

BRIEF REPORT

Proposal for a Modified Dreyfus and Miller Model with simplified competency level descriptions for performing self-rated surveys

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Abstract

In competency-based education, it is important to frequently evaluate the degree of competency achieved by establishing and specifying competency levels. To self-appraise one's own competency level, one needs a simple, clear, and accurate description for each competency level. This study aimed at developing competency stages that can be used in surveys and conceptualizing clear and precise competency level descriptions. In this paper, the author intends to conceptualize a simple competency level description through a literature review. The author modified the most widely quoted competency level models—Dreyfus' Five-Stage Model and Miller's Pyramid—and classified competency levels into the following: The Modified Dreyfus Model comprises 'absolute beginner, beginner, advanced beginner, competent, proficient, and expert,' while the Modified Miller Model uses the levels of 'knows little, knows and knows how, exercised does, selected does, experienced does, and intuitive does.' The author also provided a simple and clear description of competency levels. The precise description of competency levels developed in this study is expected to be useful in determining one's competency level in surveys.

Key Words: *Competency-based education; Intention; Knowledge; Surveys and questionnaires; Korea*

In competency-based education (CBE), it is important to establish and specify competency levels for evaluating students' achievement. The most widely quoted models in discussions of competency level are Dreyfus' Five-Stage Model of adult skill acquisition and Miller's Pyramid or Prism of clinical competence. The two theories clearly elucidate competency levels and are frequently cited. However, the competency levels are not easy to state in a simple and accurate way when used for self-appraisal of competency levels by survey. The purpose of this study is to conceptualize competency levels simply and clearly and to establish precise competency level descriptions so that students can determine their own competency levels based upon these descriptions.

Miller's Pyramid and Dreyfus' Five-Stage Model: Miller's

Pyramid Model describes clinical competency according to the relationship between knowledge and skills and classifies the competency as 'knows, knows how, shows, or does.' Based on the categorization, one is classified as a novice to an expert, by his or her 'professional authenticity.' 'Knows' and 'knows how' correspond to the 'test cognition' or knowledge domain—which refer to those lacking experience (or novices). 'Shows how' and 'does' correspond to the behavior domain: the 'shows how' level refers to one's performance on artificial simulation exercises, such as the objective structured clinical examination, while the 'does' level links with one's clinical practice in the workplace [1,2].

Dreyfus' Five-Stage Model of adult skill acquisition takes into account four elements—the components, perspective, decision, and commitment—to divide skill levels into 'novice, advanced beginner, competent, proficient, and expert.' The components can be either context-free or both context-free and situational; the perspective can be none, chosen, or experienced; the decision can be analytic or intuitive; and commit-

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ment can be detached, detached understanding and deciding, involved outcome, or involved [3,4].

Dreyfus applied the knowledge development model to medical education. For example, the ‘novice’ stage can be represented by the first-year medical student at the beginning stage of learning, listening to patients’ disease history, and remembering various factors; the ‘advanced beginner’ stage refers to the junior medical student who associates his or her knowledge with real situations; the ‘competent’ stage refers to the resident physician who can set up plans for patients under senior doctors’ supervision despite some controlled patient risk; the ‘proficient’ stage refers to the specialist doctor in early practice who can address a wide range of situations. Finally, the ‘expert’ stage refers to the mid-career physician who can address the given medical situation using his or her intuition, with accuracy, flexibility, and creativity [5].

The author’s proposed Modified Dreyfus and Miller Model for surveys: What is common between the two models is that both explain competency levels. However, while Miller distinguished between ‘knows’ and ‘does,’ Dreyfus considered ‘knows’ to be within ‘does,’ and to be based on skillfulness and experience as built by spending time in clinical practice. The Modified Dreyfus and Miller Model, developed based on the two theories, is shown in Table 1. The modified model is structured to fit a self-report survey and is therefore composed of criteria that are clear and can be easily understood by respondents. One of the two versions of the model can be chosen over the other according to the purpose of the research being undertaken. The modified model is displayed in one table for ease of comparison of the two versions of the model.

The Modified Dreyfus Model (Fig. 1) includes the ‘absolute beginner,’ who has no relevant competency at all. The term

Table 1. Proposed Modified Miller and Dreyfus Model for surveys suggested by Janghee Park

Modified Dreyfus Model	
Absolute beginner	I know almost nothing. ^{a)}
Beginner ^{b)}	I can do it, relying on rules.
Advanced beginner	I can do it, relying on rules while recognizing elements of situations.
Competent	I can do it by a set plan with an organized approach to a problem or situation.
Proficient	I can do it based on similar experiences. ^{a)}
Expert	I can do it by intuition based on sufficient experience. ^{a)}
Modified Miller Model	
Knows little	I know almost nothing. ^{a)}
Knows & knows how	I have knowledge and know how to do it.
Exercised does ^{c)}	I can do it, relying on rules.
Selected does	I can do it, while recognizing situations and selecting a plan.
Experienced does	I can do it based on similar experiences.
Intuitive does	I can do it by intuition based on sufficient experience.

^{a)}Both Modified Dreyfus and Miller Models have the same level description. ^{b)}Dreyfus Model: novice. ^{c)}Miller Model: shows how.

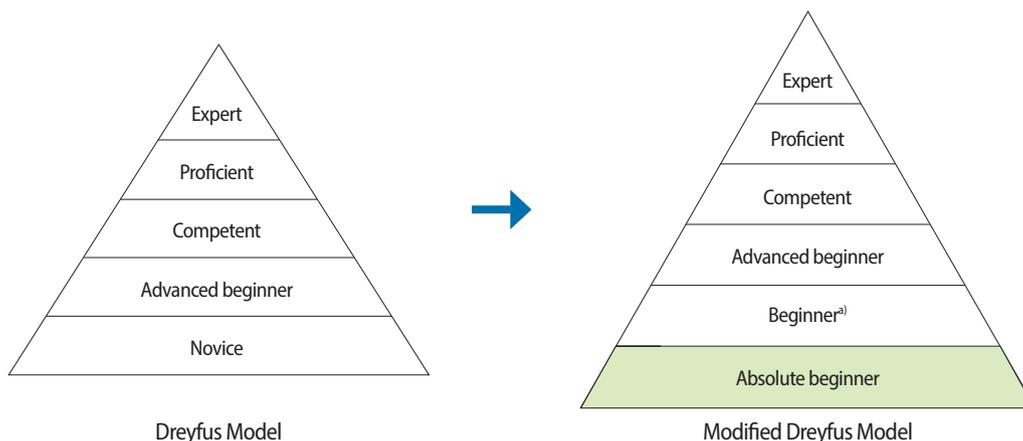


Fig. 1. Dreyfus Model vs. Modified Dreyfus Model. ^{a)}Novice.

'beginner' instead of 'novice' was used for consistency of terms. The names of each stage are 'absolute beginner, beginner, advanced beginner, competent, proficient, and expert.' The stages of *beginner* and above are based on the 'does' level, with consideration of each circumstance, and classified by skillfulness based on the amount of experience.

Among the competency levels, an 'absolute beginner' has almost no knowledge of the relevant competency. A 'beginner' can perform the relevant competency according to rules. An 'advanced beginner' can perform under rules and is merely able to understand some patient situations because he or she has little clinical experience. A 'competent' performer has some limited experience under supervision. A 'competent' performer follows rules, but can choose to take actions according to a patient's situation. A 'proficient' performer has some degree of clinical experience and selectively performs taking into consideration a patient's situation and experience of similar situations, following rules. Finally, an 'expert' has rich experience and takes actions automatically, using his or her intuitive judgment in solving problems. 'Competent,' 'proficient,' and 'expert' individuals can be distinguished by the degree of their experience in the real world and skillfulness.

Although Miller divided performance levels into 'knows,' 'knows how,' 'shows,' and 'does' [1], more broadly, they can be categorized into 'knowing' and 'doing.' 'Does' is a concept encompassing performance levels in a wide range of clinical cases. 'Does' needs to be classified by Dreyfus' criteria—situation, amount of experience, and level of skillfulness. The Modified Miller Model (Fig. 2) also added a 'knows little' level—without any relevant competency—and created the knowing level, by adding 'knows' and 'knows how.' 'Does' is subdivided into Dreyfus' criteria of situation, experience, and skillfulness. In other words, the term 'shows how' was changed to 'exercised does,' and 'does' was divided into 'selected does,' 'experienced does,'

and 'intuitive does.' Explanations for each step are as follows: Someone at the level 'knows little' has almost no knowledge of the relevant competency. Someone who 'knows and knows how' has some degree of knowledge including methods related to the relevant competency. A person at the 'exercised does' level, which is 'shows how' in the Miller Model, goes beyond knowing things or methods related with the respective competency, and can perform by following rules. In other words, a person at the 'exercised does' level has no clinical experience and has only practiced in an artificially structured setting. While someone at the 'exercised does' level performs according to rules, at the 'selected does' level, a person has some limited experience under supervision. A 'selected does' performer follows rules, but can choose to take actions according to a patient's situation and plan. A person at the 'experienced does' level has some degree of clinical experience and selectively performs taking into consideration a patient's situation and experience of similar situations, following rules. Finally, a person at the level of 'intuitive does' has rich experience and takes action automatically, using his or her intuitive judgment in solving problems. Between the Modified Dreyfus Model and Modified Miller Model, there are corresponding levels with the same descriptions: 'knows little' and 'absolute beginner,' 'proficient' and 'experienced does,' and 'expert' and 'intuitive does.'

An example of the Modified Miller Model that illustrates competency level is as follows: a medical student who merely knows about the basics and has clinical knowledge through formal studies is at the 'knows and knows how' level; the one who can perform under set rules in an artificially structured setting is at the 'exercised does' level; the one who experiences clinical environments both directly and indirectly through practice and can perform under supervision is at the 'selected does' level; the one who has some degree of clinical experience

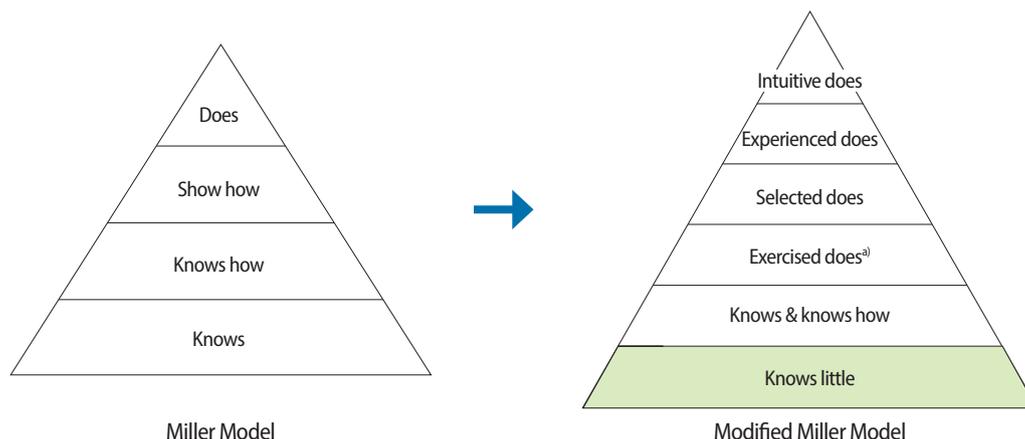


Fig. 2. Miller Model vs. Modified Miller Model. ^{a)}Shows how.

after obtaining a physician license and takes proper action according to a patient's condition is at the 'experienced does' level; the one who has extensive experience and intuitively takes appropriate measures according to patients' condition is at the 'intuitive does' level.

Prior to developing the Modified Miller Model, the author developed a similar competency model to adopt for a survey to evaluate the competency of students graduating from a medical university [6-8]. The survey had the same competency level descriptions, but the highest level was *selected does* to describe medical students before obtaining a physician license. The terms were 'none', 'novice', 'advanced beginner', and 'competent', of which meanings were the same with 'knows little', 'knows and knows how', 'exercised does', and 'selected does' in this Modified Miller Model.

The results of the analysis showed that for 36 competencies prescribed for graduation, those who were to graduate in February 2014 (n = 112) and 2015 (n = 110) reported their levels to be as follows: 'none /knows little' 4.39% (2014), 6.04% (2015); 'novice/knows and knows how' 33.32% (2014), 30.33% (2015); 'advanced beginner/exercised does' 46.09% (2014), 49.01% (2015); and 'competent/selected does' 16.20% (2014), 14.63% (2015). Reliability was very high. The Cronbach's α values were 0.972 (2014) and 0.968 (2015) [6-8].

The significance of the modified models lies in adding an additional stage of 'absolute beginner/knows little' and simplifying evaluation of the competency level in the survey. Thus, the model provides a clearer and simpler competency level description so that respondents can accurately determine their level. Furthermore, the Modified Miller Model is significant in that it subdivided the 'does' level, which encompasses performance levels in clinical practice by situation, experience, and skillfulness. Such differences are what is important in this study. If one can establish the definition of competency and the competency level in CBE and identify one's own competency level frequently through self-reflection, it would be helpful in developing one's competency, including a sense of professionalism.

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CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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SUPPLEMENTARY MATERIALS

Audio recording of abstract.

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