The use of e-portfolios for assessment of clinical practice competence & performance for radiography undergraduate students

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The University of Sharjah established at 1997, has 14 colleges and offers 86 programs at the bachelors, masters, doctoral and diplomas levels.
1. Study the ability of e-portfolio to: Teach reflection, analysis, and integrate learning across the clinical practice educational experience.

2. Integrate knowledge and experience and assist at the management of educational and clinical records.

3. Provide an online database to accessed by educators and learners anytime and anywhere to maintain accomplishments over time.

4. Prepare students for the professional career and enhance self-esteem and confidence.
As defined by Paulson & Paulson in 1991, a portfolio tells a story.

“A portfolio is the story of knowing. Knowing about things. . .

.Knowing oneself. . .Knowing an audience. . .

Portfolios are students’ own stories of what they know, why they believe they know it, and why others should be of the same opinion.

A portfolio is opinion backed by fact. . .Students prove what they know with samples of their work.”
<table>
<thead>
<tr>
<th>Portfolio Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Portfolio</td>
<td>It is a structured collection of teaching documentation with student samples.</td>
</tr>
<tr>
<td>Working Portfolio</td>
<td>Contains documents students are currently working on or have recently completed</td>
</tr>
<tr>
<td>Display Portfolio</td>
<td>Showcase of a students’ best work demonstrating the highest level of achievement.</td>
</tr>
<tr>
<td>Assessment Portfolio</td>
<td>Illustrates how a student has met specific standards and learning outcomes</td>
</tr>
</tbody>
</table>
This study approved by UoS ethical committee and it take place during the academic year (2015-2016 and 2016-2017).

Methodology

- **Phase one;** Need Assessment
- **Phase two;** Design and create the e-portfolio
- **Phase three;** Integrate the e-portfolio in Clinical practice courses.
We have 5 Clinical Practice Courses covering the following objectives/outcomes:

1- General Radiology; x-ray, fluoroscopy, Mammography, Dental, OT

2- Computed Tomography “CT scan”

3- MRI

4- Ultrasound

5- Nuclear Medicine

How?

- Daily attendance
- Log book
- Reflective journal
- Case Study
- Competency Evaluation
- Presentation
- Image evaluation
- OSCE
- Oral Exam
Our current portfolio

- Daily attendance
- Log book
- Reflective journal
- Case Study
- Competency Evaluation
- Presentation
- Image evaluation
- OSCE
- Oral Exam
Education Elements and Cycle

Theory → Labs → Training

Introduce “Topic or Concept”

Explore and research

Feedback

Practice “Apply”

Labs experiment & training
WHAT’S MISSING?

FEEDBACK
Why

- From 25 at 2010 to 130 at 2016
- From 5 to 25
- From Sharjah to RAK, Dubai, Dhaid
- 4 for 80 students
- Both imaging technology and educational technology
The benefits of feedback and reflection include:

- Increased student confidence, motivation and Self-esteem,
- Enhanced interpersonal skills and a sense of personal satisfaction,
- Achieve clinical practice objectives and outcomes.
The Heart and Soul of the Portfolio

*An electronic portfolio without Feedback and Reflection*

- is just a
  - Digital scrapbook
  - Fancy electronic resume
  - Multimedia Presentation
  - Personal web site
Phase two; Design and create the e-portfolio

Collect learning evidence

Create
Edit
Review

Ability, experience, activity

Assessment

Log book
Case studies
RJ
Evaluations
Presentation
Image
Evaluation

Competency evaluation
Achievement
Grading
Analysis

Feedback

Achievement
Discover issues
Create options and solution
Commit to Action

Share

Motivation
Improve experiences
Reduce risk
Increase knowledge
Phase two; Design and create the e-portfolio

- **E-attendance**
  - Geographical location and time (in and out)

- **Medical Images**
  - Radiology images in DICOM format

- **Feedback**
  - Reflection discussion
Value of Reflection: Reflective analysis improves everyone’s learning through promoting higher level thinking

Teach reflection, analysis, and Discussion
Writng skills
Transperency
Phase two; Design and create the e-portfolio

Ready made e-portfolio

- Can be used immediately;
- Minimum training required;
- Regular updates from the vendor.
- Budget concern

Tailored e-portfolio

- Features, and functionality are designed in accordance with the users' needs and goals;
- Updates and improvement does not depend on a vendor’s;
- There is an appropriate level of security;
- Dedicated technical support is available;

The unique functions such as;
- E-attendance through the google map geographical area
- Integration DICOM format images
A 45 years old man referred from outpatient clinic to MRI department with a request for MRI lumbar spine. He has complained of lower back pain with weak left EAL and weak ankle reflex. He was referred for MRI lumbosacral spine to rule out prolapsed intervertebral disc PIVD lumbosacral spine.

**Case Title**: Prolapsed Intervertebral Disc  
**Modalities**: MRI  
**Anatomy**: Skeletal System  
**Pathology**: Inflammatory  
**Patient Age**: 50 years  
**Gender**: male
The study uses the quasi-experimental design, senior students who had experience with paper based portfolio randomly divided into an experimental group and a control group. A third group was added for the students who enter clinical practice for the first time and they are going to use e-portfolio only.
The study has three variables:

- the independent variable of paper based portfolio and e-portfolio based assessment and the two dependent variables of overall performance in term of grades and learning outcomes and reflection “frequency, time spent in reflection, ways to reflect and feedback and grades awarded for reflection”.

### Participants’ characteristics

<table>
<thead>
<tr>
<th>Group</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group (1) only e-portfolio</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>Group (2) Senior students</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Group (3) Control Group</td>
<td>1</td>
<td>25</td>
</tr>
</tbody>
</table>
85% agreed or strongly agreed that portfolios helped them to take responsibility for their own clinical practice development, and

75% agreed or strongly agreed that portfolios enhanced their reflective skills.
Results

• However, only about half felt that portfolios helped them to become aware of their strengths and weaknesses, and that they helped them to develop independent learning.

• 35% felt that portfolios helped to promote critical thinking and only 31% felt that portfolios helped to improve their self-esteem.
Portfolios can be very effective as an assessment and learning tool, clear guidelines and comprehensive training and support should be provided for both students and instructors.

- Support and encourage from instructors is important to reduce the nervousness and stress especially towards grades.

- Ideally design should be clear and user-friendly for both students and instructors, and so can be used effectively in an environment that is extremely busy and stressful.

Conclusion
References

THANK YOU FOR YOUR ATTENTION ANY QUESTION?