

POPBL: **how?**



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Learning Activities



How to Implement?



- **Year 4: Microelectronics (BKE 4423)**

A First Attempt of Problem Based Learning (PBL) in Microelectronic Course for undergraduate Computer. Proceeding of 7th World Congress on Engineering Education.

- **Year 3: Digital System Design (BEE 3133)**

Penerapan Kemahiran Insaniah Melalui Program Pertandingan ALTERA® UP-1 Board, Persidangan Pembangunan Pelajar Kebangsaan 2008.

- **Year 2: Digital Electronics (BEE 2233)**

- **Year 1: Electrical Circuit Theory (BEE 1113)**

POPBL Experience: A First Attempt in First Year Electrical Engineering Students. 2nd Regional Conference on Engineering Education 2007.

*Submitted as Book of Chapter in IGI Global

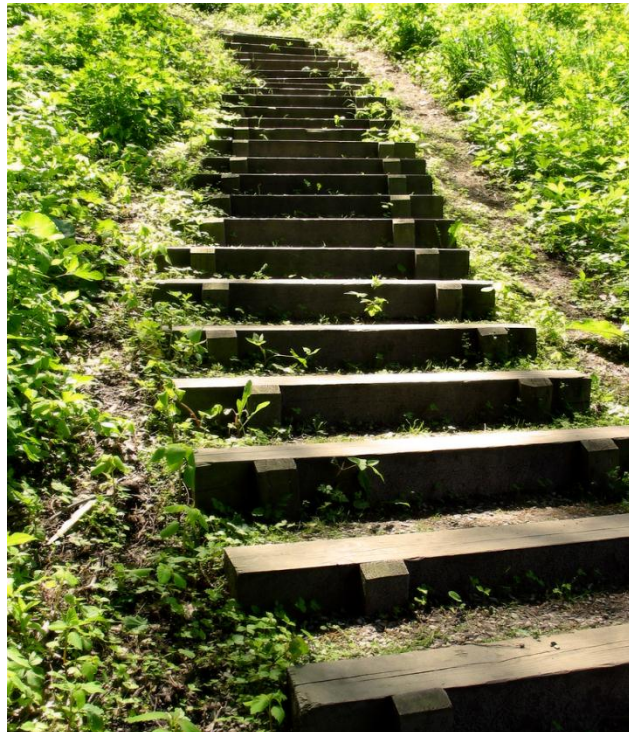


Year 4: Microelectronics (BKE 4423)

# of students	:	62
# of groups	:	10
# of supervisors	:	01

Year 3: Digital System Design (BEE 3133)

# of students	:	96
# of groups	:	10
# of supervisors	:	02



Year 2: Digital Electronics (BEE 2233)

# of students	:	74
# of groups	:	10
# of supervisors	:	01

Year 1: Electrical Circuit Theory (BEE 1113)

# of students	:	154
# of groups	:	29
# of supervisors	:	15

Example 1 (BKE 4423)



- Problem Crafting

You are required to design, simulate, and verify a design of 4-bit carry look ahead adder. All the design should be implemented via bottom-up design (using L-Edit by Tanner) and top-down design (using either VHDL or Verilog with Altera platform). For bottom-up design, choose the nMOSFET's to have aspect ratios of $(W/L)_n = 8$ and the pMOSFET's with aspect ratio of $(W/L)_p = 12$.



- Assessments

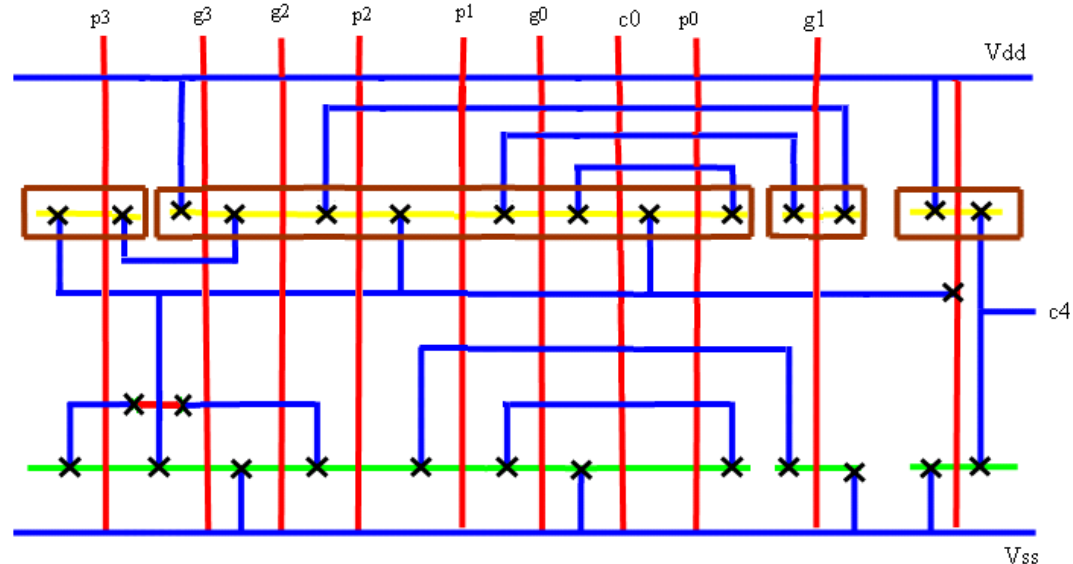
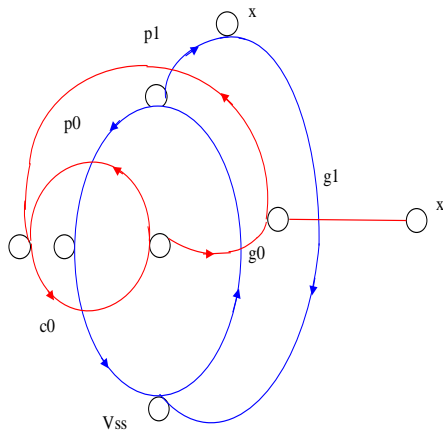
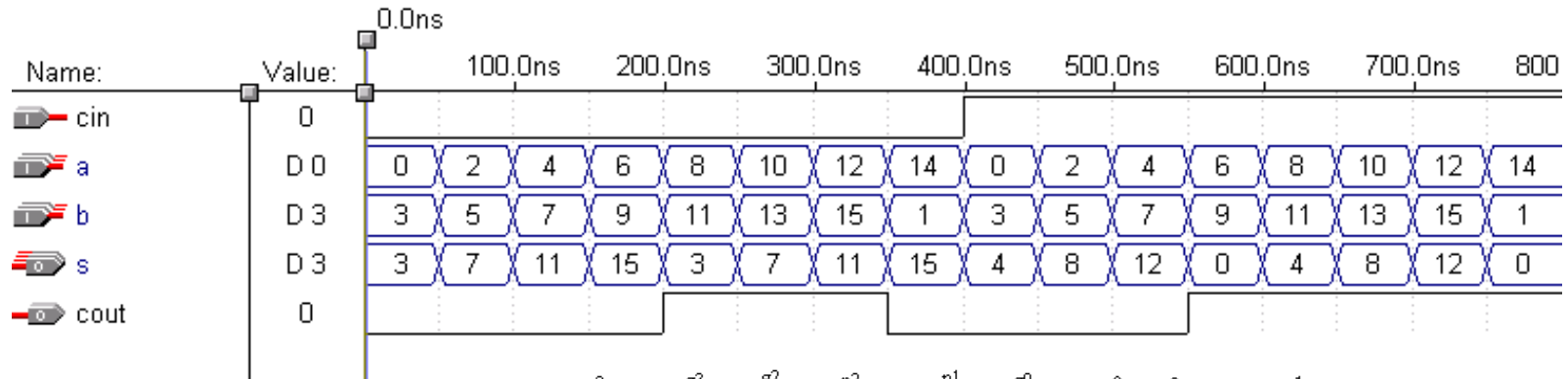
- Minutes of meeting
- Progress presentation
- E-learning discussion
- Technical report
- Technical poster

- Comments

To me, the initiative of POPBL is a good learning method since it encourages the students to think and '**learn to learn**'. Besides, the PBL had actually gives the students a little bit of something on the real world (industry) problems. The given problem excites the students' **curiosity to know more**. However, I have to agree with my friends about **the limited and packed time frame** for us to actually go through everything. [MOHD ZEID BIN ABU BAKAR 830810145539]





• Results



Example 2 (BEE 3133)

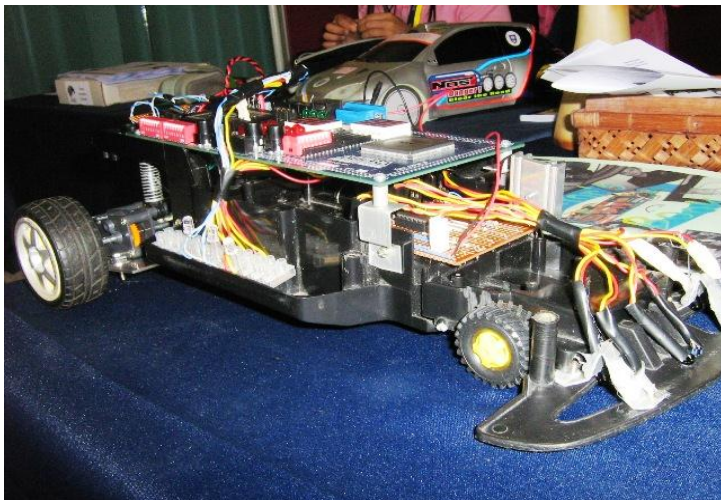
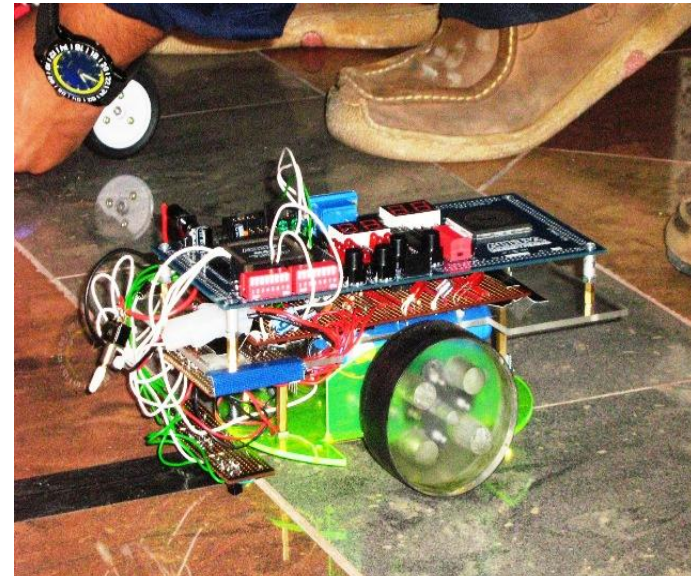
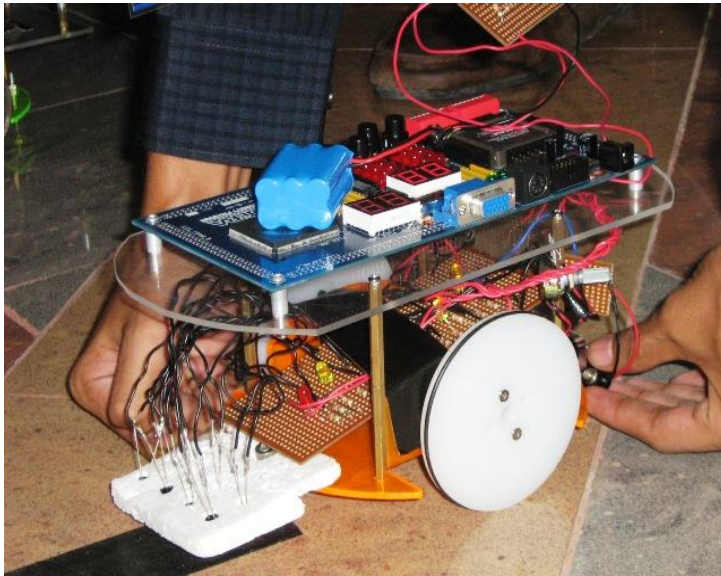
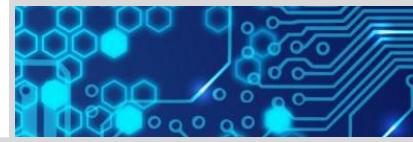


04 Mei 2007 (Jumaat)
9.00 pagi – 4.00 petang
Foyer, Kompleks FKEE (G 1)



**ALTERA UP-1 Board
Line Tracker Robot
Competition Day**





Example 3 (BEE 1113)



Examples

Summary



Feedback

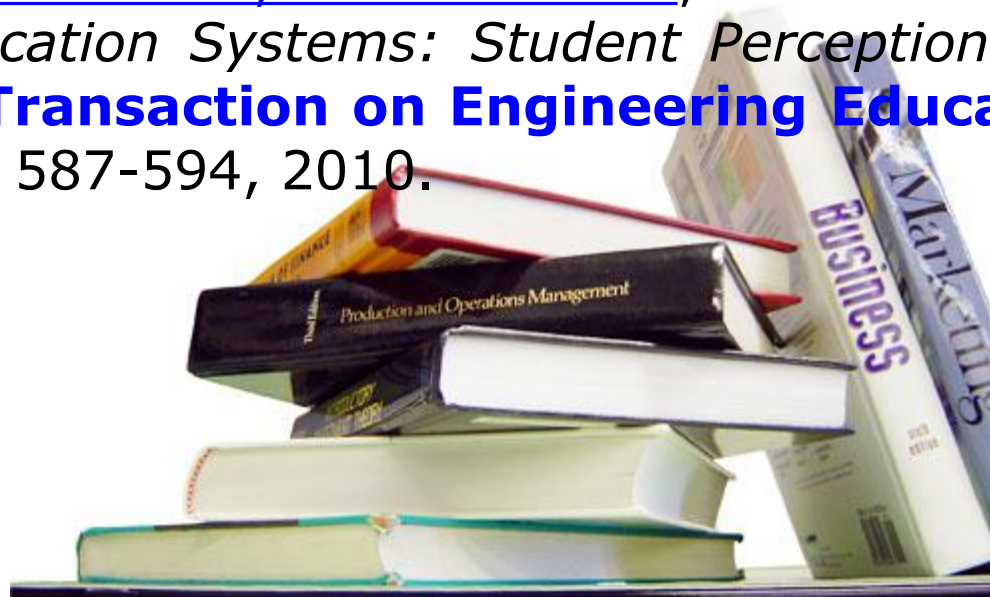
POPBL Algorithm

A close-up photograph of a hand in a white shirt sleeve, holding a black chess knight piece. The hand is positioned as if about to move the piece. The background is a warm, golden-yellow gradient.

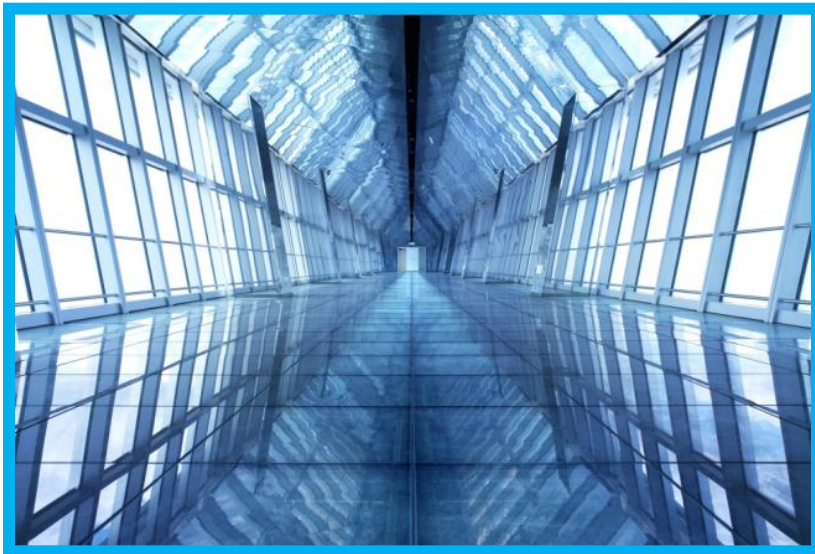
- **Step 1:** Problem crafting
 - Real and realistic
 - Bloom's taxonomy
 - **Step 2:** Assessment tools
 - Three Type of Domains
 - **Step 3:** Implementation
 - Motivation and support
 - **Step 4:** Evaluation
 - “With wisdom we evaluate”
 - **Step 5:** Continuous quality improvement (CQI)
- 
- A collection of black and white chess pieces, including pawns, knights, and a king, arranged on a light-colored surface. The pieces are in various positions, some standing upright and others lying down.



- [Lei Yong](#), "Using problem based learning in Electrical Engineering Foundation", **The China Papers**, pp. 67-70, 2005.
- [Woei Hung](#), "9-step problem design process for problem-based learning: Application of the 3C3R model", **Elsevier Educational Research Review**, Volume 4, pp. 118-141, 2009.
- [John E. Mitchell, Brian Canavan, and Jan Smith](#), "Problem-Based Learning in Communication Systems: Student Perceptions and Achievement", **IEEE Transaction on Engineering Education**, Volume 53, No. 4, pp. 587-594, 2010.







- **explain**
the POPBL concept and structures;
- **address critically**
the significant of implementing POPBL in higher learning education; and
- **design**
a dynamic to do list for implementing POPBL in their courses.