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Can we boost the Metacognitive Awareness of Prospective Teachers through Reflective Journals?

Abstract *‘Metacognition and reflective teaching are concepts that complement each other if we refer to a reflective teacher. This study investigates whether metacognitive awareness of prospective teachers can be improved through reflective journals. In present study reflective journals are comprised of practice sheets through which the prospective teachers can practice their metacognitive thoughts consciously. The methodology followed is experimental research by using quasi-experimental design into two phases. Both, control and experimental groups were taught through a combination of teaching strategies that we normally use in our classes such as lecture, discussion, or through inquiry, etc., in phase 1. In phase 2, reflective journals, along with other strategies that were used in the 1st phase, were introduced. The results of data analysis revealed a significant enhancement of prospective teachers’ metacognitive awareness and its constituent factors e.g., metacognitive knowledge and metacognitive regulation.*

Key Words: Metacognitive Awareness, Reflective Teachers, Reflective Journals, Prospective Teachers, Reflective Teaching

Introduction

In any education system, teachers play a vital role and are responsible for their students learning and teaching itself is a very demanding task that requires the alignments in content, student’s learning, and pedagogy (Feiman-Nemser, 2001; Hammerness et al., 2005) Therefore, to meet the challenges of the teaching profession, the prime objective of teacher’s training programs is to convert prospective teachers into reflective teachers (Adadan and Oner, 2018). This means that teachers' training programs must be designed to provide student teachers with a broad understanding and mastery of pedagogical knowledge and pedagogical skills but also make them think critically and reflect on their teaching.

According to Bransford et al., 2005, every teacher education program provides core understanding to the teachers so that they may be able to track down their development. So, after completion of a degree, each prospective teacher should be able to cope with all classroom problems, teach effectively but must have desired skills that are essential for a reflective teacher.

According to John Dewey (1933), reflective practices liberates us from the routine activity. It not only empowers us to direct our activities with prudence and intuition but to plan according to our desired outcomes. To be a reflective teacher, researchers are in favor of metacognitive awareness as a tool of reflective teaching and consider as an essential portion to understand the phenomenon of teaching and to develop preservice or in-service teachers personal teaching pedagogies for (Shulman and Shulman, 2004; Parsons and Stephenson, 2005; Loughran, 2013).

The teacher whose level of metacognitive awareness is high becomes cognitively habitual to self-evaluate themselves and modify their views and actions accordingly. Teachers who are less metacognitively aware mainly rely on external or other’s views regarding their teaching Hammerness et al. (2005). Many researchers often emphasized the leading role of reflective thinking in the teaching profession especially in producing teachers. (El-Dib, 2007; Jay and Johnson, 2002). For learning, teaching, learning to teach, and developing expertise reflective thinking is vital. It is also giving directions and impetus to professional growth (Rodger, 2002; Shulman and Shulman, 2004). However,

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according to Adadan and Oner (2018) that researchers could not agree on the concrete concept of reflective thinking until now.

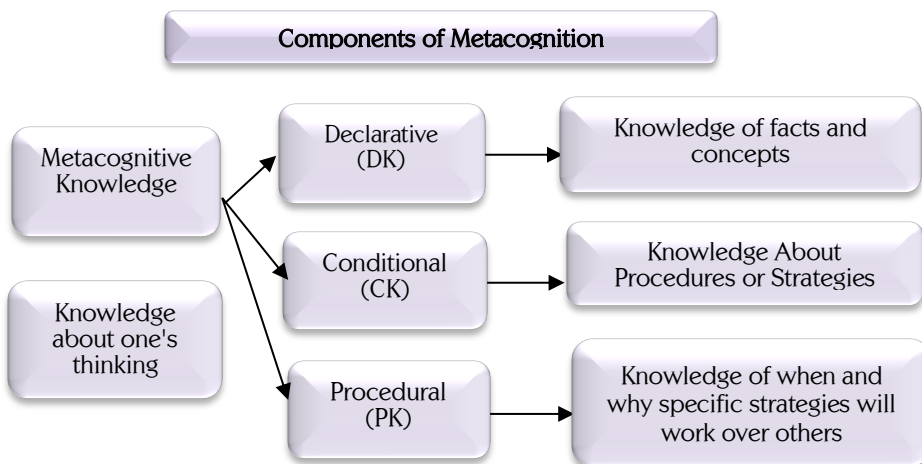
Keeping the precious efforts of various academics along with Dewey, 1933, & Ford and Yore, 2012, it can be inferred that reflective thinking is associated with the notion of metacognition and is the conscious practice of one's thinking in respect of their teaching. It involves planning, monitoring, and evaluating the abilities of teachers to regulate their thinking towards their teaching. It also helps them to understand oneself as a teacher, being aware of one's strengths, weaknesses to explore and improve one's teaching skills.

There are assorted views about the concepts of metacognitive awareness, reflective thinking and their alignment with each other. Reflective thinking is thought to be an approach to metacognition (Desautel, 2009; Knight, 2002). For some researchers, metacognition and reflective thinking are similar concepts whereas, in several researchers' view, metacognitive awareness is antecedent of reflective thinking. However, only a few types of research explored the effect of metacognitive strategies in developing reflective thinking in teachers. (Mcalpine and Weston, 2000; Hammerness et al., 2005; Parsons and Stephenson, 2005; Larrivee, 2008; Whittaker and vanGarderen, 2009; Sellars, 2014).

Theories elaborate the phenomenon of 'metacognitive awareness' awareness of an individual for cognition related to the task and the strategy. These theories also focused on a mechanism that is self-controlled (by an individual) for monitoring the process within a context (task) (Adadan and Oner, 2018, p27). Originally the idea of metacognition was presented by Flavell in 1976, according to him, metacognition is the persons' knowledge for his process and products in the cognitive domain. The process of metacognition along with its constituents' components has also been explained by others with inspiration and alignment by Flavell's definition. (e.g., Kuhn and Dean, 2004; Schraw and Dennison, 1994).

There is a lack of common thread for the nature of metacognition found among experts in the field. Adadan and Oner (2018) reported that most researchers rely on the original portrayal of the construct of metacognition. Generally, most of the researchers concurred on the two interrelated components of metacognition i.e. metacognitive knowledge and metacognitive regulatory skills (Flavell, 1976; Brown, 1987; Schraw and Moshman, 1995).

The construct of metacognitive awareness adopted in this study has been driven from the metacognitive awareness inventory by Schraw and Denison in 1994. According to them, declarative knowledge (DK), procedural knowledge (PK), and conditional knowledge (CK) are the component of metacognitive knowledge (MK) (Brown, 1987; Schraw, 2001; Zohar and Barzilai, 2013). Whereas, metacognitive regulation (MR) includes five aspects, planning (P), debugging strategies (DS), information management strategies (IMS), monitoring (M), and evaluation (E) (Schraw and Moshman, 1995; Zohar and Barzilai, 2013). The detail of these components is given in the form of flow chart given below.



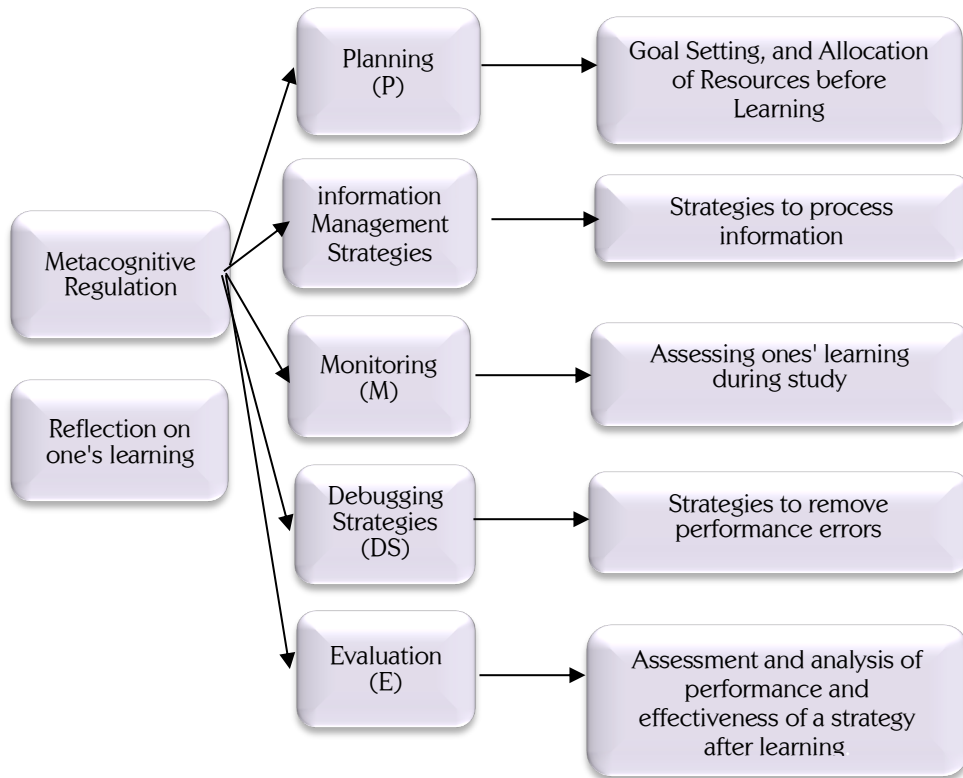


Fig 1: The Components of Metacognition.

There are few empirical researches that indicate the improvement in prospective teachers' metacognitive awareness may be observed as a result of any training. However, the shreds of evidence indicate that teaching metacognition can be amended ([Dignath et al., 2008](#)). For example; [Kim \(2005\)](#) revealed that through reflective thinking activities we can escalate students' metacognitive awareness at the college level in online learning. Similar to these studies the current study was focused on promoting preservice teachers' metacognitive awareness through reflective journals.

According to [Hofer 2004](#), many studies are in favor that metacognition can be improved through conscious efforts and may lead to the automated performance. Metacognition is considered as part of reflective thinking and reflective teaching but researchers are still exploring the ways to improve metacognitive awareness. In this study, we consider reflective journals could be one mean to improve metacognitive awareness. Whereas reflective journals as the form of prospective teachers' diaries based on classroom tasks and their metacognitive awareness. Students have to provide answers regarding their metacognitive awareness while performing a task during lectures either on a daily or weekly basis. The purpose of these journals was to let prospective teachers practice consciously to enhance their metacognitive awareness. The notion of the reflective journal s based on the idea that conscious efforts of practicing metacognitive thinking may lead towards achieving automatic performance. If a person's metacognitive awareness is high then he or she may complete any task related to their teaching smartly, self-evaluate their teaching, and hence, be a reflective teacher. However, this study is limited to the investigation of the question of whether we can improve the metacognitive awareness of prospective teachers through reflective journals. Further studies are

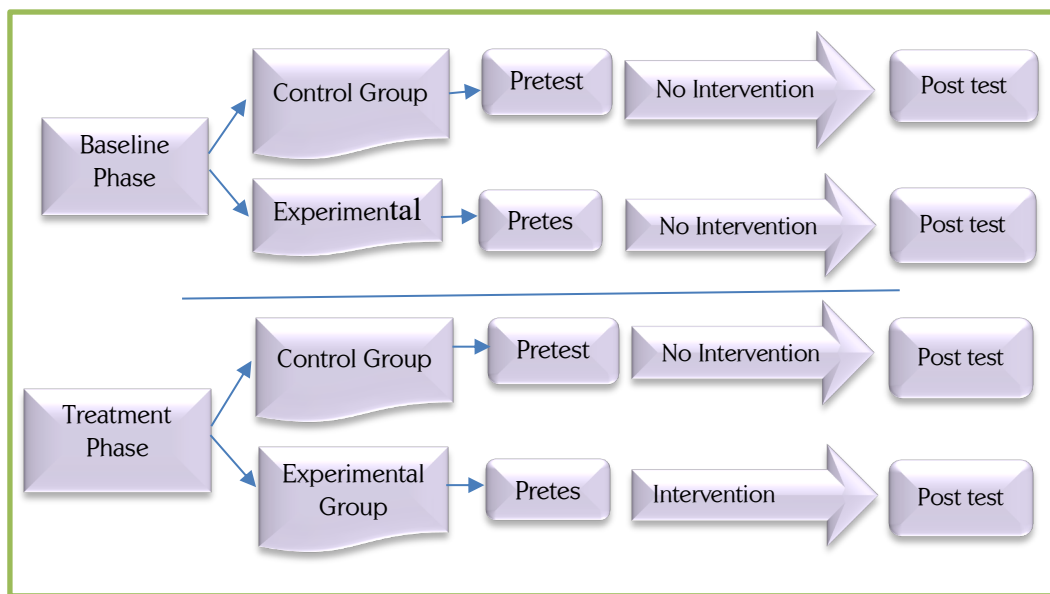
required to investigate the question that how prospective teachers having metacognitive awareness are practicing it in their teaching practice and its effectiveness in becoming reflective teachers.

Procedure of Study

In this segment particulars regarding the procedure of the study such as framework, participants, intervention, and instrument are described.

Nature and Framework

By using a quantitative approach, employing a quasi-experimental design, the effectiveness of reflective journals was sought. Two intact groups of participants; one as the control group and the other was an experimental group. The number of participants was different so non-equivalent control group design was considered as the most appropriate design in the range of quasi-experimental designs. Metacognitive awareness inventory by Schraw and Dennison 1994 was used as a pretest and the same was used as a posttest from both groups to check their metacognitive level. The total duration of the study was 32 weeks i.e.; two consecutive semesters. The study was divided into two phases each one was of 16 weeks duration. In the 1st phase, pretest and posttest were administered and no intervention was given to any of the groups and was named as the 1st phase. This phase served two purposes: First, to check that how much prospective teachers' metacognition is improved while using a regular combination of teaching strategies. Second: it helped in minimizing or controlling several internal validity threats of the experiment. After 16 weeks of teaching duration for the 1st phase, there was a gap of two weeks as term break. After that, the Treatment phase was started in which treatment was given to the experimental group whereas the control group was taught by using a combination of various teaching strategies that are normally used in everyday teaching such as, lecture, enquiring, or discussion, etc.



Framework of Study

Subjects

The subjects for the research were prospective teachers studying in 4 years degree program. Female prospective teachers who were studying in their 2nd year and are of 18 to 20 years of age were included

in this study. Total of 93 participants studying in B.Ed. (Hons) 2nd Semester was included in this study; one section of 45 prospective teachers was included in the control group whereas another section of 48 participants was selected as the experimental group. For different age groups and nomenclature of the program within the same institution may be different from the selected ones. Whereas results can be generalized on students of the same age group e.g., 18-20 years on other campuses of the same university by considering the environment as the same due to many common aspects all over the campuses.

Treatment

To give treatment one of the three researchers was chosen as an instructor with the mutual decision. The selection of instructor and course taught was the same for both the control and experimental groups. For the control group, a combination of various teaching strategies was used to teach. For the experimental group, two types of sheets were given to each prospective teacher to compile their reflective journal at the end of the semester. One we name as a worksheet and the other we name as a reflective sheet. Worksheets were given to each prospective teacher to practice their metacognitive skills during the session. Reflective sheets were more comprehensive and comprised of more open-ended questions as compared to worksheets. Questions given in reflective sheets were related to the whole week's work and covers metacognitive knowledge and metacognitive skills.

At the end of the week, each prospective teacher has to submit her whole week's work along with both work and reflective sheets. A brief comparison of both sheets is given in the following table.

Table 1. Comparison of Questions in work and Reflective Sheets

Sample Questions of Work Sheets	Sample Questions of Reflective Sheets
What the task is about?	While performing the task did you recall any information related to the concept/task?
Enlist the targets that have been set by you to complete the task.	During performing the tasks, did you ask yourself periodically if you are achieving the targets that you set at the beginning?
During performing the assigned task have you checked whether you are going in the right direction or not?	While learning a new concept did you ask yourself about how well you are doing?
The Task was easy, difficult, very difficult.	What strategy you opt to learn a new concept given in the tasks.
What mistake I made and how did I resolve?	What are your intellectual strengths and weaknesses in your opinion enlist them?
Have I met all targets?	What strategy you use to complete the task and why?
Do you think that there could be a better way to complete the task?	In your opinion how do you learn best? Enlist your points.

At the start of the term, the instructor explained the concept of metacognitive knowledge and metacognitive skills, how it is related to their learning, and how it will help them to become a smart learner. The instructor also explained the decorum of the class for the whole week by explaining to them the detail of reflective journals. There were 48 sessions and each session were of 1.5 hours during 16 weeks of the treatment phase. At the beginning of each session, the instructor describes the concept according to the course outline then assign some simple task to each student. Every student has to complete the task and write answers in their worksheets individually. Examples of some tasks that each participant has to complete are reading a paragraph, making a flow chart, summarizing the content, or discuss the central idea of the text. At the end of every session, participants were asked to fill reflective sheets and at the end of every week, students have to submit their reflective sheets and worksheets along with their classwork to the instructor.

The Instrument of the Study

Metacognitive Awareness Inventory (MAI) by Schraw & Denison (1994) was adopted for this study. MAI was comprised of 52 items and it is further subdivided into two main components i-e; metacognitive knowledge (17 items) and metacognitive skills (35 items). Researchers ensured the reliability of the instrument in the Pakistani context through pilot testing. In pilot testing, MAI was given to 279 prospective teachers of three sessions of the B.Ed. Hons program. Participants of this study were not part of pilot testing so that validity threats of instrumentation may be avoided. The original inventory was highly reliable, Cronbach's alpha values for metacognitive knowledge ($\alpha=.88$); metacognitive skills ($\alpha=.88$); and that of the entire inventory was ($\alpha=.93$) and after pilot testing, Cronbach's alpha values for metacognitive knowledge was ($\alpha=.90$); metacognitive skills were ($\alpha=.89$); and that of the entire inventory was ($\alpha=.97$).

Validity of Experiment

By nature, experimental designs face validity threats that can affect the entire experiments and results may not be true. The table given below depicts how researchers controlled the potential internal validity threats of the experiments. However, control over external validity threats was limited such as the interaction of history and treatment. Because the courses that were included in this study are part of a scheme of study offered as a core course for a prescribed degree. So, it would be difficult to conclude the sequential effects of placement of course in the scheme of study may occur or not.

Table 2. Internal Validity: Threats and Controlling Measures

Threats	Controlling Measures
History	A 1st phase was included.
Maturation	This threat controlled by adding a control group and treatment duration was also one semester.
Testing	To minimize this threat control group and 1st phase were added.
Instrumentation	A valid and reliable instrument was used for both pretest and posttest.
Selection	This threat was controlled through the 1st phase and pretest.

Results

Table 3. Analysis of Inter Group Comparison at the Beginning of the Study (1st phase)

	Control Group N=45		Experimental Group N=48		df	t	p	d
	M	SD	M	SD				
DK	18.22	4.79	15.70	4.40	91	2.62	.010	0.54
PK	8.00	2.14	6.83	2.23	91	2.57	.012	0.53
CK	11.08	3.14	9.79	2.72	91	2.12	.037	0.43
P	13.84	4.50	12.56	3.66	91	1.49	.138	0.31
IMS	21.51	6.45	18.97	5.32	91	2.05	.043	0.42
M	13.46	3.99	10.97	3.52	91	3.17	.002**	0.66
DS	9.17	2.99	8.83	2.50	91	.60	.550	0.12
E	11.48	3.79	10.20	3.12	91	1.77	.080.	0.36
Metacognition Knowledge	37.31	9.32	32.33	8.39	91	2.70	.008	0.56
Metacognition Regulation	69.48	20.21	61.56	16.15	91	2.09	.039	0.43
Metacognitive Awareness	108.53	29.03	95.95	24.12	91	2.26	.026	0.47

** $p < .01$

This table depicts that at the start of phase 1 both groups were homogenous in terms of metacognitive awareness in all respects except monitoring. The monitoring skills of control groups were better than experimental groups.

Table 4. Analysis of Inter Group Comparison after Completion of the 1st Phase

	Control Group N=45		Experimental Group N=48		df	t	p	d
	M	SD	M	SD				
DK	17.33	5.47	16.00	4.28	91	1.301	.197	0.27
PK	8.02	1.82	7.70	1.24	91	.919	.361	0.20
CK	11.64	3.46	10.93	3.68	91	.954	.343	0.19
P	15.37	5.39	13.52	4.90	91	1.733	.086	0.35
IMS	23.80	6.57	21.43	5.99	91	1.807	.074	0.37
M	14.77	3.61	13.43	3.43	91	1.829	.071	0.38
DS	9.62	3.24	9.22	2.26	91	.639	.525	0.14
E	11.80	4.54	10.33	3.91	91	1.664	.100	0.34
Metacognition Knowledge	37.00	9.80	34.64	8.39	91	1.24	.216	0.25
Metacognition Regulation	75.37	21.90	67.95	19.13	91	1.74	.085	0.36
Metacognitive Awareness	112.95	29.97	102.64	25.74	91	1.762	.082	0.36

** $p < .01$

The above table illustrates that when the 1st ended both groups were homogenous in terms of overall metacognitive awareness and its sub-factors.

Table 5. Analysis of Inter Group Comparison After the 2nd Phase

	Control Group N=45		Experimental Group N=48		df	t	p	d
	M	SD	M	SD				
DK	18.04	5.02	32.04	2.46	91	17.224	.000	3.54
PK	8.22	2.12	14.91	.941	91	19.889	.000	4.07
CK	11.46	2.95	20.45	1.12	91	19.638	.000	4.02
P	14.73	3.76	29.43	1.84	91	24.133	.000	4.96
IMS	22.15	5.65	28.87	3.01	91	22.236	.000	1.48
M	15.11	3.20	28.12	1.46	91	25.426	.000	5.23
DS	9.95	2.82	20.20	2.33	91	19.119	.000	3.96
E	12.02	3.50	25.00	1.33	91	23.866	.000	4.90
Metacognition Knowledge	37.73	9.03	67.41	3.30	91	21.29	.000	4.36
Metacognition Regulation	73.97	16.97	145.6	7.92	91	26.35	.000	5.40
Metacognitive Awareness	111.71	25.31	212.79	10.41	91	25.471	.000	5.22

** $p < .01$

The above table explains that metacognitive awareness of the experiment was improved after using reflective journals in phase 2. A significant difference is found in every domain of metacognitive awareness.

Table 6. Intra Group Comparison of Control Group Before Treatment

	Pretest-1st Phase		Posttest 1st Phase		df	t	p	d
	M	SD	M	SD				
DK	18.22	4.79	17.33	5.47	44	1.232	.224	0.17
PK	8.02	1.82	8.22	2.12	44	-.705	.484	0.10

	Pretest-1st Phase		Posttest 1st Phase					
CK	11.08	3.14	11.64	3.46	44	-.986	.330	0.16
P	13.84	4.50	15.37	5.39	44	-2.393	.021	0.30
IMS	21.51	6.45	23.80	6.57	44	-2.627	.012	0.35
M	13.46	3.99	14.77	3.61	44	-2.897	.006	0.34
DS	9.17	2.99	9.62	3.24	44	-.927	.359	0.14
E	11.48	3.79	11.80	4.54	44	-.553	.386	0.07
Metacognition Knowledge	37.31	9.32	37.00	9.80	44	.225	.823	0.03
Metacognition Regulation	69.48	20.21	75.37	21.90	44	-2.294	.027	0.27
Metacognitive Awareness	108.53	29.03	112.66	29.69	44	1.140	.261	0.14

***p*<.01

The above table shows that in the beginning no change was found in metacognitive awareness and its sub-factors of the control group.

Table 7. Intra Group Comparison of Control Group After Treatment

	Posttest-1st Phase		Posttest 2nd Phase					
	M	SD	M	SD	<i>df</i>	<i>t</i>	<i>p</i>	<i>d</i>
DK	17.33	5.47	18.04	5.02	44	1.185	.242	2.73
PK	8.00	2.14	8.22	2.12	44	1.055	.297	0.10
CK	11.64	3.46	11.46	3.46	44	.337	.738	0.05
P	15.37	5.39	14.73	3.76	44	1.081	.286	0.13
IMS	23.80	6.57	22.15	5.65	44	2.117	.040	0.26
M	14.77	3.61	15.11	3.20	44	-.812	.421	0.09
DS	9.62	3.24	9.95	2.82	44	-.690	.494	0.10
E	11.80	4.54	12.02	3.50	44	-.458	.649	0.05
Metacognition Knowledge	37.00	9.80	37.73	9.03	44	-.627	.534	0.07
Metacognition Regulation	75.37	21.90	73.97	16.97	44	.614	.542	0.07
Metacognitive Awareness	112.66	29.69	111.71	25.31	44	.315	.754	0.03

***p*<.01

The above table illustrates that metacognitive awareness and in its sub-factors of the control group were the same after phase 2.

Table 8. Intra Group Comparison of Experimental Group Before Treatment

	Posttest-1st Phase		Posttest 2nd Phase					
	M	SD	M	SD	<i>df</i>	<i>t</i>	<i>p</i>	<i>d</i>
DK	15.70	4.40	16.00	4.28	47	-.379	.707	0.06
PK	6.83	2.23	7.70	1.42	47	-2.487	.016	0.46
CK	9.79	2.72	10.93	3.68	47	-1.839	.072	0.35
P	12.56	3.66	13.52	4.90	47	-1.713	.093	0.22
IMS	18.97	5.32	21.43	5.99	47	-3.025	.004	0.43
M	10.97	3.52	13.43	3.43	47	-5.352	.000	0.54
DS	8.83	2.50	9.22	2.62	47	-1.105	.275	0.15
E	10.20	3.12	10.33	3.91	47	-.227	.821	0.03
Metacognition Knowledge	32.33	8.39	34.64	8.39	47	-1.475	.147	0.27
Metacognition Regulation	61.56	16.15	67.95	19.13	47	-2.736	.009	0.36
Metacognitive Awareness	187.79	47.11	205.20	51.58	47	-2.360	.022	0.35

***p*<.01

This table confirms that in the beginning no change was found in metacognitive awareness and its sub-factors of the experimental group.

Table 9. Intra Group Comparison of Experimental Group After Treatment

	Posttest-1st Phase		Posttest 2nd Phase		<i>df</i>	<i>t</i>	<i>p</i>	<i>d</i>
	M	SD	M	SD				
DK	16.00	4.28	32.04	2.46	47	21.978	.000	4.59
PK	7.70	1.42	14.91	.94	47	30.511	.000	2.21
CK	10.93	3.68	20.45	1.12	47	18.132	.000	3.5
P	13.52	4.90	29.43	1.84	47	21.683	.000	4.29
IMS	21.43	5.99	42.87	3.01	47	19.168	.000	4.52
M	13.43	3.43	28.12	1.46	47	25.300	.000	5.57
DS	9.22	2.62	20.20	2.33	47	21.272	.000	4.42
E	10.33	3.91	25.00	1.33	47	23.421	.000	5.02
Metacognition Knowledge	34.64	8.39	67.41	3.30	47	26.196	.000	5.14
Metacognition Regulation	67.95	19.13	145.64	7.92	47	24.273	.000	5.30
Metacognitive Awareness	205.20	51.58	426.12	20.3	47	26.593	.000	5.63

***p* < .01

This table depicts that metacognitive awareness and in its sub-factors of the experimental group were significantly changed after treatment. After using reflective journals metacognitive awareness in all sub-factors was significantly improved.

Conclusion and Discussion

The results of this research indicate that both of the groups were almost homogenous in all respects of metacognitive awareness except "monitoring". It was also observed that at the beginning monitoring skills of the control group were better than the experimental group. These results confirmed that both groups were homogeneous before the study. The difference in the monitoring aspect maybe because of the instructor's teaching style in the previous term. Results declared that metacognitive awareness of both of the groups was the same at the end of the 1st phase. The intragroup comparison showed that after the completion of the 1st phase, a very minimal change in mean scores of metacognitive awareness was observed. This change in mean score is not significant and effect sizes are also very low so, we may conclude that the curriculum and teaching methodologies that are used in daily routine do not help enhance metacognitive awareness of prospective teachers. It is also concluded that the metacognitive awareness of prospective teachers was boosted by using reflective journals. Although, the effect size obtained by using Cohen's *d* formula was not high still highly significant changes were observed. This finding is also analogous with other studies such as Yıldız1 and Akdağ, 2017; Abd-El-Khalick and Akerson, 2009; Çakır, 2011; Erskine, 2010; Foster, 1989; Kincannon et al., 1999; Mevarech and Amrany, 2008; Peters and Kitsantas, 2010; and Takallou, 2011. Yıldız1 and Akdağ, 2017 experimented to check the "Effect of Metacognitive Strategies on Prospective Teachers Metacognitive Awareness and Self Efficacy Belief". They also used Journals and metacognitive questions in their training session and they observed that metacognitive awareness of prospective teachers was increased.

Another experimental study was coxswained by Abd-El-Khalick and Akerson in 2009. They explore alteration in the opinion of prospective teachers, as a result of the three metacognitive strategies, regarding the nature of science. They also reported that during the experiment metacognitive awareness of prospective elementary teachers was augmented. Similarly, Erskine (2010) assessed metacognitive awareness and its usage of first-year university students by direct and specific metacognitive training, and after engaging them in weekly metacognitive reflection assignments and reported significant differences in the metacognitive awareness. Likewise, in 2011 Takallou also found that students' awareness regarding metacognitive strategies significantly amplified after instruction. In 2019 another experimental study was conducted by Asy'ari and Ikhsan. They

studied whether metacognitive awareness of prospective teachers improves through Inquiry Learning Model. They also reported similar results that after training metacognitive awareness and metacognitive knowledge was significantly varied. [Ibnu and Rahayu \(2017\)](#) also observed the improvement in metacognitive awareness of chemistry students after utilizing various metacognitive learning strategies. The results of this study support the finding of [Duman and Semerci \(2019\)](#) and [Özsoy and Ataman \(2017\)](#).

Duman and Semerci (2019) investigated that prospective teachers' metacognitive awareness can be affected through metacognition-based instructions. Whereas, the study by Özsoy and Ataman (2017) on 5th grade students mathematical problem-solving achievement is improved by using training of metacognitive strategy. The results of both studies showed that students became more aware of their metacognition after training.

It may be concluded that this study helps to address the feasibility of reflective journals in classroom settings. Although, this study concluded the positive impact of reflective journals on metacognitive awareness still more metacognition studies are needed.

Limitations of the Study

One limitation of this was that only female prospective teachers of one institution were included in this study so results can be generalized only on the age group of 18-20 years and on the female prospective teachers of the University of Education only. In this study both in baseline and treatment phase core courses were selected to teach so results may not be generalized on domain-specific courses or specialized courses. Another limitation of the study was observed in terms of internal validity threat of "history" as the same instructor taught one section (control group) and because of her teaching style control group performed better in monitoring skills. This threat was controlled during the semester and at the end of the 1st phase, when no treatment was given, metacognitive awareness was almost equal. There is one more deficiency that reflective journals used in this study were lengthy and are mostly open-ended questions and students spent much time filling it and it affects their interest as well.

Suggestions and Future Implications

This research confirmed that metacognition can be elevated by practicing through reflective journals but further confirmation through repeated intervention is essential. This can be done by using true experimental designs and longitudinal studies. It is strongly recommended that for more in-depth analysis qualitative or mixed-method researches should be conducted.

It is suggested that training sessions and seminars should be organized that sheds the light on the importance of metacognition in the Pakistani scenario. This study suggests that more action plans may be developed for classroom settings keeping view the curriculum of the program that may support prospective teachers to become a reflective teacher. It is also strongly suggested that reflective journals use may be improved and focused when it is more amalgamated into the course and not just a "one-shot" application. Future interventions should be more reflective and focused, repeated intervention may be necessary, a combination of metacognitive teaching strategies may be investigated and additional methods of evaluating students' metacognitive awareness other than self-report inventory should be considered.

As the reflective journals used in this study were lengthy so it is suggested that sheets may be developed by using restricted response questions and in form of prompt rather than full-length sheets to maintain the interest of prospective teachers.

It is also suggested that reflective journals may be used in our day to day teaching so that prospective teachers may better understand themselves and may regulate their learning. It is strongly suggested that more researches are required to check the effectiveness and pros and cons of reflective journals. Moreover, it is also suggested that reflective journals blended with other teaching techniques might affect not only level but also their learning, academic self-concept, higher-order thinking, and confidence.

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