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Use of Portfolios for Assessing Practice Teaching of Prospective Science Teachers

Presented by

Saiqa Azam,
IER, University of the Punjab, Lahore, Pakistan

Dr. Hafiz M.Iqbal,
IER, University of the Punjab, Lahore, Pakistan

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Use of Portfolios for Assessing Practice Teaching of Prospective Science Teachers

*Saiqa Azam,[1]
IER, University of the Punjab, Lahore, Pakistan
** Dr. Hafiz M.Iqbal,
IER, University of the Punjab, Lahore, Pakistan

Abstract

The present study is a preliminary effort to see the impacts of introducing portfolios as a part of formal evaluation of the teaching practice at Institute of Education and Research (IER), University of the Punjab, Pakistan. The component of teaching practice in IER, is evaluated and the only tool of assessment used for this evaluation is classroom observations. The use of portfolio was introduced during teaching practice of Master of Science Education program an effort was made through collecting quantitative and qualitative data to see the impact of portfolio development on student teachers learning about teaching. The study showed that portfolio assessment can minimize the disturbance caused due to observation of students teaching, moreover developing portfolios during teaching practice is enhanced student teachers' interest in teaching practice and they could value this important component of teacher preparation more. This was also an opportunity for them to reflect on their students teaching.

INTRODUCTION

The idea of developing portfolio (e.g. collection of ones best work to demonstrate targeted or specific knowledge and skills) was introduced first by artists and architects to display their professional work because they can not prove their knowledge of the profession only by articulating it. The main purpose for developing such portfolios was job seeking which is true for many other professions even for today and in teacher education Webster (1992) showed that teaching portfolio can help job seekers to exhibit their professional skills to the prospective employer.

The wide literature on use of portfolios shows great potential of portfolio to be used as an assessment tool and a learning tool. Portfolio as a form of assessment has proven to be useful for assessing student's learning in different disciplines (e.g. Knight, 1992; Johns & Van Leirsburg, 1993; Kathy, G. & Laura, S, 1999 etc) and at different levels (Hall, B.W. & Gervais, C.M., 2000). Many practical problems related to the use of portfolio as an assessment tool has not only been identified but addressed and overcome through familiarity and increased used of portfolios for assessment (Johns & Van Leirsburg, 1992). Use of portfolio as an assessment tool also discuss its benefits for teachers to better understand their teaching practices and as a result they can better facilitate their students learning (Knight, 1992). This evidence also leads towards potential of using portfolio to document process of learning. Portfolios make process of learning visible through unfolding documentation of profiling (Wolf, 1991). So developing teaching portfolio help better understand the pedagogies of teachers or student teachers (Loughran & Corrigan, 1995) and allow making statement about the learning of student teachers or students teachers more authentically as compared to other

1* Lecturer, Institute of Education & Research (IER)
** Director, Institute of Education & Research (IER)

performance assessment tools. Tuckman and Bruce (1995) also recommended portfolio assessment for more effective evaluations of teacher's performance because they think that traditional performance-based evaluation methods have limitations. Wolf (1989) suggested that 'portfolio assessment' involving the ongoing evaluation of a cumulative collection of creative works, is the best approach for assessment of teaching. Though there is still a need for extensive research to substantiate efficacy of portfolio assessment but portfolios has been widely accepted as an authentic assessment tool which provides access to the learning of students, teachers or students teachers (Loughran & Corrigan, 1995).

The process of considerate selection of sample of work to demonstrate learning through developing portfolio allows reflection and self evaluation on part of learner (Tierney, 1992). So teachers' portfolios may play a major role in the overall evaluation of teachers (Doolittle, 1994). Portfolios are dynamic ongoing assessment and learning tools that aids in stimulating thinking and promoting students' independence.

Loughran and Corrigan (1995) describe two main aspects of use of portfolios: 'portfolio as a process' and 'portfolio as a product' and these two aspects of portfolio are entwined. The significance of portfolio process makes it distinguished from other forms of performance assessment. That's why use of portfolio is most popular in pre-service teacher education program as they can help student teachers to track their progress and professional development. Moreover use of portfolios during a pre service teacher education program increases reflection and provide an ongoing record of a teacher's growth (Doolittle, 1994). Hopfer and Laura (1999) consider that exposure and process of portfolio development encourages student teachers to reflect on their knowledge, skills, and classroom practices while they evaluate their own abilities. Besides this teaching portfolios are valuable for self-evaluation because they give the teacher a structure for documenting and reflecting on practice (Bullard & Beverly, 1998).

In the present milieu the science teacher education program in Institute of Education and Research (IER), University of the Punjab, Lahore is one of the popular teacher education programs to prepare science teachers to meat the demand and supply of quality science teachers in the country. This program follows the traditional teacher education model which consists of the three main components: subject matter preparation, general education study and the professional education and is claimed to be the structure for educating science teachers since the early twentieth century (Anderson & Mitchener, 1994). The professional education is considered as the most important aspect of teacher preparation and is generally known as teaching practice, practice teaching or teaching rounds etc. Unlike many other teacher education programs around the globe teaching practice is assessed in IER and the only method for assessing student teachers performance during teaching practice is classroom observation. During teaching and working with prospective science teachers in IER, we observed two dilemmas connected with the teaching practice: first is the lack of student teachers' interest and motivation during teaching practice, and second is the assessment techniques and practices. Our informal observations and discussions with student teachers revealed that the impact of the teaching practice is not very positive on the attitudes of student teachers and instead of providing them enough practice for implementation of theory it creates disequilibration between theory and practice of teaching and instead of motivating them for learning to teach and develop professional skills among them this teaching practice promotes the concept of teaching as a common sense task.

To address the above mentioned issues the portfolios were introduced during teaching practice in science teacher education program (M.S.Ed) as an assessment tool to assess student teaching along with the conventional method of observation. The purpose of introducing portfolios (inclusive reflective journal) was to see the affects of these assessment tools on student teachers' interest and motivation for teaching practice which otherwise seems absent. The present study is an effort to explore the impact of using portfolio on students teachers attitudes towards teaching practice and to see if this authentic assessment tool can help to develop interest in teaching practice and help them lean to teach.

METHODOLOGY:

All the prospective science teachers (20 in total) in a two years teacher education program (M.S.Ed.) session (2003-2004), doing teaching practice participated in the study. The student teachers were given brief introduction about portfolio and portfolio assessment and were assigned to develop their teaching portfolios during their teaching practice. The components of the portfolio were decided between students teachers and the supervisor teacher (university lecture), and student teachers were also allowed to add anything else which they believe can illustrate their development as professional science teachers. To collect information from

participants about using portfolio during teaching practice a mix approach (quantitative and qualitative) was used. Data was collected through questionnaires (Annexure 1 & 2), document analysis and follow - up interviews.

1. Questionnaire Data

The analysis of student teachers responses on questionnaire about experiences of developing portfolio Q-1) shows their views about developing portfolio during teaching practice and its uses.

1.1Portfolios and Professional Growth

Student teachers believed that developing portfolio for assessing student teaching was an effective way to document their professional growth and they believed that their portfolio kept record of their learning and professional growth during teaching practice. Moreover they thought that constructing portfolio helped them to track their progress during teaching practice (Statement number 1, 2 and 5 (Annexure 1) with means 4.66 and 4.66 and 4.55 respectively on a 5 point scale)

1.2 Portfolio: Effective assessment

Student teachers found portfolio as an effective way of assessment during teaching practice which is evident from statement 12 (annexure 1) with mean of 4.77 on 5 point scale. Moreover the student teachers found developing portfolio as a tool for self assessment evident from statement 4 (annexure 1) with a mean score of 4.61 on a 5-point scale.

1.3 Advantages of developing portfolios during T.P.

Students teachers responses on statement 6, 18, 10, 11, 13, 14 and 8 with mean score 4.33, 4.38, 4.11, 4.83, 4.55, 4.55 and 4.66 respectively (annexure 1) illustrate that developing portfolios during teaching practice ensure enhanced involvement of students teacher in teaching practice, increased interest in teaching practice activity, creativity, growth of confidence for teaching in future, healthy competition among student teachers to develop inimitable portfolios and better interaction with supervising and advising teachers during teaching practice.

Moreover student teachers' responses shows that developing portfolio helped them to apply pedagogical theories in real classroom which is evident from statements 3 with mean score of 4.66 on a 5 point scale (annexure 1). Developing portfolios also helped students teachers to improve the teaching learning process in their classrooms (statement 7, with mean score 4.44 on 5 point scale)

1.4 Portfolio & Future of Teachers

Table 1, statements 9, 16 and 17 with mean score 3.61, 4.16 and 4.22 respectively show that student teachers see portfolio not an end product activity but they think it as a process to continued as a tool for the professional development as a science teacher.

1.5 Suggestion to improve

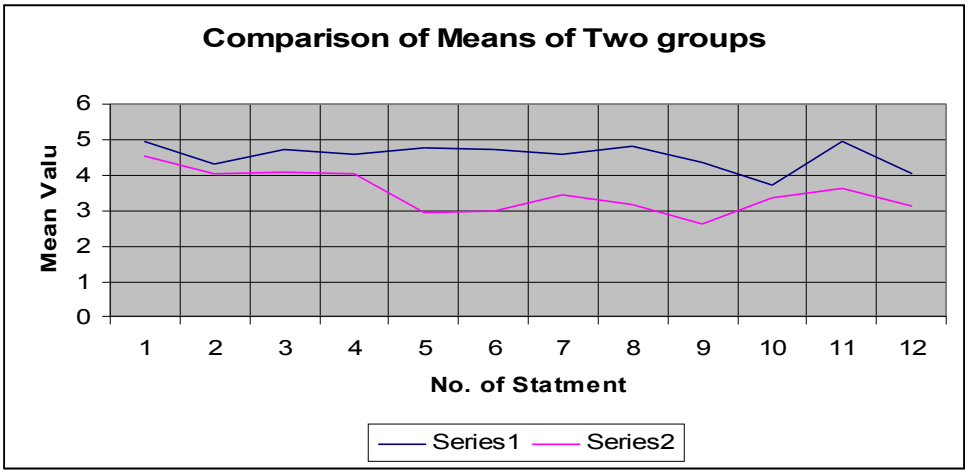
Student teachers agree that time and encouragement form university and school of placement is needed to make portfolio assessment more effective (annexure 1: Statement 15 (mean score 4.11 on 5 point scale).

1.6 Views about teaching practice

Questionnaire about students teachers' views on teaching practice (Q- 2), consisted of statements about different aspects of teaching practice, was administered to a group of students who developed portfolios during teaching practice (Group A) and to another group of students who did not use portfolios during teaching practice (Group B). The mean score of student teachers' responses on 5-point scale were calculated and compared. Figure 1 shows this difference of mean scores. Series 1 (Blue line) is mean scores of group A where Series 2 (Pink line) is mean score of group B, The group 'A' has a greater value of mean for all statements which provide some evidence of overall interest and increased value of teaching practice held by students teachers who developed Portfolios during T.P.

Figure 1

Comparison of mean scores of Group A and group B



A little vivid look at Figure 1 shows that the difference of mean score is greater in case of statements addressing specific issues (annexure 2: Statement 5, 6, 8, 9, 10) and less for statements addressing general issues (annexure 2: statements 1,2, 3, 4, 7).

2. Students' reflections about teaching practice

We were interested to know the level of interest, motivation and involvement in learning to teach of students' teachers while developing portfolios during their practice teaching, so the student teachers' reflections on their experiences of practice teaching (one entry of their portfolio) were analyzed. These reflections provided some insight into views and feelings of prospective teachers about practice teaching.

2.1 Teaching practice as interesting and exciting experience

The student teachers found practice teaching as an interesting and enjoyable activity and developing portfolio enhanced this interest and involvement even being challenging for few. Following are few examples showing students teachers views and feeling about teaching practice while developing their portfolios.

> *In my view teaching practice was really interesting and enjoyable experience…I really enjoyed constructing my portfolio for assessment…I was more involved and thinking critically to find samples of my good teaching to put in my portfolio. I was less tense about observations of my teaching because my portfolio was there to prove how I taught. I enjoyed my teaching practice very much.* (ST-1)

> *…teaching practice was an excellent and interesting experience…and collecting work for my portfolio made it a challenge for me…but it was really creative and putting my teaching into life.*(ST-3)

> *On the whole it was really an amazing and interesting experience. I learned so many things while thinking to construct a portfolio which portray my real potential of teaching.* (ST-7)

2.2 Importance of teaching practice

Student teachers showed realized the importance of practice teaching for learning to teach and some of them recommended making it long because they think it an imperative for learning to teach in a pre-service teacher education program because it provides opportunities to translate theory into practice and develop confidence of teaching. Following views show their feelings about teaching practice teaching;

> *It should be long duration. At least, one or two semesters...because I think this is best place where you can learn how to teach and can apply all theoretical knowledge.* (ST-5)

The duration of our teaching practice is too short…when you thinking you are learning really practical things it ends…..it should continue for long along with reflections and collection of work to prove what we have learned about teaching. (ST-3)

Teaching practice gave me confidence of teaching in a real classroom…I have been reflecting and thinking on my teaching so much [developing portfolios and writing reflection to put into it] so I feel I can go and start teaching in a school. (ST-3)

2.3 Role of supervising and advising teachers

Student teachers showed satisfaction with the role of the supervising and advising teachers. They think developing portfolios helped in working close contact with the supervisor and advisor and this was an opportunity to learn a great deal from their experiences. For example;

My supervisor teacher really helped me to become an affective teacher….she helped me to become an organize myself and organize my classes….she created a sense of competition and proving myself as teacher by developing portfolios. (ST-7)

Working with my supervisor I had a great opportunity to learn better methods of teaching and discuss the problem with supervisor and advisor and to teach in an effective way. (ST-5)

My supervisor and advisors provided maximum opportunity to learn to teach in the classes along with maximum control and liberty to apply theory into practice…I had long discussions with them to create excellent samples of my teaching for my portfolio. (ST-4)

2.4 Portfolio assessment

Student teachers articulated their fear of being observed and loosing marks and they found portfolio as an affective way to assess students teacher's teaching because they think they find opportunity to demonstrate their learning about teaching in the form of portfolio. They also expressed their feelings of relief about portfolio assessment and were confident to get acknowledgement for their hard work during practice teaching. They demanded more individualized guidance for student teachers and suggested assigning a small group of students for one supervisor so that they can have more time to guide and observe classroom teaching by student teachers.

The single thought that some one sitting in my classroom observing my teaching and assessing it, make me forget to teach…and I can not make them convinced I can teach even better…. but I am sure when they will have a look at my portfolio they will get to know I am a hard working teaching trying so much in my classroom. (S-4)

The feel of having portfolio as evidence of my teaching during teaching practice is such a light feeling….I will not loose marks…I think wish no observation for assessment . (S-7)

I think observations for assessment are harm for learning to teach….. I do not know why did not think it [portfolio] before…it involves a lot of time and hard work but at the end I have some thing in hand to argue about my teaching….I think if a supervisor has small group of students to guide we can develop the best in our portfolios discussing and sharing with them. (S-2)

3. Interview data

The semi-structured interview data revealed how student teachers experienced the process of developing portfolios for assessment and what were the impacts on their views about teaching practice and portfolio assessment during teaching practice.

3.1 Importance of Teaching Practice

The participants' arguments while explaining the importance of teaching practice revealed there good understanding about need of teaching practice during a teacher education course.

> The participants apprehended teaching practice because they think it is obligatory for a teacher education program because *it [M.S.Ed.] is a professional qualification*. (ST-1)

Another reason to find teaching Patrice essential for an education degree was an opportunity to apply theoretical knowledge about teaching in real classroom. For example

> *Teaching Patrice is practical implementation of all those pedagogical techniques and theory we learn during course work*. (ST-5)

> *T.P. provides an opportunity to student teachers to face real situation and to see difference in theory & practice*. (ST-7).

Prospective science teachers found teaching practices as an opportunity to learn about teaching and to develop their teaching skills. They think teaching practice is important because they could reflect on their own practice and learn from own mistakes in the classroom.

> *It [teaching practice] identifies the problems faced by student teachers during teaching, so we can eliminate them [in future]*. (ST-3)

> *Without teaching practice how we can develop teaching skills in a person [prospective teacher]*. (ST-2)

Some of them found teaching practice important because they think it provides start for a continuous professional development.

> *You can not only analyze your teaching but can guess how you can become more effective teacher in future*. (ST-1)

> *It helps in profession growth in trainee teachers*. (ST-4)

3.2 Students teachers' expectations form T.P.

Keeping in view the traditional and passive type of practices in IER regarding T.P. most of the participants had formulated their expectations according to the usual practices of T.P. in the institute and were expecting the same. But they found their T.P. different in terms of hard work involved, reflections on their own teaching, being interactive and construction of portfolios. For example

Many students teachers said that their T.P. was different from traditional practice of IER because;

> *We were assessed by developing portfolio, which was a novel idea* (ST-2)

> *It was unique* (ST-1)

> *In contrast to other students of IER we really… in a true sense… learnt through our teaching practice* (ST-7)

We learnt because of portfolios to reflect on our teaching (ST-5)

I was expecting teaching practice as 'HAWWA' (local expression: something horrible)…but it was an enjoyable as well as to some extent a hectic (hardworking) experience. (ST-3)

It was quite different form what we heard about it, because we wrote our reflective journal and developed portfolios. (ST-4)

Few enthusiastic student teachers having high expectation form their education and themselves found their T.P. meeting their expectation and challenging. In their words;

I found T.P. wonderful it was just according to my expectations…It was hardworking & professional. I liked it. (ST-2)

I think it was according to my expectations…it was exactly what I was thinking it should be…lesson plans, hard work, discussions and developing teaching skills…it was great. (ST-7)

3.3 Traditional way of assessing teaching practice in IER and feeling about 'to be observed'

Based on their observation and communication with other students in IER the participants confirmed that the observation is a long established assessment method for assessing student teaching in IER. They also called it traditional and less communicative and did not find it reliable for grading. For example

Usually in IER it is assessed by observations only, one teacher is there to assess 20-30 students teachers, so there is time limitation and one teacher could also be biased. He or she may consider his or her perceptions about students in assessment than their actual performance. (ST-5)

Traditional way of assessing teaching practice in IER is only observations… less communication with student teachers… and no reflections on teaching are demanded… and even they do not know what portfolios are. (ST-2)

Prospective science teachers expressed their feelings of un-comfort while being observed for assessment during teaching practice, they reported feeling nervousness, anxiety, loosing confidence and becoming more conscious about the supervisors' thoughts about them instead of concentrating on their teaching. Following are the sample views from prospective science teachers about their feeling of being observed while teaching during T.P.

In the beginning I became nervous…and felt anxiety…I wrote my feelings in my reflections and it was so hard to overcome my anxiety. (ST-3)

It [being observed] was really very confusing and frightening situation and I was very conscious because it is natural feeling that if you know that some one is going to observe you, you will become conscious. (ST-1)

I felt confused…I was less confident…I [was] more focused on what my teacher is thinking about me than how to teach. (ST-4)

I felt like losing confidence and hence could not better communicate. (ST-5)

Moreover the prospective science teachers criticized assessing student teachers through observation only because they think that one supervisor has to observe 20 - 30 students daily which is impossible so they believe that grades based on these observations can not be reliable. They also think that purpose of T.P. is to

help trainee teachers to learn how to teach and not only to assess and according to them observations hinder this process baldy. For example,

> *No I do not think Teaching Practice should be assessed through observation only because observer may be biased or he or she may be unable to observe all situations at that time…so feelings and reflections of student teachers are more important than observations*. (ST-7)

> *No, because through observations the supervisor can not observe all the situations and it is not reliable method because favoritism is always there…and you have no proof that someone has really done his or her work and what he or she has learnt about teaching during T.P.* (ST-1)

> *No, it [observations] does not give real picture. The purpose is not grading – it is and it should be for guiding novice or trainee teachers*. (ST-3)

> *No I think only observations are not enough & the marks and grades are not reliable*. (ST-4)

3.4 Views about portfolio assessment

The prospective science teachers strongly recommended portfolio as assessment tool for teaching practice based on their personal experiences of developing portfolios during T.P. In their words

> *YES, because it contains summary of our work*. (ST-3)

> *YES, portfolio can be used for assessing student teaching* effectively. (ST-1)

> *YES, of course portfolios are very helpful; to assess because it is a type of self check also.* (ST-2)

> *YES, because even if teacher is not present in class he or she can see student teachers reflections in portfolios about the class experiences*. (ST-5)

> *YES, portfolio is very helpful and effective for assessment of T.P. because it provides real feedback.* (ST-7)

3.5 Advantages of developing portfolios other than assessment

Overall student teachers found process of developing portfolio very productive. Prospective science teachers identified many advantages of using portfolios during teaching practice other than assessment. These included: enhance creativity, reflective practice, continuous professional growth and increased interest in teaching practice. This may be perceived safely that student teachers found process of developing portfolios facilitating their learning about teaching during teaching practice. While appreciating the experience of developing portfolio prospective science teachers said that;

> *I think it was awesome…It made us more creative, more conscious about our teaching and more professional*. (ST-1)

> *It enhanced my creativity and aesthetic sense*. (St-2)

Some of them found process of developing portfolio helping in learning to teach and developing them as reflective teachers.

It was quite good and beneficial because we kept record of everything form T.P. into it…and when we will read through it after some time we will learn what was the situation [in classroom] at that time and how it was changed and what could be the better way to co-op with this kind of situation [in future practice as teacher]. (ST-5)

It helped us to reflect [on teaching] …. it gave us opportunity for more creativity…we collected samples of our work. When we will read it [portfolio] again [in future] we will learn more. (ST-4)

Developing portfolio during T.P. was excellent & unique feature of our program. It was utilized very purposefully for assessment….it enhanced our creativity & aesthetic sense… ..we learned how we can organize our work….how can we present it…..because presenting our work is also a important as doing it…I showed it to during job interview [and succeeded]. (ST-7)

Few student teachers found enhanced creativity and continuous professional growth because of developing portfolio during T.P. For example,

It developed creativity…it makes T.P. memorable…observations, experiences mentioned in the portfolio can be used in future teaching to coop similar situations in same or different way. (ST-3)

We record our experiences of teaching [in a portfolio] and It is a self assessment tool also… one knows his or her weakness and can minimize those next day or in future. (ST-2)

It helped developing and clarifying my teaching philosophy. (ST-7)

All the participant prospective science teachers reported increased interest in teaching practice because of developing portfolio in their own words, for example,

Portfolio developed interest in T.P. because we had to think about collecting our work and doing our best to cerate it, then write our reflections on our teaching which developed interest in teaching. (ST-4)

Because we collected relevant sample of our work…we did not feel any boredom…it and used first time by us in our institution. (ST-5)

Ultimately we became more professional and more interested in our teaching practice. (ST-3)

It developed interest for teaching because we had to write our daily lessons plans and daily classroom experiences in it. It was a type of check on us even in the absence of our supervisor. (ST-2)

3.7 Problems faced during developing portfolios

Two out of seven participants did not report any problem during developing their portfolio but others found some problems which mainly was more time consumption which was a challenge for most of them one also found it challenging to select item for portfolio.

During T.P. work load on pupil teacher's increases, so due to shortage of time some problems were faced. (ST-2)

It is time consuming. (ST-3)

Selecting best piece of work was challenging. (ST-4)

In the beginning it was difficult to mange so many things but then I could overcome these problems. (ST-1)

I felt some difficulty in the start but after understanding the basic requirements clearly I really enjoyed a lot to make my portfolio most beautiful and unique.(ST-7)

3.8 Suggestions to improve use of portfolios

Because of first time use of portfolio the prospective science teachers could not suggest many useful ways to improve the use of portfolio but within their limited range of experience they suggested that;

Students should be provided practice in developing portfolios before T.P. [orientations]. (ST-1)

Co-ordination and collaboration between university and schools is needed. (ST-3, ST-7)

It was difficult to discuss many things which come into mind when constructing portfolios and writing reflections but so many students ….if number of students is less we can discuss and develop a better portfolio. (ST-5)

CONCLUSION AND RECOMMENDATIONS

The analysis of data shows benefits entrenched in using portfolio assessment during teaching practice in a science teacher education program (M.S.Ed.) in Pakistan. Portfolios were used as an assessment tool because the teachings practice was graded in the particular program but the purpose behind introducing portfolios was to explore the impact of this tool on student teachers' learning about teaching during teaching practice. The study supports the dual role played by a portfolio: tool for assessment and too for learning. The analysis of data shows that portfolios have a substantive potential for facilitating learning about teaching during teaching practice. The study also divulges that the students teachers countenance a whole range of experiences which may lead towards developing interest and motivation to actively participate in practice teaching even in a traditional type of practice teaching mode, appreciating the importance and need of practice teaching during their teacher preparation program, developing enhanced interest in practice teaching, increasing opportunity to reflect on their own learning about teaching, gaining increased confidence for taking up future responsibly as a science teacher and appreciation for portfolio as a tool to show their worth as a professional science teacher to their future employers.

Moreover introducing portfolios as an assessment tool during teaching practice in the science education program (M.S.Ed.) provided an alternative way of assessing prospective science teachers during teaching practice which can overcome the fear of being observed during teaching which is considered as an encumbrance for teacher performance during practice teaching. So, the study may conclude that, if grading is really desired for teaching practice in a pre-service teacher education program, portfolios can safely be used for assessing student teachers' performance during teaching practice, in replacement of traditional classroom observations and other performance assessment methods. But due to its potential for enhancement of learning, portfolios can play an important role as a pedagogical tool also to augment prospective teachers learning about teaching and lead towards more in-depth learning on part of student teachers during their practice teaching.

The main problems identified for using portfolios during teaching practice were lack of orientation and time management. That is why before inducting portfolios in a teacher education program there is need to ensure sufficient orientation and a realistic work load for student teachers during practice teaching because they

already have plenty of tasks to do for their classroom teaching.

The study substantiate the dominant role a portfolio can play is 'process' instead of being mere a 'product' as differentiated by Loughran and Corrigan (1995). The study confirms that portfolio is a learning tool or an innovative pedagogical tool for enhancement of students teachers' learning about teaching (Loughran & Corrigan, (1995) particularly in a setting of practice teaching.

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