

## Development of students' disciplinary literacy through reflective practice: Ukrainian case

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### Abstract

Most studies on critical thinking concentrate on developing strategies for better results in learning and life. Not enough research considers critical thinking as one of the most important components of professional competency. Thus, this research investigates how developing critical thinking skills links with arising professional competency, which forms the disciplinary literacy. In particular, this study suggests that the application of reflective strategies in professional communication significantly evolves critical thinking skills. First, a conceptual framework of the importance of critical thinking in practice and life was synthesized from the academic and scientific literature. Then the level of reflection of the groups of students of Ukrainian universities was analyzed at the observation stage. After defining the poor results, the students were taught a reflective strategy course, which significantly increased the required critical thinking skills for their professional situations. Measures of correlation were used to describe the relationships between the reflective strategies and the improved results in critical thinking skills. The results provided support for the conceptual framework with the students' increased professional competency in problem communication issues within their professional setting. Learning reflective strategies may be an appropriate way to arise critical thinking skills with the students. The implications for academics, teachers, and researcher in this field is that the reflective strategies are one of the tools to improve the critical thinking and problem-solving skills as an integral part of disciplinary literacy.

*Keywords:* critical thinking; reflective practice; disciplinary literacy; professional competency; university students; ESP

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### 1. Introduction

Despite all growing educational technologies in developing disciplinary literacy skills, modern students who are future professionals feel a lack of confidence in job problem situations. This mostly is caused by a low level or absence of reflective strategies which directly results in the level of critical thinking skills.

Although some researchers have paid attention to developing disciplinary literacy through learning the main generic skills for acquiring the specific content within the job (Lent, 2016; C. Shanahan & Shanahan, 2014; T. Shanahan & Shanahan, 2008, 2012; Zygouris-Coe, 2012), little is known about the factors which influence the development of disciplinary literacy with the first-year students in Ukrainian universities as the information is often inconsistent (Liashenko, 2019; Rebenko et al., 2019) and disciplinary literacy is often associated with the evaluation the specific knowledge and generating knowledge in the specific area (Moje, 2007). Furthermore, disciplinary literacy has traditionally been associated with a combination of content knowledge from different basic sciences with the skills reading, writing, listening, speaking, critical thinking and adequate performance (Bojović, 2017). Other researchers vote for communication and collaboration as the additional components of

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disciplinary literacy (Airey & Larsson, 2018; Lent, 2016; C. Shanahan & Shanahan, 2014). As a result, the literature on the importance of the specific components in relation to the basic disciplines is rich, as this set of the components of disciplinary literacy is suggested to be steady and invariable, but the literature does not capture the consistency of the additional characteristics of the disciplinary literacy because of the rich diversity skills which are suggested to be important professional skills of the 21st century. That is, the inconsistency in the additional components of disciplinary literacy allows us to provide the research to prove the efficiency of this component for the educational process of specific practice.

Past research on developing disciplinary literacy has outlined the structural framework of the disciplinary literacy components. However, there is little research to prove the practical effect of the additional component for better results in the professional competency of the students.

Against this background, the purpose of this research is to answer the research question: "How critical thinking skills development may influence the level of disciplinary literacy in the students of the universities?"

More specifically, the two main objectives of this research are:

to define the mechanisms for shaping critical thinking;

to provide the experimental proof of the relationship between critical thinking through reflective practices as a tool of critical thinking development and disciplinary literacy.

The information generated from this research should provide both teachers and students with a greater understanding of the ways to influence the professional component in disciplinary literacy forming.

The remainder of the article is structured as follows: first, a conceptual framework explaining the essence of critical thinking and its ability to shape the professional component, namely the reflection strategies as the subsidiary techniques to develop critical thinking, is presented. Next, this is followed by a description of the research methods and procedures used in the study. The results of our inquiry are then discussed. Finally, implications, limitations, and directions for future research are offered.

## 2. Literature Review

Disciplinary literacy (DL hereinafter) is claimed as a unique tool for professional, deep engaging in the discipline (T. Shanahan & Shanahan, 2012). As it is related to the professional sphere, we consider it as a part of the whole professional competency. DL involves specific information, specialized vocabulary, expertise critical responding to produce and communicate each specific knowledge given in the texts. It is suggested that disciplinary literacy is a highly developed skill, as it seeks to develop expertise in specific disciplines through mastering the core academic content. (Lent, 2016; T. Shanahan & Shanahan, 2012).

There is a wide range of research which proves the unity with the professional component in acquiring the discipline. DL is defined as awareness to assess the specific knowledge and generate knowledge in this specific area (Moje, 2007). The rising correlation between successful job placement and increasing literacy in the academic process is also suggested by the researchers (T. Shanahan & Shanahan, 2008; Barton & Jenkins, 1995). The specificity of the core goal has become the main feature of disciplinary literacy, and the specific circumstances characterize the frames of applying and developing disciplinary literacy (Bojović, 2017; Lent & Voigt, 2018). The final aim, students seek to achieve, is to engage in practices of the core academic skills that will issue provide support in solving specific disciplinary issues (Hynd-Shanahan, 2013). This suggests that disciplinary literacy is "...anchored in the specifics of individual disciplines" (McConachie & Petrosky, 2009) and its development involves the simultaneous engagement (eg. reading, writing, searching, presenting, listening, speaking, discussing and solving problems related to substantive expert practices) (Fang, 2012). Disciplinary literacy is suggested to refer to a particular combination of disciplinary-specific communicative practices which has

been developed for three specific situations: the academic community, the workplace and society (Airey & Larsson, 2018)

Disciplined literacy theory creates opportunities to develop accurate knowledge despite the specific perspective. This expertise is developed as a function of developing the ability to create and represent knowledge in various forms, the ability to analyze how the knowledge is represented, and in the end to evaluate statements about the truth, and the ability to apply the analytical power to develop the new knowledge that benefits society. Moreover, disciplinary literacy is interpreted as a skill for analyzing the connections between the plans and aims and final ideas (International Literacy Association, 2015). It is also defined as being engaged in the specific for each academic discipline goals and practices (Spires et al., 2018). In this way, this ability is also related to the representing of high-order skills of a critical thinking process, which is considered to be one of the most required skills in the 21st century. DL is the ability to use the common information in the appropriate for the definite discipline way, so with the specific purpose, and to use the generic skills in favor to learn the specific information within the discipline deeply. DL is correlated with the critical thinking ability to produce new knowledge but within the required discipline. It uses critical thinking and problem solving, using methods and queries within the discipline (Lent, 2016). The likability to critical thinking can also be seen in other researchers' studies. Thus, DL is stated as advanced literacy instruction within the subject with applying high-order thinking skills like questioning, visualizing and summarizing (Hillman, 2014). Research by Hynd-Shanahan (2013) suggests that the high-level thinking skills development is used by students who understand their specific content in the discipline (Hynd-Shanahan, 2013).

Through a disciplinary approach to literacy, students employ the ability to engage in goals and practices that are specific to any academic subject. The students use discipline-specific frameworks for completing the critical tasks: 1) interpreting texts and 2) composing and revising texts. The main action verbs used in DL approach instructions are 'evaluate, determine, annotate, identify, discuss, suggest' (International Literacy Association, 2017).

As the important component of disciplinary literacy is critical thinking, we would also follow the statement that disciplinary literacy is a set of developing skills assisted by critical thinking abilities to acquire the specific knowledge of the discipline. This is supported by the idea that disciplinary literacy is a special set of heuristics and mental settlements in other research in this field (Brozo, 2017; Pearson et al., 2010). For the practical development of disciplinary literacy, educational researchers suggest a number of strategies that are closely connected with critical inquiry and analyzing. For example, for reading activities the main key actions for activation the disciplinary literacy may be: 'provide ongoing, embedded literacy professional learning', 'form a literacy leadership team', 'make sure professional learning communities or disciplinary literacy cohorts are grounded in continuous disciplinary literacy learning and collaborative inquiry', 'provide the resources', 'ensure that teachers, especially those in cohorts or teams, experience encouragement, support, and opportunities to stretch their skills and knowledge', 'encourage cross-curricular or cross-team collaboration', 'foster leadership in all areas', 'use reflection, learning, and planning collaboratively', 'find opportunities for co-teaching and peer coaching within disciplines' (Lent & Voigt, 2018).

Another constituent of disciplinary literacy, particularly the professional competency, is collaboration. Disciplinary literacy depends on collaboration within a team in mutual activities that are pointed at the specific target (Lent, 2016). The specific professional target should be attained through the natural amount of collaboration, such as sharing, critiquing, publishing to achieve a specific goal (Airey, 2015)

There are also the techniques for evaluating the speaker's thinking process which is designed to inquire and deeply understand the specific content, necessary within the discipline. They might be these:

1. What is the purpose of the talk or interview?
2. Why was this speaker chosen to speak on the topic?

- What are his or her credentials?
- In what way is he or she an expert in the field?
- 3. How did this speaker's thoughts differ from others who speak on the same topic?
- 4. How did the speaker make key points? (For example, did he or she tell a story, show graphs or charts, use persuasion or emotion, use facts and figures, or employ humor?)
- 5. What question(s) would you like to ask the speaker about his or her thoughts on the subject?
- 6. What do you think the speaker's notes looked like as he or she was preparing the talk or presentation?
- 7. Did the speaker leave out something you feel was important to include?
- 8. Write an analysis of these speakers' thoughts using examples from the talk to substantiate your thoughts.
  - In what ways are your thoughts different or similar to the thoughts of the speaker?
  - How might the speaker have made his or her thinking more clear?
- 9. In what way did the speaker demonstrate the thinking of experts in his or her field? (Lent & Voigt, 2018).

The impact of reflection strategies on critical thinking development is proved by numerous research about modern technologies in methodologies. Thus, the correlation between reflection and action as the constant interrelation between thinking and doing, which results in further action, is suggested by some research (Schön, 1983; Ash et al., 2005). Critical thinking in its structure is directly connected to the problem solving skills as well as to the professional component of students' future job (Tripon & Găbureanu, 2020). So, applying the additional efforts in imagining possible situations widens the ability to look step ahead, which adds valuable professional critical thinking at evaluating the situations and problem-solving.

Critical reflection together and within the specific activity and experience background is the main instrument to attain the target goal in learning and acquiring the professional development, personal growth and civic learning, where collaboration is designed as the general category to provide the interaction within a group (Ash & Clayton, 2009). Reflective journals as one of the reflective strategies of critical reflection are stated to promote critical thinking (Varner & Peck, 2003). In addition, it is an effective tool for professional development as it helps students to reflect on their attitudes, beliefs and ideas in order to promote and properly assess their personal goals (Uline et al., 2004). Reflecting on critical incidents allows evaluating the event and assessing its meaning which requires the professional analysis and deep understanding of the specific details (Bolton, 2001). This example of the correlation between critical thinking and reflection strategies leads to the increase of professional competency.

The influence of reflective strategies, particularly, reflective blogging on critical thinking of students is proved by the research, which suggests that reflective learning practices significantly increase critical thinking skills within the specific area, so the professional field itself (Wetmore et al., 2010). These techniques are proved to be a valuable tool to develop professional competency. Another proved tool of reflective thinking development is pedagogical essay, sustainably feeding reflective thinking and self-reflective thinking (Venera-Mihaela & Gabriel, 2019).

In a specific professional field, it is important to think critically in order to understand the details and evaluate the results of the study and work properly (Noveanu, 2010). Due to the complexity of the set of assignments being faced by modern students, there is a need to apply reflective practice, which is a type of critical thinking. Reflective practice means thinking critically about one's experiences in order to better understand them and improve one's practice in the future (World Learning, 2018).

This study utilized reflective practice as a reflective learning tool to facilitate the development of critical thinking and specific reasoning skills in the Bachelor students of two Ukrainian universities. Based on the aforementioned discussion, it is

hypothesized that reflective practice offers the potential for reflection and subsequent critical thinking, which leads to the development of professional competency.

$H_0: \mu_{\text{reflective practice}} = \mu_{\text{critical thinking}}$

$H_1: \mu_{\text{reflective practice}} \neq \mu_{\text{critical thinking}}$ , where critical thinking covers all relevant variables and professional competency is considered as any or some of the constituents according to the theoretical background.

### 3. Methodology

In order to explore the objectives of the study, an action research paradigm was adopted. Action research is known as the practical learning or "learning by doing" with identifying the problem, treating the lacks of the situations, observing the results and correct by additional actions (O'Brien, 1998). Aimed to collect research data we applied the same pre-test and post-test and speaking competence activity - problem situations discussion - in group-work. The data obtained we analyzed by means of statistical methods, namely descriptive statistics, effect size measurement, and single-factor ANOVA.

#### 3.1. Setting and participants

This primarily quantitative study utilized interval estimation, pre-test - post-test design in several groups of students who study ESP in Taras Shevchenko National University of Kyiv and Sumy State University Sumy University in short.

The research was carried out during the series of classes (4 classes in the whole) which took a period of a month.

The Bachelor students of Law (Sumy University) and IT (Kyiv University),  $n=40$  and 50 correspondingly, who study English for Specific Purposes course of two groups each university took part in the experiment in the period of 2018-19 academic year. These cohorts were homogeneous convenience samples chosen because students were enrolled in the university with similar admissions criteria, prerequisites, and curricula. In addition, the ESP course was taught according to the same syllabus.

#### 3.2. Stages of research

The study encompassed four stages: observation, pre-test, reflective practice and post-test.

First, we just observed the students' individual behavior, information perception, peer communication, interaction with a teacher, interest in training activities and thus, their overall class engagement.

After the observation stage, the students were offered to complete the pre-test adopted from the World Learning online course (World Learning, 2018) and enriched with specific professional problem situations (Appendix A). At this stage, the students' abilities in speaking and using reflective practices and specific vocabulary units were evaluated. After completing the pre-test tasks, they were assigned to discuss one of the situations mentioned in the test.

#### 3.3. Materials

The description of reflective practice, professional problem situations, instruction and data collection procedures are described below.

##### **Reflective practice**

At the next stage, the students were taught the series of the lessons (Appendix 3) that addressed the development of reflection practices and critical and creative skills within professional situations. The aims of the lesson were:

- to be able to find the appropriate solution to the professional problem
- to be able to view a situation from a new professional perspective

- to be able to reflect on applying critical thinking skills and reflection strategies/language.

The main reflective strategies which were practiced in the lessons were the following:

1. Use your full attention to read or listen to an interlocutor.
2. Reflect before responding.
3. Make sure you understood what the other person meant.
4. Recognize the emotional side.
5. Offer alternatives.
6. Share your point of view, knowledge, or experience.
7. Request more information.
8. Ask questions the other person hasn't thought of.
9. Take an objective stance.
10. Offer a different way of seeing things.
11. Get the other person thinking about the future.
12. Be respectful (World Learning, 2018).

### ***Professional Problem Situations***

The professional problems were selected according to their specialisms, for example, the students of Law had to deal with the specific situations involving authentic problems in interaction between a lawyer and a client, a lawyer and a judge, a judge and jury. The students of IT-sphere were offered the problem situations about various through- and for-specificity situations. The full description of the example of the situations is given in Appendix 4.

Table 2 demonstrates the rubrics for evaluating the critical reflection skills in the speaking tasks.

**Table 2.** Critical thinking evaluation rubrics for speaking

<b>Levels</b>	<b>Scoring</b>	<b>Speaking</b>
Initial Stating	1 initial	I can recognize the main specific information and see the difference according to the patterns.
Developing Applying	2 poor	I can use the main vocabulary (general) necessary for the right area. I can match the definitions with the meaning. I can produce moderate speaking on the appropriate topic.
Satisfactory Analyzing	3 satisfactory	I can add the similar ideas in speaking on a specific topic and categorize it. I can deduce about the main ideas. I can plan and develop the speaking according to the requirements and use 1-2 items of specific vocabulary and 1-2 reflective practices.
Proficient Evaluating	4 good	I can reframe my speaking on a specific topic. I can plan the right description of the specific idea supporting this with the correct vocabulary and functional language (3) and use 3-4 reflective practices in critical evaluation of the situation.
Distinguished Creating	5 excellent	I can create my own idea by designing the topic and using the specific vocabulary (4-5 items). I can invent the correct description of the specific topic and use a number of reflective practices (5 and more).

### 3.4. Instruction

After reviewing the materials, the authors gave both reflective practice and specific professional vocabulary tasks and output tasks for a class a week over a month, making a total of 4 classes.

Finally, after completing the series of lessons at the post-test stage the students were asked to take the test on the Reflective Practice/ the same test diagnosing reflective practice skills (Appendix 1). At the final stage, the students had to discuss, reflect and find a solution to the professional problem, using professional vocabulary and reflective practices. The model follows the I-I-I methodology pattern described by Carter and McCarthy (1995). The students first were demonstrated examples of reflective strategies (Illustration). Then, they learned the typical situations of applying these strategies and discussed their effect (Induction). Their final task was to discuss possible problem situations related to their specialisms using both critical reflection strategies and specific vocabulary units. (Interaction)

### 3.5. Data collection procedures

Administration of the observation stage, pre-test reflective practice at the first stage and post-test after training was followed by the implementation of the independent variables, reflective practice, and vocabulary specific language units, at the first stage in all groups. Then, the post-test reflective practice test was administered to the groups to determine if the reflective practice had an impact on the dependent variables: critical thinking and levels of professional competency. A post-test rubric was used to assess levels of reflection and critical thinking skills evidenced in student test answers and their oral descriptions of the professional critical situations. This design allowed for empirical testing of the second stage post-test results while also providing the opportunity for learning new insights about students' reflective practice. The pre-test was carried out a few days before the instruction and the post-test two days after the lessons were completed. The authors did not carry out the delayed test of what is considered as a possible limitation of the study.

The results taken from the pre-test and post-test stages on reflective strategies and evaluation of speaking were analyzed. The points from the test, both pre-test and post-test stages, were inverted into the scale from 1 to 5, related to the levels from 'initial' to 'excellent', which was used for descriptive statistics after that (Table 3 Appendix 5). The number of used professional specific language units was counted and according to the main criteria for the assessment presented in Table 4 were inverted into the points.

**Table 4.** The main criteria for the assessment of reflective practice and specific language

Skills	Level	NPS*	Level	NPS*	Level	NPS*	Level	NPS*	Level	NPS*
Specific language	excellent	< 5	good	4	satisfactory	3	poor	2	initial	1
Reflective Practice	excellent	< 5	good	4	satisfactory	3	poor	2	initial	1

## 4. Results

The data collected from the observation and pre-test stage revealed the following.

### 4.1. Observation stage key findings

The observation stage of the experiment involved studying the spontaneous behavior of the participants at the lesson as their natural surroundings. During the first 3 lessons (2 academic hours each) the focus was made on the students' reactions to classroom activities, both verbal and non-verbal. Verbal students' reaction was diagnosed by their actual interaction in the group, particularly peer-questioning, responding and discussing. We recorded that only 10% of the participants demonstrated their understanding actively, as they requested more information to clarify the initial task directions and then started conveying their own opinion on the topic. 40% of the participants also reflected verbally but they overused L1 in reproducing the ideas of the situation they heard and redirected responses to those students who, from their point of view, felt more fluent in L2. Non-verbal communication skills of all the above-mentioned participants were quite developed due to stable eye-contact, curious facial expression, posture, and hands movement. Although engagement activity of this 50% of the participants was relatively high, both verbally and non-verbally, none of the students either asked for feedback attitudes of any his/her group participant or offered alternatives to encourage multiple points of view group discussion. Thus, no critical thinking and reflection practice skills of the students under investigation were recorded. The rest 50% of the participants did not cooperate in doing the task given at all. They remained indifferent during group discussion; their overall physical appearance proved the students' unwillingness to contribute to learning exploration. Findings showed the necessity to modify some lesson activities aimed at developing the critical thinking skills of the students.

### 4.2. Pre-test, Reflective Practice and Post-test stages key findings

At the pre-test stage, the students (N=90) used a deficient amount of reflective practice (98 % of negative grades - initial and poor level) and an insufficient amount of professional specific language units (95% of negative grades - initial and poor level).

By the time of the post-test stage, the use of reflective strategies and professional specific language units had increased considerably. The number of negative grades had decreased to 4% and 8% correspondingly. The positive results had grown up to 95% (reflective strategies) and 92% (professional specific language) units correspondingly.

The results are set out in Table 5.

**Table 5.** The dynamic of pre-test and post-test assessment result

Assessment	Pre-Test		Post-Test	
	usage of specific vocabulary	usage reflective practice	usage of specific vocabulary	usage reflective practice
negative (1,2)	95,56 %	98,89 %	7,78%	4,44 %
positive (3,4,5)	4,44 %	1,11 %	92,22 %	95,56 %



To prove the reliability of the results we used the estimating reliability to check whether this had any validity (Glass & Hopkins, 1996).

The items were labeled ranging from 1 to 5, where 1 relates to the initial level and is the lowest one, and 5 is the highest - and relates to 'excellent'.

In order to conduct further analysis of this survey, we applied descriptive statistics and effect size measurement. The key indicators were calculated according to the following formulas:

1. Mean value (M) for each criterion:

$$M = \frac{\sum_{i=1}^n x_i}{n}$$

where:

$x_i$  – value of  $i$ -th estimation;

$n$  – number of estimations.

Standard deviation value (SD):

$$SD = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - M)^2}$$

2. Standard error of mean (SE):

$$SE = \frac{SD}{\sqrt{n}}$$

3. Effect size value (Cohen's  $d$ ):

$$d = \frac{M_2 - M_1}{\sqrt{\frac{SD_1^2 + SD_2^2}{2}}}$$

The key quantitative findings are outlined in Table 6 below.

**Table 6.** Mean differences between assessment of pre-test and post-test specific vocabulary units and reflective practice

Assessment criteria		n	M	SD	SE	Sig.	Cohen's d
Specific vocabulary (Criterion 1)	pre-test	90	1.511	0.585	0.062	p < 0.05	3.086
	post-test	90	3.778	0.858	0.090	p < 0.05	
Reflective strategies (Criterion 2)	pre-test	90	1.244	0.457	0.048	p < 0.05	3.967
	post-test	90	3.844	0.806	0.085	p < 0.05	

Next, to check the influence of reflective practice we applied single factor ANOVA method using MS Excel Data analysis instrument. Table 7 reveals the data obtained.

**Table 7.** Single factor ANOVA results

<b>Criterion 1</b>						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	231,2	1	231,2	428,485	2,93E-49	3,894
Within Groups	96,044	178	0,5396			
Total	327,244	179				
<b>Criterion 2</b>						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	304,2	1	304,2	708,326	5,97E-64	3,894
Within Groups	76,444	178	0,4295			
Total	380,644	179				

With regards to the two criteria of our study, the students' specific language (Criterion 1) and reflective strategies skills (Criterion 2), the pre-test mean values we obtained were far lower for strategies than the means for vocabulary, 1.244 and 1.511 correspondingly (Table 6). Conversely, the post-test mean values appeared to be 3.844 and 3.778 correspondingly. This shows that at the beginning of the experiment the students used only 1-2 specific units and nearly no reflective strategies at all in each professional situation practiced in class and received "initial/poor" in both skills. Then, at the post-test stage of the experiment, the students appeared to apply 4 and more units of specific vocabulary together with 4 and more reflective strategies in each situation to discuss. Considering standard deviation (SD) data, the effect sizes were obtained for Criterion 2 and Criterion 1: Cohen's  $d = 3.967$  and  $3.086$ , respectively. This is also an indication that after a series of lessons on reflective practice development the students of two different specialties – Law and IT – improved their speaking skills as they started to reflect using both specific units and strategies – 4 and more each. Interesting is that Criterion 2 effect size increased far more significant than the effect size of Criterion 1 – that is, a boost of the reflective practice and, consequently, critical thinking skills of students happens faster than forming and further development of specific vocabulary clusters. Although students might have difficulties in choosing a proper term or specific phrase to describe a professional phenomenon, they do not stumble to share their opinion, suggest alternatives, ask for more information, offer a different way of seeing facts, etc. The more fluent their speech becomes, the more productive their reflection and decision-making become, thus, the more convincing their utterance sounds. This corroborates other findings reported in the literature – e.g., Juliane House's "pragmatic fluency" in L2 acquisition (House, 1996).

At the pre-test stage of the study, SD data were 0.585 and 0.457 (Criterion 1 and Criterion 2 correspondingly), while at the post-test stage – 0.858 and 0.806. It is quite revealing that at the pre-test, a range of points earned by the students was not widely "spread out" and mostly all of them received "initial/poor". At post-test, i.e. after the methodology implementation, the students' points evaluating professional language and reflective strategies skills became more diverse ("satisfactory/good/excellent") due to students' individual abilities. These findings proved that the students enhanced both their professional vocabulary and reflective practice skills, thus, ESP performance and proficiency. Within statistical significance 0.95% ( $p < 0.05$ ), the obtained data let us claim that the study hypothesis is true, and the results are relevant.

Aimed to evaluate the significance of differences between pre-test and post-test assessments we applied single factor analysis of variance (ANOVA) (Table 7). Sum-

of-squares (SS) measures the total variation among the 90 values: students' points between pre-test and post-test are more varied than within each point group. Mean squares (MS) determine whether treatment - in our study, reflective practice ESP training methodology is significant. As shown, the influence of implemented training techniques on the students' performance is significantly bigger than their individual peculiarities with insignificant error probability ( $p\text{-value} < 0.000001$ ).

To describe the relationship between two criteria, we used the Pearson correlation coefficient, which allowed us to compare the respective correlation between the results of applying the reflective practice and specific vocabulary units in the education.

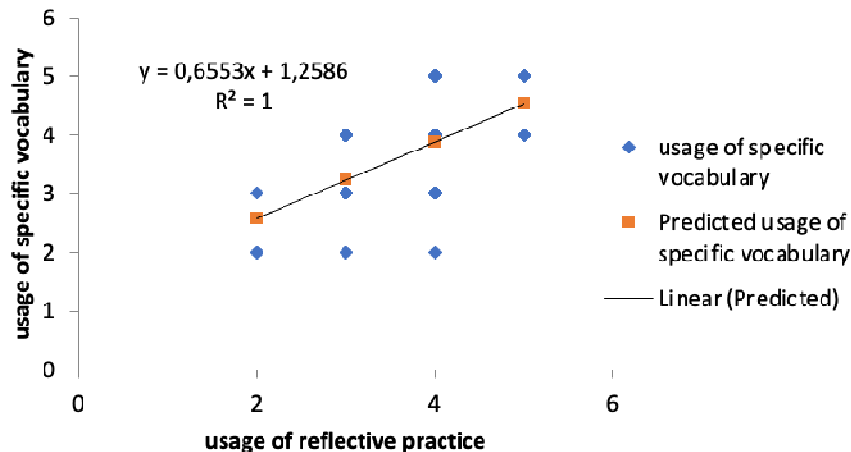
We obtained the Pearson correlation coefficient basing on the standard deviations of our variables, reflective practice and specific vocabulary units and their covariance.

In the course of the correlation analysis we wanted to find out the linear relationship between the use of reflexive practice and the specific vocabulary units. To do this, we determined the linear Pearson correlation coefficient.

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

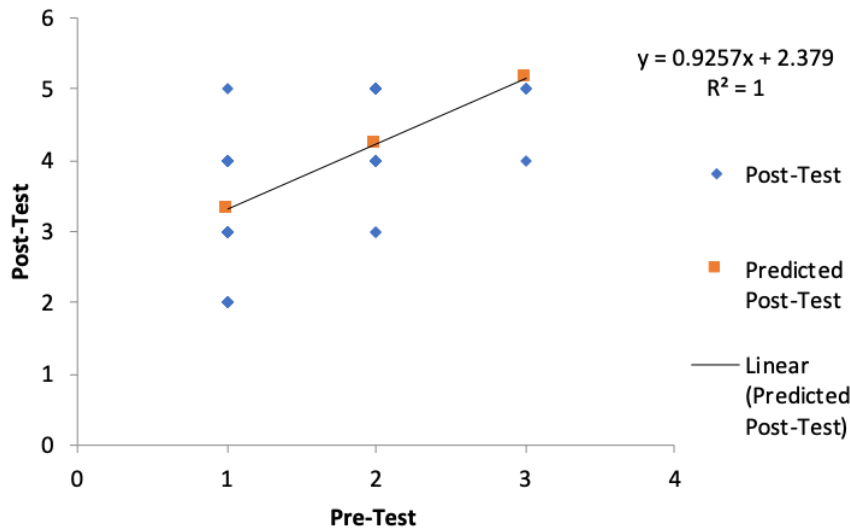
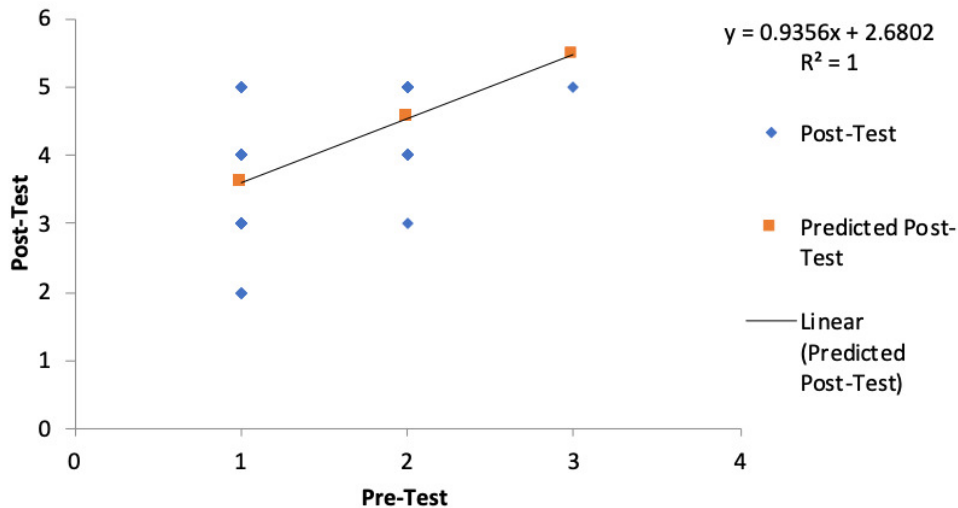
The computations showed that the correlation coefficients for the pre-test and the post-test are 0.322 and 0.615, therefore, we can describe the strength of the correlation using the guide that Evans (1996) suggests for the values of  $r$ : the influence of the reflexive practice on the use of specific vocabulary units training was "weak", but after the series of lessons the value becomes "positive strong", which clearly proves the relationships between the two criteria. Moreover, "positive" correlation shows that our variables have tendency to grow.

The regression analysis allowed us to evaluate the impact of reflective practice acquisition on specific vocabulary. Using MS Excel data analysis regression (Strategies-Vocabulary Regression Data in Supplementary Excel File, Appendix 6), we obtained a coefficient of determination ( $r^2$ ) of 0.379, which proves the relationship between our model's parameters. The scatterplot (Fig. 1) indicates the linear association between the specific vocabulary units and reflective practice and shows that acquiring reflective practice even without improving the success rate allows the level of usage of specific vocabulary to increase by 1.26 points with the growth in reflective practice rate of every 1 (one) point leads to an increase in the vocabulary success of another 0.655 points.



**Figure 1.** Scatterplot of specific vocabulary units and reflective practice

The regression analysis allows us to obtain correlation between the influence of training on the change of success in reflective practice acquisition and vocabulary replenishment. The scatterplot (Fig. 2-3) shows that our method of preparation has a significant positive impact on the students' success both in the specific vocabulary and reflective practice with the performance gains of 2,379 and 2,680 points, correspondingly. Furthermore, focusing more on reflective practice strategies, we got the success rate on this criterion slightly larger (growth rate 0.9356) than on the specific vocabulary units (growth ratio 0.9257).

**Figure 2.** Scatterplot of the pre-test and post-test results in acquiring specific vocabulary**Figure 3.** Scatterplot of the pre-test and post-test results in acquiring reflective practice

## 5. Discussions

This study tested the relationship between developing reflective practice strategies as an integral part of critical thinking skills and deepening professional competency, which is appeared in for building disciplinary literacy in the students of Sumy State

University and Taras Shevchenko National University of Kyiv. This research contributes to disciplinary literacy literature by demonstrating the importance of affective factors in the context of developing critical thinking skills such as reflective practice. Most previous perceived value models were developed and tested using various critical skills strategies for developing higher-order thinking skills. A notable exception was Varner and Peck (2003) investigation with reflective journals. However, their idea was supposed to work in writing. We investigated the correlation between these two important factors in examining the speaking skill as an important part of a future professional.

Consistent with recent research advocating the importance of critical thinking and reflective practice in understanding creating disciplinary literacy (Schön, 1983; Bojović, 2017; ILA, 2015; Ash et al., 2005; Hillman, 2014; Hynd-Shanahan, 2013; Greenleaf et al., 2010; Lent & Voigt, 2018), our findings indicate that developing professional component in literacy is strongly linked to the critical thinking development. Disciplinary literacy is an integral part of professional competency. As disciplinary literacy contains the critical thinking element as an important condition of creating a holistic meaning (Lent, 2015; Hillman, 2014; Hynd-Shanahan, 2013; Lent & Voigt, 2018), it also becomes an increasingly important factor in developing the professional component - a specific professional element within the discipline.

Our findings are also congruent with the research about the strong influence of critical reflection on the development the professional competency, particularly disciplinary literacy (Wetmore et al., 2010).

The results of this study also highlight the crucial role of reflective practice in developing disciplinary literacy.

While testing the students at the beginning of the experiment, we obtained the results of using a deficient amount of reflective practice (98 % of negative grades - initial and poor level) and an insufficient amount of professional specific language units (95% of negative grades - initial and poor level).

By the time of the post-test stage, the number of negative grades had decreased to 4% and 8% correspondingly. The positive results had grown up to 94% (reflective strategies) and 87% (professional specific language) units correspondingly.

Applying the single factor ANOVA, we obtained the statistically proved results demonstrating the significant difference in the students' specific language and reflective strategies skills, 1.244 and 1.511 at the pre-test stage and 3.844 and 3.778 correspondingly.

Moreover, the results show that while at the beginning of the experiment the students used only 1-2 specific units and nearly no reflective strategies at all in each professional situation practiced in class, after the treatment stage at the post-test stage of the experiment, the students appeared to apply 4 and more units of specific vocabulary together with 4 and more reflective strategies in each situation.

Finally, our study empirically validated the relationship from reflective practice to using the specific vocabulary units, which demonstrates the growth of professional competency. Our results reveal that the correlation coefficients have grown from "weak" level (0.322) to "strong" (0.615) according to Evan's (1996) guide with positive development.

Consequently, researchers should be aware of the fact that, while the relationship between reflective practice and specific vocabulary is considered to be proved, there may be a number of factors influencing the ultimate result. The most typical are individual personality cognitive abilities, behavioral influence, environment setting, etc.

This finding is consistent with recent studies in influencing reflective practice on the professional competency growth (Bolton, 2001; Wetmore et al., 2010).

Our study indicates that relationships among reflective practice and specific vocabulary units are important drivers of disciplinary literacy development. As today's employers increasingly demand high competent professional staff with developed 21st-century skills, such as critical thinking and creativity, collaboration and communication, problem solving and technology literacy, and many others.

Consequently, educators should direct more of their attention to developing and implementing the above-mentioned skills within the specific discipline. Our study suggests that reflective practice strategies can impact the development of disciplinary literacy both in the specific content and other related skills. The connections between acquiring specific and general disciplines through interaction and the ability to study should be developed and practiced within the specific professional content.

In addition, most of the studies prove the interrelations between these two components: critical thinking and discipline-specific frameworks, where the latter are used for performing the critical tasks, such as 1) interpreting texts and 2) composing and revising (Brozo, 2017; Pearson et al., 2010).

This study provides strong empirical support for the potential development of disciplinary literacy through reflective practice.

Some limitations might be related to collecting our data and interpreting our results. A first limitation might be the omission of important variables. For example, collaboration and ability of problem-solving, writing and reading could be added as additional antecedents of trust or commitment.

Although the sample size was deemed acceptable, a larger sample would have allowed us to run more powerful analyses.

Another potential shortcoming in the research is the lack of a delayed test, so perhaps the strength of the relationships between these constructs may be somewhat inflated.

The confidence in our results could be strengthened with access to a wider range of specific professional content and studying further possible relationships between the components within the discipline. Future work should examine other potential factors that might influence the growth and development of professional competency and creating a professional identity.

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## Annexes

### Annex A. Test on Reflective Practice

#### Instructions

Meet John, a 20-year-old intern at GGenerator startup. He is a student of Computer Science Department and is currently shifting between his Bachelor's paper in Software Engineering and part-time work.

For each of the following situations, indicate which technique for encouraging reflective practice is being demonstrated.

#### Question 1

John is applying for a software engineer position now. Before the job interview he was sent an instruction list on his would-be duties but did not read it carefully. An interviewer is asking John if all responsibilities are clear to him.

*Use your full attention to read the instructions.*

*Offer alternatives.*

*Request more information.*

#### Question 2

After applying the firm John became a part of a team project. As an intern, he was asked to assist Sue, a rather creative but, in John's opinion, not experienced enough employee. He thought part of Sue's work wasn't properly designed. John was ready to say so and express his overall opinion on Sue's talents.

*Offer a different way of seeing things.*

*Reflect before speaking.*

*Take an objective stance.*

#### Question 3

Actually, it was not the first time when Sue hesitated and stumbled. She tried to stay optimistic but seemed to feel unhappy about the project delay. John heard as Sue was crying and convincing herself the team failure was only her fault.

*Recognize the emotional side.*

*Get the other person thinking about the future.*

*Make sure you understood what the other person wrote.*

#### Question 4

John had previously had a similar experience in his early days of programming. He shared it with Sue, to whom he started to feel more than just support. He told her what



exactly he did to make things work better the next time and said that he was ready to remedy the situation with their ongoing project.

- Take an objective stance.
- Offer a different way of seeing things.
- Share your point of view, knowledge, or experience.

**Question 5**

All of a sudden, John was invited to the boss’ office. One of the questions that he was asked about the project was, “Where is the lost data?”

- Ask questions the other person has not thought of.
- Reflect before responding.
- Request more information.

**Annex B.**

**Table 1.** Interval estimation results at pre-test and post-test stages

Expert	Pre-Test			Post-Test		
	usage of vocabulary	specific	usage of reflective practice	usage of vocabulary	specific	usage of reflective practice
1	1		1	4		4
2	2		1	4		5
3	2		1	4		4
4	2		2	5		5
5	1		2	4		5
6	1		1	3		3
7	2		2	4		5
8	2		1	3		4
9	1		1	2		2
10	2		1	4		4
11	2		1	4		3
12	1		1	5		4
13	1		1	4		4
14	2		1	4		4
15	2		1	3		3
16	1		1	3		4
17	2		2	4		4
18	2		1	4		3
19	2		1	4		3

20	2	1	4	4
21	1	1	3	4
22	1	1	4	3
23	1	2	4	5
24	1	1	3	4
25	2	1	5	4
26	2	1	5	4
27	2	1	4	5
28	1	1	4	5
29	2	1	4	4
30	1	1	3	3
31	3	3	5	5
32	1	1	3	4
33	2	2	4	4
34	1	1	4	5
35	1	1	3	3
36	2	1	5	4
37	1	1	3	3
38	1	1	3	4
39	2	1	4	3
40	1	1	3	4
41	2	2	4	4
42	2	2	5	5
43	2	1	4	3
44	2	1	5	4
45	1	1	4	3
46	1	1	3	4
47	1	1	4	4
48	2	1	5	4
49	1	2	4	5
50	2	1	4	4
51	1	2	2	4

<b>52</b>	1	1	2	3
<b>53</b>	2	2	5	5
<b>54</b>	1	1	4	4
<b>55</b>	1	1	3	3
<b>56</b>	1	1	2	2
<b>57</b>	3	1	5	4
<b>58</b>	1	1	3	3
<b>59</b>	1	1	3	3
<b>60</b>	1	1	2	2
<b>61</b>	2	2	5	5
<b>62</b>	1	1	4	4
<b>63</b>	3	1	4	4
<b>64</b>	1	1	3	4
<b>65</b>	1	1	3	3
<b>66</b>	2	1	4	3
<b>67</b>	1	1	4	4
<b>68</b>	2	1	5	4
<b>69</b>	1	1	3	4
<b>70</b>	2	2	5	5
<b>71</b>	1	1	4	3
<b>72</b>	1	2	4	4
<b>73</b>	1	1	3	2
<b>74</b>	1	1	3	3
<b>75</b>	1	2	2	3
<b>76</b>	2	1	4	4
<b>77</b>	1	1	4	4
<b>78</b>	2	2	4	4
<b>79</b>	3	2	5	5
<b>80</b>	1	1	2	3
<b>81</b>	1	1	3	3
<b>82</b>	1	1	3	3
<b>83</b>	2	1	4	3

84	2	1	5	4
85	2	2	4	5
86	1	1	3	4
87	2	2	5	5
88	1	1	4	4
89	1	1	4	5
90	2	2	5	5

### Annex C. Lesson Plan

1. Overview description of your students (how many, age, language level, and purposes for studying English)

A group of university students of senior years / adults of about 10-15 people, with a level of English B1 on average, English for specific purposes (they might be lawyers, IT sphere, sportsmen, physical rehabilitation professionals, etc. - this lesson plan is supposed to be suitable for most disciplines).

2. What aspect(s) of critical thinking does this lesson work on?

I am going to address the reflection practices and critical and creative skills.

What aspect(s) of intercultural awareness and culture does this lesson work on?  
differentiating the ideas and specificity of the related discipline

3. In this lesson, I anticipate students will be challenged by:

finding the appropriate solution to the professional problem

viewing a situation from a new professional perspective

being able to reflect with applying critical thinking skills and reflection strategies/language.

4. To address these challenges, I plan to (note the specific activities that will address these challenges):

In order to help them find the appropriate solution to the professional problem, I will

1) take the preliminary tests for developing this language in this sphere (matching, gap-filling, cloze, true/false, etc.);

2) work with a text (or listening) on this topic, discussing the possible solutions and thinking on their feet about possible problems;

3) drill short problem situations with the specific meaning where it is required quick professional solution;

In order to help the students get a better awareness of the specificity of the discipline, I will 1) let them get acquainted with the professional sample (watching a video, recalling a typical situation from their background, discussing the questions in groups, sharing the experience, comparing the situations, etc.);

2) learning the necessary lexis and functional language;

3) engage them in a roleplay or situation with possible developing the situation in the professional context with using and practicing the learned information and trained skills.

In order to help the students apply their reflection and critical thinking skills analyzing the job situations, I will introduce them to the functional language on reflection.

5. The main criteria for assessment will be:

In their answers the students use both specific language and apply the ability to reflect the problem professional situations:

Skills	Level	NPS*	Level	NPS*	Level	NPS*	Level	NPS*	Level	NPS*
Specific language	excellent	< 5	good	4	satisfactory	3	poor	2	initial	1
Reflective Practice	excellent	< 5	good	4	satisfactory	3	poor	2	initial	1

Note: \* – Number of phrases/ strategies per one situation (appx. 5 sentences)

Essential advantages will also be in applying fluency and speed in finding the correct solutions and laying out the ideas; lively reflecting of the situations.

Objective(s): By the end of the lesson, students will be able to reproduce the authentic situation using the specific language and functional language fluently and correctly create the problem situation related to their job, reflect on it with specific functional language and lay out all possible ways for its solution.

#### Detailed Lesson / Activity Plan Steps

Time	Lesson content / Activity stages	Students will... (what they will do and how they will interact with each other and the content)	Language focus (what kind of language will the students be using / practicing)	Role of the teacher... (my role, and what I will be paying attention to)	Questions that I will ask the students to deepen their learning
5 min	Warm-up discussing the questions on an implicit professional theme (the importance of the discipline, related problems, advantages and disadvantages of some ideas within this discipline) (S – S, Ss – Ss, T - Ss)	discuss in pairs, express their ideas, comment each pairs ideas	functional language for suggesting opinions, agreeing/disagreeing	lead the discussion, asking auxiliary questions, encourage students to express themselves	When was the last time you did... (this activity) ? Have you experienced this...? What would happen if... ? Do you think you could change... (some activity, experience, feelings)..?
10 mins	Introduce vocabulary (that might be preliminary tests for developing this language in this sphere (matching, gap-filling, cloze, true/false, etc.)	do the tasks in groups, then we check together	specific vocabulary on the topic <i>5 items (related to e.g. court etiquette - for lawyers;</i>	ask content (concept) checking questions for better understanding, help in figuring out the correct idea	giving additional details on the usage of the words and phrases, their derivatives and thesaurus; ask questions for figuring out the possible

	(Ss, T – Ss)				specific job situations with the usage of this vocabulary which can lead to failure
<b>15 mins</b>	Introducing the functional language on reflection (watching presentational video Encouraging Reflective Practice in Others). (T – Ss, Ss – Ss).	Students will make notes, analyze the usage of the phrases. In groups they have the Follow-on Quiz on Encouraging Reflective Practice to check and remember the usage of these practices.	Functional language on Encouraging Reflective Practice.	Check the answers and discuss them with the whole group	Give students short professional problem situations (read..) and encourage students to use as many reflective practices as possible. Students may be divided into two teams and give their answers in a competing way.
<b>15 mins</b>	reading (reading the text related to the topic, which includes this vocabulary and specific problem job situation). Actually, I would first pick the right text, then would develop the exercises based on the vocabulary from this text. The alternative: there may be two different texts and two groups. Students read the texts, then retell their texts to the other group which gives reflection on	Read the text, retell it using the specific vocabulary, reflect on the other group's text, using the reflective practices.	specific vocabulary on the topic; language structure; coherence language; functional language on reflection	encourage students to do the correct type of reading, lead them to find the right answers if they might have difficulties, help with reflection practices usage.	ask additional questions on the text, based on the underground context or details (explain what is related to some specific numbers, places, reasons, etc.) Discuss questions about possible similar situations or predicting the unknown details: e.g. How would you feel in this situation? What would you apply? How do you think our client could feel? If the situation is ...e.g.

the situation (S  
– S, Ss -Ss).

different..,  
what would  
you do? Ask  
students to  
analyze (if  
possible from  
the text) the  
professional  
level of the  
characters; ask  
to develop  
similar  
situations but  
with different  
elements.

<b>10 mins</b>	watching short (3-4 mins) video with some specific professional situation(s) (T – Ss)	students watch the video 1) seeing the problem in the professional field; 2) writing down specific and language and reflective strategies related to the topic (e.g. How do they describe...(some specific point..? reflective strategies?)	specific language, functional language on reflection	let the students watch the video, find the problem situation and recognize the vocabulary, create their own respond to the situations, using the specific language and reflective functional language.	What do you think would be the right solution (behavior) in this situation? Do you think it is the appropriate solution? What would you add /How would you change in the response? What similar problems might be in this sphere?
<b>15 mins</b>	discuss short problem situations with the specific meaning and where it is required quick professional solution (e.g. defining the specific task: How would you help your client register a company? (for lawyers) (Ss – Ss)	students in the group develop and make the list of possible problems and find the possible solutions to them, then present their ideas on the board - a representative from each group sums up the discussed ideas	specific language; language structure, reflective strategies.	encourage students to produce the ideas, writes down the main list of problems on the board (flipchart), numbering them in the list; encourage students to reflect on the situations, using the discussed strategies.	additional questions which reflect more problem content related to the authentic situation encouraging students to reflect.
<b>10 mins</b>	Summing up (T – Ss)	recall back what they have learned at the lesson	main specific language, reflective language	sum up, analyzing the possible mistakes, evaluation.	Homework: find information about other possible problems (at

least 3), write the possible list of them, suggest the solutions, reflect on the situations, using the reflective practices.

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#### Annex D. Professional Problem Situations Practice

To show what these ideas mean in practice, it seems to be rather useful to explore an example. The study participants at Taras Shevchenko National University of Kyiv were given a series of pre-test problem situations to reflect on aimed at diagnosing their critical thinking skills level. For instance, one of the particular situations to reflect on for the second-year IT students was the following:

##### **Problem situation**

John, a 20-year-old intern at GGenerator startup, is currently busy with the project targeted creating an educational platform for IT students. He is at the working place now when suddenly his girlfriend's call interrupts him. Sue is tearfully asking John to come to her place immediately because her laptop fails to work properly. John is at a crossroads. On the one hand, he cannot leave the office and delay the task because of the pressure of the deadline; on the other hand, John realizes that his refusal to help Sue could spoil their relationship. How would you tackle the situation given? Suggest your own solution of the particular problem.

The class was divided into three groups, 5 students each. The teacher's directions were the following: (1) to project the situation on you and consider your own way-out (up to 3 min of self-consideration); (2) to discuss in group each of the 3 tasks suggested (3-5 min each); (3) to offer your own solutions and single out the most effective one suggested in your team (5-7 min for each participant).

First, it took 3 min for each participants' consideration. Next, the students were provided with 3 tasks on the problem situation 1 and were involved in group discussion. The teacher kept track of the students' answers on pre-test vocabulary and strategies of active speaking to see how they could encourage reflective practice. Table 2 provides an example of problem situation problem situation practice at the ESP lesson.

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#### **Pre-test tasks on specific vocabulary and reflective strategies usage**

<b>Questions on problem situation</b>	<b>Pre-test specific vocabulary, used by the students</b>	<b>Pre-test reflective strategies, the students were about to use</b>
<b>1</b>		
<u>Task 1</u> <i>Express your point of view on possible challenges in John's project.</i>	IT students learning in general; how to learn at home; design of learning applications; fast Internet access at campus; languages of programming; web design platform; teacher-student cooperation; design of a social network in the university campus, etc.	So it sounds to me as if...; John appears to be feeling...; This seems really important to John that...; What would happen to John if...; How do you believe John's biggest challenge should be sorted out? Are there any other solutions?



<p><b>Task 2</b> Decide on the best solution in the problem situation with Sue's laptop.</p>	<p>It simply won't start again; try to debug a program; find a virus; to address the problem to an expert; to take the laptop out; to forget about the problem forever and eat out tonight etc.</p>	<p>I see what you mean but...; That sounds really frustrating/ annoying but...; Would you agree with such an idea if John...? How do you think you personally would handle that if it happened to you? This story reminded me ...</p>
<p><b>Task 3</b> Discuss on the situation with John's job problem and suggest the possible ways out.</p>	<p>Stay at his workplace; leave the office and go to Sue for assistance; work on the project today and help Sue tomorrow; ask Sue to stay patient and wait for him to finish the project; forget about both the project and Sue's laptop etc.</p>	<p>I have also experienced the same situation, when...; What do think would happen if you John...; What would you do if you knew the right answer? Correct me if I am wrong but I understood that Sue...</p>

Within this particular case, we observed the participants' question-and-answer like academic performance and no reflection on three tasks suggested. Thus, we evaluated their reflective engagement in class activity as poor. The problem situation output was inferred to be unproductive due to diagnosis of the students' group work inactivity. As part of this debate, we aimed to modify common ESP learning methods aimed at developing critical thinking skills of the students.

Annex E.

**Table 3.** Descriptive statistics of the variables

Column1	Column2	Column3	Column4
Mean	1.511	3.777	1.244
Standard Error	0.061	0.090	0.048
Median	1	4	1
Mode	1	4	1
Standard Deviation	0.585	0.858	0.457
Sample Variance	0.342	0.736	0.209
Kurtosis	0.532	0.468	1.360
Skewness	0.643	0.314	1.564
Range	2	3	2
Minimum	1	2	1
Maximum	3	5	3
Sum	136	340	112
Count	90	90	90
Largest(1)	3	5	3
Smallest(1)	1	2	1
Confidence Level(95,0%)	0.122	0.179	0.095
	588	755	806

Annex F. Supplementary Excel file with statistical analysis  
<https://drive.google.com/file/d/1KYPt7LDn1ZNnGLIWRdKTmcRss58Jtom4/view?usp=sharing>  
 Figures and Tables

**Table 2.** Critical thinking evaluation rubrics for speaking

Levels	Scoring	Speaking
Initial Stating	1 initial	I can recognize the main specific information and see the difference according to the patterns.
Developing Applying	2 poor	I can use the main vocabulary (general) necessary for the right area. I can match the definitions with the meaning. I can produce moderate speaking on the appropriate topic.
Satisfactory Analyzing	3 satisfactory	I can add the similar ideas in speaking on a specific topic and categorize it. I can deduce about the main ideas. I can plan and develop the speaking according to the requirements and use 1-2 items of specific vocabulary and 1-2 reflective practices.
Proficient Evaluating	4 good	I can reframe my speaking on a specific topic. I can plan the right description of the specific idea supporting this with the correct vocabulary and functional language (3) and use 3-4 reflective practices in critical evaluation of the situation.
Distinguished Creating	5 excellent	I can create my own idea by designing the topic and using the specific vocabulary (4-5 items). I can invent the correct description of the specific topic and use a number of reflective practices (5 and more).

**Table 4.** The main criteria for the assessment of reflective practice and specific language

Skills	Level	NPS*	Level	NPS*	Level	NPS*	Level	NPS*	Level	NPS*
Specific language	excellent	< 5	good	4	satisfactory	3	poor	2	initial	1
Reflective Practice	excellent	< 5	good	4	satisfactory	3	poor	2	initial	1

Note: \* – Number of phrases/ strategies per one situation (appx. 5 sentences)

**Table 5.** The dynamic of pre-test and post-test assessment result

Assessment	Pre-Test		Post-Test	
	usage of specific vocabulary	usage of reflective practice	usage of specific vocabulary	usage of reflective practice
negative (1,2)	95,56 %	98,89 %	7,78%	4,44 %

positive  
(3,4,5)

4,44 %                      1,11 %                      92,22 %                      95,56 %

**Table 6.** Mean differences between assessment of pre-test and post-test specific vocabulary units and reflective practice

Assessment criteria		n	M	SD	SE	Sig.	Cohen's d
Specific vocabulary (Criterion 1)	pre-test	90	1.511	0.585	0.062	p <0.05	3.086
	post-test	90	3.778	0.858	0.090	p <0.05	
Reflective strategies (Criterion 2)	pre-test	90	1.244	0.457	0.048	p <0.05	3.967
	post-test	90	3.844	0.806	0.085	p <0.05	

Note: Sig. – statistical significance

**Table 7.** Single factor ANOVA results

<b>Criterion 1</b>						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	231,2	1	231,2	428,485	2,93E-49	3,894
Within Groups	96,044	178	0,5396			
Total	327,244	179				
<b>Criterion 2</b>						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	304,2	1	304,2	708,326	5,97E-64	3,894
Within Groups	76,444	178	0,4295			
Total	380,644	179				

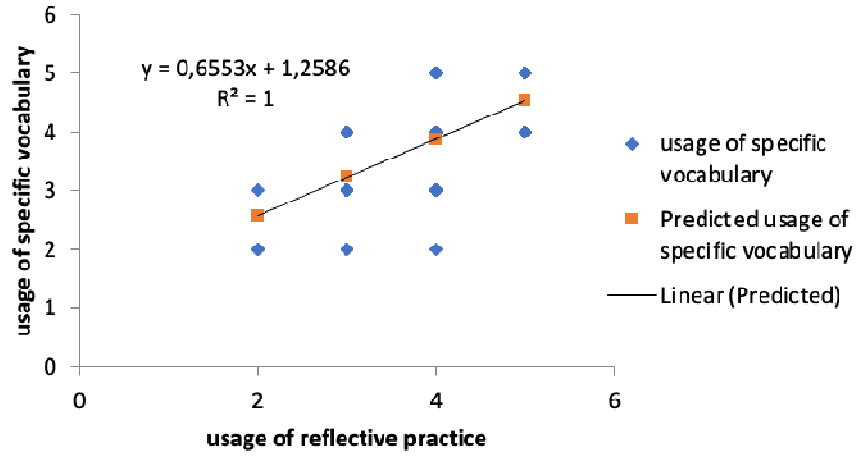
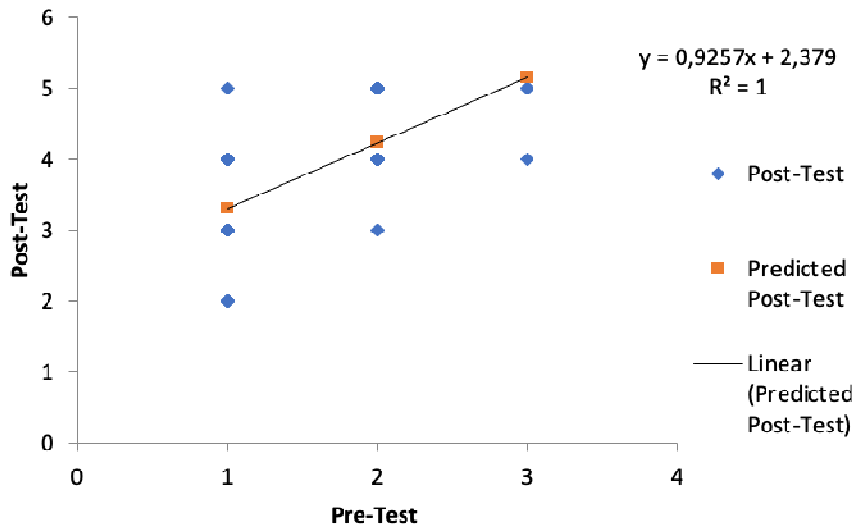
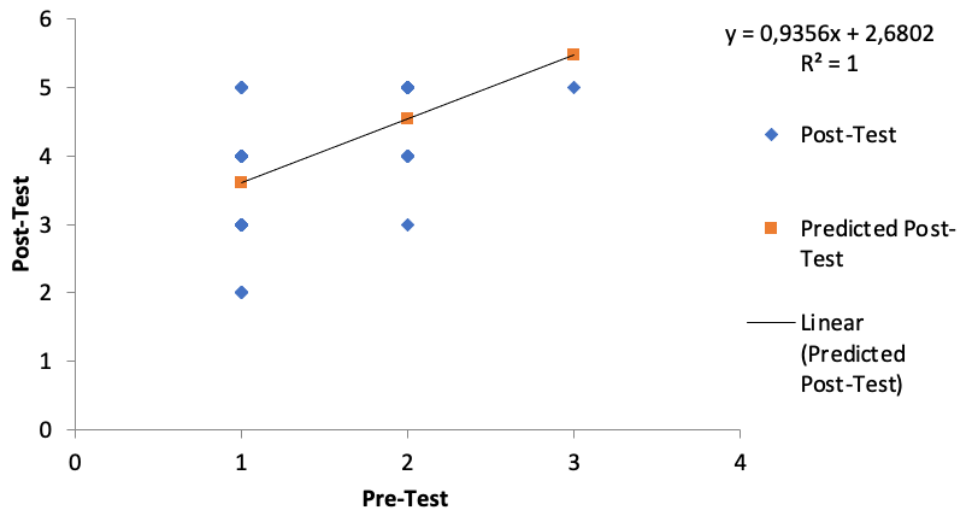


Figure 1. Scatterplot of specific vocabulary units and reflective practice



**Figure 2.** Scatterplot of the pre-test and post-test results in acquiring specific vocabulary



**Figure 3.** Scatterplot of the pre-test and post-test results in acquiring reflective practice