

Analysis of Quality Education in Franchised Schools at Early Childhood Education Level in Lahore (Punjab)

Asma Alvi¹, Muhammad Asif² & Norman Reid³

Abstract

The Jomtien Conference on *Education for All* in Thailand (1990) identified many important educational areas needing addressed: language, numeracy, problem solving, basic knowledge, skills, values and attitudes. Early years education can be seen as laying the foundation for later development. The objectives of the research are to explore how Pre-primary teachers understood the nature of quality in early years education and how they saw their own teaching and the external constraints placed on them in relation to quality. 60 head teachers and 180 pre-primary teachers completed questionnaires (franchised schools) in Lahore at Early Childhood Education level. The questionnaires employed multiple formats: semantic differential, situational set format and open questions. Principal components analysis was applied to the questions but only with the semantic differential items was a factor structure observed. This suggested that there were three key aspects to quality as seen by both teachers and head teachers: the place of play and enjoyment unrestricted by imposed curriculum demands; the freedom to develop rich learning experiences without always thinking of the needs of the next stage (primary education); the need to take responsibility and to set their own standards to ensure quality. Statistically significant differences were observed between the response patterns of teachers and head teacher but much related to the greater experience of head teachers.

Key Words: Early Childhood Education, Pre-primary teachers, quality education, factors encouraging quality.

¹ Ph.D scholar (Education), University of Lahore, Lahore; email: asmaalvi6@gmail.com

² Muhammad Asif, Head of Department (Education), University of Lahore, Lahore

³ Norman Reid, Emeritus Professor of Science Education, University of Glasgow, Scotland

Introduction

Education can be seen as a way to equip the future young people to make a contribution to their society as well as releasing their potential abilities fully. The central role of teachers in this is well established (Saeed & Mahmood, 2002) but teachers are only able to achieve what they are allowed to achieve. Thus, what teachers can do is determined to a large extent by the prescriptions of the curriculum and the resources made available to them. In the history of education throughout the world, primary education (ages around 5 to 12) has tended to be developed first, with secondary and higher education developing much later. However, in recent decades, there has been a rapid growth in early years education. Some has focused on one or two years, seen as a preparation for primary education while there has also been a growth in early childhood education, giving a programme for toddlers right up to about age 5 or 6.

The benefits for children from Early Childhood Education and Care are well established (Heckman, 2006). Thus, the World Bank (undated) is also investing heavily in Early Childhood Development along with aspects of nutrition, intellectual, societal, emotional development of child, educating parental programmes. They have also supported the professional development of teachers in numerous programmes related to early years education (Sayre et al., 2015).

According to PESRP (2017), Private School Census Data shows the development of early years education (Pre-Nursery, Nursery and Prep) being offered through 54,000 private schools in the Punjab (Pakistan). The government of the Punjab has set quality criteria for ECE classroom, teaching and learning standards. The quality education standards are classified as: classroom environment, teacher qualification, parental and community engagement, health, nutrition and transition to primary school (Punjab Early Childhood Education Policy, 2017)

Early childhood education is the formal and informal learning for 3-5 year old children in a loving and caring environment (Syed et. al. 2011). Early childhood educational programmes are run under government or private provision, free or paid. The child centred curriculum is offered with association of family and community (OECD, 2015). The curriculum supports educational foundations such as Key Learning Areas (Whitton et al., 2004) and development of more multidimensional abilities such as intellectual, behavioral, social, physical development of the children (Elliot, 2006).

One of the big issues for all early childhood education is that much is based on a fun-based and activity-based approach while primary education is more book-based. There needs to be a transition from one to the other. In a country like Scotland where early childhood education has been established for a long time, fun and activity are seen as central to learning and the transition to more formal education now poses few problems. Indeed, there is much fun and activity in primary school classes and this in no way undermines the need for more formal teaching and learning.

Education always involves the interaction, directly or indirectly, between learners and their teachers. The quality of that interaction is an important basis for quality learning (Hua et. al., 2017). However, the nature of the interactions is strongly influenced by the curriculum (which is determined mainly outside schools) and the resources made available to schools. Given the right framework and support, teachers are in a powerful position to enable children to develop and move forward in exciting and positive ways (McMonagle, 2012).

Review of Literature

Language plays a vital role in learning and understanding. This stems back to the seminal work of Vygotsky (1978) who studied early childhood cognitive development. It is through language that teachers transmit their knowledge and cultural values to their children through cultural interactions. However, language also provides the mental tools to make cognitive development possible (Vygotsky, 1962). Learning involves interactions between people. It can involve the interactions between learners and their adult mentors including teachers, parents and other significant adults. However, the interactions can also be across peer groups. Thus, understandings develop by means of interactions between the child and his/her environment [the focus of the work of Piaget (Wadsworth, 2004)] and interactions between the child and others, sometimes described as collaborative learning (Barkley et al., 2014).

In the class-room, collaborative learning may enhance the participation of learners. However, there is no evidence that the actual activity of collaboration will generate better understandings in learners. The key lies in mental activity. Overt collaboration may enhance this or may undermine this. It is possible for the child to be very actively involved but learn very little. Thus, Hattie (2009), in his meta study looking at some 800 studies, showed the central importance of the teacher. In simple terms, when considering knowledge acquisition and understanding, there is no evidence that any form of student-centred learning will bring benefits. Learners need some guidance.

The key lies in mental activity, not overt activity like collaborative learning. Long ago, Ausubel (1968) showed that the extent of teacher centred-ness (or learner centred-ness) was unrelated to the extent of understanding gained by the students. Later, Sweller et al (1998) showed that the extent of supposed learner-centred-ness was not only an irrelevance but the limitations of working memory capacity are almost certainly going to make learner-centred learning LESS effect in developing understanding. Increased understanding arises when learners *mentally* interact with each other, with teachers, with learning materials or whatever. Collaborative learning may or may not enhance this.

Nonetheless, there are some significant aspects to collaborative learning. Firstly, it requires extensive teacher preparation in advance. Secondly, the role of the teacher changes and moves to be closer to a facilitator of learning rather than the source of

information. Some argue that this leads to greater achievements (Woolf, 2010) or there is quality pedagogy with student engagement (Goldspink, et al., 2008). However, numerous major studies have shown that the overall evidence does not support such a simple analysis. Thus, Hattie and Yates (2013, p. 78) note that, '*The lack of direct guidance has greater damaging effects on learning in low ability students ...*'.

With older learners, collaborative learning is certainly enjoyed by learners. However, studies show that the benefits come in the development of skills and attitudes (Johnstone and Reid 1981; Clarkeburn *et al.* 2000). Van Merriënboer and Kirschner (2013) have brought together the key research findings and this demonstrates that, for understanding, teacher help is needed. Willis *et al.* (2015, p. 37) wisely note that the advanced preparation for collaborative learning can be very costly in terms of money, time and resources. They note, '*... it is mythical to think that learning-centred approaches can be successfully developed and implemented unless educators are given dedicated time/space, coaching and support from their institutions for thinking/conversation about tools/methods to assist personal transformation and ultimately a more effective learning-centred curriculum*'.

One problem is that the idea of quality in education has competing definitions (Siraj-Blatchford, 2010). Groundwater-Smith *et al.* (2007) argue that the child must be placed at the centre of discussions about quality. The difficulty is in establishing what the child needs, especially in early childhood education. Too often, government agencies provide curricula and syllabuses that teachers must follow (Ho, 2010) but the basis for these directions is not clear. Is the goal to release all the latent potential in each child where the needs and abilities of children will be very diverse? However, is the goal to ensure that every child covers the syllabus content to a satisfactory level? In the context of childhood education, specified curriculum and syllabuses make teachers focus on the pedagogy of ensuring that the children achieve the pre-set objectives and outcomes. Another aspect relates to the relationships between the family, the community, and the school being significant in enabling each child to flourish and develop. Often the imposed curriculum does not really encourage such relationships (Ashton *et al.*, 2008). In the context of early childhood education, many of these findings have great importance. It raises the question about the extent to which externally-decided curricula and syllabuses should be established. With very young children, play and enjoyment are critical. To what extent should play be seen as a central feature of early childhood education? To what extent is the learning to be individual, group-orientated, or teacher directed? The teacher needs to set up learning experiences: to what extent do these experiences involve collaborative learning? To what extent is teacher input important?

Research Methodology

Research Design

The research was intended to explore how Pre-primary teachers understood quality and the ways by which quality might be attained. The teachers were drawn from the private sector, Lahore. A descriptive survey approach was adopted and the data analysed both quantitatively and qualitatively. The respondents were selected on the base of availability and cooperation for research.

Population and Sampling

The goal of the study is to explore how quality with early years education is perceived by pre-primary teachers in the Lahore area, focusing on (name the sectors explored). Purposive sampling technique was used. Three franchised schools were selected. 60 head teachers and 180 pre-primary teachers were involved for conduct of the survey. The study aimed to look at the actual teaching as well as the provision of resources and support. The longer term goal is to identify the strengths and weakness in the current provision. The sample selected involved:

- (1) 20 head teachers and 60 teachers from 20 campuses of The Smart School, Lahore.
- (2) 20 head teachers and 60 teachers from 20 campuses of Dar-e-Arqam, Lahore.
- (3) 20 head teachers and 60 teachers from 20 campuses of EFA School System, Lahore.

Tool of Research

The data were gathered by questionnaires designed for the purpose. A self-developed questionnaire was used for both head teachers and pre-primary teachers. The questionnaires involved several item formats:

- a) Questions following the semantic differential format (Osgood, 1969a,b; Osgood and Suci, 1969; Osgood et al., 1957).
- b) Questions following the Likert (1932) format.
- c) Questions following the situational set format (Reid, 2006, 2012).
- d) Open-Ended questions.

Procedure of the study

Development of Tool

The data obtained from questionnaires and surveys are ordinal in nature. These can only be analyzed legitimately using non-parametric statistics (Reid, 2006). Thus, each item was considered on its own and non-parametric statistics employed where appropriate.

Validity

The validity of the survey was checked by applying the questionnaires to a small sample in advance and discussing the outcomes with the respondents. In addition, the design of the items allowed qualitative cross checks to be made in response patterns.

Reliability

Reid (2003) has established that reliability (in the test: re-test sense) in the use of questionnaire is not an issue provided that samples are reasonable in size and the questionnaires are completed under sensible conditions. Both these criteria were met.

Collection of Data

The researchers collected data was personally within two months.

Analysis of data

The data from the questionnaires were coded and entered into a spreadsheet before transferring to SPSS. This generated summaries of frequencies. Correlation between individual items (using Kendall's tau-b correlation which can handle ordinal data) was carried out and Principal Components Analysis (using varimax rotation) was employed with groups of items using the Semantic Differential and Likert scales. The correlation data showed where response patterns in pairs of items showed any kind of association.

Principal Components Analysis is the most commonly used method of factor analysis. The procedure identifies the number of factors (components) that are needed to explain inter-item correlations. This sometimes can reveal the underlying factor structure (if it exists) underpinning response patterns and can identify key issues. The method only identifies the number of factors and their importance. It does not indicate what the factors are: this needs human judgment from the loadings tables obtained. For the factor analyses here, a criterion of explaining at least 70% of the variance was set and only loadings above 0.6 were considered. This approach can be justified by considering the mathematics behind the procedure.

Using these approaches, it was hoped to identify the key issues as seen by teachers and head teachers in the early years education sector as they considered the development of quality education. It was also hoped to see where teachers and head-teachers held different insights. This paper will focus only on some of the items and questions - chosen as those which offered the greatest insights.

Results

Question 1 looked at quality in early childhood education using the semantic differential format. The same set of items was employed for both teachers and head teachers. Table

1 shows the data obtained. The data are shown as percentages for clarity but the comparisons between the response patterns of the two groups were compared using chi-square as a contingency test (no control group) using a program designed for the purpose and frequencies were employed here. The statistic is asking: is there a statistical difference in the patterns of responses to each item when comparing the two groups with each other?

Table 1: Question 1. Data from Pre-primary Teachers and Head teachers

		<i>Data as %</i>							χ^2	df	p
A	<i>I want the child to enjoy what they are doing</i>	HT	71	8	5	5	3	9	1.4	3	ns.
		T	59	19	12	2	3	5			
B	<i>I see this as a preparation for primary school</i>	HT	15	8	6	18	39	15	28.4	4	p < 0.001
		T	15	17	21	16	15	15			
C	<i>It is vital to complete the set curriculum</i>	HT	18	6	11	18	33	15	76.8	4	p < 0.001
		T	16	25	37	12	6	3			
D	<i>Play is an important part of learning at those age</i>	HT	24	25	29	9	6	8	15.9	3	p < 0.01
		T	39	32	14	5	5	5			
E	<i>I want an atmosphere of tight discipline</i>	HT	5	6	11	44	28	6	12.4	3	p < 0.01
		T	9	10	11	19	33	18			
F	<i>Parents know what way is best in learning</i>	HT	11	20	20	24	16	9	41.6	3	p < 0.001
		T	7	6	9	13	25	40			
G	<i>I need to meet the standards set by others</i>	HT	3	6	13	26	26	26	16.9	3	p < 0.001
		T	16	14	10	11	24	24			

In six of the seven items, teachers and head teachers hold statistically different perspectives. Both groups are very aware of the importance of enjoyment [item (a)]. In item (b) head teachers are less convinced that early years education is a preparation for primary education, perhaps seeing early years education having its own goals. In item (c), understandably, teachers are more concerned to complete the set curriculum and are

more convinced of the value of play at this stage [item (d)]. In relation to the place of discipline [item (e)], teachers hold views that vary widely while head teachers are less concerned for discipline. The role of parents is explored in item (f). Head teachers are much more aware of the value of input from parents. In setting standards [item (g)], head teachers are more confident to set their own standards. The differences are largely to be expected in that head teachers tend to have more experience. This offers tangential evidence of the validity of the data obtained.

A Principal Components Analysis was carried out on the items in question 1 for each of the two groups: teachers and head-teachers. Both analyses gave three factors (74% of variance explained for teachers, 76% for head teachers). The rotated components matrix is shown in table 2 (only loadings above 0.6 are shown).

Table 2: Factor loadings

Item	Components (Factors)					
	Teachers			Head teachers		
	1	2	3	1	2	3
1(a)	0.90			0.66		
1(b)		0.64		0.74		
1(c)	0.74			0.74		
1(d)	0.88			0.81		
1(e)		0.74				
1(f)		0.83			0.80	
1(g)			0.93			0.66

The nature of what the factors are is found by looking at the items which load most highly on to each factor in turn. Interestingly, item 1(b) loads differently for the two groups (showing that they are seeing that item in different ways) while item 1(e) also shows a difference. A loading is the correlation coefficient between what an item is measuring and what the factor is. Loadings above 0.7 are helpful. A tentative identification of the factors is shown in table .3.

Table 3: Loadings for items in question 1

	Factor	Possible interpretation
1	Issues related to what is done in class	Teachers want to emphasise play, enjoyment and not to be restricted by curriculum demands.
2	Issues related to learning	Teachers do not wish to be tied to what primary schools need but wish to educate with freedom.
3	Issues related to standards	Teachers hold variable views on how to set standards although more see it as their personal responsibility.

This suggests that quality in early childhood education is perceived by both groups in terms of not only what happens in the class but also in terms of the extent of freedom allowed to teachers to determine what is best for the children and the way they see their own personal responsibilities. This raises some central issues:

- a) To what extent is early childhood education is to be conceptualized in terms of play or in terms of some kind of external imposed curriculum?
- b) To what extent should teachers in early childhood education be treated as professionals and encouraged to develop the activities that they see develop the children best?
- c) To what extent can standards be imposed from outside or are standards best left to practicing teachers who know the needs of their children best?

These three questions could form the agenda for future major studies and have much wider implications than early childhood education but are issues for every sector in school education.

The items in the Likert format questions did not reveal anything that was unexpected or very insightful. Principal Components Analysis was applied to the questions for both groups and no factor structures were obtained. There were some significant inter-item correlation but they revealed little that was unexpected. However, the questions using the situational set format offered additional insights.

Both groups (question 2) were asked to look at the perceived priority for quality. The actual question is shown.

Imagine you were asked to write down what is the *single* most important priority for your work in early childhood education.

In ONE sentence, what would you say?

My most important priority is.....

The responses were grouped and ten categories were found. However, as might be expected, the frequencies for these ten categories differed slightly when comparing head teachers and teachers.

For teachers: The four most common chosen replies were that they saw quality in terms of: a preparation for primary education, dealing with students with love, care and patience, using the Montessori Method and providing a friendly atmosphere.

For head teachers: Five categories were chosen most frequently: providing a friendly atmosphere. Ethics and character building, discovering and exploring learner abilities, dealing with students with love, care and patience, giving quality education.

Although the fifth category from the head teachers is unhelpful (it merely repeats what the question was asking), the differences between the two groups make some sense. Head teachers are older and more experienced and they see quality on a wider scale. However, what the question does reveal is that there is a very important issue to be considered in training programmes for early childhood education. It is important to identify the key criteria for quality in the context of early childhood education and that such criteria are agreed across all the professionals involved. It would be an interesting exercise to look at how educational managers see the nature of quality.

In the final question, respondents were given another open-ended question in the situational set format.

Imagine you were placed in charge of all early years education in Pakistan

*What **ONE** change would you make to bring about the greatest improvement for your learners?*

My most important priority is.....

Response patterns were again revealing.

For teachers: Implementation of Montessori methods, introducing more activities, enhance learning by doing, focus away from memorisation, update education system and books.

For head teachers: Many emphasised two aspects: conceptual learning and learning based on activity and fun-based learning.

While there are differences in perceptions, there is a common theme emerging here. Both groups wish for what goes on to be much more activity based and much less focused on memorization. They see learning as ‘*doing*’ and activity and fun are central.

Discussion and Conclusions

A questionnaire designed using multiple formats allows probes to be made in relation to some complex theme and a picture to be developed that throws light on the key issues. In analyzing the items one by one, the important detail is clearer, a point stressed long ago by Johnstone (1982). The approach also avoids the incorrect application of statistics, stressed again in many places (Reid, 2006).

The picture emerging from the data shows the teachers and head teachers stressing the importance of enjoyment, play, freedom to learn and develop, with extensive use of activity. The central goal for early childhood education rests in allowing the children to develop in an atmosphere that is secure and enjoyable. This will lay the foundation for further education at primary school stages and beyond.

There is a clear message from the teachers. They want greater professional freedom and what they do to be less controlled by curricula imposed from outside. Perhaps a better way forward would be to have some general curriculum framework, leaving the teachers freedom to develop the activities that they see are best for the children.

When the theme of how quality is seen is considered, some key issues were apparent. This is part of a wider issue. There is simply no agreement in how quality in school education is to be conceptualized. Looking at the issues from a world standpoint, Almadani has discussed this in considerable detail (Almadani 2012; Almadani *et al.* 2011, 2012). For some, quality is to be measured in terms of attainment and this places the role of curriculum control and examinations centre stage. However, all the evidence shows that written tests and examinations can only test a very narrow range of educational outcomes (Stobart 2008, 2014). This has implications for early childhood education. If attainment dominates thinking, then early childhood education as a preparation for primary education starts to become important. If wider skills, including allowing the children to develop their skills over a wide range of areas, are seen as central, then early childhood education teacher must be freed from central curriculum control and encouraged to develop learning situations determined by their own professional judgments as in the best interests of the development of the children.

The outcomes from the study show the importance of security for the children and their development by means of play and enjoyment, with teachers having the freedom to enable every latent skill in the children to develop naturally. However, perhaps the most important challenge from the study relates to how quality in early childhood education is

to be seen (Fenstermacher (2005). If the provision is to move forward, there must be major initiatives to develop a shared understanding, shared between teachers, head teachers, parents and educational managers. Then all groups can work together to set in place the activities to achieve the shared goals.

This leads on to a future research agenda. Studies need to be undertaken to explore how quality is seen in early childhood education and then move on to generate some agreed understanding. Studies are also need to look at what happens in other countries where teachers retreated as professionals and given the needed freedoms. Finland is one such country (Varjo *et al.* 2013).

References

Almadani, K.A. (2012) *Quality Assurance related to secondary education in the Kingdom of Bahrain*. PhD Thesis, Dundee: University of Dundee. Retrieved from <https://discovery.dundee.ac.uk/en/studentTheses/quality-assurance-related-to-secondary-education-in-the-kingdom-o>. Accessed 5 November 2019.

Almadani, K., Reid, N. & Rodrigues, S. (2011). Quality Assurance: a Pressing Problem for education in the 21st century. *Problems of Education in the 21st century*, 32, 9-22.

Almadani, K., Reid, N. & Rodrigues, S. (2012). What examinations test. *Problems of Education in the 21st century*, 1, 6-19.

Ashton, J., Woodrow, C., Johnston, C., Wangmann, J., Singh, L., & James, T. (2008). Partnerships in learning: Linking early childhood services, families and schools for optimal development. *Australian Journal of Early Childhood*, 33(2), 10-16.

Ausubel, D.P. (1968). *Educational psychology a cognitive view*, New York: Holt, Rinehart and Winston.

Barkley, E. F., Cross, K. P., & Major, C. H. (2014). *Collaborative learning techniques: A handbook for college faculty*. John Wiley & Sons.

Clarkeburn, H., Beaumont, E., Downie, R. and Reid, N. (2000). Teaching biology students transferable skills, *Journal of Biological Education*, 34(3), 133-137.

Elliot, A. J. (2006). Approach and avoidance motivation. *Motivation and Emotion*, 30, 111-116

Fenstermacher, G.D. & Richardson, V. (2005). On Making Determinations of Quality in Teaching. *Teachers College Record*, 107(1), 186–213.

Goldspink, C., Winter, P. & Foster, M. (2008). Student Engagement and Quality Pedagogy. *In European Conference on Educational Research in Goteborg*, pp.10-12.

Groundwater-Smith, S., Ewing, R., & Le Cornu, R. (2007). *Teaching challenges and dilemmas, third edition*. Melbourne: Nelson Australia.

Hattie, J. (2009). *Visible Learning: A Synthesis of 800 Meta-Analyses Relating to Achievement*, New York: Routledge.

Hattie, J. and Yates, G.C. (2013). *Visible learning and the science of how we learn*, New York: Routledge.

Heckman, J. J. (2006). Skill Formation and the Economics of Investing in Disadvantaged Children. *Science*, 312(5782),1900-1902 (doi:10.1126/science. 28898).

Ho, D. C. W. (2010). Teacher participation in curriculum and pedagogical decisions: Insights into curriculum leadership. *Educational Management Administration and Leadership*, 38(5), 613-624.

Hua, B. Y., Zhoua, Y., Chenb, L., Fana, X., & Winsler, A. (2017). Preschool expenditures and Chinese children's academic performance: The mediating effect of teacher-child interaction quality. *Early Childhood Research Quarterly*, 41: 37- 49.

Johnstone, A.H. and Reid, N (1981). Towards a Model for Attitude Change, *International Journal Science Education*, 3(2), 205-212.

Johnstone, A.H. (1982). Attitude Measurements in Chemistry: Pitfalls and Pointers. In: *Chemical Education Research - Implications for Teaching*, London: Royal Society of Chemistry, pp. 90-103.

Likert, R. (1932). A technique for the measurement of attitudes, *Archives of Psychology*,140, 5-55.

McMonagle. (2012). Professional pedagogy for early childhood education. DCCC Publishing 2012 ISBN: 978-1-907235-05-4

OECD (2015). *Starting Strong IV: Monitoring Quality in Early Childhood Education and Care*. Paris: OECD Publishing.

Osgood, G.E. (1969a). The nature and measurement of meaning. In: J.G. Snider and C.E. Osgood, eds., *Semantic differential technique*, Chicago: Aldine, pages 3-41.

Osgood, G.E. (1969c). Semantic differential technique in the comparative study of cultures. In: J.G. Snider and C.E. Osgood, eds., *Semantic differential technique*, Chicago: Aldine, pages 303-334.

Osgood, C.E., Suci, C.J. and Tannenbaum, P.H. (1957). *The measurement of meaning*, Urbana, IL: University of Illinois Press.

Osgood, G.E., and Suci, G.J. (1969). Factor analysis of meaning, In: J.G. Snider and C.E. Osgood , eds., *Semantic differential technique*, Chicago: Aldin, pages 42- 55.

Punjab Early Childhood Education Policy. (2017). Retrieved from: <https://pctb.punjab.gov.pk/system/files/Punjab%20ECE%20Policy%202017.pdf>

PESRP (Punjab Education Sector Reform Programme). 2017. *Non-SED School Census Data 2016*. <http://www.pesrp.edu.pk/datacenter>

Reid, N. (2003). *Getting Started in Pedagogical Research, Higher Education Physical Sciences Practice Guide*. Hull: Higher Education Academy. <https://www.advance-he.ac.uk/knowledge-hub/getting-started-pedagogical-research-physical-sciences>. Accessed 9 November 2019.

Reid, N. (2006). Thoughts on Attitude Measurement, *Research in Science and Technological Education*, 24(1), 3-27.

Saeed, M. & Mahmood, K. (2002). Assessing competency of Pakistani primary school teachers in mathematics, science and pedagogy. *International Journal of Educational Management*, 16(4), pp.190-95.

Sayre, R. K., A. E. Devercelli, J. Neuman, and Q. Wodon. 2015. Investing in Early Childhood Development: Review of the World Bank's Perspective. Washington, DC: World Bank.

World Bank (undated) https://olc.worldbank.org/sites/default/files/Investing%20in%20Early%20Childhood%20Development_Review%20of%20the%20WB%20Recent%20Experience_eBook_0.pdf

Siraj-Blatchford, I. (2010). A focus on pedagogy. *Early childhood matters—Evidence from the effective pre-school and primary education project*, 149-165.

Stobart, G. (2008). *Testing Times: The Uses and Abuses of Assessment*. London, New York: Routledge.

Stobart, G. (2014). *The expert learner, Challenging myths of ability*. Berkshire: Open University Press, McGraw-Hill Education.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12, 257–285. https://doi.org/10.1207/s15516709cog1202_4

Syed, S. Z., Asif, M., & Yousaf, A. (2011). Rethinking ECE in Pakistan, *Journal of elementary Education*, 21(2), pp65-76

Whitton, D., Sinclair, C., Barker, K., Nanlohy, P., & Nosworthy, M. (2004). *Learning for teaching: Teaching for learning*. Melbourne: Thomson.

van Merriënboer, J. J. G., & Kirschner, P. A. (2013). *Ten steps to complex learning* (2nd Rev. ed.). New York, NY: Taylor & Francis.

Varjo, J., Hannu, S. and Rinne, R. (2013). Finland's PISA results: an analysis of dynamics in education politics. In: H-D. Meyer and A. Benavot, eds., *PISA, Power and Policy*, Oxford: Symposium Books, pages 51-76.

Vygotsky, L.S. (1962). *Thought and Language*, Cambridge, MA: The Massachusetts Institute of Technology Press.

Vygotsky, L.S. (1978). *Mind in Society*. Cambridge, MA: Harvard University Press.

Wadsworth, B.J. (2004). *Piaget's theory of cognitive and affective development*, Boston, Mass. and London: Longman.

Willis, J., Willis, M. and Huijser, H. (2015). Learning Power: Taking Learning-Centredness Seriously in a Blended Learning Environment, in: M.K. Harmes, H. Huijser, H. and P.A. Danaher, eds., *Myths in Education, Learning and Teaching, Practices, and Principles*, Basingstoke: Palgrave Macmillan, pages 19-39.

Wolf, B. P. (2010). *Building intelligent interactive tutors: Student-centered strategies for revolutionizing e-learning*. Morgan Kaufmann.