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The Role of the Unit Operations Laboratory in the Chemical Engineering Education

Contemporary standards of engineering education require that students acquire knowledge and skills, attain the right attitudes, and be simultaneously motivated for creativity. Classrooms and textbooks provide students with the knowledge and skills that are, more often than not, related to problems which are artificial and theoretical in nature. The unit operations laboratory (UOL), on the other hand, integrates theory and practice and promotes practical and creative work. Students learn hands-on and develop and improve a variety of academic and industrial skills by practicing, training, and tackling real problems [1-7]. Students are expected to explore previously learned knowledge, acquire new knowledge by practice, and develop various skills and attitudes [7].

This paper reviews the recent developments in the objectives of teaching laboratories in chemical engineering. It discusses the factors that affect developing and improving critical and creative skills in an integrative approach with other skills such as troubleshooting, safety, and maintenance. It also shows how to apply understanding levels in a practical way inside the lab. This method is based mainly on three factors, namely:

- (1) Having the right attitude,
- (2) Developing and practicing thinking techniques and tools and
- (3) Recognizing and avoiding thinking errors (thinking blocks).