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Integrated Sci-Tech : The Interdisciplinary Research Approach Integrated Sci-Tech : The Interdisciplinary Research Approach i Integrated Sci-Tech : The Interdisciplinary Research Approach This book is all about the interdisciplinary research that integrates engineering, life and applied sciences, medical and biomedical engineering, agriculture engineering and food sciences.

The aim was to provide the initial roadmap at a cross section basic research, technological and social developments, processes development, applications integrity, and real-world usage. The genuine motivation for the book was to provide a suitable reference text for those who interested in the multi and inter disciplinary studies which might be beneficial for basic and advance researches, enhancing the curriculum and enriching teaching and learning materials, mostly in the level of postgraduate studies.

In addition, the book was also planned to provide advanced orientation and understanding for related industries and governments to looking across industrial partnerships, business strategic, and policy and regulations. In general, the book is expected to be beneficial for a wide range of readers. This book consists of twenty five chapters divided into four sections i.e.,

engineering, life and applied sciences, medical and biomedical engineering, agriculture and food science. Each chapter is a completely self-directed contribution in chained discussion which aims to bring academia, researcher, practitioners and students rise to speed with the novel developments within the particular area.

In order to enhance the reader experience, each book chapter contains its own abstract, instruction, main body, as well as conclusion sections. Moreover, bibliography resources

are available at the end of each chapter. To achieve all these aims and goals, the book should deliver a breadth of information. We are pleased and thankful for all distinguish authors and reviewers for their contribution that have made this book possible.

We do hope that you will enjoy this book and find it as a useful guide and reference.

Editorial board: Ardian Ulvan (Dept. of Electrical Engineering, University of Lampung)

Irza Sukmana (Dept. of Mechanical, University of Lampung) ii Integrated Sci-Tech : The Interdisciplinary Research Approach Preface

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..... 282 277 Integrated Sci-Tech : The Interdisciplinary Research Approach Hipotetic Model of Continuous Professional Development of Vocational Lecturer in The Higher Vocational Education In Lampung Sugiyanto1,a 1Department of Mechanical Engineering, Faculty of Engineering, Lampung University, Indonesia asoegijanto_mesin@yahoo.com Abstract. One key to the

effectiveness and efficiency of higher vocational education lies in human resources namely lecturers.

Lecturers are professional educators and scientist with main task of transforming, developing, and spreading the knowledge, technology, and art through education, research, service to the community. To do that, need development model of continuous professional competence which will affect the increase of 4 competence of lecturers, especially professional competence.

The problem is the development of lecture professional competence in higher vocational education in Lampung has not optimally yet, and uncoordinated well, so that the level of professionalism of lecturers depend on himself. The objective of this research is to develop hypothetical model of continuous professional competence development of vocational lecturer in the higher vocational education in Lampung.

The research begins with describing the condition of existing management professional competence of vocational lecturer, then do the theoretical studies and concludes with the development of hypothetical model. Keywords: continuous professional development, higher vocational education, lecturer professionalism I. Introduction Lecturer in vocational education, must have special professional competence.

Because vocational education is the total process of education aimed at developing the competencies needed Effectively function in an occupation or group of occupations, Wenrich and Wenrich (1974). Vocational education as a forum for competence development in accordance with one's needs, developed on the basis of a person's need for a particular job.

Vocational education has another purpose beside to develop the hard skills, also oriented on soft skills, educational values and attitudes (Wenrich&Wenrich,1974, Thompson 1973), applied, occupational/ jobspecific consisting of lines diploma (D-I, D-II, D-III and D-IV) and specialists (Sp1 and Sp2), (Hadiwiratama in Dedi Supriadi, 2002). Education Diploma and politeknik will produce alumni who are entrepreneurial, (Bambang Budiyo 2001, Clarke 2008).

The importance of continuous improvement of the professional competence of vocational lecturers have not been fully recognized by professors and leaders in higher education vocational institutions. Lecturer professional competence covers three areas/ Tri Dharma College: education and teaching, research and community service. Continuous improvement of professional competence for lecturers, supported by Government Regulation 37/2009 and Law No.

14 Year 2005 on Teachers and Lecturers Article 60, Law Number 20 Year 2003 on National Education System Article 39 paragraph 2 of Law No. 20 in 2003. The development of continuous professional competence for vocational lecturers means that the lecturer competence development carried out in accordance with the needs, gradually, continuing to increase professionalism.

Competence is something that someone pointed out in the work every day, the focus is on the behavior in the workplace, (Kravets, 2004), and the competence of either category threshold and differentiating with regard to the effectiveness of individual performance on the job, (Spencer1993, Green 1999, Liu 2009, Masten 1995, Looy 1998).

Thus competencies into aspects that determine the success of the organization, with high competence that lecturer have will determine the quality of faculty that are owned by the college, which will 278 Integrated Sci-Tech : The Interdisciplinary Research Approach ultimately determine the competitive quality of higher education itself .

George Klemp (1980) in Boyatzis (1982) and Dubois (2004) describe the "job competency as an underlying characteristic of a person the which results in effective and/or superior performance in a job". He also expressed "competencies are characteristics that are causally related to effective or superior performance in a job". To answer the truth of the above needs to be generated hypothetical model of Continuous Competence Professional Development of Vocational Lecturers (CCPD-VL) on vocational education in Lampung. II.

Research Methods The study was conducted in three phases, namely: (1) preliminary studies, assessment of the condition of professional competence development lecturer (existing pre-assessment), (2) the development of prototypes and (3) the outcome of research, which produces the final hypothetical model. Data obtained by the analysis of theory, observation and interviews, with observation measurement tools guide and the interview guide.

The study population is a lecturers in vocational education in Lampung by purposively sampled. III. Result and Discussion The research of development hypothetical model CCPD-VL outline contained in Fig. 1 below Fig 1. Hypohetic Model of CCPD-VL Vocational Education DIKTI - Tridharma Perguruan Tinggi - Teacher and lecturer law - Permenpan RB No:46 year 2013 Vocational Higher Education Character Analysis of Vocational Lecturer Needs Analysis of Vocational Lecturer Selection Type of Intervention Arranging CCPD-VL Training materials: Guide and Materials Define the CCPD-VL Training Tools Financing plan (money) Plan Reporting System (minute) Implementation

of CCPD- VL Training guided: a. Training guidelines b .

Material based on specified time uration c. Staff Officer / d Guidelines for assessment
Credit score Coordinate planning result: TPJA-PT, staff, research institute, training place,
module. COMPETENCE Implementation report CCPD-VL ORGANIZE Evaluation of
CCPD-VL implementation Evaluation Improvement material and exercise Module
Lecturer CCPD-VL models Vocational Education be able to : (1) measuring the
continuous professional competence vocational lecturers match the standard set , (2)
contains about steps of CCPD-VL , (3) can be implemented by the Vocational Higher
Education .

279 Integrated Sci-Tech : The Interdisciplinary Research Approach The first phase of the
hypothetical model CCPD-VL is planning covers several aspects: personal (man),
financing (money), material (materials), method (method), equipment (machine) and
reporting (minute). In planning CCPD-VL involves three units namely PATA-C (Position
Assessment Team Academic College), Institute for Research and Community Service
(IRCS), and Section Officer (SO). Briefly linkages agencies/ institutions that play a role in
planning and components as well as aspects of planning can be observed in Fig. 2. Fig2.

Chart of CCPD-VL Planning Component The second step is organizing a working
mechanism between organizers CCPD-VL, which PATA-C with the personnel department
concerning the results of the planning and preparation of the training PKPB - DV
involving various parties , as it has been formulated in the committee . Organizing
includes components : (1) the committee training CCPD-VL and description of work , (2)
resource training, (3) the draft budget implementation of training CCPD-VL, (4) a
method of training CCPD-VL, (5) training material and guidance assessment of credit
points, (6) the infrastructure of education and training, (7) the requirements of
participants and (8) the training schedule. Coordination is also done to prepare the
place , materials and training equipment that will be used.

Chart of CCPD-VL organizing components as shown in Fig. 3 . the implementation phase
of the entire plan has been drawn up . Existing activities at this stage is the
implementation of training CCPD-VL with the availability of a place of education and
training, training materials, training equipment, speaker training, a training and
assessment guidelines vocational lecturers credit points; as shown in Fig. 4.

DIKTI - Tridharma Perguruan Tinggi - Teacher and lecturer law - Permenpan RB No:46
year 2013 - Permendikbud No. 092 year 2014 Vocational education Head of SO, Leader
of PATA-C, Head of IRCS, Senior Lecturer, Vocational Lecturer MAN Finance committee,
planning, and implementation of training MONEY Training guide, training materials,

standard guide number of credits , infrastructure training, participants requirements, training schedule .

MATERIAL CCPD-VL Model: Training METHOD CCPD Training Tools MACHINE Report system: stages, content, timing, and reporting purpose MINUTE 280 **Integrated Sci-Tech : The Interdisciplinary Research Approach** The fourth stage is the control, executed by : (1) an evaluation of the development of **professional competence of vocational lecturers** using predefined assessment standards , this evaluation is to determine the vocational lecturers that has developed and underdeveloped professional competence.

(2) Evaluation of education and training CCPD-VL ranging from planning, organizing and implementation. Evaluation is expected as feedback for the organization of training CCPD-VL next year. The implementation of evaluation made by the organizing committee.as shown in Fig. 5. Fig 5. Chart of CCPD-VL Controlling Patterns IV.

Conclusions and Suggestions CCPD-VL hypothetical model of vocational higher education which is developed is expected to be an alternative **in the development of** professional competence on an ongoing basis for vocational lecturers to overcome the problem of not smooth faculty in developing professional competence and in order to get CCPD- VL models that are effective, efficient and practical .

Thus the model that developed is able to : (1) measure **the professional competence of** lecturers on an ongoing basis according to the guidelines calculation of credit points, (2) contains about steps models CCPD-VL and guidebooks training CCPD-VL, and (3) can be implemented by vocational higher education. Fig. 4. Chart of CCPD-VL Implementation Component Vocational Lecturer Fig 4.

Chart of CCPD VL Implementation Component Training Place Forms to counting the credit points Training tools Guidelines for assessment the number credit of VL CCPD-VL Proess Training Training speakers Training timing CCPD-VL Tridharma PT Evaluation of Planning, Organizing , and Execution Implementation of CCPD-VL Training Guideline of credit score 281 **Integrated Sci-Tech : The Interdisciplinary Research Approach** References [1]. Boyatzis, Richard E. (1982).

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