



# Alternative Assessment & Portfolio



Assoc. Prof Ts. Dr. Syamsul Nor Azlan bin Mohamad  
Head of Assessment & Evaluation  
Curriculum Affairs Unit, Academic Affairs Division  
Universiti Teknologi MARA

Faculty of Education UiTM

# Alternative Assessment & Portfolio

## Profile

Holding a Phd in Education (Information Technology and Resource) and Master in Educational Technology. His areas of expertise in curriculum, e-Portfolio/alternative assessment, learning and predictive analysis. Now, he is a Head of Assessment and Evaluation in Universiti Teknologi MARA. He actively engaged with KPM, KPT, Apple.Inc, MDEC, IBM, HP, Dreamcatcher, public and private universities for research and consultation for digital maker talent and innovation initiatives.



Associate Professor Ts. Dr. Syamsul Nor Azlan Bin Mohamad  
Faculty of Education, UiTM Puncak Alam

Head of Assessment & Evaluation  
Curriculum Affairs Unit, Academic Affairs Division  
Universiti Teknologi MARA







# Future Skillsets and Disruptive Education



# FUTURE SKILLSETS

## Future Skillsets and Talents

Today, because of rapid **economic** and **social change**, schools have to **prepare students** for:

*“jobs that have not yet been created,  
technologies that have not yet been invented  
and  
problems that we don’t yet know will arise”*

(Andreas Schleicher - OECD Education  
Directorate: 2011)



# FUTURE SKILLSETS

## Future Skillsets

### 2022 Skills Outlook

1. Analytical Thinking and Innovation
2. Active Learning & Learning Strategies
3. Creativity, Originality & Initiative
4. Technology Design and Programming
5. Critical Thinking & Analysis
6. Complex Problem-Solving
7. Leadership & Social Influence
8. Emotional Intelligence
9. Reasoning, Problem Solving & Ideation
10. System Analysis and Evaluation

Source: Future of Job Report 2018, World Economic Forum (WEF)





# EDUCATION LANDSCAPE

## Education Landscape Leading to...

<b>Volatility</b>	Fast, Unpredictable change without clear patterns or trends
<b>Uncertainty</b>	Frequent disruptive changes where the past is not very good predictor of the future
<b>Complexity</b>	Multiple, complex, intertwined technological, societal, geo-political and ecological evolutions
<b>Ambiguity</b>	Little clarity on what is real or true and difficult to predict the impact of action or initiatives



# DISRUPTIVE EDUCATION



**Generation Gap**  
**Personalisation**  
**Badges & Credential**  
**Bring Your Own Device (BYOD)**  
**Social Media Content Sharing**



# DISRUPTIVE PEDAGOGY

- Learner behaviors and experiences
- Voluntary activity participation
- Higher order thinking and negotiation
- Sociability
- Learning enjoyment
- Learning context





# 21st CENTURY EDUCATION



Technology allows for access to information, constant **social interaction**, and **easily created and shared digital content**. In this setting, educators can leverage technology to create an **engaging and personalized** environment to meet the emerging educational needs of this generation. The opportunities afforded by technology should be used to re-imagine 21st-century education, focusing on **preparing students to be learners for life**.

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**FORGING AHEAD WITH  
FORWARD THINKING  
ASSESSMENT**



# FORWARD THINKING ASSESSMENT

Reorientate assessment beyond the standardized test and examinations and establish evidence based learning. The call for intuitive technology and adaptive approach measuring learning outcome

## Forward Thinking Principles

- Evidence-based learning
- Data Driven Learning & Assessment
- Learning Analytics
- Learning Experience
- Integrative & Collaborative

<https://youtu.be/IDiAo5vuyfk>



# FORWARD THINKING ASSESSMENT

## HOW?

- Clarity of Purpose
- Create Positive Culture
- People-Centered Principles
- Emerging Technologies and ecosystem





# FORWARD THINKING ASSESSMENT

## Interrelated Benefit of Forward Thinking Assessment

- Learner-centered approach
- Contemplative approach
- Self Inquiry and regulatory
- Flexible, agile and dynamic
- Life widen and lifelong learning



# FORWARD THINKING ASSESSMENT

complete person  
who have  
**intellectual,  
psychical,  
emotional and  
spiritual**

an individual who  
demonstrate  
**holistic,  
entrepreneurial  
and balance  
graduate**

Set of  
**predetermine  
standard** in  
defining scope  
and skills

**Graduate  
Profiling for  
employability**

**“Forward thinking assessment is only about analyzing, designing, executing. The ultimate aim is to measure the quality of the whole system in assessment and evaluation”.**



# FORWARD THINKING ASSESSMENT

## Immersive & Active Learning Experiences

- Values of assessment
- Use variety of assessment
- Use contextual assessment
- Personalize learning
- Resource are design to support student learning

**INPUT**

## Quality of Assessment

- Teaching provides effective stimulation and challenge and encourages students to engage
- Designing effective and efficient feedback on instruction design
- Effective assessment to support student development

**PROCESS**

## Student Gains & Learning Outcome

- Direct and indirect measurement
- Performance Indicator
- Intervention and attainment

**OUTPUT**

# DEFINITION & DIFFERENTIATION OF ASSESSMENT

	<b>Assessment</b>	<b>Evaluation</b>	<b>Testing</b>	<b>Measurement</b>
Process	Evidence of the student achievement	Series of steps	Instrument or systematic procedures	Uses variety of instruments
Role	Gathering and organizing data	Establishing outcome(s), delivery and assessment tasks	Measuring behaviour	Obtaining numerical description of the degree of individual possessess
Tool	Validity, reliability, fairness and consistency	Using measurement gathered in assessment	Measure skills, ability and knowledge	Standard measurement
Concern	Validity, difficulty, discriminability	Criterion/Norm/Curve	Validity, difficulty, discriminability	Intervention



# THE STATEMENT OF ASSESSMENT

- **Shifting form “teaching” to “learning**
- **Confusion** of terms and conditions
  - **Evaluation**
  - **Assessment**
    - Formative and Summative (**interconnected** and seldom stand alone in construction and effect)
    - Formative (informal, interactive and timely feedback)
    - Formative assessment has the **greatest impact** on learning and achievement



# VALUES IN ASSESSMENT

- Teachers value and **believe in students**
- **Sharing learning goals** with the students
- Involving students in **self-assessment**
- Providing **feedback** that helps students recognize their next step and how to take them
- Being confident that every **student can improve**
- Providing students with examples of what we expect from them.





# THE NATURE OF ASSESSMENT

<b>PASSIVE ASSESSMENT</b>	<b>ACTIVE ASSESSMENT</b>
<ul style="list-style-type: none"><li>• Examination</li><li>• Short / Medium / Long Essays</li><li>• Fill in the blanks</li><li>• Matches</li><li>• MCQ</li></ul>	<ul style="list-style-type: none"><li>• Portfolio</li><li>• Presentation</li><li>• Direct Observation</li><li>• Project-based</li><li>• Problem-based</li><li>• Case Study/Analysis</li></ul>

# CONCEPT OF ASSESSMENT

01

## Assessment for Learning

Diagnostic & Formative

## Assessment as learning

Feedback

02

03

## Assessment of Learning

Summative



# HIGH IMPACT EDUCATIONAL PRACTICES (HIEPS)

Alternative/HIEPs	1st Year	Service/ CBL	Intensive Academic Writing	Collaborative Assignment and Project	Undergradua te Research	Capstone	Diversity and Global Learning
Case Study/ Analysis	X		X	X	X		X
Problem/Project- based Learning		X		X	X	X	X
Field Experience	X	X		X	X	X	X
Portfolio	X	X	X	X	X	X	X
Simulation	X	X		X		X	
Presentation/ Written			X	X	X		X
Role Play		X		X			X

# EVIDENCE-BASED LEARNING

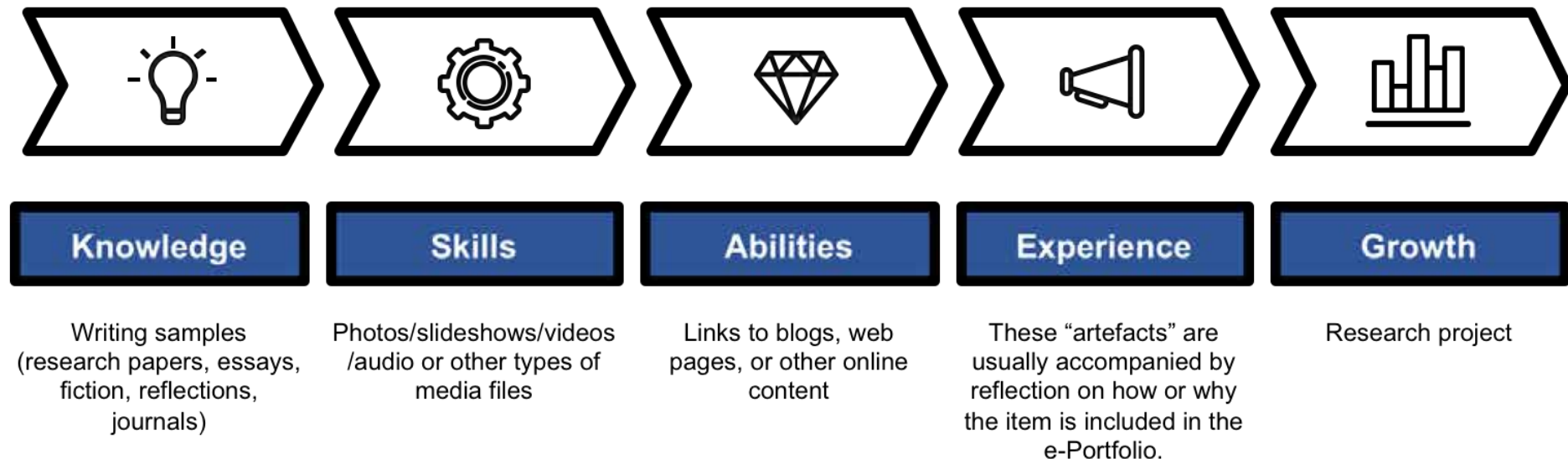


# EVIDENCE-BASED LEARNING

# E-PORTFOLIO

## Portfolio as Evidence based for Future Ready Graduate

An e-Portfolio (electronic portfolio) is a digital collection of work that documents and **showcases knowledge, skills, and abilities, and their growth over time**. An e-Portfolio may include such things as:





# E-PORTFOLIO

## Portfolio

“ Portfolio Should Provide **Additional or Supportive Information/Data** of our Graduates to **Industries** ”



“Hire me” concept vs  
“I have a job, do apply”



Industry-driven



complimentary to  
SPM/STPM/HLI



Empowered by  
students, backed by  
HEIs



One stop Portal  
of e-Portfolios



Quantitative vs  
Qualitative (e-Portfolio)



Visibility of Malaysian  
graduates

to see the person,  
not just the grades.

Industries

# WHY E-PORTFOLIO

**Visibility**  
**Industry Driven**  
**Marketability**  
**Big Data**  
**Learning Analytics**



# E-PORTFOLIO PEDAGOGICAL FRAMEWORK

## Portfolio Pedagogical Framework

as an evidence of

### Documentation

The emphasis on assessment technologies is spurring the development of new online and desktop systems for collecting, analysing, and reporting information about students' achievement. Electronic portfolios have become a choice for tool of assessment.

### Achievement

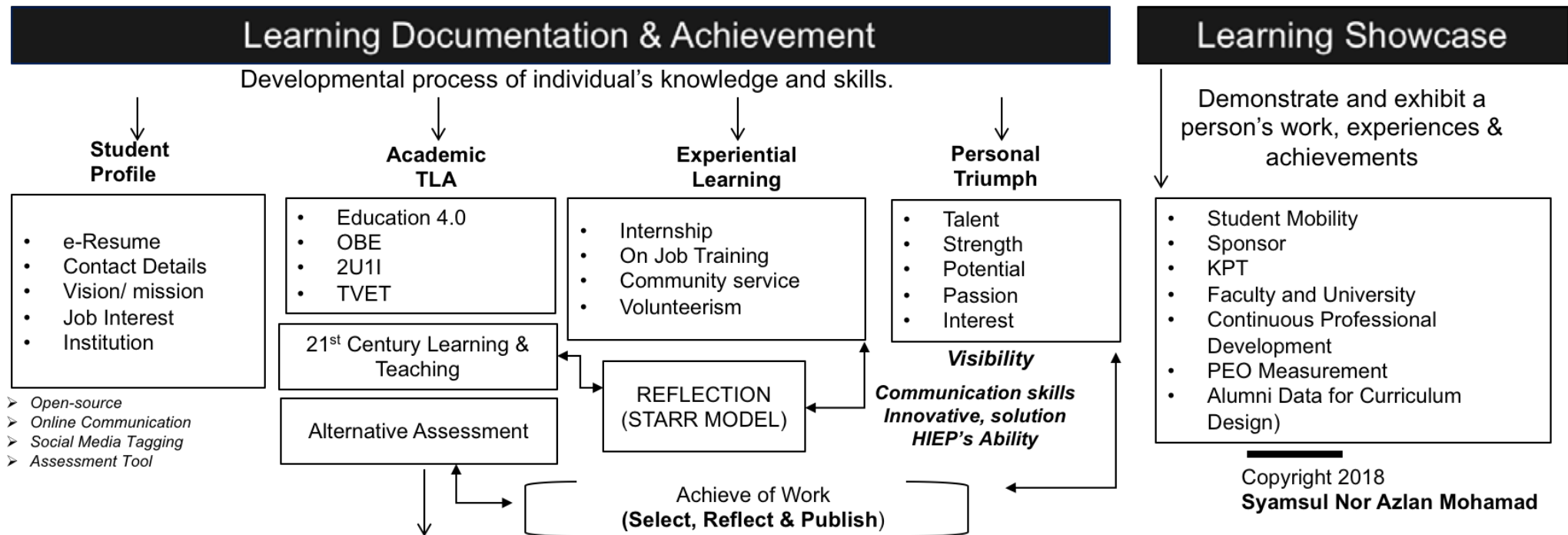
Course Portfolio – knowledge, skills, and abilities achieved from an academic course where the portfolio is developed.

Integrated Portfolio - knowledge, skills, and abilities achieved over the whole duration of study, including academic and non-academic experience.



# E-PORTFOLIO PEDAGOGICAL FRAMEWORK

## Portfolio Pedagogical Framework



# E-PORTFOLIO ATTRIBUTES

## E-Portfolio Attributes (MQA1.0)

Based on the mapping of PLO and 10 Skills of 2020 from WEF 2016)

PLO (MQA1.0)	1	2	3	4	5	6	7	8
Complex problem solving	x	x				x		
Creativity						x		x
Critical thinking						x		
People's management			x					x
Coordinating with others					x			
Emotional intelligence (EQ)			x	x				
Judgement and decision making				x	x	x		
Service orientation			x					
Negotiation					x			
Cognitive flexibility	x					x		

# E-PORTFOLIO ATTRIBUTES

## E-Portfolio Attributes (MQA2.0)

Based on the mapping of PLO and 10 Skills of 2020 from WEF 2016)

PLO (MQA2.0)	1	2	3	4	5	6	7	8	9	10	11
Complex problem solving	x	x									
Creativity		x									
Critical thinking		x									
People's management				x							
Coordinating with others					x						
Emotional intelligence (EQ)				x					x		
Judgement and decision making		x			x						x
Service orientation					x					x	
Negotiation					x						
Cognitive flexibility	x	x									



# E-PORTFOLIO BASED ASSESSMENT

Portfolio is a digital collection of work that documents and showcases knowledge, skills, and abilities, and student's growth over time. These learning experience can be documented and showcased as early as first year at university. An e-Portfolio can be created on these two types

- Course Portfolio
- Integrated Portfolio
- Professional Portfolio



## Sample of Electronic Portfolio

<https://mrsnazlan.wixsite.com/snazlanportfolio>

# E-PORTFOLIO BASED ASSESSMENT



<https://mrsnazlan.wixsite.com/pencil2pixel>

# E-PORTFOLIO BASED ASSESSMENT

The screenshot shows a mobile browser view of a WordPress blog. The browser's address bar displays 'snazlan.wordpress.com'. The page header features a profile picture of a man with glasses and a blue geometric background. Text in the header includes 'twitter: @snazlan', 'snazlan.wordpress.com', and '#snazlan'. A black box with the text 'Personal Blog' is overlaid on the right side of the header. Below the header, the page title is 'snazlan's blog | creativecapture'. The main content area shows a post titled 'WEB 2.0 FOR EDUCATION USING SOCIAL MEDIA FOR TEACHING AND LEARNING' dated 'JULY 17, 2018'. A calendar for 'DECEMBER 2019' is visible on the right side of the page.

6:40 PM Sun 1 Dec

Test and Exam... x Google Sites x https://classroo x https://panel.gi x Gmail x snazlan's blog | x

snazlan.wordpress.com

Personal Blog

twitter: @snazlan  
snazlan.wordpress.com  
#snazlan

snazlan's blog | creativecapture

art | edutech | photography | scientist

ACADEMIC

MYPHD

INSTAGRAM

There was an error retrieving images from Instagram. An attempt will be remade in a few minutes.

WEB 2.0 FOR EDUCATION

USING SOCIAL MEDIA FOR TEACHING AND LEARNING

JULY 17, 2018 LEAVE A COMMENT

Social media tools can complement effective teaching strategies that encourage students to participate in learning and communication with

DECEMBER 2019

M	T	W	T	F	S	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

<https://snazlan.wordpress.com/>



# E-PORTFOLIO BASED ASSESSMENT

ASSESSMENT, EVALUATION, MEASUREMENT &  
TESTING IN EDUCATION

## Course Portfolio

Innovative Assessment is more interactive ways in measuring student knowledge, skills and abilities and has it potential to change how we measure learning and delivery. The participants will be expose with type of alternative assessment that constructively aligned with the learning outcome, delivery and activities.



<https://sites.google.com/view/assessmentforeducation>

# E-PORTFOLIO BASED ASSESSMENT

The screenshot displays a YouTube channel page for Prof Madya Ts Dr Syamsul Nor Azlan Mohamad. The channel name is prominently displayed at the top, along with a subscriber count of 171. The page is titled "Course Portfolio" in the upper right corner. The main content area shows a grid of video uploads, each with a thumbnail, title, and view count. The videos include:

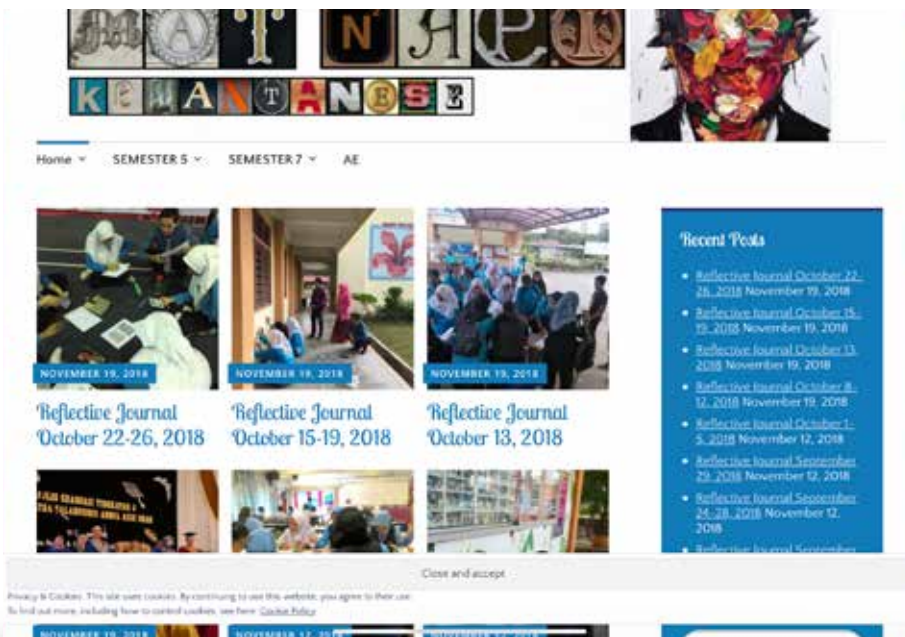
- Forward Thinking Assessment Framework (1 view, 8 minutes ago)
- Forward Thinking Assessment in Higher... (60 views, 1 day ago)
- Matrix-Method for Systematic Literature Review (21 views, 2 days ago)
- Internet Mediated Research (IMR) in the Era of Pandemic (68 views, 2 days ago)
- Scope of Inquiry-based Research (48 views, 3 days ago)
- Review Your Framework in Research (44 views, 4 days ago)
- Sesi HEA "Anda Tanya Kami Jawab" (68 views, 1 week ago)
- Google Hangout Meet - Part 1 Set New Meeting (96 views, 1 month ago)
- iPad Apps Beyond Capability (7 views, 1 month ago)
- Google Classroom - Part 4 Grading (74 views, 1 month ago)

The left sidebar shows navigation options like Home, Trending, Subscriptions, Library, History, Your videos, Watch later, Liked videos, and Show more. The bottom of the page shows a Windows taskbar with various application icons.

<https://www.youtube.com/channel/UCxILVPxlxGw8jACHpCGX40A>

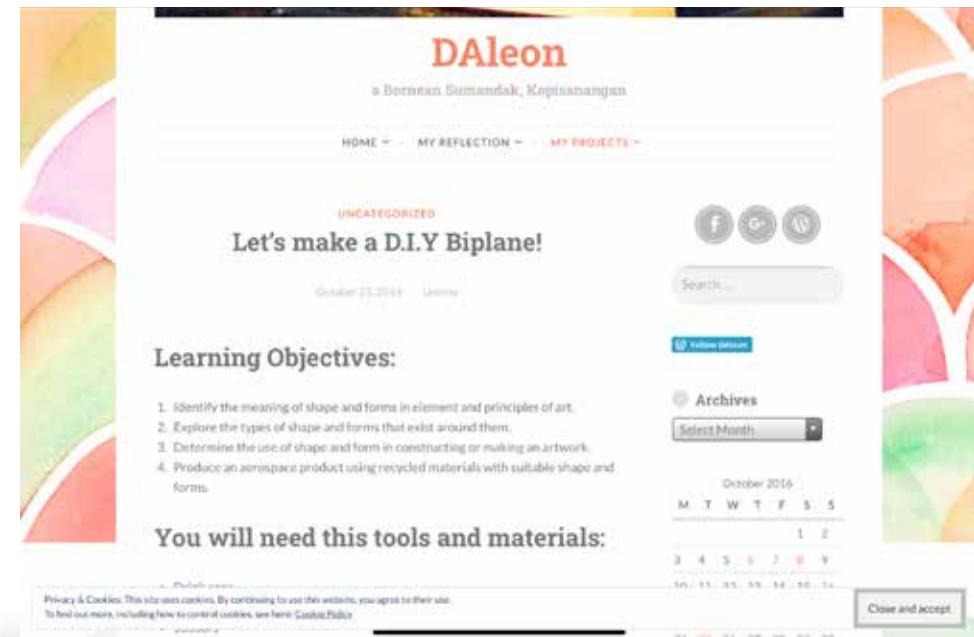
# E-PORTFOLIO BASED ASSESSMENT

## SCREENSHOT OF PORTFOLIO



School Practicum Training - Use E-Portfolio to replace traditional logbook

<https://muhamadhanafiblog.wordpress.com>



Student Individual Portfolio - Course & Program Based Portfolio

<https://daleonsite.wordpress.com>



# E-PORTFOLIO BASED ASSESSMENT

## EVIDENCE-BASED LEARNING STUDENTS PORTFOLIO FACULTY OF EDUCATION

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## PROJECT-BASED LEARNING E-PORTFOLIO ASSESSMENT (PEGASUS)

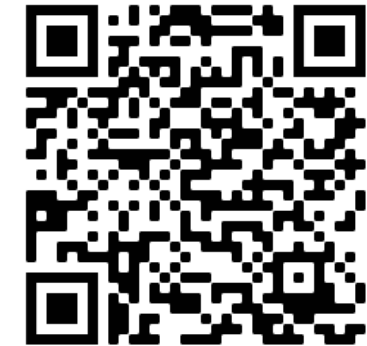


The objective of innovation has always been, up to now, to verify whether Project-based Learning E-Portfolio Assessment can be regarded as a valuable tool to encourage students to reconsider and narrative their learning experience by engaging that reiterative process of looking back to previous performance and looking forward to goals and by reflecting of their learning.

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Sept 2016 - Jan 2017



Mac 2017 - Jul 2017



Sept 2018 - Jan 2019



Mac 2019 - Jul 2019

# TIPS DESIGNING ASSESSMENT INSTRUCTION

## Example: Designing Assessment Instruction

<b>Situation</b>	<ul style="list-style-type: none"><li>▪ Describe the general context of the activity</li><li>▪ Describe the specific situation that you were in</li></ul>
<b>Tasks</b>	<ul style="list-style-type: none"><li>▪ Identify the task(s) that students needed to accomplish</li></ul>
<b>Action/ Activity</b>	<ul style="list-style-type: none"><li>▪ Explain, what students should do?</li><li>▪ How students will do it?</li><li>▪ Why?</li><li>▪ Duration / Time / Length / SLT / SPT</li></ul>
<b>Result</b>	<ul style="list-style-type: none"><li>▪ What was the outcome of this actions?</li><li>▪ What did you achieve?</li><li>▪ What did you learn?</li></ul>
<b>Rubric</b>	What is your analytical & holistic rubric
<b>Reflection</b>	What is your diagnostic result

# TIPS DESIGNING ASSESSMENT INSTRUCTION

Week	CLO	Context	Delivery Methods	Instructional Activities	Assessment
WEEK 5	Design and create an educational application using the authoring program in a field of interest/art education	<b>Structure Design Development/ requirements development process</b> a) Storyline b) Gant Chart c) Flowchart	<b>A. Synchronous &amp; Asynchronous Mode.</b> <b>Online Meeting using Cisco Webex</b> a) Reflection b) Present Slide c) Record Conversation d) Estimated 1 hrs session  <b>B. Asynchronous Mode</b> <b>Telegram</b> ( <i>small bit of video size and instruction</i> ) <b>Youtube</b> Channel ( <i>video with estimation of time 3 minutes per video</i> )  <b>C. Workspace</b> a) Padlet & Google Site	<b>Task:</b> Before develop interactive multimedia package. The student need to have the ability to plan with clear storyline, gant chart and flow chart.  <b>Action / Activity:</b> a) Create storyline. b) Prepare your gant chart with a 10 week plan in completing your multimedia project. c) Design your flowchart. Student is able to choose 1) linear or 2) non-linear in preparing the flowchart. Upload using PDF format. d) Upload case analysis via Padlet according to the specific shelf. e) Date of submission 15 April 2020	<b>Result and Reflection</b> <b>Student need to submit the on going process by completing:</b> a) Storyline b) Gant Chart c) Flow Chart  <b>Note:</b> <i>Individual Portfolio (Update activities and progress through Portfolio as Evidence-based Learning)</i>



# ASSESSMENT & LEARNING ANALYTICS

LEARNING ANALYTICS TECHNIQUES	DATA MEASURES
<p><b>Qualitative Analysis</b></p> <ul style="list-style-type: none"> <li>a. Discourse Analysis</li> <li>b. Conversation Analysis</li> <li>c. Reflection</li> </ul>	<p><b>Quality of Reflection</b></p> <ul style="list-style-type: none"> <li>a. Rationale</li> <li>b. Multiple Perspective</li> <li>c. Supporting theories or frameworks</li> <li>d. Common patterns</li> <li>e. Repeating events</li> </ul>
<p><b>Social Network Analysis (</b></p> <ul style="list-style-type: none"> <li>a. Interaction between peer &amp; facilitator</li> <li>b. Interaction among students</li> <li>c. Listen, Question and Negotiate</li> </ul>	<p><b>Interaction measures</b></p> <ul style="list-style-type: none"> <li>a. Frequency of Posts</li> <li>b. Length of Posts</li> <li>c. Themes and Issues</li> </ul>
<p><b>Quantitative</b></p> <ul style="list-style-type: none"> <li>a. Capabilities using technological tools</li> <li>b. Find a solution using technologies</li> </ul>	<p><b>Engagement Measures</b></p> <ul style="list-style-type: none"> <li>a. Adaptability</li> <li>b. Flexibility</li> <li>c. Digital Skills (Literacy and Ethics)</li> </ul>

# TECHNOLOGY TOOLS IN ASSESSMENT

## **Portfolio Based Assessment**

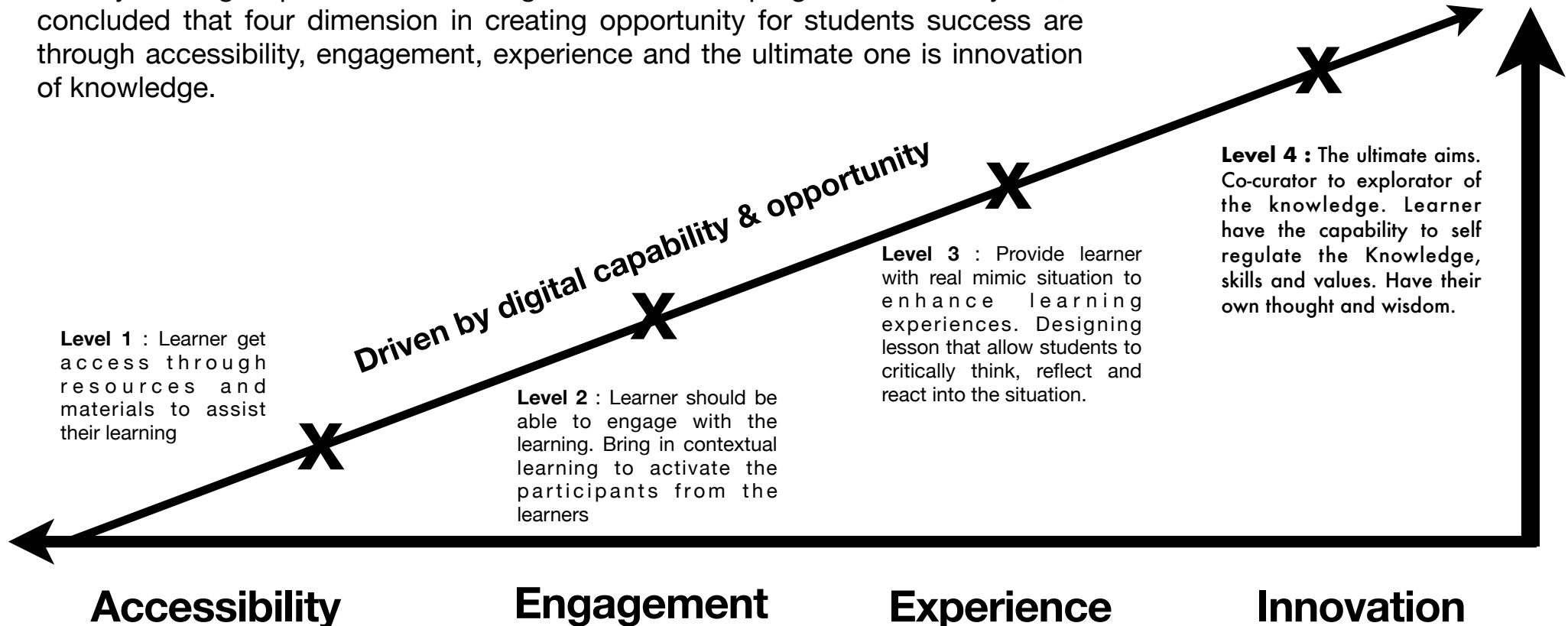
Google Site, Wix,  
Weebly, Pathbrite,  
Wordpress, Youtube,  
Wiki, Linkedin,  
iTunes U, Social  
Networking,  
Portfolium, Padlet, etc



# TRANSFORMATIVE ASSESSMENT & DELIVERY

## CREATING OPPORTUNITY OF SUCCESS FROM ACCESSIBILITY TO INNOVATION

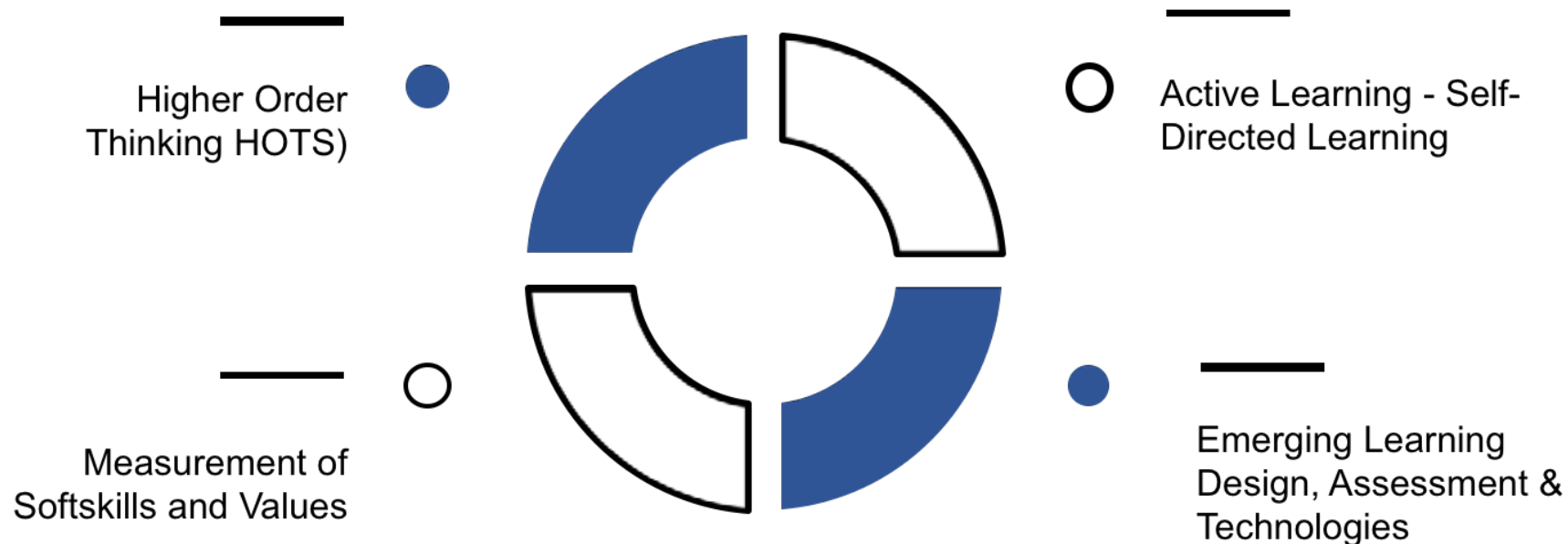
For learners, educators, and researchers, assessment as learning analytics is already starting to provide crucial insights into student progress. After 12 years, I concluded that four dimension in creating opportunity for students success are through accessibility, engagement, experience and the ultimate one is innovation of knowledge.





# ASSESSING LEARNER'S PERFORMANCE

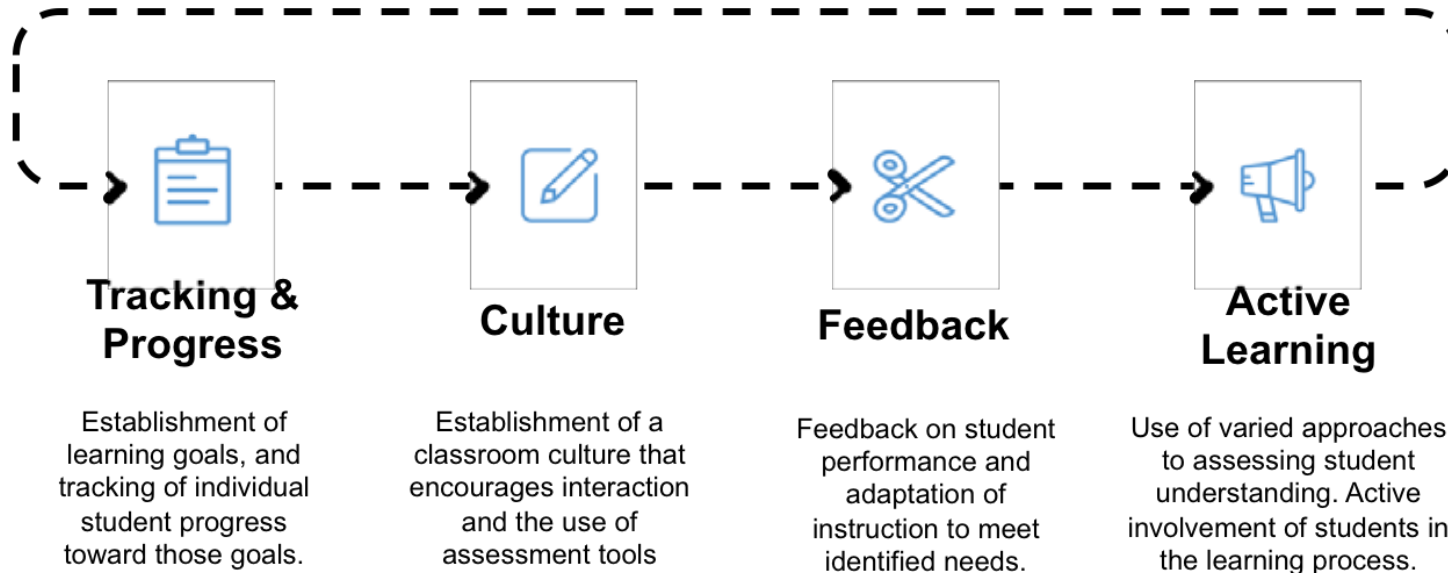
## E-Portfolio as Measurement Mechanisms and Approaches in Assessing Learner's Performance and Growth of Knowledge, Skills and Abilities



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# THE BENEFITS

## Portfolio Assessment Benefits



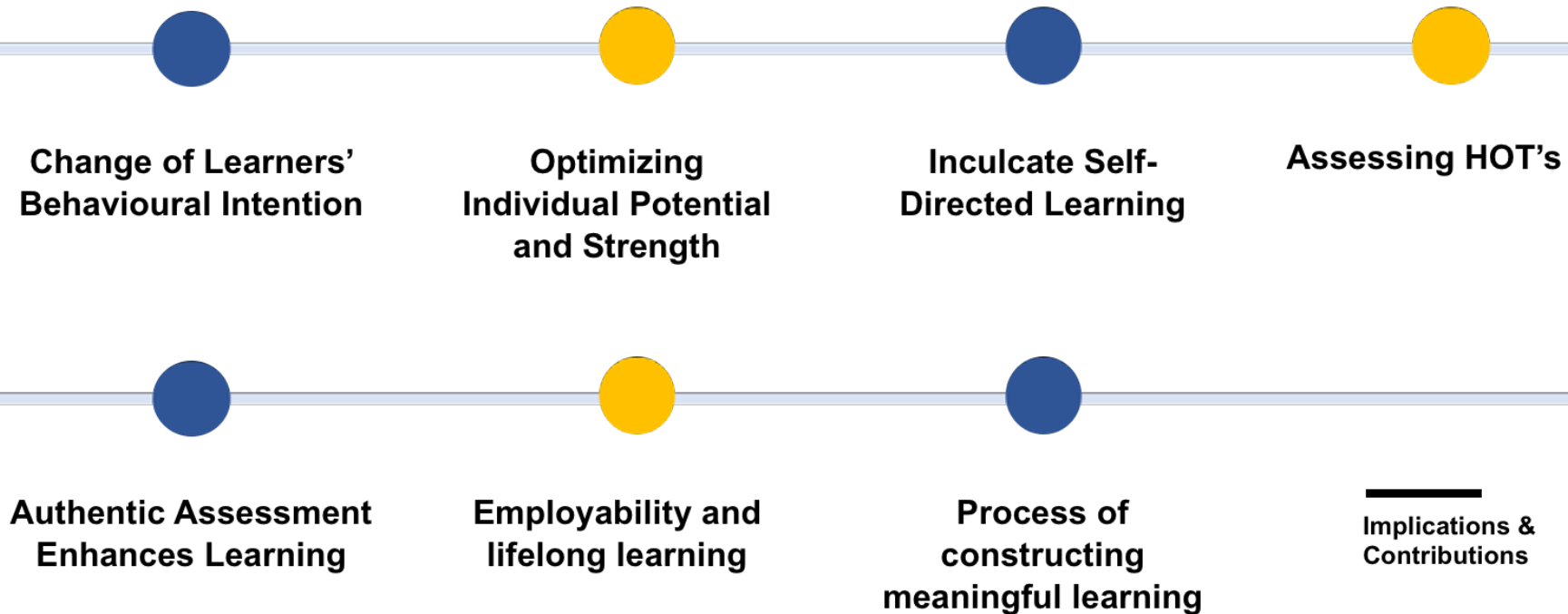
### 7 Interrelated Benefits of Alternative Assessment

- Promote active debate on the nature of teaching, learning and assessment
- Strengthen professionalism
- Strengthen learner-centred approaches
- Diversify and deepen approaches to programme evaluation for accountability
- Balance structure and flexibility
- Devote the necessary resources – people, time and money
- Strengthen the knowledge-base

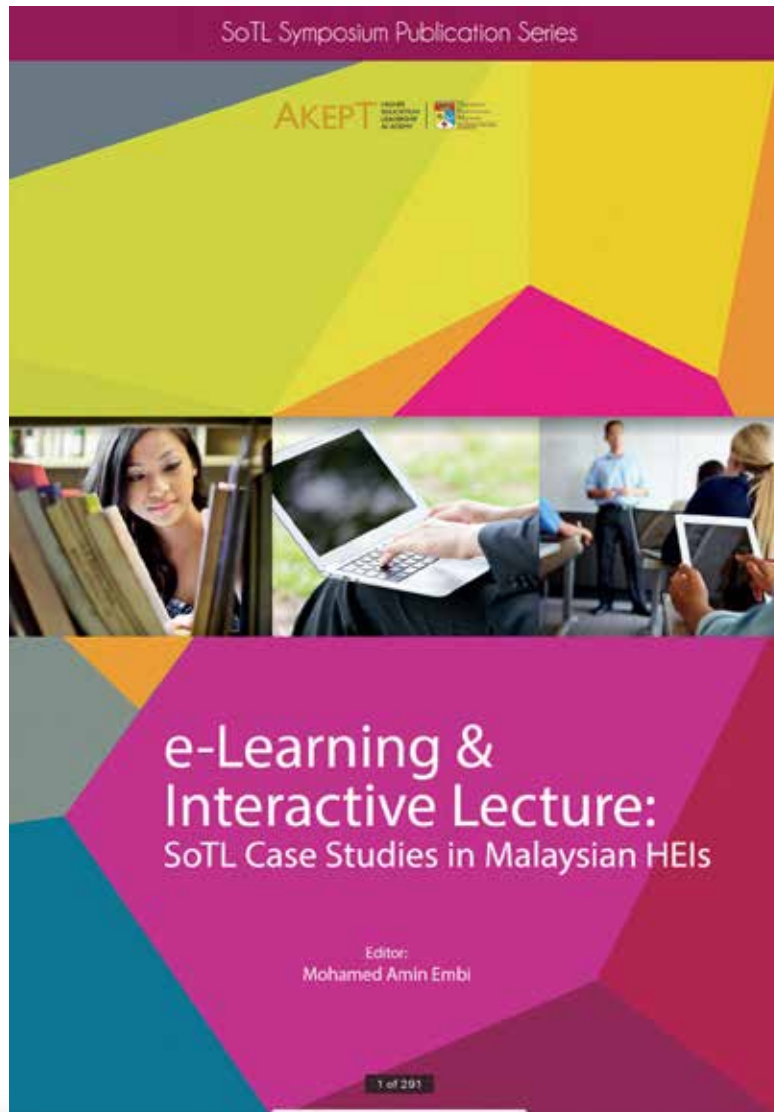
Copyright 2018  
Syamsul Nor Azlan Mohamad

# THE POTENTIAL

## The Potential of Portfolio in Learning and Assessment



# REFERENCES



Chapter

## 3

### Learners' Readiness to Adopt e-Portfolio: A Preliminary Study

Syamsul Nor Azlan Mohamad, Mohamed Amin Embi & Norazah Mohd Nordin  
Universiti Kebangsaan Malaysia

#### Introduction

Since 1990s, the use of Electronic portfolio or known as e-Portfolio is one of the new ranges of educational instrument that has been gradually implemented in a few higher education institutions for curriculum, teaching content and assessment. Two reasons for this growth can be attributed to the rise of the constructivist approach to education which emphasizes learning by experience and a rise in the wide spread use of computer technology in education.

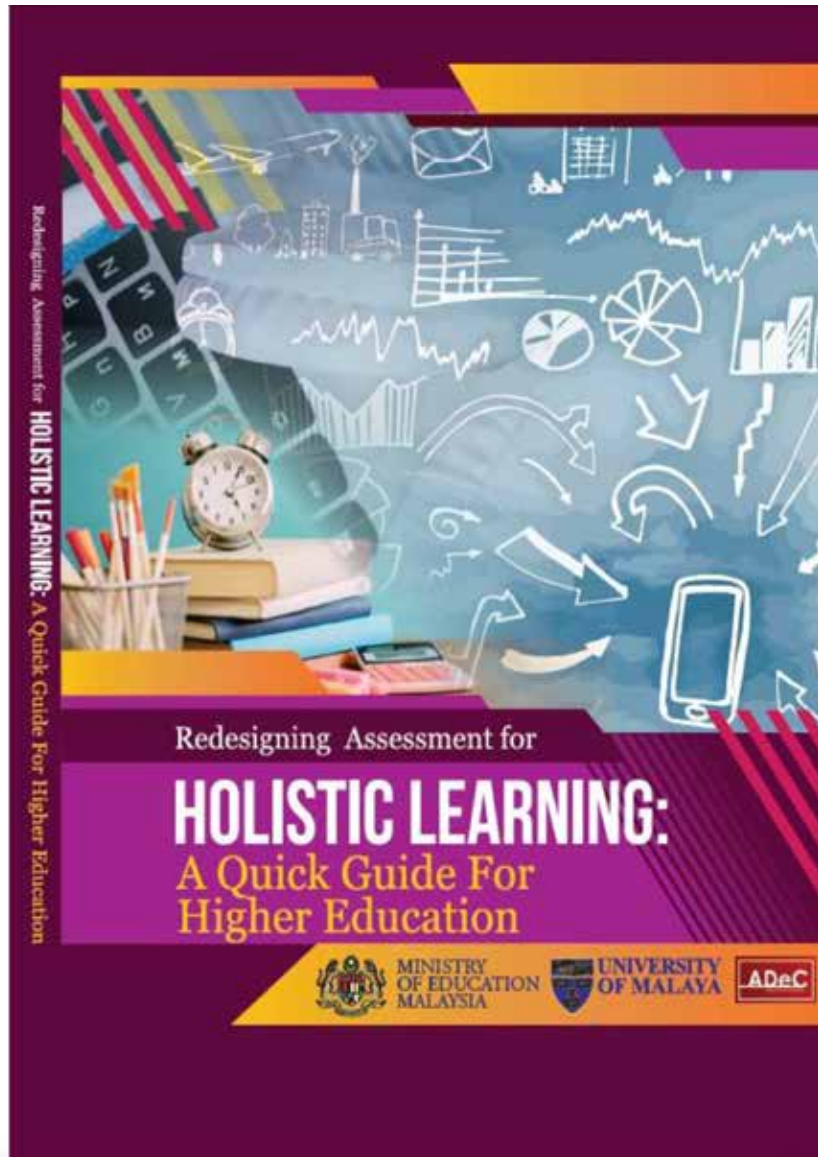
In higher education institutions, students are creating portfolios for the purpose of supporting their learning needs for assessment (Michelson & Mandell, 2004; Baume & Yorke, 2002; De Rijdt, Tiquet, Dachy, & Devolder, 2006; Klenowski, Askew & Carnell, 2006; Seldin, 1997; Wolf, 1991; Wright, Knight & Pomerleau, 1999). This argument was supported by Love and Cooper (2004) who cited e-Portfolio as having the most significant effect on education as it involves techniques in instruction and evaluation (Lopez-Fernandez & Rodriguez-Illera, 2009). Instead of paper-based teaching and learning, most of the higher institutions here have been using e-learning as a medium of teaching learning due to the potential and the benefit of technologies.

Teaching and learning applications in ICT have a very high potential to change the educational process to support higher order thinking skills among learners. However, the evidence is still limited in data. The role and potential of ICT in bringing major changes in the education system cannot be questioned. The increase in number,

33 (1 of 10)



# REFERENCES



Madam 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 the 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 specialisation area is in educational measurement and evaluation. She actively involves in professional development programmes for USM academic staff. Her research focus includes development of assessment framework and assessment tools for school and university level.

## Chapter 5: Portfolio-based Assessments



Dr. Zahiruddin Fitri Abu Hassan, Faculty of Built Environment, University of Malaya (zahiruddin@um.edu.my). He is a Senior 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@iiu.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.



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 is 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.

# REFERENCES



## PENULIS

### KELOMPOK U2

1. PROF. MADYA DR. ASMATY AMAT (UMS) - KETUA
2. PROF. MADYA DR. MASHITOH YAACOB (UKM) - KETUA II
3. AISAH BINTI MAT DAN (UNISEL) - KETUA III
4. DR. NURUL FARHANAH MOHD NOORDIN (UTM)
5. DR. CHE RAZI JUSOH (UM)
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13. ZAMRE BINABU HASSAN (UM)
14. CHRISTOPHER GEORGE (SIDMA COLLEGE)
15. ILYAS BIN ABDULLAH (ITMS GLOBAL COLLEGE)

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#### Urusetia

Bahagian Pengurusan Pembangunan Akademik  
Jabatan Pendidikan Tinggi

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7. MOHAMMAD AZRI, (BINSULAIMAN (ALMACREST INTERNATIONAL COLLEGE)
8. KHAUSELYA A/P PADMANATHAN (KOLEJ ERICAN)



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*“If learning act as an exploration, then technologies equips the explorer for the journey of lifetime.” (Syamsul, 2018)*

Thank you

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