

PRE-SERVICE SCIENCE TEACHERS' VIEWS ABOUT A TWO-COLUMN-WRITING ACTIVITY

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Abstract

In the age of science and technology one of the aims of higher education is developing individuals' lifelong learning abilities. To achieve this aim it is important to develop individuals' higher order thinking skills. One of the higher order thinking skills is reflective thinking, and two-column writing is one of the ways of developing reflective thinking. The purpose of this study is to determine 10 first grade pre-service science teachers' views about two-column writing process. A semi-structured interview protocol was developed and employed to collect data. Findings of the study showed that most of the pre-service science teachers are positive regarding to two-column writing process. However, a few pre-service teachers indicated that they could not benefit from either the summary or the reflective journal part of the two-column writings. The pre-service teachers stated that keeping reflective journals help them gain information about their learning styles and determine their learning deficiencies and find solutions for them. In addition, the results showed that the pre-service science teachers, who earned lower reflection level scores from their journals, do not see and appreciate benefits of keeping reflective journals. In further research it is suggested that a combination of teaching methods should be employed to develop reflection skills of pre-service science teachers whose reflection level is low and the assignments should be scored to encourage pre-service science teachers to prepare the assignments properly.

Keywords: Two-column writing, reflection, reflective thinking, reflection level, pre-service science teachers

Özet

Bilgi ve teknoloji çağını yaşadığımız günümüzde yüksek öğretimin amaçlarından biri yaşam boyu öğrenme becerilerine sahip bireyler yetiştirmektir. Bu amaca ulaşmak için bireylerin üst düzey düşünme becerilerinin geliştirilmesi büyük önem arz etmektedir. Üst düzey düşünme becerilerinden biri yansıtıcı düşünmedir ve iki kolonlu yazılar yansıtıcı düşünmeyi geliştirmek amacıyla kullanılabilir yaklaşımlardan biridir. Bu çalışmada birinci sınıfta öğrenim görmekte olan 10 fen bilgisi öğretmen adayının iki kolonlu yazı uygulamasına yönelik görüşlerini belirlemek amacıyla yarı yapılandırılmış mülakatlar kullanılmıştır. Çalışmanın sonuçları çoğu öğretmen adayının iki kolonlu yazılara yönelik olumlu görüşleri bulunduğunu göstermektedir. Bununla birlikte iki kolonlu yazıların özet veya yansıtıcı günlük bölümünden yararlanmadığını belirten öğretmen adayları da vardır. Öğretmen adayları iki kolonlu yazılarda yaptıkları yansıtımların çalışma yöntemleri konusunda bilgi sahibi olmalarını sağladığını ve öğrenmeleri ile ilgili eksiklikleri tespit ederek çözümler üretmelerini sağladığını belirtmişlerdir. Bununla birlikte çalışmanın sonuçları yansıtma seviyesi düşük olan öğretmen adaylarının yansıtıcı günlüklerden yararlanmadığını göstermiştir. Çalışmanın sonuçlarına dayalı olarak öneriler yapılmıştır.

Anahtar kelimeler: İki kolonlu yazı, yansıtma, yansıtıcı düşünme, yansıtma seviyesi, fen bilgisi öğretmen adayları

Introduction

In the age of information and technology it is important to have lifelong learning skills to improve the living conditions of individuals (Göksan,Uzundurukan & Keskin, 2009). Lifelong learning is a learning habit and it means to understand the world and oneself. Lifelong learning is part of everyday life and it emphasizes on constant development of individuals in all stages of their lives (Erdamar, 2010). The lifelong learning movement was born to respond a number of deficiencies in education including inconsistency of objectives and tools, paying attention to learning of information transmitted from books, lack of communication and information technologies, negative perception towards learning because of the obsession to success and not taking account of individual differences are some of these deficiencies (Budak, 2009). There are several skills that need to be improved in order to maintain lifelong learning. These include reading, writing, mathematics and other basic skills including listening, speaking, and personal skills such as communication with groups and self-managing. Other important skills that are need for lifelong learning are thinking skills (Erdamar, 2010). Bryce and Withers (2003) identified the key elements of lifelong learning for their project. One of these elements emphasizes the importance of thinking: "Learning is about how to think rather than what to think" (p.2). One of the higher order thinking skills is reflective thinking.

One of the aims of higher education is to help students became self-perpetuating and independent learners. To achieve this aim paying attention to 'reflection on learning' is important (Stefani, Clarke & Littlejohn 2010). Reflective thinking aims to create and develop positive feelings (Sönmez, 2010). It enables students to take responsibility from their learning. Through reflective thinking, students think about their experiences and become aware of their actions. Thus, it is expected that they would learn from their experiences (Tok, 2008).Writing is associated with reflective thinking by many researchers because while writing, individuals have an opportunity to think so that they can gain reflective skills and they can be aware and participate more effectively in the learning process (Kozan, 2007).

Keeping learning journals is one of the most employed and researched technique that is also associated with reflective thinking. In the related literature many positive effects of reflective journals were cited. Amodeo (1996) reported that guided reflective journals had positive impact on college students' writing abilities and critical thinking. Moffitt (2000) indicated that it helps students to determine what they learn. Similarly Grant et al. (2006) asserted that reflective journals increase the awareness of learning styles. Park (2010) argued that keeping reflective journals helps students develop self-assessment; increases students' interest and participation to the course; encourages students to take responsibility for their learning; makes them more reflective in their studies; improves their awareness about how they study and how this effects their learning. Few other studies, however, also reported that some of the participants did not find the journaling process beneficial. Moffitt (2000), for example, studied with 10th grade students. He analyzed the students' views about dialogue journals. Results of the study revealed that many students thought that journaling activity was a waste of time. Langer (2002) analyzed adult learners' opinions about keeping journals. Most of the adult learners uttered that journal writing was an activity more appropriate for children not for grown-ups. They found keeping journal as time-consuming activity.

There are different kinds of journals for different purposes including personal journals, two column journals, dialogue journals, class journals, and journals of a particular subject area (Wilson & Jan, 1993). Two-

column writing is relatively new approach to promote reflective thinking and learning science concepts. In literature there are very few studies related to the two-column writings (Tok, 2008a;Tok, 2008b). Getting students' views about writing for learning or keeping a journal activity is very crucial to evaluate and properly develop these activities. Thus, the aim of this study is to investigate pre-service science teachers' views of two-column writing process. The guiding research questions for this study are:

1-What are pre-service science teachers' views about two-column writing process?

2-How do pre-service science teachers' views about reflective journals change based on their reflection levels?

METHOD

The study was conducted at a large university located North Eastern part of Turkey. The participants were 21 first-year pre-service science teachers who enrolled General Chemistry Laboratory II and volunteered for the study. The study was conducted during Spring 2011. The General Chemistry Laboratory is held once a week for two hours and the participants are required to perform one experiment each week regarding a general chemistry topic. They were asked to prepare two-column writings every week after they perform their weekly laboratory experiments for ten weeks. Most of the participants did not complete all ten writing assignments. In the assignment, the pre-service science teachers were asked to divide a page into two equal columns. On the left column, they were asked to write what they had known about the topic before the lesson and what they learned during and after the experiment. On the right column, the participants were asked to reflect upon their experiences by evaluating their own learning with their thoughts and feelings associated with the learning process. The left side of the assignment was called the summary and the right side was called reflective journal. In order to determine the pre-service science teachers' level of reflection, each learning journal was examined and graded from 1 to 4 based on Moon's (2006) categorization (descriptive writing, descriptive account with some reflection, reflective writing 1 and reflective writing 2). But, it was soon realized that it is difficult to fit some of the journals into these categories, so we developed intermediate levels to describe the levels of reflection. In another paper, we described this process in detail and presented pre-service science teachers' reflection levels (Cengiz, Karataş & Yadigaroglu, 2012). For the purpose of the current paper, the reflection level of each pre-service science teacher was calculated by taking average scores of all collected journals. The participants' mean scores of reflection level and the number of completed assignments can be seen in Table 1.

In order to determine the participants' views about two-column writing, semi-structured interviews were conducted with ten pre-service science teachers. The interview protocol consisted of 5 open-ended questions. Questions were aimed to determine whether the pre-service science teachers benefit from two-column writing activity and how they perceive reflection process. The protocol was reviewed by an expert in chemistry education. The interviews took approximately 15 minutes to complete for each participant and each interview was audio-recorded. The interview data were transcribed verbatim by the first researcher. The transcriptions were organized first to get rid of irrelevant data. Then, each participant's views were analyzed to establish rich and thick descriptive cases.

RESULTS

The results based on the analysis of the data collected from the participants' reflective journals and interviews are presented in two parts. In the first part, the average reflection level of the pre-service science teachers is shown. In the second part of the results section, the pre-service teachers' ideas about the two-column writing process are presented.

Table 1. Pre-service science teachers reflection level and completed assignment numbers

Average reflection level	Name	Average reflection level/ Assignment number
1,5 and below 1,5	Seçil	1.38/ 8
	Ayşe	1.10/ 5
	Tülay	1.50/ 9
	Yaşar	1.50/ 6
Above 1,5	Nilay	1.65/ 10
	Candan	1.94/ 9
	Sema	1.61/ 9
	Gamze	1.72/ 9
	Yılmaz	1.94/ 9
	Suat	1.75/ 4

Table 1 provides information about the number of two-column journals each pre-service teacher kept and the average reflection level for them. As seen in Table 1, the pre-service teachers were divided into two groups based on their average reflection levels: four pre-service teachers' (Seçil, Ayşe, Tülay, Yaşar) average reflection levels are 1.5 or smaller and the remaining participants' (Nilay, Candan, Sema, Gamze, Yılmaz, Suat) reflection levels are above 1.5. The reflection levels range from 1.10 to 1.94. Most of the participants wrote eight or more journals, but Suat, for example, completed only four journals.

The data from the interviews were analyzed to describe each and every participant's views so that we can check whether there is a relationship between their views and their reflection levels. Thus, the participants' views were presented separately beginning with Seçil.

Seçil

Seçil's average reflection level is below 1.5. Seçil stated that she completed all of the writing tasks (8) just a day earlier than it should be handed in. As seen in table 2, she thinks that she benefitted from preparing the summary part of two column writing, but not from the reflective journal part. Seçil pointed out that if journals were written realistically they could be effective for understanding whether one understands the content or not. She also stated that grading the writings and providing feedbacks are the only way to make students to write them effectively. Thus, it can be deducted from the interviews that Seçil did not consider writing activities as serious homework. Seçil views writing reflections as expressing feelings, thoughts and the experiences gained from the chemistry laboratory. It is understood from the interviews that Seçil's self-efficacy of writing a reflection journal is low: "... (Reflection) is something which I cannot do... something like diary... I can't do. I can't transfer my feelings or experiences on a paper." On the other hand, Seçil thought that the feedbacks that were given by the instructor are very useful that they encourage her to figure out her inadequacies related to chemistry content. She also indicated that the summary part of the writing assignment

was very useful while studying for the exams which are great determiners of her grade for the laboratory. Seçil also stated that using two column writings will be effective especially in numerical courses. Because of its effectiveness, when she becomes a teacher she will give her students similar assignments in order to identify her students' inadequacies and address them right way.

Nilay

As seen in table 1 Nilay's average reflection level is above 1.5. Nilay stated that she completed all of the writing tasks (10) one day before the course in which she should be handed it in. She thinks that she benefitted from both parts of the two column writing. She finds the assignments beneficial because it is effective in remembering the subjects and they can be used as a summary notes while studying for the exams. Nilay's definition of reflection gives some clues about the benefits she gained by writing reflective journals: *"What is reflection? I discover myself that is what I understand from reflection... I try to change according to it, for example I am taking notes (now), I see that I should keep notes or what happens if I don't keep notes"* and she adds *"What I have written to the right side clearly reveals what kind of a working method I applied until now. The things you wrote about me (feedbacks) showed that I should do repetition and after writing them (preparing the homework) I started to do daily repetition... At least it changed my studying habit... for example I used to summarize the information two days before the exam and memorize them... now I start to study one week before the exam."* Nilay stated that she wrote each feedback given from the instructor on a separate paper and when she is done what she is advised to do she marks the related feedback as "done." Thus it can be deduced from the interviews that preparing the assignments increased her self-confidence: *"I developed self-confidence... I improved my lacking sides, my studying habit has been improved. Because of that I feel comfortable, I can answer all kinds of questions that instructor asks me... because I can view questions from different angles... Nowadays, I recognize that I am getting more interest in science. This is due to a little help with your assignments and feedbacks. I used to interest in abstract things, now I started to interested in more concrete things."* Nilay pointed out that the feedbacks changed her perspective by showing her the instructor's points of view. Nilay thinks that two column writing will effective in any courses. And she adds that when she becomes a teacher she will ask her students to prepare similar assignments. She will ask them to write on colorful papers and there will be a part which they can even draw.

Candan

Candan's average reflection level is above 1.5. Candan stated that she completed some of her writing tasks immediately after the session related to the task and completed the others one day before the session in which she should be handed in. Candan thinks that she did not benefit from the summary part of the homework: *"I don't think that the summary side of the writing has any benefits because I always take notes on my book about our procedure in the laboratory. In my opinion, writing the summary part is just transferring my notes to another place..."* She views reflection as a process that shows both students and the teacher what is gained by students and she explains the effect of writing reflective journal on her: *"when I am doing a job I always put my state of mind before science. I mean it is important whether I gained something from it. I put emphasis on questions like 'Why didn't I gain something from it?', 'Is it about me or something else?'"* Candan also stated that writing reflective journals help her relax. She pointed out that the feedbacks encourage her to think about and recognize things. She also stated that two column writing is appropriate for laboratory courses:

“(two column writing) *yes it is appropriate for a laboratory course but I think it can't be applied to physics or maths... (In laboratory) we don't just share scientific information, we also learn from and ask our friends and other kinds of social sharing happens.*” Candan indicated that when she becomes a teacher she may ask her students to prepare two column writings but she also added that writing journal activity will not be on regular basis. She noted that when students are asked to keep journals very often (e.g. weekly), it becomes boring.

Ayşe

Ayşe's average reflection level is below 1.5. Ayşe stated that she completed her writing tasks at different times of the week. As seen in table 2, she finds the summary part of the homework beneficial but the reflective journaling unnecessary and she added that when she becomes a teacher she will not ask her students to prepare reflective journals. When the definition of reflection was asked, she answered as *“we write what we learn”*. Ayşe thinks that if the writings were graded they would be prepared carefully. On the other hand, she also listed a few useful effects of the assignment on herself: *“We take responsibility, you gave us a homework and we should do it. At first, I tried to do it systematically but then I got bored and didn't do it...”* She pointed out that it helped them to realize the experiment and the feedbacks helped them while preparing for the exams. Ayşe also stated that she finds the homework appropriate for laboratory courses: *“It is suitable for this course. Moreover, it would be better if we kept journals in physics laboratory because we don't pay attention to these courses much but after we began keeping journals we started paying more attention... I don't think that it can be applied to other courses in which we learn theoretical knowledge...”*

Tülay

Tülay's average reflection level is 1.5. Tülay stated that she completed all of the writing tasks (9) just a day earlier than it should be handed in. She thinks that both sides of the two-column writing activity are effective in learning, but she claimed that she did not gain much from the reflection journal part. This might be the reason why she could not keep journals as it was asked from them. She stated that this may be because this is the first time that she prepares this kind of homework. She also thought that she is not capable of expressing herself by writing. However, she pointed out that reflection is an activity that enables them to be aware of themselves as well as help the instructor to get informed about what the students have learned. It is understood from the interviews that writing the summary part was not a difficult task for her; she rather enjoyed doing it. She also noted that the summary part of the writing help her recall the course concepts. On the other hand, she indicated that writing the reflective journal is a hard task to do. Especially answering the question *“what is your aim”* was difficult: *“You asked us what are our aims? I believe that it is strange because I didn't do something like that before... Until now I have had easy targets... if we integrated this activity into our course at the beginning of the first semester, it would be better...”* Tülay pointed out that the feedbacks helped her revise her homework. She thinks that two-column writing activity is appropriate for the chemistry laboratory and other verbal courses. She is willing to employ this activity in her classes when she becomes a science teacher.

Sema

Sema's average reflection level is 1.61. Sema stated that she completed her writing tasks at different times of the week. She stated that preparing the summary part made her go over the subject and she finds it useful for the exam. She indicated that writing reflective journal relaxes her. She explained what she

understands from reflection as: *“When we do an experiment and learn all concepts about it, I can question its contributions to me and what has changed in my knowledge after doing the experiment.”* She said when she becomes a teacher she will ask her students to prepare two-column writing. She pointed out that this will help her students identify the problems about her teaching and she can communicate with her students this way. She thinks that two-column writing can be applicable in all courses.

Yaşar

Yaşar's average reflection level is 1.5. Yaşar stated that he completed all of the writing tasks (6) a day earlier than it should be handed in. He said he benefited from summary part of the homework but he did not benefit from the reflective journal part and he thinks that this part has no effect on learning. He explained what reflection as: *“in journals we answer questions like, why we couldn't be successful... reflection is explaining what you have and haven't learned in the course... and why?”* Yaşar indicated that the summary part allowed him to repeat the content and it was very useful for the exam. He thinks that the feedbacks and prompt questions were well-put, but the students did not pay enough attention to them. So, they could not gain from the feedback as much. Yaşar finds this application suitable for chemistry laboratory, but he does not consider employing a similar approach when he becomes a teacher because he believes that middle school students would not like keeping journals.

Gamze

Gamze's average reflection level is 1.72. Gamze completed each writing task right after the laboratory session. She believed that both parts of the two column writing are beneficial. She defined reflection as: *“It is reflective of your situation. If you want to declare your problems you can show them this way.”* Summary part help her consolidate her knowledge and it was beneficial for the exam. The feedbacks were encouraging her to do research. The reflective journal enabled her to assess herself and to decide how to improve herself. She plans to employ a similar activity when she becomes a teacher in order to diagnose her students. She claimed that two-column writing is suitable for chemistry laboratory and she added *“if you ask me in which laboratory you have learned more? I would say chemistry rather than physics because I did not need to write in it (physics laboratory).”*

Yılmaz

Yılmaz's average reflection level is above 1.5. Yılmaz stated that he sometimes completed the writing tasks in the same day after the related laboratory session and sometimes a day earlier than it should be handed in. It is deducted from the interviews that he benefited from both sides of the two column writings. He stated that summary part makes the information persistent and the reflection journal part develops writing ability, self-expression and enables one to pay more attention to the subject. Yılmaz also indicated that when he writes, he realizes the issues that he has trouble which he needs to pay more attention to improve upon those issues. He pointed out that feedbacks helped him improve his homework. Besides he indicated that the homework connected him to the class and he felt enthusiasm for learning. He stated that when he becomes a teacher he will give his students similar assignments. He thought that this activity is appropriate for chemistry laboratory as well as physics: *“we also take physics laboratory. It would be better if this assignment was also asked us there because I think that learning doesn't occur (there) as much as in chemistry laboratory...”*

Suat

Suat's average reflection level is above 1.5. Suat completed the writing tasks at different times of the week. Suat stated that he found the summary part of the assignment superficial and reflective journal part of the writing assignment was far more useful. He pointed out that reflective journals helped him observe how he has changed over time. Suat also thinks that when someone asks a question to himself/herself and writes an answer for that question, then the answers is more honest. Suat explained the aim of reflection as providing answers for the following questions: "(After the experiment) *did I achieve my goals? How was my performance?... Why didn't I achieve my goal? Where did I make mistake?*" Suat perceives the writing activity as a chance to see his own development and to increase his motivation to study other courses. He mentioned during the interview that his development is apparent when he compares his first and last assignment. The feedbacks, he continued, given from the instructor are also very supportive for his development. He said that when he becomes a teacher he will ask his students to prepare two-column writings. But, he thinks that answering the same questions every week is boring, so he will make a few weekly changes. He also stated that the chemistry laboratory is the right place to employ this activity.

The pre-service teachers' views about the two-column writing activity are summarized in Table 2. The two-column writing activity is considered as three dimensional processes for students; as writing summary, writing reflective journals and receiving feedback.

Table 2. Pre-service teachers' views about two-column writing

Dimensions of Writing	General views	Participants	f
Summary	Beneficial	Seçil, Ayşe, Tülay, Yaşar, Nilay, Sema, Gamze, Yılmaz	8
	Partially beneficial	Suat	1
	Useless	Candan	1
Reflective journal	Beneficial	Suat, Candan, Nilay, Sema, Gamze, Yılmaz	6
	Beneficial if prepared well	Seçil, Tülay	2
	Useless	Ayşe, Yaşar	2
Feedback	beneficial	Suat, Candan, Seçil, Ayşe, Tülay, Nilay, Sema, Gamze, Yılmaz	9
	I think that students not appreciative	Yaşar	1

DISCUSSIONS

A two-column writing activity can be thought as a three-way process: preparing summary, preparing reflective journal and getting feedback. In this section of the study, the participants' views regarding writing summary, keeping reflective journal, and provided feedback are discussed respectively..

Most of the pre-service teachers found writing summary part beneficial. Especially they emphasized the positive effect of preparing summary part on exams. Some of them pointed out that they used summaries as course notes while preparing for exams. Some of them indicated that writing the summaries give them opportunity to recite the laboratory content and some of them think that writing summary helps them remember class content. However two participants did not find summary part as beneficial as reflective journal column. The reason for this view might be attributed to the participants' lack of experience and knowledge of how to

prepare summaries. Because one of the participants, who did not see writing summary a beneficial activity, defined summarizing process as transferring knowledge from one place to another. In her study, Deneme (2009) examined 50 second-year pre-service English teachers' summary writing strategies that they use while they are writing summaries. She determined that the pre-service English teachers were weak in terms of summary writing strategies they used. The reason for not being able to use summary writing strategies by the pre-service teachers explained by the researcher as the pre-service teachers did not train about summary writing. Similarly in this current study participants did not train about summary writing.

The pre-service science teachers have made several and various comments regarding the impact of the reflective journal writing. First comment was about finding answer to the question: "What did I learn?" Similarly, Moffitt (2000) reported that reflective journals help students determine what they learn or not. In the related literature many positive aspects of reflective journals were cited: increasing the awareness of learning styles (Grant et al., 2006); helping students develop self-assessment; increasing students' interest and participation to the course, encouraging students to take responsibility for their learning; making them more reflective in their studies; improving their awareness about how they study and how this affects their learning (Park, 2010); increasing students' writing abilities and critical thinking (Amodeo, 1996). The findings of the current study support these cited studies. In this study the pre-service science teachers indicated similar benefits of reflective journals including gaining awareness about their study habits; enabling to find the source of the problems about their learning; identifying lacking aspects and focusing on them; improving writing skills and self-expression; and paying more attention to the course. One of the participants also indicated that while writing reflective journals, one can judge himself or herself more honestly. Similarly, Malthouse and Barentsen (2013) reported that reflective thinking forces us to be honest with ourselves.

Negative views regarding keeping journals, however, were also reported. Moffitt (2000), for example, noted that many students indicated that keeping journals is a time wasting activity and these students could not find a connection between learning science and keeping journals. Similarly, we found that the participants whose average reflection level scores are below 1.5 (see Table 1) stated that they did not get benefit from keeping a reflective journal. The participants whose average reflection level scores are above 1.5 stated that they benefited from this activity. Thus, it can be argued that the individuals with higher metacognitive skills may gain more from keeping a reflective journal. In other words, one might be aware and get benefit from reflective journals over a certain level of reflection. Furthermore, it can be said that writings with descriptive characteristics have little or no effects on metacognition. Von Wright (1992) described two levels of reflection and he indicated that second level reflection involves metacognitive learning skills (as cited in Grabinger & Dunlap, 1995). The data gained from 2 out of 4 participants who said that they couldn't benefit from the reflective journals supports this argument. These participants indicated that reflective journals will be effective when it is well prepared. Both students felt lacking of ability about writing reflective journals.

All of the participants found the feedbacks for the two-column journals beneficial except one. This participant thought that his classmates did not utilized the feedbacks sufficiently. Other participants reported the benefits of feedbacks as helping them think thoroughly and encouraging them to research, changing perspective by showing the instructor's point of view, giving them a chance to see their development, and helping them improve the assignment.

CONCLUSIONS AND RECOMMENDATIONS

The pre-service science teachers in this study generally convey positive views about summarizing laboratory work and getting feedback from their writings. In the case of keeping reflective journals, the participants uttered different opinions. It is found that the pre-service teachers seem to benefit more from the journal keeping activity, when their reflection levels are high. In this study, the participants' reflection levels were generally low, so further research is needed to examine the relationship between the reflection levels of participants and their views.

Many participants indicated that reflective journals help them gain awareness about their study habits and methods, identify possible sources of learning problems, and determine their deficiencies so that they can try to fix them.

There is another issue that we would like to bring on instructors' attention. The interviews pointed out that when assignments are not scored by the instructors, students do not pay enough attention to preparing them. This situation should be taken into consideration in further research as well.

Last, but most important conclusion of this study is that the individuals cannot benefit from the reflective journal as we expected unless they have certain level of reflection and reflective thinking skills. Therefore, different methods should be employed (e.g. reflective conversations and prompt questions) to develop reflection skills first in order to utilize benefits of keeping reflective journals.

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