



The Educational Process of the Work-integrated Learning (WIL) Program: Case Study of Engineering Faculty, Rajamangala University of Technology Lanna, Thailand

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DOI: <https://doi.org/10.30880/jtet.2023.15.01.021>

Received 19 October 2022; Accepted 16 January 2023; Available online 31 March 2023

Abstract: This research studies the educational process of the Work-integrated Learning (WIL) program in a case study of engineering faculty, at Rajamangala University of Technology Lanna (RMUTL), Thailand. The opinions of students and teachers who participated in the WIL program are investigated. In this regard, during the academic year 2020-2022, we applied for the "The Questionnaire about the Educational Process in WIL program". The questionnaire was sent to a sample of 120 students and 50 teachers. The subjects answered to questions regarding the roles of students, teachers, factory trainers, the quality of curricula, the effectiveness of teaching methods, the establishment, and university and executive support, in the WIL program. The conducted study shows the necessity of developing WIL curricula and strengthening a modern WIL learning process. WIL had an impact on students' increased responsibility and organizational communication. Teachers and factory trainers were obliged to have integrated performance of their teaching skills. New courses should be created expressly for WIL to reduce study time and interact with the workplace. The WIL model should also be improved student learning effectiveness. To effectively handle and administer the project with the backing of the executive's policy, the administrative framework and structure should be established.

Keywords: Work-integrated learning, curricula, teaching and learning process

1. Introduction

In higher education, the institution provides teaching and learning activities to develop work-ready graduates before sending them to work in the real world. However, technology changes rapidly nowadays, particularly in engineering. Therefore, the demand for work-ready graduates, who are familiar with the new technology in the workplace is increasing, and the need for greater work-integrated learning (WIL) is a growing concern for the education sector (Cooper et al., 2010). WIL is commonly used in the teaching and learning method that emphasizes the creation of curricula along with the employers who employ graduates by offering students the chance to apply their knowledge in the real world (Ibrahim et al., 2018). WIL can also support the students by enabling them to combine theoretical studies with practical work experience during their study (Berndtsson et al., 2020). Furthermore, WIL is flexible and transforms into other educational models, such as informal education or lifelong learning (Jeong & McMillan, 2015)

WIL is widely used to include work experience in profession-based academic programs such as law, medicine, nursing, and engineering which may be practised after graduation (Abeysekera, 2006). The strengths of WIL are to

produce potential graduates that are able to get a high paid occupation (Abd Karim & Mustapha, 2022). Also, they can seek a job that suits their competency since studying in the actual workplace (Govender & Wait, 2017).

The vision of the Faculty of Engineering, the Rajamangala University of Technology Lanna (RMUTL), is to produce ethical graduates who are proficient in technology and innovation for society towards an international standard. Cooperative education between university and establishments are provided to promote advanced skills and knowledge to learners. Several curriculums designed WIL program in relation to an engineering undergraduate curriculum (Berndtsson et al., 2020), i.e., Industrial Engineering, Electronics Engineering and Automatic Control Systems, and Agricultural and Biological Engineering, under cooperation with many companies, such as BDI Groups, SNC Former Public Co., Ltd., Michelin Siam Co., Ltd., Betagro Public Co., Ltd., Star Holdings Co., Ltd., and Thai Eastern Group Holdings PLC.

There is no central data survey regarding the WIL programs described above, including the internal education management. There are numerous styles of educational administration. It relies on numerous variables, including the factory, curriculum, and students. In addition, an information survey is required for the development of the WIL model to improve the educational efficiency of students. Moreover, it will support executives, entrepreneurs, and teachers in curriculum development, investment, and WIL efficiency improvement decision-making.

The objective of this paper is to examine the educational process of the WIL program through a case study of the engineering faculty at the Rajamangala University of Technology Lanna (RMUTL), Thailand. The opinions of participating students and teachers in the WIL program are studied. The questionnaire regarding the educational process in the WIL program is conducted for 120 students and 50 teachers. The participants responded to questions addressing the quality of curricula and the efficacy of teaching methods. Moreover, the support from the establishment and university is investigated. The objectives of this research are as follows:

- i) to study the educational management model of the WIL for the Faculty of Engineering curriculum. Rajamangala University of Technology, Lanna.
- ii) to study the opinions of students and teachers towards WIL education management.
- iii) to explore the need for improvement and the development of factors that affect education management in the WIL program.

2. Work-Integrated Learning (WIL)

Educational background, personal and professional abilities, and personality traits, all contribute to the employability (Blackmore et al., 2017). A degree, which makes up the first component, is no longer a "passport into graduate employment". For instance, more than 70% of South African engineering students who lacked workplace skills were evaluated as being unemployable (Makhathini, 2016). Students in a variety of fields, including the humanities, sciences, and engineering, understand that a university degree is only a prerequisite and is insufficient to guarantee employment (Beaumont et al., 2016; O'Leary, 2017). In fact, character traits and professional identity are becoming more important to employers than technical expertise. Employers also place a higher importance on students' soft skills than on their university's reputation (Hossain et al., 2020). Work-integrated learning (WIL) seeks to strategically engage students to encourage them to pursue prospective future occupations and so assist economic innovation and growth. To support student career development, higher education must incorporate WIL into curricula and requirements. It's a priceless chance for academics to combine theory and practice, as well as to introduce incoming graduates to the workforce and evaluate their experiential learning (Adegbite & Govender, 2021).

For students, WIL offers both personal and professional advantages (Nguyen et al., 2018). Students get professional knowledge and skills from their experiences in the industry, which might include things like working practices, organizations, and working processes, as well as job-specific talents (Lutz & Paretti, 2021). Along with conceptualization, cooperation, and social intelligence, students' general skills such as critical thinking, problem-solving, communicating, reasoning, analysing, and diagnosing are also honed (MARTIN et al.). Students learn about values and attitudes, as well as the language and conduct necessary for the job, through social interactions within the professional communities of their employers (Rowe et al., 2021). The WIL working environment has a significant impact on how well students do in their job experiences (Smith et al., 2019). As a result, the workplace environment has a significant impact on how employable students become by WIL (Bowen, 2020). According to Ajjawi et al. (2020) research, students should be given access to real-world WIL activities that provide them the chance to understand the goals, settings, and actions of workers.

HA and VAN DUONG examines the employability content that ought to be included in the work-integrated learning (WIL) curriculum at universities in Vietnam. WIL stakeholders, including university department heads, business executives, lecturers, business professionals, graduates, and students were interviewed in-depth and participated in focus groups as part of an exploratory sequential mixed-methods approach. The results showed that a WIL program should include the following: 1) Overarching workplace standards including safety standards and work ethics; 2) a basic understanding of good communication skills; and 3) a mindset that supports working well with customers. In line with a survey conducted in Australian universities (Jeong & McMillan, 2015). With the help of a focus group interview and literature review, it can determine the type and degree to which work-oriented placements at an international level provide opportunities to experience actual and modern practice. All stakeholders, including curriculum developers, education

providers, students, and users of health services. The study identified four key findings: 1) Reflections on real work/real-time activities, including direct observation and third-party reports; 2) The necessity of using structured activities in simulation, demonstration, and activity sheets; 3) Oral and written questioning (including work-related projects); and 4) Keeping records in portfolios and/or actual current workplace documentation of activities.

Khampirat et al. (2019) showed that WIL experiences can improve students' performance in their work-related skills since they can gain a variety of implicit and explicit knowledge, skill, and attitude types while they are working. WIL is one of the types of experiential learning that gives students the chance to engage in real-world work and is crucial to both their personal growth and the building of a sustainable society through career development.

This study examines the teaching and learning environments from the viewpoints of the WIL curriculum at Faculty, the Rajamangala University of Technology Lanna, Thailand, to fill this research gap. The purpose is to contribute to the global search for solutions to improve the quality of WIL and increase student employability while also providing curriculum developers with useful information for building learning content, particularly WIL creators and implementors in Thailand.

3. Methodology

The methodologies of this research were implemented in the following step.

3.1 Sample Group Determination

The sample group involved the current students and teachers who participated in the WIL program from three curricula: Industrial Engineering, Electronics Engineering and Automatic Control Systems, and Agricultural and Biological Engineering Program, Faculty of engineering, RMUTL. The purposive sampling method was used to obtain 50 teachers and 120 current students in the 2020-2022 academic years.

3.2 Questionnaire Development and Validation

A questionnaire is a technique for gathering information from respondents. It is an effective method of data collection, but the researcher must be aware of what is necessary and how to measure the variables of the interest (Kazi & Khalid, 2012). In addition, it is crucial for a researcher to understand the significance of a properly constructed questionnaire and whether it measures what it is intended to assess.

In WIL programs, questionnaires are utilized to collect quantitative data from both students and teachers. The content of the questionnaires is evaluated from the perspective of current students and teachers regarding the roles of students, teachers, and factory trainers, the quality of curricula, the efficacy of assessment and teaching methods, and the establishment and university support for the WIL program. The following describes the questionnaire's contents:

- 1) The teacher questionnaire contained five topics:
 - Part 1: General information
 - Part 2: Opinion on the WIL program
 - Part 3: Information about the WIL program
 - Part 4: Recommendations
- 2) The student questionnaire contained four topics:
 - Part 1: General information
 - Part 2: Opinion on the WIL program
 - Part 3: Information about teaching and learning management
 - Part 4: Recommendations

The content of the questionnaire is validated using the Index of Item-Objective Congruence (IOC) (Ismail & Zubairi, 2022) by nine experts. There is consistency between each question item and its content. In addition, the reliability of the questionnaire was tested using the Coefficient of Cronbach's Alpha (Ravinder & Saraswathi, 2020) and tried out with 10 samples. As a result, the reliability of the teacher and student questionnaires was 0.72 and 0.85, respectively.

3.3 Data Collection

The questionnaires were sent to 50 teachers and 120 students. Data collection was completed in October 2022. The respondents took approximately 10 - 20 minutes to complete the survey. Ethical clearance was received from the Ethics Committee for Research Involving Human Subjects of Rajamangala University of Technology Lanna (RMUTL-IRB 004/2021) to protect all participants in the study. Participants had been formally informed about this data collection. They read the information sheet to understand the study before deciding whether to participate.

3.4 Results Analysis

This study is based on a questionnaire survey led by the following research objectives: 1) to study the educational management model of the WIL for the Faculty of Engineering curriculum. 2) to study the opinions of students and

teachers towards WIL education management. 3) to explore the need for improvement in the WIL program. This analysis was developed in three stages: (I) WIL program review; (II) Questionnaire survey; (III) Data analysis. The statistics data were analysed as follows.

- i) Frequency was applied to the checklist questions before summarizing in percentage.
- ii) Mean (M) and Standard Deviation (S.D.) were applied to the rating scale questions.
- iii) Multiple response frequency was applied to the ranking questions before summarizing in percentage.

4. Results

The research results consisted of three parts. The first part presents the WIL program by comparing the three curricula. The second part shows the analysis results obtained from the student questionnaire. The last part presents the analysis results obtained from the teacher questionnaire.

4.1 WIL Program

The WIL program comprises three curricula, which are Industrial Engineering (Curricular A), Electronics Engineering and Automatic Control Systems (Curricular B), and Agricultural and Biological Engineering (Curricular C). Those curricula have different characteristics in terms of education management in the WIL program shown in Table 1.

Table 1 - WIL program in engineering faculty, RMUTL

| Educational Management | Curricular A | Curricular B | Curricular C |
|---|---------------------|---------------------|---------------------|
| Duration of WIL program | 2 years | 2 years | 2 years |
| Total credits | 145 | 136 | 136 |
| Percentage of Credit Transfer | 13% | 30% | 22% |
| Percentage of Study duration in university: workplace | 0:100 | 50:50 | 0:100 |
| Percentage of Course provided in classroom: workplace | 80:20 | 80:20 | 80:20 |
| Special curricula for WIL | No | No | No |
| Student Compensation | Yes | Yes | Yes |

Table 1 shows that the duration of all programs is 2 years. The credit transfers of Curricular A, Curricular B, and Curricular C was 13%, 30%, and 22% from all credits offered in each program, respectively. In terms of the study duration, Curricular A and C study at the workplace entirely while Curricular B studies at the university and the workplace at a ratio of 50:50. Regarding the course provided in a classroom ratio, compared to the workplace, 80% of the course of all curricular are in the classroom, and 20% are at the workplace. Each WIL program period could be concluded, as shown in Figure 1.

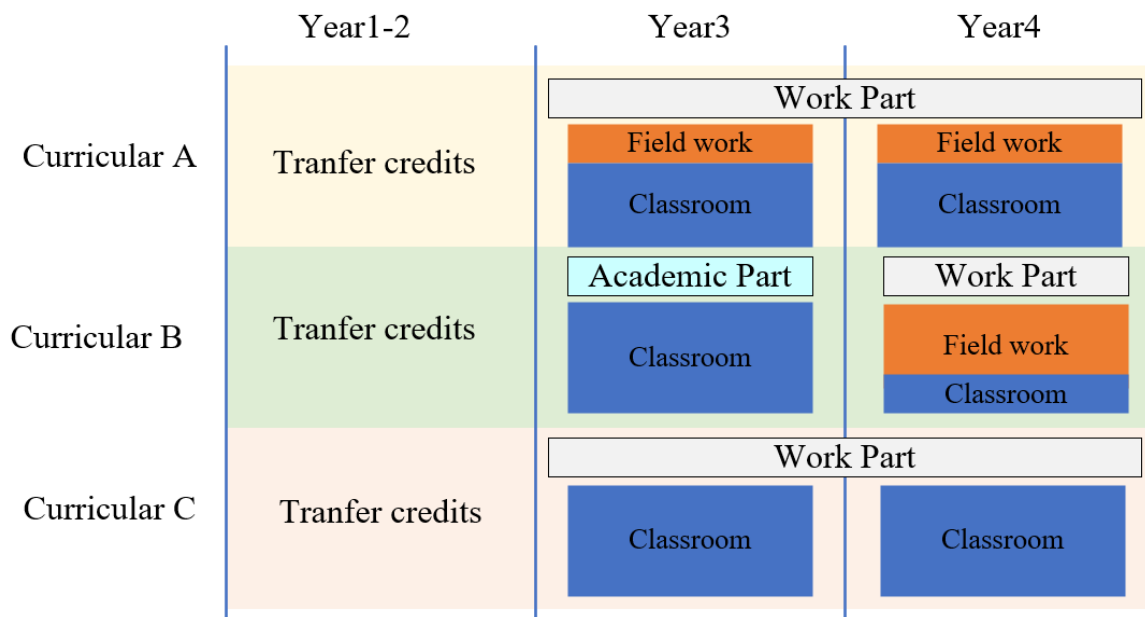


Fig. 1 - Duration of the WIL program

4.2 Data Analysis Results from The Student Questionnaire

4.2.1 General Information

The total respondents were 120 students in the engineering faculty, at RMUTL, Thailand. They were a third year (25%) and fourth year (75%) of their bachelor's degree program in Industrial Engineering, Electronics Engineering and Automatic Control Systems, and Agricultural and Biological Engineering. The average age of the respondents was 21-23 years (88.3%) and 24 years and above (11.7%). 111 (92.5%) were male and nine (7.5%) were female. Most of the students (102, 85.0%) did not have any work experience before the beginning of the WIL program. The demographic profiles of the respondents are summarized in Table 2.

Table 2 - Characteristics of the respondents (n=120)

| Characteristics | Frequency | % |
|---|------------------|----------|
| Curricula | | |
| Industrial Engineering | 25 | 20.8% |
| Electronic Engineering and Automation Control | 60 | 50.0% |
| Agricultural and Biological Engineering | 35 | 29.2% |
| Age | | |
| 21-23 years | 106 | 88.3% |
| 24 years and above | 14 | 11.7% |
| Gender | | |
| Male | 111 | 92.5% |
| Female | 9 | 7.5% |
| Year of study | | |
| Year 3 | 30 | 25% |
| Year 4 | 90 | 75% |
| WIL experiences | | |
| Yes | 17 | 14.2% |
| Not yet | 102 | 85.0% |
| Do not Know | 1 | 0.8% |

4.2.2 Students' Opinions on The WIL Program

The respondents were invited to rate themselves in each factor of the WIL program by using scoring rubrics in self-performance assessments. The rubric, quantitative labels, contained five levels of autonomy (1-5) ranging from one for highly structured direction.

According to the survey results, students have an average impression of their own performance that ranges between 3.96 and 4.17. Their self-adjustment and organizational communication, and punctuation all scored on average 4.17 and 3.96, respectively, for the highest and lowest performance. Students' opinions of teachers range in mean score from 3.83 to 4.25, with teaching proficiency having the greatest mean at 4.25 and integration having the lowest mean at 3.83.

The students' average opinion of the factory trainer ranged from 3.58 to 4.17, with the highest mean at the 4.17 level for proficiency in work and the lowest value at an average of 3.58 for the evaluation. The average student rating of the curriculum ranged from 3.42 to 3.75, with the highest mean rating of the curriculum meeting the students' needs at 3.75. From the students' point of view, the consistency of content and work operations is lowest at 3.42.

The range of student opinions on teaching management was 3.33 to 4.25 on average. The extracurricular activities are appropriate, scoring the highest on average (4.25). The number of factory trainers assigned to each student is not appropriate. Its average value is the lowest, at 3.33. The average of the student's opinions of the establishment ranged from 4.00 to 4.25. The locations are secure and suitable for WIL education. The average student opinion of universities and executives ranged from 3.11 to 3.92, with an average of 3.92 given to the university for offering the best learning resources for WIL studies. However, facilitation has the lowest value at 3.11.

Table 3 - Student' opinions on WIL

| Item | Topics | <i>M</i> | <i>SD</i> | Interpretation |
|---------------------------------|---|----------|-----------|----------------|
| Student | | | | |
| 1 | Punctuality | 3.96 | 0.68 | High |
| 2 | Discipline | 4.00 | 0.71 | High |
| 3 | Concentration | 3.98 | 0.62 | High |
| 4 | Self-adjustment and Organizational communication | 4.17 | 0.55 | High |
| 5 | Responsibility | 4.16 | 0.71 | High |
| | Total | 4.05 | 0.66 | High |
| Teacher | | | | |
| 6 | Proficiency in profession | 3.92 | 0.86 | High |
| 7 | Proficiency in teaching | 4.25 | 0.72 | High |
| 8 | Integration of course content | 3.83 | 0.80 | High |
| 9 | Evaluation by actual conditions | 4.04 | 0.84 | High |
| 10 | Responsibility for teaching | 4.21 | 0.50 | High |
| | Total | 4.05 | 0.77 | High |
| Factory trainer | | | | |
| 11 | Proficiency in work | 4.17 | 0.80 | High |
| 12 | Proficiency in teaching | 3.62 | 0.92 | High |
| 13 | Integration of course content to work performance | 4.00 | 0.91 | High |
| 14 | Evaluation by actual conditions | 3.58 | 0.76 | High |
| 15 | Responsibility for teaching | 4.04 | 0.84 | High |
| | Total | 3.88 | 0.88 | High |
| Curricular | | | | |
| 16 | Curricular innovations | 3.67 | 0.85 | High |
| 17 | Correspond to the learner demand | 3.75 | 1.01 | High |
| 18 | Consistency of content and work operation | 3.42 | 0.86 | Moderately |
| 19 | Appropriate lesson plan and study period | 3.50 | 0.91 | Moderately |
| 20 | Application of content to work operation | 3.46 | 0.76 | Moderately |
| | Total | 3.56 | 0.89 | High |
| Teaching management | | | | |
| 21 | Sufficient materials and equipment | 3.92 | 0.86 | High |
| 22 | Appropriate number of mentors to learners | 3.33 | 0.80 | Moderately |
| 23 | Student supervision | 4.00 | 0.71 | High |
| 24 | Support on compensation, accommodation, travel | 3.92 | 0.64 | High |
| 25 | Appropriate extracurricular activities | 4.25 | 0.60 | High |
| | Total | 3.88 | 0.79 | High |
| Establishment | | | | |
| 26 | Appropriateness to WIL | 4.25 | 0.60 | High |
| 27 | Suitable facilities | 4.13 | 0.78 | High |
| 28 | Safety | 4.25 | 0.60 | High |
| 29 | Personnel cooperation | 4.00 | 0.71 | High |
| 30 | Consistency to profession | 4.04 | 0.68 | High |
| | Total | 4.13 | 0.68 | High |
| University and Executive | | | | |
| 31 | Policy to promote WIL | 3.38 | 0.75 | Moderately |
| 32 | Learning sources provision | 3.92 | 0.86 | High |
| 33 | WIL management structure | 3.26 | 0.85 | Moderately |
| 34 | Facilitation | 3.11 | 0.87 | Moderately |
| 35 | Adequate budget allocation | 3.88 | 0.88 | High |
| | Total | 3.51 | 0.91 | Moderately |
| | All total | 3.87 | 0.84 | High |

4.2.3 Recommendation for Improvement

The respondents shared their thoughts on how to improve WIL education to make it more effective. The most expectation to improve is WIL model, accounting for 35% of the total, followed by curriculum development in accordance with the specific WIL model, accounting for 25%, while teachers and students' performance required the least improvement, as indicated in Table 4, accounted for 3.33% and 1.67%, respectively.

Table 4 - Significance of WIL

| Ranking Item | Rank | Main Themes | Percentage |
|---------------------|-------------|--------------------------------|-------------------|
| Significance of WIL | 8 | Students | 1.67% |
| | 7 | Teachers | 3.33% |
| | 4 | Factory trainer | 8.33% |
| | 2 | Curricular | 25.0% |
| | 6 | Establishment | 4.17% |
| | 3 | Teaching management | 16.67% |
| | 5 | University and Executive | 5.83% |
| | 1 | Work Integrated Learning Model | 35.0% |

4.3 Data Analysis Results from The Teacher Questionnaire

4.3.1 General Information

The results of data analysis from the questionnaire replies of 50 participants in the WIL program at the engineering faculty, RMUTL. Teachers of electronic engineering and automation control curricula made up most responders (46%), followed by teachers of industrial engineering (34%), and teachers of agricultural and biological engineering (20%). Most teachers that participate in the WIL program have master's degrees (72%), followed by doctoral degrees (28%). Male teachers made up 84 percent of the teaching force, while female teachers made up 16 percent. Most respondents (76%) had academic positions as lecturers, followed by assistant professors (24%). All information is shown in Table 5.

Table 5 - Characteristics of the respondents (n=50)

| Characteristics | Frequency | Percentage |
|---|------------------|-------------------|
| Field of expertise | | |
| Industrial engineering | 17 | 34% |
| Electronic Engineering and Automation Control | 23 | 46% |
| Agricultural and Biological Engineering | 10 | 20% |
| Graduate | | |
| Bachelor's degree | 0 | 0% |
| Master's degree | 36 | 72% |
| Doctor's degree | 14 | 28% |
| Gender | | |
| Male | 42 | 84% |
| Female | 8 | 16% |
| Academic position | | |
| Lecturer | 38 | 76% |
| Assistant professor | 12 | 24% |
| Associate Professor | 0 | 0% |
| Professor | 0 | 0% |
| WIL experiences | | |
| Yes | 35 | 70% |
| Not yet | 15 | 30% |
| Do not Know | 0 | 0% |

4.3.2 Teachers' Opinion on WIL program

The teachers were asked to rate their opinion in each aspect of the WIL program using scoring rubrics. In terms of adaptation and communication inside the organization, the opinion level of teachers toward students has an average score 4.25, while the punctuality was the lowest at an average of 3.88. The teachers were asked to rate their own teaching performance in WIL program. The result shows that the instructional responsibility having the highest mean at 4.25 and content integration having the lowest mean at 3.92, the average scores ranged from 3.92 to 4.25.

The average teacher's opinion of factory trainers ranged from 3.54 to 4.21 and agreed that factory trainers are skilled at their jobs. However, they are lower in the evaluation by actual conditions. For the curricular, teachers agree that the curriculum meets the needs of the students. Moreover, extracurricular activities are appropriate at an average of 4.21.

The teacher's opinion towards the establishment indicates that they are suitable for WIL education and are safe. The highest mean was 4.33. The staff's cooperation was the lowest at 4.08. The opinion level of teachers toward universities and executives was averaged at 3.00-4.08, with the university providing learning resources for WIL education having the highest average of 4.08. Facilitating project management has the lowest value, at an average of 3.00.

Table 6 - Teacher' opinions on WIL

| Item | Topics | <i>M</i> | <i>SD</i> | Interpretation |
|---------------------------------|---|----------|-----------|----------------|
| Student | | | | |
| 1 | Punctuality | 3.88 | 0.60 | High |
| 2 | Discipline | 3.92 | 0.64 | High |
| 3 | Concentration | 4.07 | 0.68 | High |
| 4 | Self-adjustment and Organizational communication | 4.25 | 0.60 | High |
| 5 | Responsibility | 4.24 | 0.74 | High |
| | Total | 4.07 | 0.67 | High |
| Teacher | | | | |
| 6 | Proficiency in profession | 4.04 | 0.84 | High |
| 7 | Proficiency in teaching | 4.00 | 0.82 | High |
| 8 | Integration of course content | 3.92 | 0.76 | High |
| 9 | Evaluation by actual conditions | 3.96 | 0.73 | High |
| 10 | Responsibility for teaching | 4.25 | 0.52 | High |
| | Total | 4.03 | 0.75 | High |
| Factory trainer | | | | |
| 11 | Proficiency in work | 4.21 | 0.87 | High |
| 12 | Proficiency in teaching | 3.83 | 0.80 | High |
| 13 | Integration of course content to work performance | 4.04 | 0.93 | High |
| 14 | Evaluation by actual conditions | 3.54 | 0.76 | High |
| 15 | Responsibility for teaching | 4.13 | 0.78 | High |
| | Total | 3.95 | 0.86 | High |
| Curricular | | | | |
| 16 | Proficiency in work | 3.67 | 0.94 | High |
| 17 | Proficiency in teaching | 4.13 | 0.83 | High |
| 18 | Integration of course content to work performance | 3.46 | 0.91 | Moderately |
| 19 | Evaluation by actual conditions | 3.50 | 0.82 | Moderately |
| 20 | Responsibility for teaching | 3.50 | 0.87 | Moderately |
| | Total | 3.65 | 0.91 | High |
| Teaching management | | | | |
| 21 | Sufficient materials and equipment | 3.92 | 0.76 | High |
| 22 | Appropriate number of mentors to learners | 3.46 | 0.96 | Moderately |
| 23 | Student supervision | 4.04 | 0.73 | High |
| 24 | Support on compensation, accommodation, travel | 3.96 | 0.68 | High |
| 25 | Appropriate extracurricular activities | 4.21 | 0.58 | High |
| | Total | 3.92 | 0.79 | High |
| Establishment | | | | |
| 26 | Appropriateness to WIL | 4.33 | 0.62 | High |
| 27 | Suitable facilities | 4.17 | 0.80 | High |
| 28 | Safety | 4.33 | 0.62 | High |
| 29 | Personnel cooperation | 4.08 | 0.76 | High |
| 30 | Consistency to profession | 4.13 | 0.73 | High |
| | Total | 4.21 | 0.72 | High |
| University and Executive | | | | |
| 31 | Policy to promote WIL | 3.38 | 0.70 | Moderately |
| 32 | Learning sources provision | 4.08 | 0.76 | High |
| 33 | WIL management structure | 3.20 | 0.83 | Moderately |
| 34 | Facilitation | 3.00 | 0.82 | Moderately |
| 35 | Adequate budget allocation | 3.54 | 0.96 | High |
| | Total | 3.44 | 0.90 | Moderately |
| | All Total | 3.90 | 0.84 | High |

4.3.3 Information About Teaching and Learning Management

Most teachers use the lecture method, accounting for 37.5% of the total, followed by the question-answer method in the classroom. The least occurring teaching method was integration, at 4.2%. The activities that occur during the class are listening to lectures (33%), followed by question-and-answer (25%), and the least occurring activity was a demonstration (8.3%). Teaching materials used in class are assignments, followed by computer presentations. The types of tool

evaluation are subjective exams (33.3%), followed by practice exams (29.2%), and the least used measure of achievement was an interview (8.3%).

Table 7 - Ranking of WIL significance

| Ranking Item | Rank | Main Themes | Percentage |
|----------------------------|--------------------------|--|------------|
| A. Teaching method | 1 | Lecture | 37.5% |
| | 2 | Question-Answer | 29.2% |
| | 3 | Discussion | 16.7% |
| | 5 | Experiment | 4.2% |
| | 4 | Integration | 12.5% |
| B. During-study activities | | Demonstration | |
| | | Group activity | |
| | 1 | Lecture | 33.3% |
| | 2 | Doing exercise | 25.0% |
| | 3 | Question-Answer | 16.7% |
| | 4 | Experiment | 8.3% |
| | 3 | Demonstration | 16.7% |
| | | Group activity | |
| | | Discussion | |
| | | Presentation | |
| C. Media used | | Work operation | |
| | | Integration | |
| | 5 | Board | 10% |
| | 3 | Document | 20.8% |
| | 2 | Computer | 30% |
| | 4 | Exercise / Test | 20% |
| D. Evaluation tools | 1 | Online media | 35% |
| | | Work performance sheet.... book / textbook | |
| | | Job assignment sheet | |
| | 1 | Subject test | 33.3% |
| | 3 | Objective test | 16.7% |
| | 2 | Fill-in-the-blank exam | 29.2% |
| | 5 | Practical exam | 8.3% |
| 4 | Observation | 12.5% | |
| | Interview | | |
| | Assigned job performance | | |

4.3.4 Recommendation for Improvement

The teachers who answered the questionnaire commented on what should be improved to increase the efficiency of the WIL education. The most important thing to improve is the curricula in accordance with the specific WIL model (42%), followed by the WIL model (28%), while the factory trainer had the least need for improvement (2%). The details are shown in Table 8.

Table 8 - Significance of WIL

| Ranking Item | Rank | Main Themes | Percentage |
|----------------------------|--------------------------------|---------------------|------------|
| Significance affecting WIL | 5 | Students | 2.0% |
| | 1 | Teachers | 42.0% |
| | 3 | Factory trainer | 16.0% |
| | 4 | Curricular | 10% |
| | 2 | Establishment | 28% |
| | | Teaching management | |
| | University and Executive | | |
| | Work Integrated Learning Model | | |

5. Discussion

This survey research was applied to 170 samples, 120 students and 50 teachers who were involved in the WIL program. Three curricula were studied, Industrial Engineering, Electronic Engineering and Automation Control Systems, and Agricultural and Biological Engineering. The results discovered the following aspects.

WIL was applied to the available curricula in the university. The result shows that the course transfer method was implemented, and the maximum transfer was 30% of the entire course. For this reason, the teaching and learning plan was very compact, and students had to study and work very hard, which was proved by the ratio of classroom learning and work part, 80:20. Anyhow, the new curricula should be created to specifically implement WIL for long-term development, such as investigating the stakeholder needs, examining the competency from the establishment to set the competency of the curricular, setting the continuing curricula that directly admitted the graduates from high vocational diploma degree, and developing the performance measurement and evaluation of the work part to shorten the classroom study period.

Opinions of students and teachers on WIL; Students who attend the WIL program had high responsibility, self-adjustment, and organizational communication. Meanwhile, the discipline and punctuality of students were at a low level. Interview results also revealed that students spent their working time and after-class time studying, so they were exhausted in class.

Opinions on teachers who were involved in WIL showed that they had high responsibility for teaching and proficiency in their profession and teaching. Students and teachers agreed that there was low content integration between the course content and the working experience. The interview with teachers showed that the taught curricula were the general curricula for the university, so the course description did not support the integration.

Regarding the opinions on factory trainers, they were proficient in their jobs with high responsibility and were able to integrate the content to work operations. However, most factory trainers had no proficiency in educational performance measurement and evaluation.

Students and teachers agreed that the curricula should be improved to suit the WIL program. For example, the application of course content to work performance, consistency of content and work operations, and the modernity of the curricula. Moreover, the consistency of the lesson plan and reduction of study duration should be improved.

Regarding the administration and management, student supervision was at a high level. However, the number of factory trainers was low, and the support of learning materials and equipment is insufficient.

Regarding the establishment, students and teachers agreed on the appropriateness of WIL in terms of facilitation, safety, and consistency of work and profession.

In terms of university and executive, the sample group agreed that the WIL administrative structure, and specific division that facilitated WIL, e.g., disbursement, operations, and budget allocation for project management should be developed.

From the student's perspective on the need for improvement of WIL efficiency, the WIL program should be improved. Meanwhile, teachers would like to develop specific curricula for the WIL program. However, the content of both aspects was consistent and required urgent review. It was in line with the opinions on the need for developing new curricula to enhance education efficiency.

6. Conclusion

The study of the work-integrated learning curricula: a case study of Faculty of Engineering, Rajamangala University of Technology Lanna, with a total of 170 students and teachers, demonstrated that WIL affected the higher responsibility and organizational communication of students. At the same time, teachers and factory trainers were required to have teaching skills promotion and integrated performance measurement. In terms of curricula, new curricula should be specifically developed for WIL program to minimize the study duration and integrate with work experience. In addition, the WIL program should be developed the student's learning efficiency in work experience. Regarding the policy support from the executive, the administrative structure should be set, and the project leader should be authorized to handle and manage the project efficiently.

Further research should develop WIL Model for curricula that respond to the demand of stakeholders by determining the competency to be consistent with the establishments. Further, the teaching and learning model that suits WIL should be considered, as well as the instructional media and performance measurement and evaluation by actual conditions, especially the evaluation of expected competency.

Acknowledgements

This research was partially supported by National Higher Education Science Research and Innovation Policy Council (NXPO) in Program Management Unit for Human Resources & Institutional Development, Research, and Innovation (PMU-B) under grant B01G640025. This support is gratefully acknowledged.

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