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# Developing e-Bandongan as a learning system for flipped-classroom in medical education and massive open online courses in medical long-life learning

*by* SuwitoBambang Edi

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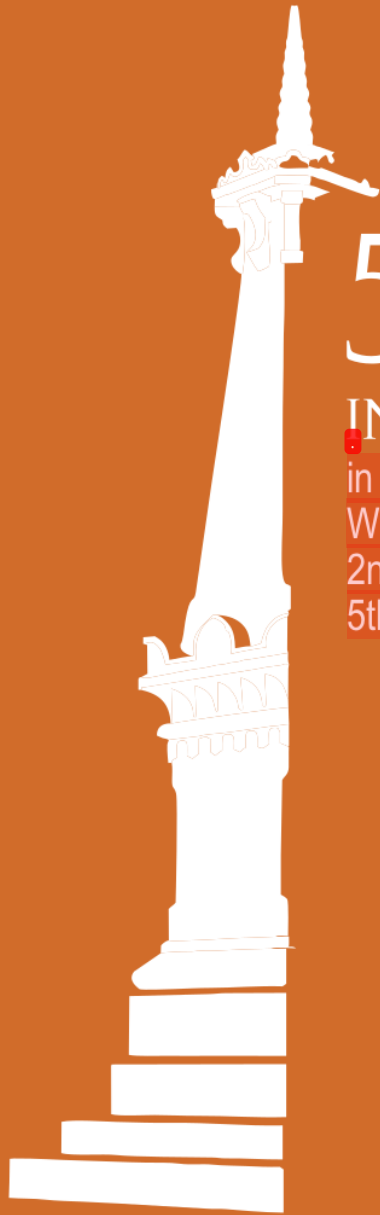
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Department of Medical Education, Faculty of Medicine - Universitas Gadjah Mada  
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medicaleducation@ugm.ac.id

# CONTENTS

## SECTION 1

1. Welcome Message.....	1
2. SEARAME and SEARAME Conference.....	3
3. Committee.....	4
4. Invited Speakers.....	5
5. Student Session.....	64
6. Pre-Conference Workshop.....	67
7. Conference Program.....	69
8. Oral Presentation Index.....	75
9. Poster Presentation Index.....	78
10. The Winners.....	80

## SECTION 2

1. Pre-Conference Workshop.....	81
2. Conference Day.....	90

## SECTION 3

1. Item analysis of multiple choice questions (MCQS) used in neurology module of medical faculty of baiturrahmah university (Resti Rahmadika Akbar, Dian Ayu Hamama Pitra).....	114
2. The community service program activity as a learning method at YARSI university faculty of medicine (Miranti Pusparini).....	120
3. Evaluation of clinical lecturers competence in medical doctor profession education universitas halu oleo (Wicaksono, S., Saimin, J., Hafizah, I., Parawansah, Indriyani, N.).....	130
4. How does feedback in clinical teaching motivate student's learning? (Sylvia MS).....	134
5. Professional identity formation: initial historical study on GPs' identity (Hikmawati Nurokhmanti).....	144
6. Nurturing professionalism in pre-clinical years: medical teachers' perception in faculty of medicine universitas Indonesia (Estivana Felaza, Rita Mustika).....	149
7. Toward a humanist health and medicine education in Indonesia by reintegration of religion and science (Fatma Sylvana Dewi Harahap)..	154
8. The correlation between the readiness in interprofessional collaboration with clinical decision making ability of midwifery students (Bulan Kakanita Hermasari, Brian Sahar Afifah, Erindra Budi Cahya).....	162
9. A delphi consensus study to identify clinically most valuable anatomy material of the digestive system for teaching medical students (Siti Munawaroh, Maudy Putri Saraswati, Nanang Wiyono, Yunia Hastami, M. Nur Dewi Kartikasari, Bulan Kakanita Hermasari).....	167
10. Knowledge, attitude and practice about human papilloma virus/HPV vaccine in the prevention of cervical cancer among the medical students (Umme Jamila Akther Manni).....	176
11. Developing e-Bandongan as a learning system for flippedclassroom in medical education and massive open online courses in medical long-life learning (Herdiantri i Sufr iyana, Bambang Edi Suwito).....	188
12. Perceptions of health students on learning interprofessional education (Dina Zakkiyyatul Fuadah).....	193
13. Dramatics in medical education: an experience of online listservdiscussion through mentoring and learning web sessions of gsmc fairer fellowship programme (Rahul Bogam, Priyadarshini Mishra, Anju Kapoor, Tushar Jagzape, Sucheta Dandekar, Santosh Salagre, Avinash Supe).....	197
14. Evaluation of video-based communication skills teaching learning in prosthodontics based on kirkpatrick model to improve the quality of health professionals for better health services in future (J.Varsha Murthy, K.R. Sethuraman, Shakila R., Sunayana Choudhury).....	201
15. Indonesian Islamic educational tradition meet emerging technologies: Implementation of the e-Sorogan learning technological model in medical education (Herdiantri Sufriyana, Irmawan Farindra).....	206
16. On-the-spot project collaboration in medical article writing using clinical search engine and online word processor (Muhammad Auzan Ferdiansyah).....	213
17. Anxiety overview of medical students undergraduate (Ashaeryanto, Sitti Marwah Sara Bitu, Junuda RAF).....	218
18. The influence of visual and audiovisual learning style to memory retention of medical students (N Juni Triastuti, Zudha Mauliyani).....	225
19. A review on patient satisfaction level on BPJS participants who come in outpatient room with SERVQUAL method, encourage medical education institution simulate empathy attitude in learning process (Rospita A. Siregar, Merien Stephanie Siregar).....	231
20. Impact of reflective writing on medical student attitude (Siti Khotimah, Sulistiawati Sudarso).....	235
21. The description of medical students' interest and achievement on anatomy at faculty of medicine universitas kristen Indonesia (Bernadetha Nadeak, Lamhot Naibaho).....	238
22. Virtual patients technology for quality improvement of medical personnel (Komandaniel Simanullang).....	248
23. Bridging high school student to medical student (Jimmy TTF, Devina N, Michelle CP).....	252
24. Development of low cost ultrasound phantom for simulation training in follicle growth monitoring during control ovarian stimulation (Agung Dewanto, Hindun Wahab, Nurulita Ainun Alma, Shofwal Widad).....	257
25. Development of an artificial model for ovum pick up simulation (Hindun Wildani Wahab, Shofwal Widad, Agung Dewanto).....	261

# Developing e-Bandongan as a learning system for flipped-classroom in medical education and massive open online courses in medical long-life learning

**Herdiantri Sufriyana, Bambang Edi Suwito**

Medical Education Unit, School of Medicine, University of Nahdlatul Ulama Surabaya, Indonesia

## ABSTRACT

**Background :** Information gathering have been substituted with problem-based learning in many medical school worldwide regarding the need of clinical problem solving skill and the limitation of time to master rapidly-growing of medical sciences. The students may not have the opportunity to gain an understanding of the concepts in logical progression. Medical learning material in social media have a potential benefit to facilitate the student needs. This work aims to describe our development on e-Bandongan as a learning system for flipped-classroom in medical education and massive online courses in medical long-life learning.

**Summary of Work:** We offered audio, video, and written material resumeres in Indonesian language for every topic in existing discipline-based textbook. We also explained about its utilization as part of flipped-classroom in their education and massive open online courses in their future long-life learning. The online anonymous questionnaire was given to identify the students perception on their behavior to the material resumeres. Thirty-seven students responses were taken. The respondents answer for the opened question were assessed qualitatively.

**Summary of Results :** All respondents admitted that they will always (16.2%), very frequently (29.7%) and quite frequently (48.6%) utilize the material resumeres. However, the addition of exercises feature and/or non-curricular rewards did not change the utilization frequency, indeed, it made the 'never' and 'quite rarely' utilization were admitted. The qualitative assessment demonstrated their reasons that the material resumeres were more concise, repeatable, synhronized with the exam question from the teachers, visually-explained and in Indonesian as their native language.

**Discussion & Conclusions :** Respondents admitted that they will utilize the offered material resumeres. Video material resumeres from their own teachers is preferred. Future investigations will compare their behavior to the online material resumeres between the on-page website statistics and these self-assessed perceptions.

**Take-Home Messages :** The e-Bandongan as a learning system for flipped-classroom and massive open online courses was acceptable for the medical students with or without both exercises feature and non-curricular rewards.

**Keywords :** *ebandongan, medical long life learning, learning system, medical education*

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Contact : herdiantrisufriyana@unusa.ac.id



## INTRODUCTION

In recent years, problem-based learning has been considered as better curriculum compared to information-gathering (lecture-based) which at the opposite side in the SPICES continuum (1). Nonetheless, there is a possibility to integrate information-gathering without disrupting problem-based learning. The Falk Library Program had facilitate its integration for the medical students in University of Pittsburgh by providing the packages of informational materials in small-group rooms based on the librarians' case-related resource lists and by hiring key informants in central location during specific time to be students partner for informal discussion (2). Although this offline program was successful for the integration, the online implementation have not been elucidated yet.

It is important to innovate in medical education with problem-based learning, however, it does not means to sacrifice the information-gathering, particularly using the students-centred approach. Medical doctors who graduated from lecture-based medical schools after 9.91 years perceived that they have better possession of profession-relevant knowledge, writing reports or articles, productivity and ability to work under pressure, in comparison with graduates from problem-based medical schools after 8.49 years who perceived that they have better interpersonal competencies (3). McGill University's medical school that integrated problem-based and lecture-based learning in hybrid curriculum for eleven years demonstrated that their students had more text-generated rather than inferences-generated explanation, while the students with problem-based curriculum had a great deal of inferences, particularly in basic sciences (4). Although evidence-based medicine is considerably important to enhance patient care (5), and the evidences is exploding in fundamental process of human biology, basic sciences has been shrinking in most medical schools curricula (6), along with shrinking of information-gathering as time-compensation for the expanding clinical problem-based curriculum. Therefore, we need teacher-directed, students individual learning beyond face-to-face class and time to enhance competencies of the medical graduates, at least on four competencies above.

More time for application of knowledge in problem-based learning can be given by removing transmission of factual knowledge in information-gathering from face-to-face meeting to pre-meeting

teacher-directed learning, that is, well-known as flipped-classroom model (7). This model demonstrated significant improvement on oral case presentation skills (8), and exam results of physiology as the basic science (9,10), however, no improvement on examination of obstetrics and gynaecology as the clinical practice (11). Flipped-classroom utilizes video lectures and computer-graded tests that makes it potentially expanded as massive open online courses (MOOCs) by adding discussion forums (12). Both of them require self-directed learning readiness, while it is lower by students in some health profession educational institutes from different countries (13–15), including from Indonesia. However, no study has found either for flipped-classroom or MOOCs in Indonesian medical education.

We will develop the learning system for MOOCs as well as for flipped-classroom because of its benefit for medical long-life learning (16). In addition, since our institution need to adopt *bandongan*, the mass approach learning in Islamic secondary education (17), we named the learning system as e-Bandongan (electronic *bandongan*). Anyone can attend *bandongan* without formal requirement which is similar to MOOCs' principle. Therefore, this work aims to describe our development on e-Bandongan as a learning system for flipped-classroom in medical education and massive online courses in medical long-life learning.

## RESEARCH METHODOLOGY

This is a pilot study based on quantitative and qualitative responses from thirty-seven medical students in University of Nahdlatul Ulama Surabaya. The respondents consist of first-year (32,4%), second-year (21,6%), third-year (27%) and fourth-year (18,9%) students. We need to get insight about future behavior of the students on offering audio, video, and written material resumers to support flipped-classroom and MOOCs.

The material resumers were offered in Indonesian language for every topic in existing discipline-based textbook. It was explained to them that way since it is intended to negotiate with limited credits in relative to huge medical topics over clinically-oriented medical school curriculum rather than to provide specific learning system based on the curriculum. Medical learning materials were also largely provided in English rather than their native language (Indonesian). In addition, we also explained about its utilization as part of flipped-

classroom in their education and MOOCs in their future long-life learning.

The online, anonymous and concise questionnaire was given to identify the students perception on their behavior to the material resumer. The respondents answered both for the closed and opened question. Four closed questions were multiple-choices with 5-points Likert scale that asked about utilization frequency of the material resumer with or without exercises feature and/or non-curricular rewards. Each closed question consists of 'never', 'quite rarely', 'quite frequently', 'very frequently' and 'always'. One opened question asked about their reasons choosing the answer of each closed question and were assessed qualitatively.

**RESULT**

Utilization frequency for the material resumer without both exercises feature and non-curricular

rewards demonstrated highest proportion on option 'quite frequently' (48.6%), then followed by 'very frequently' (29.7%), 'always' (16.2%) and 'quite rarely' (5.4%), but no one chose 'never' (Figure 1). Addition of exercises feature made them mostly choosing 'quite frequently' (40.5%), then followed by 'very frequently' (35.1%), 'always' (13.5%), 'quite rarely' (8.1%) and 'never' (2.7%), while addition of non-curricular rewards made them mostly choosing 'quite frequently' (54.1%), then followed by 'very frequently' (24.3%), 'quite rarely' (16.2%) and 'always' (5.4%), but no one chose 'never'. Both exercises feature and non curricular rewards made them mostly choosing 'quite frequently' (55.6%), then followed by 'very frequently' (27.8%), 'always' (11.1%) and 'quite rarely' (5.6%), but no one chose 'never'.

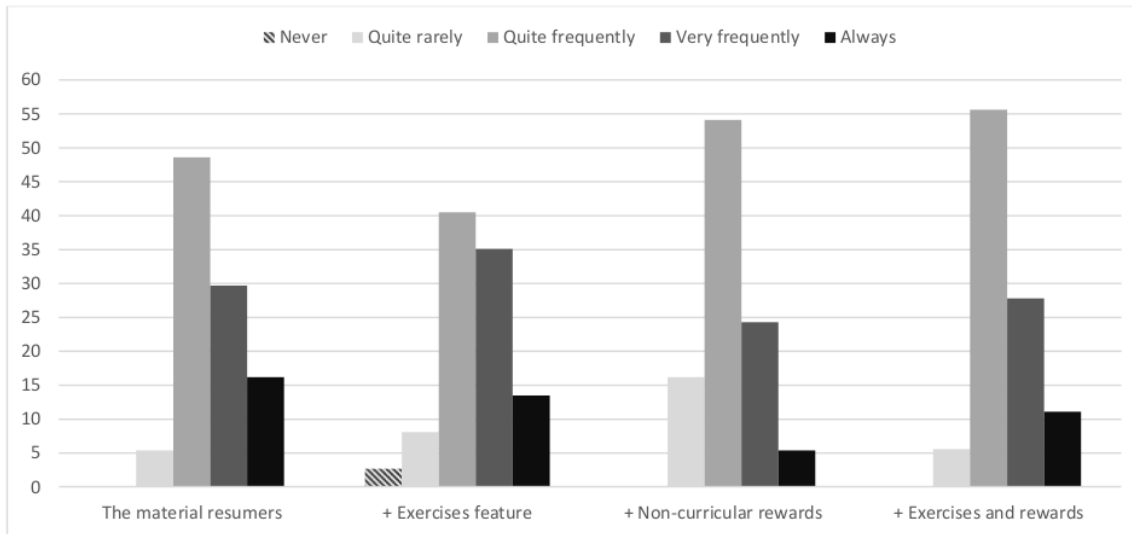


Figure 1. Utilization frequency of the material resumer with or without exercises feature and/or non-curricular rewards. The vertical axis is cut at maximum 60% to optimize visualization.

Their reasons choosing the answer of each closed question had been qualitatively assessed. The respondents would like the material resumer because of more concise and repeatable. They also like the material resumer that are definitely synchronized with the exam question from the teachers. The material resumer in video were preferred. Since most of medical textbooks are in English, the material resumer in Indonesian as their native language were also preferred.

**DISCUSSION**

Flipped-classroom model had been developed by many disciplines with several names. It is introduced by J. Wesley Baker in discipline of communication as the 'flipped classroom' (18), and by Maureen J. Lage, Glenn J. Platt and Michael Treglia in discipline of economics as the 'inverted classroom', on the same year about 18 years ago (19). An employment of this model in medical education is emerging since the widespread

use of MOOCs in recent years (7). The MOOCs have promoted the self-directed learning skill that is required by medical graduates for the continuing medical education (16). The openness of education is the main spirit that emerges the MOOCs (12). This makes us to name the learning system in this study as e-Bandongan since the same spirit is found in *bandongan*. It is a traditional learning method with mass approach that the *kyai* (Islamic cleric term in Indonesian) did textbook-based teaching for *santri* (Islamic boarding school students term in Indonesian) for hundred years (17).

Self-directed learning atmosphere is confirmed on flipped classroom model in this study as described in previous studies (8–11). This is because the addition of exercises feature and/or non-curricular rewards did not change the utilization frequency. The respondents' qualitative answer indicated their urgent needs for the material resumers. Interestingly, the addition of exercises feature made the 'never' utilization was admitted insignificantly. The 'quite rarely' utilization also tend to be higher by addition of exercises feature and/or non-curricular rewards.

More concise, repeatable and synhronized with the exam question from the teachers were the reasons why they would like the material resumers. Similar condition was found in The Falk Library Program that the key informants or the topic experts were the most use feature that is provided by the library in University of Pittsburgh School of Medicine (2). They chose to discuss with these key informants because of to-the-point, relevant and confirmable information the informants given.

The video lectures were preferred in this study. Although the students prefer video lectures, they supposed to integrate the live lectures with it rather than to substitute the live lecture, and the mean post-test score was still better for the live lectures rather than for the video lectures ( $p=0.049$ ) (20). In addition, other study demonstrated 74% of students admitted that they watch video to review concepts they missed in live lectures, and the student attendance to the live lectures did not affected also (21).

Most of medical textbooks which are in English were perceived by the respondents as the barrier that can be solved by the material resumers in Indonesian. The language barrier in education is also described in Japan that no ideal English textbook for students regarding dental medicine was admitted (22). Medical textbook translation from English to other language should be contextually in manner of the other language native speaker rather than in manner of the English native speaker (23).

## CONCLUSION

Future utilization of the offered material resumers is admitted by the respondents. The material resumers from their own teachers is preferred, especially the

video lectures. However, the difference between the utilization based on on-page website statistics and these self-assessed perceptions may be exist that should be investigated further.

## TAKE HOME MESSAGE

The e-Bandongan as a learning system with or without both exercises feature and non-curricular rewards was acceptable for the medical students for flipped-classroom and MOOCs.

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