Magnetic Braking System (MBS) An alternative MBS learning tool develop at Politeknik Kota Bharu via Project Based Learning (PjBL)

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ABSTRACT
This Magnetic Braking Systems (MBS) project summary is written to explain the importance and needs of product development of MBS for vehicle (motorcycle) and MBS Learning tools by utilizing the Project Based Learning (PjBL) via eSOLMS of producing innovative product (automotive). This concept aims to improve the braking system by using magnetic concept. Its focus on 3 aspects; 1) to producing alternative product for vehicle braking system (motorcycle brake system), 2) to producing learning tools in advance automotive focus on magnetic braking system, 3) to develop self-regulation of engineering students (automotive) for producing an innovative product (MBS) focus on PjBL:eSOLMS concept. This project was focus on both automotive project development and 21 century e-learning process in nature. The product producing data was analyzed using standard engineering forms or automotive lab sheet collection data. A total of 2 product; MBS for motorcycle and MBS learning tool will intering 18-25 weeks for pilot test. The finding will shows the important and needs of product research and development of MBS in future. On the other hand, the result of lab/workshop measurement and observation on the usage for the MBS on vahicle and using MBS as learning tool hopefully effected on the development of engineering students’ self-regulation. It is hoped that the MBS concept can be further developed and implemented in the engineering advance automotive and Outcome Based Education (OBE) system of Malaysia.

Introduction
The Project Based Learning (PjBL) nowadays become new alternative process for project development & engineering product producing (Syntenta 2001,2002 & 2003). The trends in producing an innovative product field engineering automotive braking system more focusing in its efficency and economically product (Knoll & Michael, 1997; Barron, 1998; Morsund, 2002; Mat el al., 2010;Dym et al., 2004). This innovative PjBL process for product magnetic braking system producing aims to improve the comman used of braking parts from pneumatic and hidraulic system to magnetic systems (Rooney, 1996;Thomas, 2000;Yang,2001). This innovative product wil producing by implementation of Project based learning via eSOLMS to generate self-regulation of Mechanical Engineering (automotive) Students in Kota Bharu Polytechnic (PKB), Kelantan (Kamaruzaman et al., 2010; Md Baharuddin et al., 2011,2012). This product also will producing an invention pedagogy (PjBL) instrument of MBS development and evaluation process (Kurubacak & Gulsun, 2007; Nooe Azean Atan el al., 2006). This MBS instrument generate special touch with the needs in engineering automotive knowledge, otherwise this product will generate a collaborative project based development with e-learning among engineering automotive students at PKB.

Project Objectives
- Producing an alternative source in braking system (electical used)
- Save enviromental product (MBS)
- An effective braking systems (MBS)
- Low cost and high impact in automotive industry.
- Future product (motorcycle MBS)
- Implementation PjBL:eSOLMS in product development.
- Develop self regulation for automotive student in product (MBS) development.

Problems Statements
- Not yet produce product in motocycle using an alternative source such MBS (electical used)
- Goverment policy, should produce product enviromental friendly such MBS.
- Not yet RnD product in motocycle type MBS implementation at PKB.

The Concept of “Magnetic Brake System” Development
The first procedure will come up with MBS survey data collection as reference for the Project MBS Development. The Final product and concepts of used as per figure below:-

Pedagogy MBS instrument for RnD in product development

Figure 1 : side view
The Ideas for installation of MBS on motocycle Brake Disc

Above figures shown the combination of two MBS product development (MBS pedagogy instrument for RnD and MBS prototype on motocycle). Hopefully when it’s been RnD and pilot test on motocycle, this MBS product become special MBS pedagogy instruments to works as catalyzed in automotive students learning development. This MBS project looks able to full fill alternative braking system. Its also match with the needs in engineering automotive knowledge development match with KPTM philosophy.

Conclusions

The purpose of this MBS project was to assess the importance and needs of MBS pedagogy instrument and MBS for motocycle development. The benefit of development of MBS focuses on lecturer MBS instruments to fill in advance automotive lab/workshop, otherwise the MBS product producing will fill in an innovative product at local market. The RnD data’s also carry on to assess the used of product MBS refer to experts perception for development of next MBS project. While
the prototype of MBS was completed, its will piloting among at advance automotive lab/workshop at PKB with among students to match with 21 century skilled and transfer knowledge. This benefits will growth while MBS was introduced as an alternative braking product in automotive industry. Though it is difficult to generalize the results due to prototype under progress. The exploratory study provides evidence and support for the adoption of MBS match with automotive engineering standard for polylechnic produce high expectation of engineering students needs for 21 century level in Technical and Vocational education.

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