PERSONALISED EDUCATOR-LEARNER PORTFOLIO MANAGEMENT SYSTEM (PEL-PMS): AN EDUCATIONAL RESOURCES MANAGEMENT SYSTEM FOR PERSONALISED LEARNING

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ABSTRACT

The student-centred learning approach has been adopted in teaching and learning in universities throughout the world. Taking the advantage of the information and communication technology (ICT) platforms, universities have developed Open Educational Resources (OER) containing a variety of academic and educational resources and learning materials at institutional and individual levels to support both massive and personalised learning. This paper discusses the Personalised Educator-Learner Portfolio Management System (PEL-PMS), an educational resources management system containing customized resources tailored around personal academic portfolio. The personal educators' educational resources gathered into the PEL-PMS are expected to help enrich the personalised learning environment which includes designing and developing an online learning system focusing on the students' individual learning.

Keywords: Student-Centred Learning; Open Educational Resources (OER); Educational Resources; Educational Resources Management System; Personalised Educator-Learner Portfolio Management System (PEL-PMS); Educational Portfolio

INTRODUCTION

Recently, many universities throughout the world have adopted student-centred learning (SCL) approach in teaching and learning. This universal move was mainly based on the idea and the need to 'be enabled to think and not be told what to think' and the reality that students differ in their learning styles, needs and interests, experiences and background knowledge (National Team of Bologna Experts, 2011, p. 19). According to Bransford et al. (2000), SCL refers "to environments that pay careful attention to the knowledge, skills, attitudes, and beliefs that learners bring to the educational setting" (p. 133). This conception implies the "building on the conceptual and cultural knowledge that students bring with them to the classroom" (Fouts, 2000, p. 11). In this approach, the emphasis is on "interdisciplinary knowledge" and "a vigorous encouragement of higher order thinking and information skills" (Di Napoli, 2004, p. 4) that students should gather for their future life. The thrust for this approach is the constructivism theory that views learning as a process where a learner "constructs" meaning of a learning subject based on his/her prior knowledge and experience and builds mental schemas.

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The SCL or personalised learning are terms used to describe the learning approach that "gives students greater autonomy and control over choice of subject matter, learning methods and pace of study" (Vale et al. 2010, P. 571; Gibbs, 1992, p. 23;), "putting the learner at the heart of the education system" (Bartle, 2015, p. 3, Bates 2014, p. 2) and changes the students role from 'consumers' of education to a 'co-producers and collaborators' of their learning pathway (Bates, 2014, p. 21). The conception of the SCL as in the literature implies that the SCL requires a "building block" to enable its implementation. In ensuring the student-centred learning or personalised learning effectively and successfully being implemented, Williams (2013, p. 2) proposes the six essential themes i.e.;

a. Locus of control
A learner-centred approach will not succeed without a committed shift towards sharing the ownership of learning with students.

b. Knowing students as learners
A personalised learning approach requires educators to know the attainment and progress of each student.

c. Student engagement
Connecting student's learning to their lives and aspirations through authentic activities will provide them with purpose and motivation to gain new knowledge and skills.

d. Collaboration
Personalised learning environments foster a culture where learners see themselves as both participants and contributors to the learning process.

e. Effective use of ICT
Technology allows for an anywhere, anytime, anyone approach to learning and can support the culture shift required for a student-centred approach across two broad areas: (1) providing the infrastructure to support personalised learning (learning analytics) and (2) providing a platform to deliver learning activities and resources to students.

f. Classroom culture
The relationship between educators and students is emphasised in a personalised learning environment and the educator must be aware of each student's interests, learning styles and readiness to ensure the needs of each student are met. This creates challenges for large classes but generates opportunities to use educational technologies and learning analytics to support the educator with this.

All facets outlined by Williams (2013) are necessary to ensure the successful implementation of student-centred learning approach. However, item #e, i.e. effective use of ICT plays a very significant role due to that students' learning is about effective delivery of appropriate educational resources and contents. The indication of e-learning and ICT as the platform supporting student-centred learning is easily understood as nowadays, information and communication technology (ICT) based learning is the best medium for educational resources delivery (Fouts, 2000; Bandele, 2006; Plomp & Voogt, 2009; Masino, 2013). Moving from this, universities have developed a variety of ICT based tools in enabling the effective delivery of educational resources for online learning. In Malaysia, a nationwide initiative named Open Educational Resources (OER) in Malaysian Higher Learning Institutions that include detailed reports on the nine (9) OER of Malaysian universities (Embi & Alsagoff, 2013) has been reported. The OER can include any form of educational resources, such as textbooks, course materials, learning objects, curricula, and lesson plans that have been designed for use in teaching and learning that are openly available for use by the public for free. Embi and Alsagoff (2013) also listed some worldwide OER tools such as OER Common, Curriki and Saylor that can be used for facilitating students' learning.

The OER, Open Courseware (OCW) and Massive Open Online Course (MOOC) were established for supporting institutional teaching and learning. There are some OER initiatives established by individual educators reported in Embi and Alsagoff (2013) and Jalil, Ismail, Aziz, and Fatt (2013). However, the specialised educational resources tailored around individual teaching and learning portfolio is not widely available. This paper argues that educators' academic and educational resources such as research activities and research reports, publications in all types, assignments of previous cohorts of students and many other educators' resources are a critical part that can contribute to student's personalised learning. In enabling the

retrieval and access by students following the "differentiation" and "individualisation" connected with the learner's interest and experiences, needs, abilities and interests (Bartle, 2015), the educators' academic and educational resources should be presented in a proper manner and made available online following the "*effective use of ICT*" one of the critical facets of student-centred learning approach. Educational electronic portfolio is suggested as a solution for management and presentation of educators' academic and educational resources. This paper discusses the student-centred learning approach tailored into the need of educational portfolio, and the ICT initiatives, mainly the educational resource management system such as OER and individual educator initiatives that support personalised learning. Then, the personalised educator-learner portfolio management system (PEL- PMS) is described as an alternative educational resources management system that can be used to support personalised learning. Finally, the way each module in PEL-PMS works in facilitating students' personalised learning is presented.

STUDENT-CENTRED LEARNING AND THE EDUCATIONAL RESOURCES

Student-centred learning is an advancement of prior learning approach and practices that focus on teachers. In this "advance mode", students' learning styles and preferences are the main subject and are placed at the centre of the learning circle. According to Bartle (2015) it "involves extending the educational concepts of differentiation and individualisation to connect to the learner's interest and experiences and meet the needs, abilities and interests of every student through tailoring curriculum and learning activities to the individual. The customization of learning and teaching infrastructures is necessary in enabling this advance mode to be successfully implemented" (p. 3).

The resource is one of the elements that require customization and giving close look in ensuring the success of personalised learning. Green, et al. (2005) posited that "at the heart of personalisation is the understanding that learning environments comprise the totality of factors with which the learners interact, including people, spaces and resources" (p. 19). The authors further added that "on a practical level, personalised learning environments should be sufficiently flexible to enable learners to interact with resources when it is most appropriate for them. At school, college, work or home the learner should be able to connect to resources, peers and people at the institution and beyond, using equipment and connectivity that are centrally provided. Live lessons can be accessed over the Internet from home, or archived lessons can be accessed at a time which is convenient to the learner" (p. 19).

In the personalised learning environment, students are given opportunities to conduct learning activities that include listening, discussing, reading, writing and reflecting to subject contents and issues by their own dynamic behaviours and understanding, because "a mass production way for years is no longer meeting the needs of each student" (West, 2011, p. 1). Therefore, providing sufficient, related and appropriate educational resources are critical in ensuring a meaningful student independent learning and success in the assessment. As a consequence, universities and academic institutions should incentivize their academic staffs to establish and manage their course materials and educational resource for both face-to-face discussion and reading at students' preference. Walker's (2007) phrase "highly supportive system, i.e. the role of the Ministry to help schools build capacity to meet the needs of the students" (p. 23) represents the idea of the need of establishment and management of educational resources narrated herein.

THE EDUCATIONAL RESOURCE MANAGEMENT SYSTEM

Lately, universities throughout the world actively invested on the development of ICT based platforms in supporting institutional learning activities. The use of information and communications technology (ICT) is to encourage the process of learning, to support communication in learning settings, to assess learning activities, to manage resources and to create educational materials (Mohd, Shahbodin, & Pee, 2014). In this sense, ICT based platform provides a meaningful way for educators and learners in establishing the learning activities. In Malaysia in particular, such ICT based platforms are nationwide initiatives in which all public universities in Malaysia have operated educational resources accessible by both academic communities and the public. In a "special" publication, Embi and Alsagoff (2013) have reported detailed initiatives of the OER established by nine (9) Malaysian public universities. In that publication, both educational resources management system at institutional and individual levels are included.

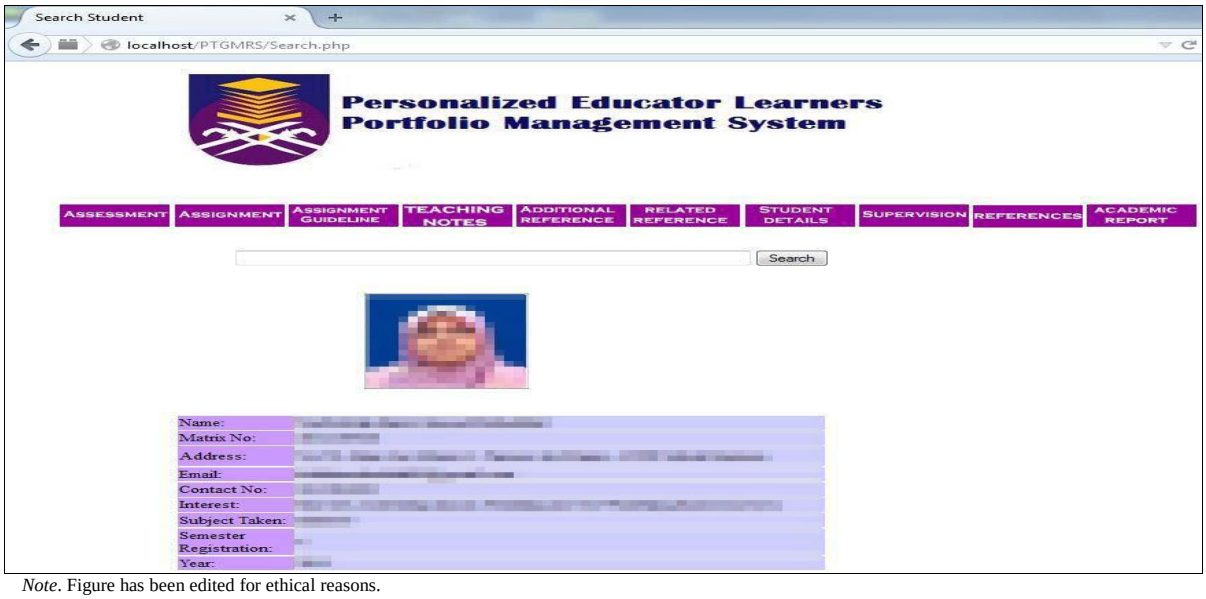
It is learnt from Embi and Alsagoff's (2013) report that there are at the institutional level, educational resources and learning materials ranging from digital and open textbooks, lecture notes, tutorial notes, research repositories, lesson plans, and exercise questions and other type of intuitional teaching and learning materials. At the individual level, the educational resources system such as of ZaidLearn (http://zaidlearn.blogspot.com/;

http://pinterest.com/zaidlearn/zaidlearn/) (Embi & Alsagoff 2013), Bahaman Abu Samah (http://ace.upm.edu.my/~bas/), Steven Eric Krauss (http://upmdce5920.blogspot.com), Juridah Md Rashid (http://juridahrashid.blogspot.com) and Sidek Ab Aziz (http://share.snacktools.com/597D95D9E8C/fukabj9u) (Jalil, Ismail, Aziz, & Fatt, 2013) are tailored around special contents and are dynamic. They may contain learning adventures, description of workshops and talks that have been conducted, discoveries and ideas on how to transform education using technology training materials (statistics, research methodology, qualitative research) and discussions on chosen issues/topics pertaining to the prescribed texts the author(s) taught. These initiatives were established and ran at institutional and individual levels by taking advantage of ICT based platform. It implies the criticality of management of educational resources in proper means effectively delivered to the end users i.e. students. In this way, it is argued that management of educational resources may help boost up personalised learning.

PERSONALISED EDUCATOR-LEARNER PORTFOLIO MANAGEMENT SYSTEM (PEL-PMS)

The work of individual educators described earlier is expected to help the learners' access to rich-content educational resources. This work also motivated and triggered the idea of the development of personalised educator-learner portfolio management system (PEL-PMS), the main subject reported in this paper. The PEL-PMS is an educational portfolio in its essence. The educational portfolio referred to in this paper is the sort of characteristics of "documentation of learning and an articulation of what has been learned" outlined in Snadden & Thomas (1998 p) and Ingrassia (2013, p. 3-4) with some additional subjects. Adding some necessary subject and modules into a portfolio is not against any rule for portfolio development as Ingrassia (2013) claimed that "a portfolio can include some of the things listed above as long as the learner [author] also provides written reflective accounts of the events documented, reflections on problem areas, what has been learnt and plans for how new learning needs will be tackled" (p. 4). In other words, the content of educational portfolios should be dynamic and may contain elements that an author thinks appropriate.

The general guidelines set forth by Snadden and Thomas (1998) and Ingrassia (2013) were applied in developing the PEL-PMS (Abdul Rahman et al. 2015a). The PEL-PMS differs from previous individual educational resources management initiatives reported by Embi (2013). PEL-PMS is an educational portfolio where are deposited all necessary personalised learning documents and resources pertaining to a particular course (Abdul Rahman et al. 2015a; Abdul Rahman et al. 2015b). The PEL-PMS was designed to include modules or subjects as in a personal portfolio. In designing the PEL-PMS, some necessary modules and subjects such as Teaching Notes, Assessment, Assignment, Assignment Guideline, References, Additional References, Related References, Supervision, Academic Report and Student Detail were considered. The PEL-PMS reported in this paper and illustrated in Figure 1, Figure 2 and Figure 3 is the first version. We are considering including more modules such as Publications, Research Activities, and Research Reports in the enhanced version in the near future. The three screenshots below depict the selected interfaces of PEL-PMS.



Note. Figure has been edited for ethical reasons.

Figure 1. PEL-PMS – Example of interface of student detail module

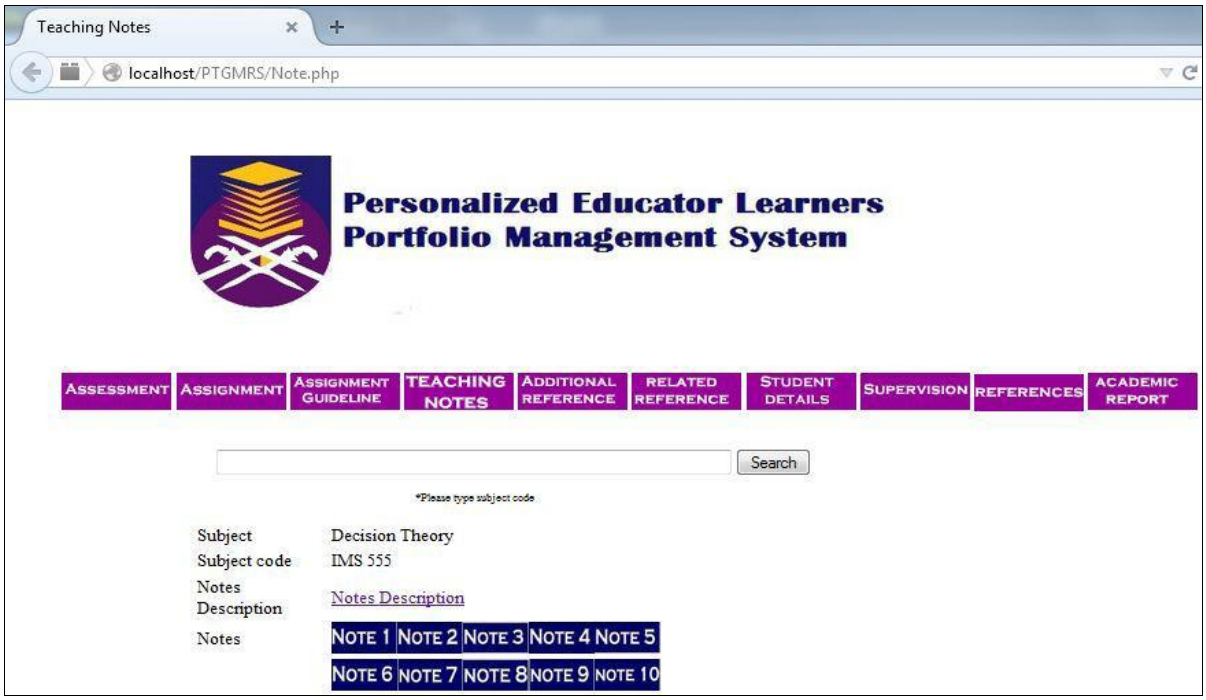


Figure 2. PEL-PMS – Example of interface of notes module

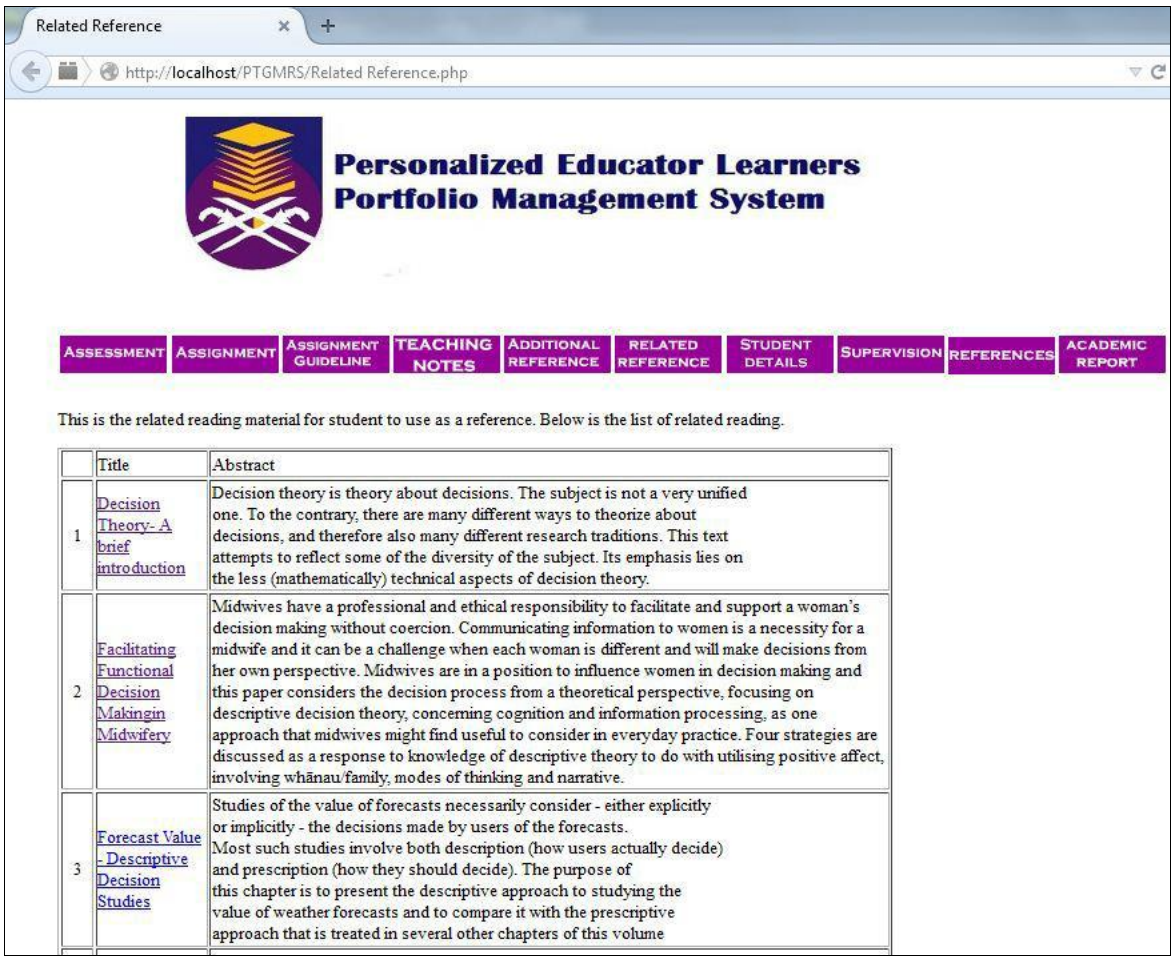


Figure 3. PEL-PMS – Example of interface of related reference module

The PEL-PMS is an individual educators' educational portfolio that is accessible by every students (both degree and master levels) registered to the courses taught by the educator. These groups of students are granted access to the PEL-PMS using their student matric/ID number. The limitation of access is deemed necessary as this kind of educational resources and portfolio is dedicated to enhance the student personalised learning.

MODULAR EDUCATIONAL RESOURCES IN PERSONALISED EDUCATOR-LEARNER PORTFOLIO MANAGEMENT SYSTEM (PEL-PMS)

As seen in the three figures above, the 1st version of PEL-PMS was designed to include nine modules (Teaching Notes, Assessment, Assignment, Assignment Guideline, References, Additional References, Related References, Supervision, and Academic Report) with exception to Student Detail. Each of these modules aimed at different objectives and roles. Table 1 summarizes the modules in the PEL-PMS. In the following subsections, descriptions of each module are presented.

Table 1. Modular Educational Resources of PEL-PMS

Modules	Objective
Teaching Notes	Resources on teaching notes arranged into topics/chapter
Assessment	Resources on variety of rubrics (improvement over time) of assessment for the courses taught
Assignment	Resources on the past assignments established by cohort of students pertaining to the topic within the courses taught
Assignment Guideline	Resources on the guidelines for assignments that have been established and to be established (by current students)
References	Resources on bibliographies/references as in the course information
Additional References	Resources on additional bibliographies and references that are not listed in the course information but useful for meaningful reading
Related References	Resources on closely related reference and bibliographies that can contribute to students' better understanding on the courses taught
Supervision	Resources on specialised area, topic, subject and details of research students under individual educator's supervision
Academic Report	Resources on the research (Degree and Master levels) reports by students under individual educator's supervision

Teaching Notes
Teaching notes are the customized documents for personalised teaching and are prepared in Microsoft Words (.doc), Portable Document File (.pdf) and Microsoft PowerPoint (.ppt). By customization, they are developed based on educators best knowledge on subject matter (courses taught), selective materials from literature and are prepared accordingly into topics or chapters.

Assessment
This module contains the rubrics that explain how individual and group assignments for each course that an educator taught has been and will be evaluated and conducted. Rubrics can change over time due to specific needs and improvement made by the institution, faculty and school. The inclusion of rubrics of assessment into the PEL-PMS is to get students exposed to the conduct of assignments.

Assignment
The Assignment module contains the past individual and group assignments and reports established and submitted by previous cohort of students. Definitely, the assignments cover special topics within the predetermined scope of course. In practice, the softcopy of individual and group assignments prepared in Portable Document Format (.pdf) are gathered and loaded into PEL-PMS.

Assignment Guideline
This module contains documents or instruction sheets on how the individual and group assignment should be established. They outline what to do and not to do, the limitation, the scope and special instructions in performing the assignments.

References
To encourage the reading and understanding among the students in care in-line with personalised learning, PEL-PMS provides the resources of references (bibliographic) in the form of e-book and Portable Document Format (.pdf) following the list in the course information. Although not all listed references/bibliographies can be provided, all available references are prepared in the softcopy (e-book and .pdf) and made available to students.

Additional References
The list of references stated in course information is insufficient to nurture meaningful reading among students. Other than this, a common practice is to include or list a number (usually 5) of best references in the course information. Some references (e.g. new books) cannot immediately be included in the reference list as the curricular revision is conducted according to a specific schedule. Therefore, additional references are a way to let students gain access to closely related references not listed in the course information that are useful for their learning and understanding.

Related References
This module is to let students gain access to resources related to resources and materials listed in the References module. This module is seen as necessary since students need related reading materials for a better understanding of a particular topic or issue found and read in the Additional References.

Supervision
In academic institutions, an educator is also an academic supervisor regardless of the level of students (Diploma, Degree, Master, and Doctoral) he/she supervised. Often, supervision is tailored around the specialised area/topic/subject and domain, and special interest of an educator. Therefore, the histories of supervision that include details of student conducting research under specialised area, topic and subject are useful resources which are considered in PEL-PMS.

Academic Report
In this last module, the research (Degree and Master levels) reports of students under an individual educator's supervision are gathered and sharable by new and current students of an individual educator or supervisor. The academic report describes the academic works of previous student.

CONCLUSION

Personalised learning requires a very conducive learning environment in ensuring its successful commencement. One of the critical elements that directly support effective personalised learning is the delivery of educational resources through an ICT based platform. The efforts spent by academic institutions and individual are skewed toward institutional and general educational resources and is accessible by the public and is considerably not "personalised". This paper promotes the PEL-PMS, an educational resources management system designed to support personalised learning. With its nine modules - namely Teaching Notes, Assessment, Assignment, Assignment Guideline, References, Additional References, Related References, Supervision, Academic Report, PEL-PMS is expected to be able to contribute to learning in a more "personalised" setting.

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