consist of findings and data via the Google Docs provided for grading.
- Grading of their reports will be done according to a laboratory rubric with the help of Doctopus and Goobric.
- In some tasks, students will create videos using PowToon instead of reports. The submission and grading processes are similar to the lab work reports.

RELATED LEARNING OUTCOMES

PO5 – Communication; PO7 – Information management.

3. Case studies

CASE STUDY 3: The Assessment of E-Project-based Learning in Developing Skill-based Courses for Massive Open Online Course: "MOOC in MOOC" Technique

SUBJECT AREA

Poster production

SCAN ME!

RESEARCHERS

Anuar bin Mohd Yusof
Universiti Malaysia Kelantan

ISSUE

- Limited facilities and trainers at the faculty to conduct and to assess studio-based learning in large numbers of students.

INNOVATIVE APPROACH / INTERVENTION

- Gamification is used to increase learner's motivation to complete the tasks given. This method emphasises instructor's systematic design that highlights students' level of knowledge, the concept of persuasion and appreciation (reward).

- Based on constructive philosophy by Dewey and Vygotsky, student-centred learning approaches in blended-learning were introduced. Through eProjBL Model, the course has been developed through KLU strategy (Know-Learn-Use) on each module with the challenges in MOOC. Assessment of each module was created based on gamification approach, which helps the learners to maintain engagement.

3. Case studies

DESCRIPTION OF APPROACH

- Step 1 • Student register Theory-based MOOC
- Step 2 • Execute all module until...
- Step 3 • Student register Skill-based MOOC
- Step 4 • Execute the assessment
- Step 5 • Evaluation of the assessment
- Step 6 • Rewarding the Artefact
- Step 7 • Rewarding with badge
- Step 8 • Students tracking their own performance

- The Course Assessment was developed according to the gamification arranged through the framework of the eProjBL model. This model is used as a base for this course. Poster production skill course by using Adobe Photoshop was used as evaluation, which included three learning outcomes as indicators. This course was designed and became a "Learning Object" for the other courses in the Faculty of Creative Technology and Heritage such as Computers and Art course and Computer Graphics 2D course as a pioneer for the “MOOC in MOOC” technique.

- The activities in the course were designed by integrating Web 2.0 tools such as Powtoon, Biteable, GoAnimate, Coggle, Popplet, Canva, and Google apps. The creativity of learners can be highlighted.

RELATED LEARNING OUTCOMES

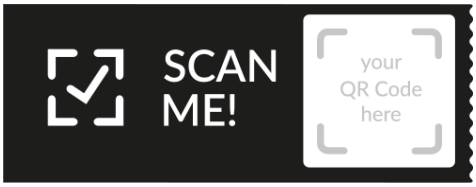
PO6 – Problem solving.

3. Case studies

CASE STUDY 4: Easy Marking with ForAllRubrics

SUBJECT AREA

Introduction to Research Methodology



RESEARCHERS

Annafatmawaty Ismail

Politeknik Ungku Omar, Ipoh

ISSUE(S)

- The growing number of students in most classrooms in polytechnics and limited time factor make conducting an effective assessment using the traditional rubric challenging.

INNOVATIVE APPROACH

- Easy marking with ForAllRubrics.
- It can be accessed from multiple devices (such as laptops, tables and smartphones).
- It helps educator evaluate students' performance (such as analysing the trends) and provides the real-time feedback.
- It has a mobile version which allows educator to work offline, allowing it to be used without internet connection.
- By only clicking on the sync menu (whenever you are able to connect to the internet), the work will be updated.
- Thus, it makes the process of constructing and marking an assessment easier and interesting.

3. Case studies

DESCRIPTION OF APPROACH

Figure 1: Register / Log in the website

Figure 2: Dashboard

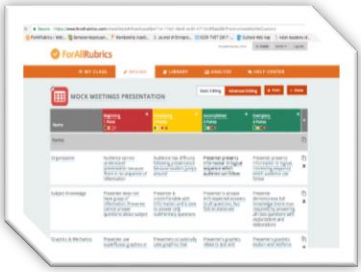


Figure 3: Rubrics

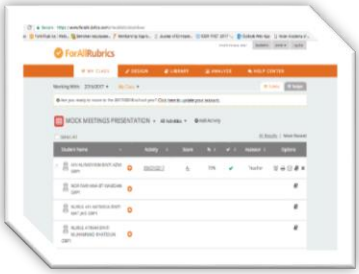


Figure 4: Names of student

Figure 5: Performance Report

- In order to create the rubrics online, educator should register ForAllRubrics account via the website.
- Once logged in, there will be a dashboard where educator can create or upload the rubrics and the name of students.
- Educator can provide a real-time feedback to the students through email.
- A variety of report can be produced whether by class or individuals.

RELATED LEARNING OUTCOMES

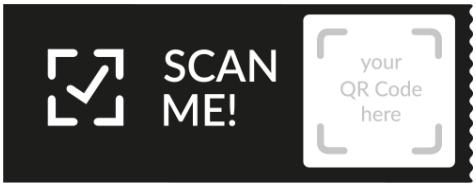
PO5 – Communication; PO7 – Information management.

3. Case studies

CASE STUDY 5: Continuous Assessments through eLecture exercises and eQuizzes

SUBJECT AREA

Entrepreneurial Skills



RESEARCHERS

Teh Ya Yee

Sunway College, Kuala Lumpur

ISSUE

- The former Entrepreneurial Skills (ES) assessments were not effective. The three contributing factors identified:
  - Results of MPU subjects is given in a separate slip which does not affect students' final grade and does not appear in their transcripts.
  - Students generally are not highly motivated to attend classes. They put minimum effort in completing their assessment.
  - Students, particularly Gen Z, may prefer more contemporary assessment formats.

INNOVATIVE APPROACH / INTERVENTION

- To encourage learning, conventional assessment approach was changed to the more contemporary mix mode to include eLecture exercises and eQuizzes.

3. Case studies

DESCRIPTION OF APPROACH

- 50% of the assessment requirements were transferred to the eAssessment format, comprised of four eLectures and three eQuizzes.
- Assessments were conducted fully on an online platform.
- This mixed method of combining class assessments as well as online work was able to meet the different learning styles of the students.

eLecture Exercises	eQuizzes
Using Edpuzzle, questions were inserted in the videos to test on students comprehension	Using Google Form, Multiple Choice Questions (MCQs) are made accessible online for 24 hours for that week's lessons
Students answer the questions posted to them intermittently as they watch the videos	Student can complete the assessment at the time of their convenience
Skipping or fast forwarding the video is not permitted to ensure full delivery of the information	Tests students comprehension of the previously learnt content by saving F2F contact time and with lesser anxiety

Strategic Control

one **open ended question** is included in each eLecture to evaluate students comprehension of the content and ensure individual responses are received.

Two sets of questions for each eQuiz were developed as a control measure to encourage students own attempt with little or no reference from their peers.

RELATED LEARNING OUTCOMES

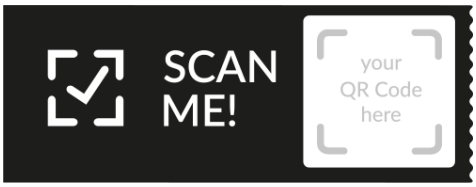
PO6 – Problem solving.

3. Case studies

CASE STUDY 6: Task Completion Using VoiceThread to Enhance Language Skills in Mutimedia English Classroom

SUBJECT AREA

English Communication



RESEARCHERS

Mahani Mohamad

Universiti Sultan Zainal Abidin

ISSUE(S)

- In traditional classroom, assessment of verbal communication has been a task based exercise. Utilising digital storytelling, the group of students are given a task completion by developing a tall story based on the prompt given via VoiceThread.

INNOVATIVE APPROACH

- The course synopsis states that students' language skills will be enhanced using relevant technology. One way to create this awareness is by introducing different mobile applications and web 2.0 educational tools that can be used to help enhancing the four language skills: reading, writing, listening and speaking. VoiceThread is one of the web- based applications introduced.

- Project based assessment is designed as a way to familiarize the students to the tools thus creating awareness by completing a set of task individually and collaboratively in a group.

3. Case studies

DESCRIPTION OF APPROACH

- Learners are required to find images using Google or Flickr, then select and download relevant and interrelated public domain photos.
- Create storyline based on those photos using PowerPoint.
- Upload Digital Storytelling Project and narrate story using proper voicing on VoiceThread.
- Set to view only option.
- Provide references to the source of the media used in the project.

RELATED LEARNING OUTCOMES

PO5 – Communication.

3. Case studies

CASE STUDY 7: Reflection In A Blog: Scaffolding To Formative and Summative Assessment

SUBJECT AREA

Educational Technology

SCAN ME!

RESEARCHERS

Rosseni Din, Nabilah Othman, Nor Laila Che Murad, Huzaimi Alias, Umi Azmah Nasran & Mohd Khalid Nasir

Universiti Kebangsaan Malaysia

ISSUE

- There is a need for methods to encourage students to apply the knowledge learnt.

INNOVATIVE APPROACH / INTERVENTION

- Every week, students will complete a task. The accomplishment of a task is spelled out by uploading the finished product onto the "Peer Content" area and reflecting on the process in their individual blogs. Incomplete task can be uploaded in the Facebook Group for a more private consultation between the group and facilitators. Facilitators and peers can comment on learners' progress via MOOC, Facebook, Youtube or the WordPress blogging platform for reflections.

3. Case studies

DESCRIPTION OF APPROACH

- Learners produce a report of their overall processes which includes describing the roles of individuals, time taken to complete a task, results of the assignment, etc.
- Learners are required to describe and express their emotion during face-to-face (F2F) class, individual task, group project and discussions within their group.
- Learners submit their reflection by assigning different mood.
- Learners report their experience before and after the task has been completed. This will allow learners to measure their own performance on whether they are able to complete the task successfully.
- In the end of the assessment, learners are expected to produce action plan and immediate effect in relation to the new knowledge or information gained. Learners share their thought on whether they would use information in the near future.

RELATED LEARNING OUTCOMES

PO5 – Communication.

3. Case studies

CASE STUDY 8: Formative to Summative in One Go: Getting to the Final Destiny with EduTechnovation Day

SUBJECT AREA

Video production

SCAN ME!

RESEARCHERS

Rosseni Din, Nabilah Othman, Nor Laila Che Murad, Huzaimi Alias, Umi Azmah Nasran & Mohd Khalid Nasir

Universiti Kebangsaan Malaysia

ISSUE(S)

- There is a need for methods to motivate and reward learners to perform certain desired behaviours.

INNOVATIVE APPROACH

- Gamification is applying the science and psychology of gaming in a non-game context. This study use the concept of gamification to complete learners project from (i) proposal, (ii) storyline, (iii) storyboard, (iv) video drafts and summarize them into a completed video with poster and oral presentations to be competed in the EduTechnovation Day.

3. Case studies

DESCRIPTION OF APPROACH

- In this course we want our learners to gain knowledge, values and transferable skills at each stage of the projects and contribute learning objects from the final product to the online community sharing space as useful shared-knowledge.
- We offer badges for those who contribute a certain number of posts; or they may work to level up to the next reward that provides recognition among other learners for their accomplished task.

RELATED LEARNING OUTCOMES

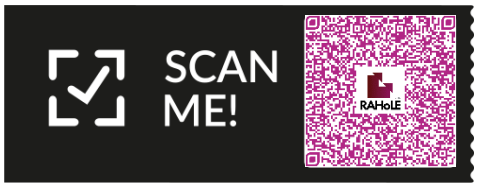
PO6 – Problem solving.

3. Case studies

CASE STUDY 9: Redesigning Formative Assessments for Land Law using Augmented Reality

SUBJECT AREA

Law



RESEARCHERS

Puteri Sofia Amirnuddin

Taylor's Law School, Faculty of Business and Law, Taylor's University Lakeside Campus, Subang Jaya, Malaysia

ISSUE

- A qualitative survey was done in exploring students' experience in learning UK Land Law. The results of the survey have shown that students need to 'see' the law instead of 'hear' the law in order to be able to grasp a solid understanding of UK land law.

INNOVATIVE APPROACH / INTERVENTION

- The assessment for UK Land Law was altered to include Augmented Reality (AR) as part of the formative assessment. By incorporating AR learning in the classroom, it can make the students to become more curious, engaging and interested to learn land law. Students were also provided with an opportunity to familiarize with the use of technology in learning land law.

3. Case studies

DESCRIPTION OF APPROACH

- Augmented reality was done outside the classroom. The students were advised upfront that there are three (3) pit stops that they need to uncover throughout their journey in learning Land Law. At the first pit stop, the assessment requires the students to inquire with the staff at the Academic Office for the first clue on the topic of 'Easement'. Once they have asked the correct staff at the Academic Office, they will receive an envelope containing issue on the topic of 'Easement'.

- In order for the students to resolve the issue on 'Easements', they need to direct themselves to the second pit stop. The second instruction will require the students to use AR mobile platform (namely 'Layar') by scanning the poster on 'Easement'. Once they have viewed the two-dimensional videos that appeared on their mobile phones, they will be able to advise the client and provide a summary of their understanding on the law pertaining to Easement.

RELATED LEARNING OUTCOMES

PO6 – Problem solving.

3. Case studies

CASE STUDY 10: Wiki as an Online Reflection Tool in Pre-service Teachers' Teaching Practicum

SUBJECT AREA

Self-reflection; Wiki

SCAN ME!

RESEARCHERS

Farrah Dina Yusop & Siti Mariam Muhammad Abdul Basar

Department of Curriculum and Instructional Technology, Faculty of Education, University of Malaya

ISSUE

- As pre-service teachers are undergoing practicum, they are required to write weekly progress, which will be shared with their course instructor. However, time constraint often limits the meetings between per-service teachers and their course instructor, in which feedback will be given based on their reflection.

INNOVATIVE APPROACH / INTERVENTION

- In this exploratory case study, wiki was utilized as a self-reflection tool and lesson plan repository for six pre-service teachers who were undergoing their teaching practicum assessment. Through Wiki, not only can they write their weekly progress but also interact with their peers and course instructor directly in Wiki. Course instructor too, can leave immediate feedback and monitor students' progress through Wiki without having to wait until the end of the practicum period.

3. Case studies

DESCRIPTION OF APPROACH

- Students were instructed to upload their daily lesson plans detailing the activities conducted with their students to the course wiki.
    - These included learning objectives, content to be delivered, methods of assessments, and teaching and learning materials such as videos, notes, and worksheets.
- They were also required to post their weekly self-reflections to the class wiki as a platform to share their thoughts and concerns, as well as to get support from supervisor and peers.
- Figure 1 displays a print screen of one of the students' self-reflection in wiki.

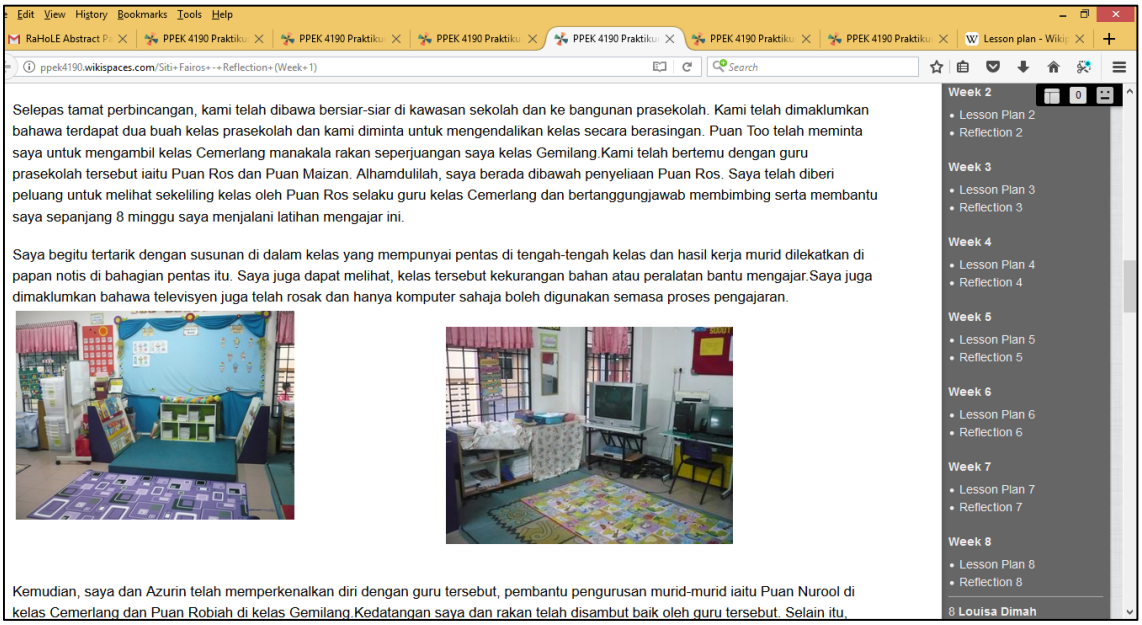


Figure 1: Student's self-reflection.

RELATED LEARNING OUTCOMES

PO5 – Communication; PO7 – Information management.

3. Case studies

CASE STUDY 11: Authentic Service-learning as a means to nurture civic-minded professionals

SUBJECT AREA

Instructional design

SCAN ME!

RESEARCHERS

Farrah Dina Yusop

Department of Curriculum and Instructional Technology, Faculty of Education, University of Malaya

ISSUE

- Service-learning has been highlighted as an effective teaching approach in educating students as agents of change (Furco & Billig, 2002; Stein, Isaacs & Andrews, 2004). Hence, authentic service-learning approach should be practiced in university.

INNOVATIVE APPROACH / INTERVENTION

- This case study applied authentic service-learning approach embedded in a series of postgraduate instructional design and technology (IDT) course as part of the Master in Instructional Technology program at a Malaysian research intensive university.

3. Case studies

DESCRIPTION OF APPROACH

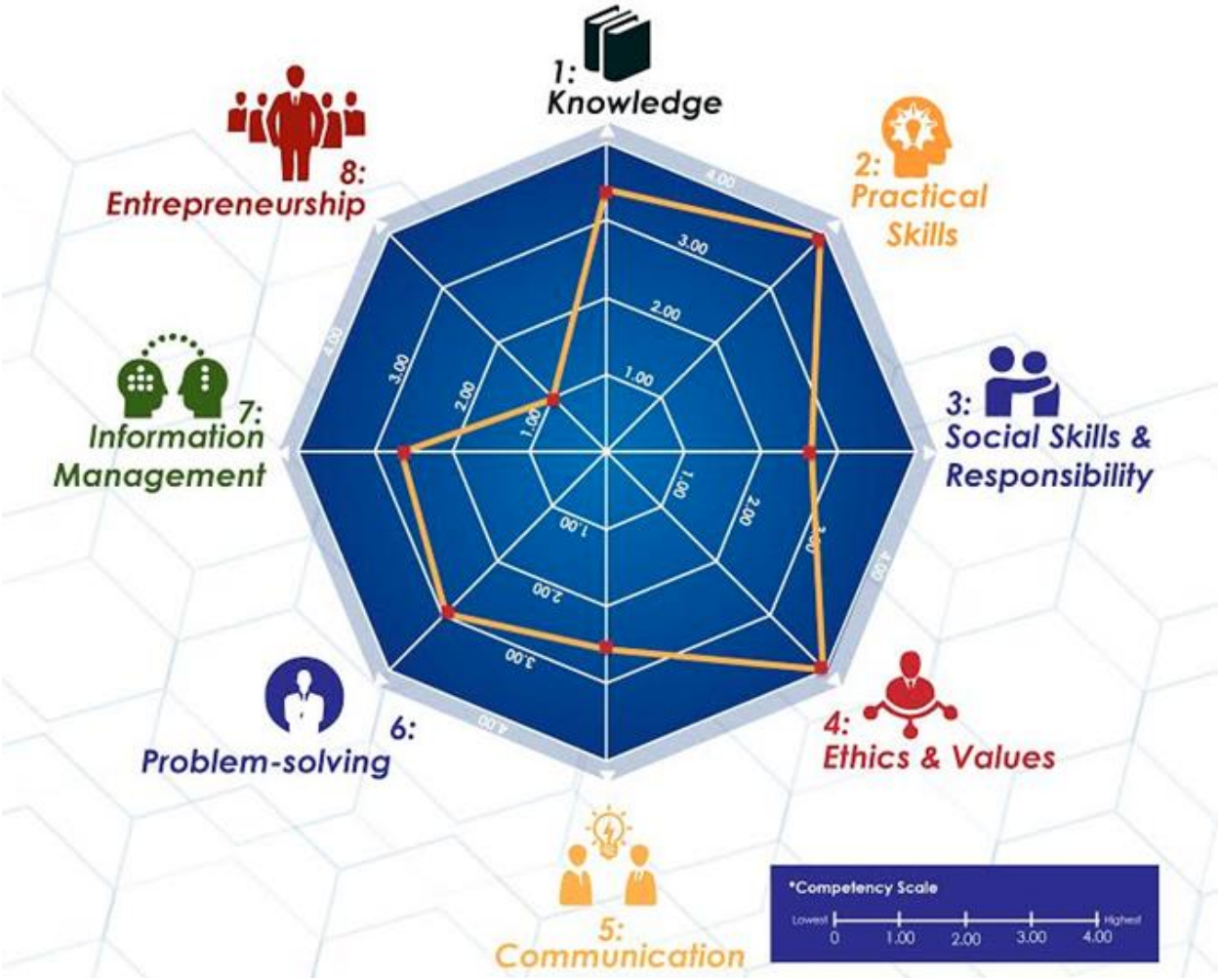
- Following the Civic-Minded Instructional Designers (CMID) framework (Yusop & Correia, 2012), students in this course were required to develop appropriate and relevant instructional solutions to real-life social problems experienced by socially and/or economically disadvantaged populations such as women, children, elderly and poor people based on their IDT knowledge and skills. Some examples of projects they worked on were:
    - educating teenagers on protecting themselves against becoming sexual victims;
    - developing an educational kit to educate highly-stressed teachers on stress management; and
    - creating electronic audio books for blind college students.

- At the end of the course, students were required to present their instructional solutions to a group of panel consisting of other students and members from industry.

RELATED LEARNING OUTCOMES

PO5 – Communication; PO6 – Problem solving.

4. Related Learning Outcomes (LOs)



http://jpt.mohe.gov.my/images/yootheme/icgpa.png

4. Related Learning Outcomes (LOs)

CASE NO.		PO1 Knowledge	PO2 Practical skills	PO3 Social skills and responsibility	PO4 Ethics & values	PO5 Communication	PO6 Problem-solving	PO7 Information management	PO8 Entrepreneurship
1.	QR Code Manual Laboratory (MLC)						/		
2.	MyFIGo – My fun interesting google classroom					/		/	
3.	The assessment of E-project-based learning in developing skill-based courses for massive open online course: "MOOC in MOOC" technique					/		/	
4.	Easy Marking with ForAllRubrics					/		/	
5.	Continuous Assessment through eLecture exercises and eQuizzes						/		
6.	Task completion using voicethread to enhance language skills in multimedia English classroom					/			
7.	Reflection in a blog: Scaffolding to formative and summative assessment					/			
8.	Formative to summative in one go: getting to the final destiny with EduTechnovation Day						/		
9.	Redesigning Formative Assessments for Land Law using Augmented Reality						/		
10.	Wiki as an Online Reflection Tool in Pre-service Teachers' Teaching Practicum					/		/	
11.	Authentic Service-learning as a means to nurture civic-minded professionals					/	/		

5. Advantages of technology-based assessments

1. TBA improves students' **digital literacy and engagement** especially through formative assessments and adaptive feedback.
2. Some TBA systems support adaptive assessments, which results in efficient **adaptive learning** environment for students.
3. Allows teachers to provide **real-time feedback** to students.
4. Personalized feedback can be delivered to individual student, which results in more **personalized learning**.
5. TBA system records students' assessment practices, thus allowing **learning analytics** to be conducted.
6. TBA improves **efficiency** in delivering, marking, managing assessment processes.
7. Gives better **flexibility** as assessments can be conducted at anytime and anywhere.
8. TBA system is **time saving** for lecturers as feedbacks can be automated.

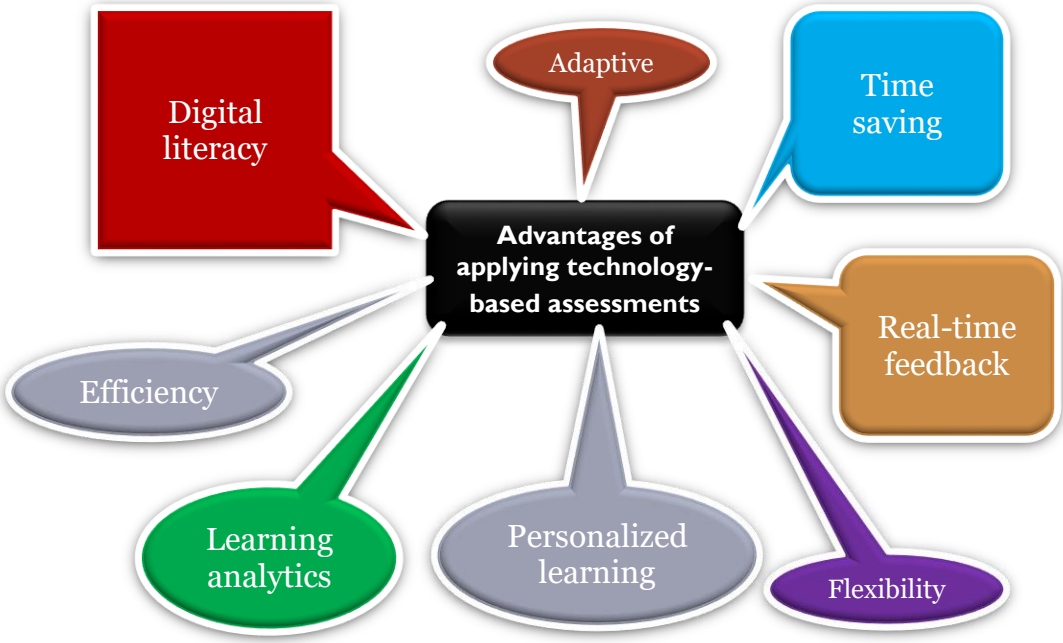
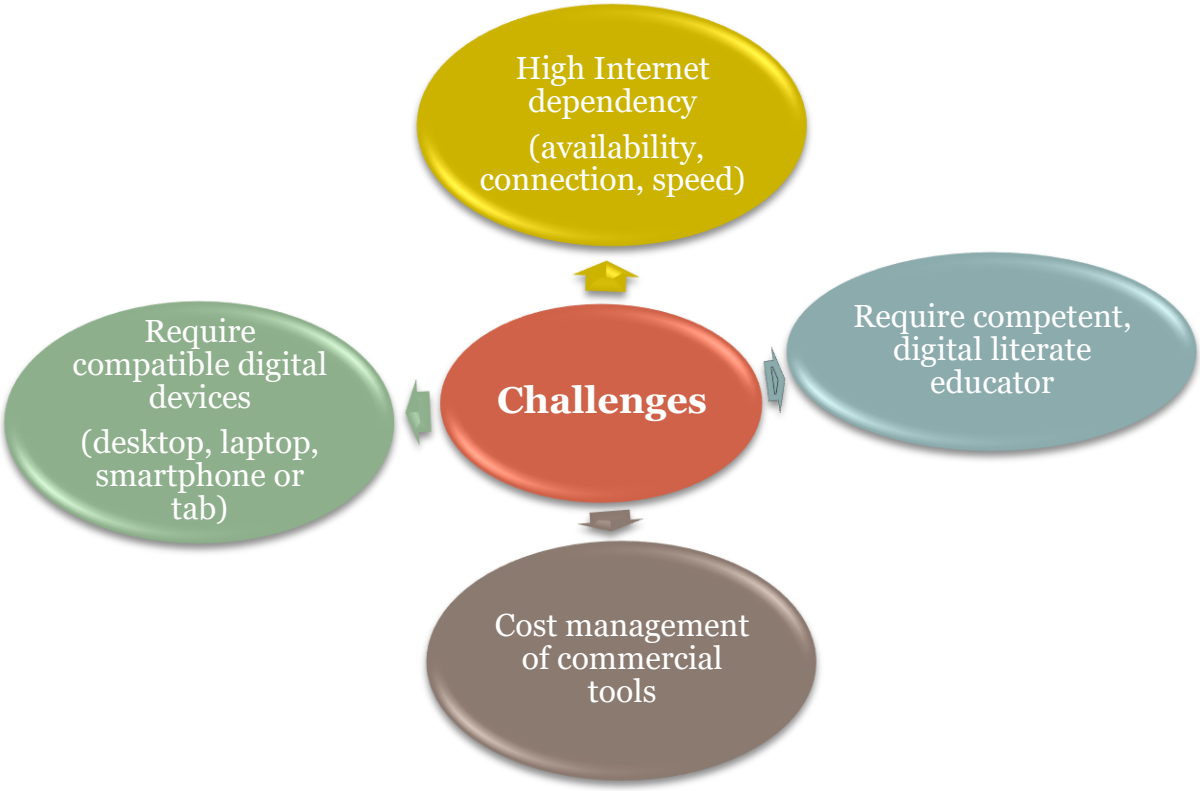


Figure 1: Advantages of applying Technology-Based Assessments

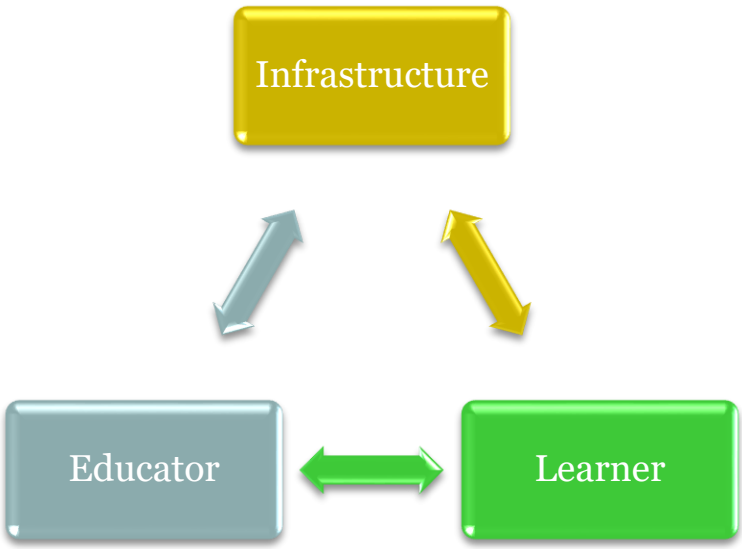
6. Limitations of technology-based assessments

1. Online TBA systems are highly dependent on internet availability, connection and speed.
2. TBA systems require basic digital literacies and competencies on the lecturers' part.
3. Commercial TBA systems will involve some costs to the institutions.
4. TBA systems need to be compatible with other digital devices used by lecturers and students including desktops, smartphones or tabs.



7. Things to consider when implementing technology-based assessments

- **Curriculum** should be aligned with relevant learning outcomes.
- **Activities** should vary, focusing both on lower and higher order thinking skills.
- **Communication** of digital assessment should be clear, concise and free from ambiguity.
- **Marking** schemes should be weighted more on the student's learning process and output, and less on the use of technology.
- **Feedback** should utilize appropriate technology to ensure that it is timely and constructive.
- **Accessibility** for special needs should be addressed.
- Educator's **digital literacy** is critical for success.



8. References

Ahmed Amin Mousa and M. Abd El-Salam, (2016). Employing QR Code as an Effective Educational Tool for Quick Access to Sources of Kindergarten Concepts. Vol 10, No. 7.

Basar, S.M.M.A. & Yusop, F.D. (2014). Using Wiki to teach part-time adult learners in a blended learning environment. Malaysian Online Journal of Educational Technology, 2(2), 53-68.

Furco, A., & Billig, S. (2002). Service-learning: the essence of the pedagogy. Charlotte, NC: Information Age Publishing.

Ghizlene Soulimane, Belkacem Kouninef, Mohamed Senouci, et all, (2016) International Journal of Technology Diffusion, Vol 7, Issues 4.

Gurhan Durak, E.Emre Ozkeskin, Murat Ataizi (2016) QR Codes in education and communication. Turkish online journal of Distance Education, Vol 17 Issues 2.

Kai-Yi chin, Z-W.Hong and Y-L hen,(2015). Impact on Student Motivation by Using a QR-Based U-Learning Material Production System to Create Authentic Learning Experiences. IEEE Transaction on learning technology, Vol 8 no 4.

Ministry of Education Malaysia (2015). Malaysia Education Blueprint 2015-2025.

Pearson Education. (2017). Technology-Based Assessments. Retrieved from https://www.pearsonassessments.com/largescaleassessment/types-of-assessments/technology-based-assessments.html

Phan, Will (2015). Head Back to School with new features in Google Classroom. Google for Education. Retrieved from http://googleforeducation.blogspot.com/

Stein, S. J., Isaacs, G., & Andrews, T. (2004). Incorporating authentic learning experiences within a university course. Studies in Higher Education, 29(2), 239-258.

Unit 9: ICT in Assessment. (n.d.). Retrieved November 20, 2017, from http://www.riemysore.ac.in/ict/unit__9__ict_in_assessment.html

Vygotsky, L. S. (1978). Mind in Society: The Development of higher Psychological Processes. Cambridge, Massachusetts, Harvard University Press.

Yusof, A. M. and K. A. Aziz (2010). Creative Industries in Education: The Creativity of Teaching Method Using Animation. ICERI 2010: International Conference of Education, Research and Innovation, Madrid, Spain, IATED.

Wayase (2015). QR Code: An innovative teaching tool. International Journal of innovative science,Engineering and Technology, Vol 2 Issues 7.

8. References

Yusop, F.D. & Basar, S.M.M.A. (2014). Effective integration of wiki for collaborative learning in higher education context. World Applied Sciences Journal, 30(14). Doi: http://dx.doi.org/10.5829/idosi.wasj.2014.30.icmrp.13

Yusop, F.D. and Correia, A-P. (2012). The civic-minded instructional designers framework: an alternative approach to contemporary instructional designers' education in higher education. British Journal of Educational Technology, 43(2), 180-190.

Yusop, F. D., & Correia, A.-P. (2013). The benefits and challenges of implementing service-learning in an advanced instructional design and technology curricula: implications for teaching professional courses. The New Educational Review, 32(2), 220-232.

Yusop, F.D., & Correia, A.-P. (2014). On being a civic-minded instructional designer: an ethnographic study of an instructional design experience. British Journal of Educational Technology. DOI 10.1111/bjet.12112

9. Summary

Technological based assessment is incorporating the electronic systems and software in formal education. It is used to assess and evaluate the progress of student. This assessment provides opportunity for the young people to take on new participatory and collaborative roles in learning online and outside the classroom.

However, there are several challenges in implementing technology assessment which include internet access, competency of the educator, cost management and device compatibility.

The following are several components needed to be considered to overcome these challenges:

- It is important for the top management to provide support in terms of providing facilities for both the student and instructor.
- Workshop and training are required to ensure the instructor competence in dealing with digital technology and devices.
- Even though digital technology is used in daily life, students may have difficulty in relating technology with learning and critical thinking. Thus, instructor should demonstrate and guide students to adapt technology with learning.