

Examining Varied Conceptions of Learning Among Mixed Ability Students: An Empirical Investigation in Public Schools

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Abstract

The study intended to examine the learning conceptions among average, below average and above average students from ten public schools in Lahore. The total sample (n=300) participating in the study comprised of 135 boys and 165 girls. In order to explore secondary school students' conceptions of learning, data were collected using the 'Conceptions of Learning Inventory' developed by Purdie and Hattie (2002). Results indicated that the high achieving students tend to hold more conceptions of learning in terms of gaining, using and understanding information and personal change. High achieving male students held significantly more conceptions of learning as compared to female counterparts. This study presents implications for policy makers and education authorities to reform the school education system by introducing effective ways of learning to students according to their academic needs.

Keywords: Learning conception, mixed ability students, remembering, gaining information.

1. Introduction

A permanent change in one's knowledge, skill or behavior as a result of the construction of experience is known as learning (Campbell & Smith, 1997) while the experience is a multidimensional concept encompassing a variety of situations such as direct instruction, personal experience, every day discussions, readings or experiments etc. Therefore, learning is much influenced by its context (Peterson, Brown, & Irving, 2010; Campbell & Smith, 1997; Barnet, Pillay, & Dart, 2003) where enough drill and practice helps in developing the long lasting impact of the learning experience. Individuals construct knowledge and gain information by engaging themselves in experiential learning (Steketee, 1996) while developing personal meanings for it.

Consequently, different perspectives are generated for the concept of learning. These perspectives are simply known as conceptions of learning (Steketee, 1996; Lai & Chan, 2005). In general, individuals develop such conceptions in every aspect of their life, including personal and professional parts that execute their set behaviors and are revealed through their actions (Candy, 1990; Hoffman, 2015). Likewise, students develop such conceptions of learning as an exposure to classroom activities and school environment. Such aspects of learning become the motivating forces for students to adopt different learning styles, study habits and study patterns either in group or as a self-independent reader (Eklund-Myrskog, 1998; Van Rossum & Hamer, 1985). Consequently, students determine their learning styles according to their learning environment and the conception they have. This variation becomes evident when they represent their own reflection of learning through engaging in different processes to obtain a similar outcome (Vibran, 2014).

By considering the importance of these conceptions regarding learning, researchers have extracted the forms of learning conceptions held by individuals through exploring their opinions for learning (Saljo, 1976; Marton, Dall'Alba, & Beaty, 1993; Biggs & Moore, 1993; Purdie & Hattie, 1996).

1.1 Theoretical Framework

Conceptions are taken as a foundation of someone's actions leading to the attainment of varied outcomes. The phenomenon of learning conceptions was first explored by Marton and Saljo (1976) by interviewing students of varied levels of study and age utilizing a phenomenographic approach. These conceptions were classified as 'learning as the increase of knowledge', 'memorizing information', 'acquisition of facts', 'procedures which can be retained or utilized in practice', 'abstraction of meaning' and 'an interpretative process' aimed at the understanding of reality. They further classified these conceptions as moving from simpler to the complex nature.

The first two conceptions were considered as reproductive, whereas the last two conceptions of learning were taken as higher level cognitive orientation (Purdie & Hattie, 2002; Biggs & Moore, 1993; Marton et al., 1993; Purdie & Hattie, 2002). The conceptions focusing gaining and restructuring of information were classified as quantitative, whereas understanding of meaning and personal change as qualitative perceptions of learning (Purdie & Hattie, 2002). Some have also classified conceptions in a hierarchical manner (Marton et al., 1993; Lai & Chan, 2005).

In 1996, Purdie and Hattie again explored the phenomena among secondary school students and found nine different conceptions of learning. They labeled the themes as (a) increasing one's knowledge; (b) memorizing and reproducing information; (c) using information as a means to an end; (d) understanding; (e) seeing something in a different way; (f) personal fulfillment; (g) a duty; (h) a process not bound by time or context; and (i) developing social competence. In order to explore the generalizability of the learning conceptions originated by the work of Purdie and Hattie, a study has been carried out, through quantitative inquiries (Peterson, Brown & Irving, 2010), with students of different countries including Australia, Malaysia (Purdie & Hattie, 2002), China (Lai & Chan, 2005), and New Zealand. As a result of these international investigations, the final categorization of learning conceptions was redefined as 'gaining information', 'learning as remembering', 'using information', 'learning as a duty', 'learning as personal change', 'learning as a process' not bound by time or place, and 'learning as the development of social competence'.

Scholars and psychologists are of the view that there is a link between conceptions of learning and their students' learning outcomes (Tsai, 2004). Results of the previous studies reported that students having more sophisticated conceptions, tended to produce higher results in academic tasks as compared to those who ought to process information through simple nature of conceptions that emphasize lower order of learning (Vibrant, 2014; Zeegers, 2004). Considering the fact that learning outcomes are assumed to be the product of various factors, including environmental as well as personal characteristics, researchers explored the nature and impact of these conceptions on students' academic achievement. Individuals' beliefs are one of the basic characteristic effecting tasks and preferred ways of approaching those tasks. Watkins and Drew (1998) studied the influence of these conceptions through establishing the link between academic causal attributions, academic self-concept and academic achievement. The study involved university students whose data were analyzed through structural equation modeling. Authors found direct paths between causal attribution, academic self-concept and academic achievement. The results verified that both surface as well as deep approaches to learning impact academic achievement positively.

Similarly, a strong relationship was found between students' conceptions of learning and their achievement scores (Purdie and Hattie in 2002). They found that the students having high conceptions of learning performed better in academic tasks as compared to those who had low conceptions. Mclean (2010) investigated conceptions of learning of students in the medical field and their link to their achievement in academics. The author classified students into different ability groups based on their academic performance and explored their preferred conceptions of learning. The results showed that high achieving students held more transformational conceptions such as problem solving as compared to those who relied on memorization of content. Furthermore, Irving and Peterson (2009) carried out a multi-study project to examine the correlation between students' conceptions of learning and impact on achievement. The researchers obtained data from 608 secondary level students to determine their learning conceptions and academic achievement in areas of reading as well as in mathematics. The study found that students having conception of learning as a duty did not perform as well as those students whose conception was learning as a continuous process. Similar results were also reported by different researchers (Watkins, 1984; Dart, 1998; Marton et al., 1993; Prosser & Millar, 1989; Trigwell & Prosser, 1991; Van Rossum & Schenk, 1984).

Research on learning conceptions has been investigated widely in the Western culture and at higher level, whereas non-Western countries are still lacking in work on such areas (Watkins & Drew, 2011). Most available literature focuses on the exploration of conceptions and their classification, instead of examining the impact these may have on other variables, such as students' attitudes towards learning and academic motivation (Vettori, Vezzani, Bigozzi, & Pinto, 2018).

1.2 Pakistani Case in Terms of Students' Learning Conceptions

The Pakistani system of education is segregated into public, private and madrassah education. All these systems are working with their own objectives and different pattern of teaching and assessment mechanisms. The private sector with good repute offers the international O-level/ IB, whereas the public school system has its own centralized curriculum and assessment system conducted by the official Board of Intermediate and Secondary

Education (BISE). For the public schools, upon completion of grade IX, students have to sit for the standardized tests for all of the courses being taught in grade IX. The same tests are repeated at the end of grade X for the courses taken and learned during grade X. The students passing these two standardized exams are awarded the certificate of secondary school which is mandatory to get admission in the next grade. This exam is also known as matriculation certificate or matric in short.

There is much literature relating to the correction of deficiencies found on part of students learning in Pakistani schools. The system of education in Pakistani schools focuses on memorization of the content and the lower level cognitive domains of learning (Imran, 2008; Rahman, 2004). Researchers found that teaching is also not focused on engaging students in higher order learning, and the students are encouraged to learn by rote memorization in order to complete an academic task as no alternative is offered. In contrast to the situation in public schools, the private school systems are preferred due to their reputation of providing higher order learning experiences needed to reach the more demanding international standards. These students show higher academic performance compared to public school students (Hussain & Awan, 2018).

The present study is worthwhile as it will provide a great insight into public school students varied ways of thinking, which leads to the different assessment results in BISE. It would be valuable to know how these students value learning in terms of conceptions; their deficiencies, and the relation of these to achievement.

Most of the research in this area in the past has focused on college level students (Boulton-Lewis et al., 2001; Marshall, Summer, & Woolnough, 1999; Morris, 2001). Tsai (2004) points out that it is more necessary to explore the learning conceptions at school level, where students are still developing their conceptions. Conceptions are assumed to be context dependent, which is one of the major determinant of their development. Exploring the phenomena in Asian culture has also been preferred by various researchers (Marton et al., 1997), in order to explore the reality of phrases used for Asian students such as 'the brainy Asian' and 'the Asian learner as a rote learner'. This study would reveal the reality of Asian (Pakistani) learners with respect to their conceptions of learning in an Islamic context. Less developed Countries such as Pakistan provide a chance to study the nature of learning construct by providing different perspectives and perceptions.

1.3 Research Questions

1. Whether there is a difference in the varied conceptions of learning among below, average and above ability students as defined in terms of High, Average and Low achievement.
2. Whether there is a difference in the varied conceptions of learning between male and female students.

2. Methodology

2.1 Sample

A cluster sample of students enrolled in tenth grade was drawn from ten public schools ($n=300$) at secondary level. Schools located in the District City Lahore were targeted for the data collection. A total of ($n=135$) boys and ($n=165$) girls from three abilities participated in the study. Respondents were categorized into three ability groups, high achiever ($n=149$), average ($n=123$) and low achiever ($n=29$).

2.2 Instrument

To collect data, we used a survey inventory 'Secondary School Students' Conceptions of Learning' established by Purdie and Hattie in (2002) from male and female respondents to measure their different conceptions of learning while studying at school level. Conceptions of Learning Inventory (COLI) is a 6-point Likert type scale having response scale ranging from strongly agree (6) to strongly disagree (1). This inventory consists of five subscales; learning as a gaining information; remembering information; understanding and using information, personal change and social competency.

The overall Cronbach Alpha of the COLI was found 0.86. This value is meaningless unless you state what the overall concept is that is being measured. The reliability of the four subscales of COLI are 0.57 for gaining information; 0.62 remembering information; 0.60 understanding and using information; 0.60 personal change; 0.60 for social competency respectively.

2.3 Procedure

Researchers of the study sought permission from their Departmental Review Board to conduct this current study. The purpose of conducting the survey questionnaire was to: examine the learning conceptions of the students who were academically categorized into three ability groups; and determine their learning conceptions (gaining information, remembering information, using and understanding information, personal change and social competency) to suit their learning situations. After seeking the ethical approval, researchers initiated their

personal visits to the schools and informed the nature of the study to the heads of the schools and then took the consent of the participants to take part in the research study. Regarding categorizing the ability groups of the students, (high, average, low) from their final school result of previous class (9th grade) was taken from their school admin block. Students were labelled into ability categories according to their achievement scores/grades determined by their schools through their grade policy that distinguish achievement criteria. They were told that their identity would remain anonymous, and data would be entered without mentioning their identity.

2.4 Data Analysis

Secondary school students’ conceptions of learning after classifying them into mixed ability groups; high, average and low achievers were explored through One-way Analysis of Variance. To explore the conceptions based on gender of the students, a t-test was used to know the difference between male and female students having higher achievers. However, no significant differences were found on the overall gender and between groups of average and low achiever categories.

3. Results

Table 1. Mean, SD and one-way ANOVA for Conceptions of learning Measures among three ability groups

Variables Learning as a	Low Achiever (n=29)		Average Achiever (n=123)		High Achiever (n=148)		F	P
	M	SD	M	SD	M	SD		
	gaining information	28.10	6.06	29.83	4.74	30.24		
remembering information	27.59	6.33	28.89	4.87	29.54	3.58	2.52	.08
using and Understanding information	26.66	5.86	28.49	4.64	29.06	3.78	3.71	.02*
personal change	27.07	6.31	28.13	5.05	30.15	6.75	5.41	.00**
social competence	30.96	5.96	31.91	4.90	32.50	4.62	1.36	.25

df= 297

The Table 1 shows results of low, average and high achiever students’ learning conceptions that indicates high achiever students held higher mean score for conception ‘gaining information’ (M=30.24, SD= 3.36) as compared to low achiever (M=28.10, SD= 6.06) and average students (M=29.83, SD= 4.74). Likewise, high achiever tended to have higher mean for the conception ‘remembering information’ (M=29.06, SD=3.78) than their low (M= 26.66, SD= 5.86) achiever counterparts. Similar pattern can be observed for the conception personal change where high achiever students have significantly higher mean value (M=30.15, SD= 6.75) in comparison of their low (M= 27.07, SD= 6.31) and average (M=28.13, SD= 5.05) fellows.

Table 2. Mean, SD and t test for Conceptions of learning Measures between male and female students

Variables Learning as a	Gender				t	P
	Male (n=39)		Female (n=109)			
	M	SD	M	SD		
gaining information	31.71	3.16	29.72	3.28	3.30	.00*m
remembering information	30.03	3.81	29.37	3.50	0.98	.32
using and Understanding information	30.26	3.92	28.63	3.66	2.33	.02*s
personal change	30.38	4.64	30.07	7.37	0.24	.81
social competency	32.87	4.81	32.36	4.57	0.58	.56

df=146, m=medium effect size, s= small effect size

Table 2 shows results regarding male and female students’ conception of learning that indicates that male students’ score for the conceptions of learning as ‘gaining information’ (M=31.71, SD= 3.16) is significantly higher than female students (M=29.72, SD= 3.28). Similarly, male students were found more inclined to the conception of learning as using and understanding information (M=30.26, SD=3.81) as compared to female (M=28.63, SD= 3.66) students.

4. Discussion

The present study aimed to explore the secondary school students' conceptions of learning among different ability students. The results revealed that high achiever students held more conceptions of learning encompassing gaining information, using information and personal change as compared to average and low achieving students. This finding is consistent with the previous research study by Malik and Zaheer (2012), they reported that Board of Intermediate and Secondary Education tends to measure the knowledge ability (facts and figures) of students through exam questions and few exam questions are set on application and analysis level. They also concluded that there is a need to modify the assessment strategies to measure students' knowledge and understanding on cognitive, affective and psychomotor domains.

Results of the present study are also similar to those found by Purdie and Hattie who found similar finding. Their study also revealed that students with higher performance found to be having more conceptions of learning as compared to their low achieving counterparts.

The results of present study found that high achieving students have higher level of agreement to the conception of learning as gaining information. This finding is quite in compliance to the finding revealed by a study carried out by Ali, Khurshid, Shahzad, Hussain and Bakar (2017). Approaching the phenomena through qualitative strategy, they also discovered that secondary school science students possess learning conceptions categorized as intake of knowledge and cooperation. The thematic analysis corroborated Pakistani secondary school science students' intake of knowledge and cooperation conceptions of learning. The findings of present study also are aligned to those found by Alamdarloo (2013) in Tehran. The researchers found direct link between conceptions of learning and students' academic achievement in schools. Their study found that students having conceptions of learning such as gaining information, a process not bound by time and place and as a social competence were the major predictors of students performance in academics. Likewise, present study on Pakistani secondary school students found high achievers having conceptions of learning gaining information, using and understanding information and learning as a personal change. The study by Watkins and Drew (1998) also found the positive links between surface as well as deep approaches to learning and student academic achievement. Present study also validates the results as it appeared that high achievers utilized memorization, using and personal change conceptions in order to perform in an excellent way. Therefore, it can be inferred that academic tasks would require students to process simpler and complex learning conceptions to perform better that has been shown through the present study.

It can be inferred from the results that to achieve higher, students would adopt various styles of learning requiring surface as well as deep approaches to learning. In view of Lee, (1998), students integrate both surface and deep approaches to learning, must pay attention to the conditions of learning and level of ability required by an academic task. Scholars are also of the view that students having multiple conceptions would use higher level cognitive abilities and chose problem solving techniques that would guarantee high performance in academics (Lin & Tsai, 2013).

Considering the nature of findings we got from this research is quite encouraging. These findings show that students having higher achievement utilize multiple cognitive abilities. Therefore, we should encourage teachers to engage students in multiple cognitive abilities in order to achieve higher performance in examinations.

The second objective of the study was to compare the conceptions of learning among male and female students at secondary level. The results revealed that male students are higher in their conceptions of learning as gaining information, using information and understanding information. The finding is again upto the expectation as in Pakistani context, it is a male dominant society. Male students have more freedom to roam about, have more exposure to outdoor activities and more opportunities to apply what they learn in school or out school. In contrast to the role of male persons in society, females have less exposure to outer world as they are expected to remain indoors, and participate in indoor activities. They have less opportunity to spend time in outdoor events. Seemingly, have less chances to gain information from different sources as well as less opportunity to utilize what they learn and understand.

The study by Sheikh and Loan (2010) also revealed that male students have different intention for studies as compared to female. They reported that female students also being higher in reading study for the purpose of education whereas for male students reading means to get information. Such findings validate the reason of male students having more interest in getting information for the purpose of use in their real life situations. Study by Chiou, Liang and Tsai (2011) also found that male students who took learning of biology as a memorizing were inclined to have deep motive and utilized deep approach to learning. The possible reason for such unexpected relation was explained that in Asian culture memorization is taken as a first step to learn something. Thus Asian

students would prefer to memorize what they think as important (Marton, Watkins, & Tang, 1997).

5. Implications of the Study

Teachers can make students engage in higher order learning domains so as to achieve optimum utilization of secondary level students' abilities. This exploration would help in investigation of nature of content presented in textbooks and assessment mechanism with those of demanding higher order learning skills (Sketee, 1996). This study being investigated in Pakistani context is important considering the fact that no other research has been reported yet in the context of determining varied conception of learning among different ability students.

References

- Ali, R., Khurshid, K., Shahzad, A., Hussain, I., & Bakar, Z. A. (2018). Nature of Conceptions of Learning in a Collectivistic Society: A Qualitative Case Study of Pakistan. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(4), 1175-1187. doi:10.29333/ejmste/81867
- Allan, B. (2003). Approaches to learning and academic achievement of Filipino students. *The Journal of Genetic Psychology*, 164, 101-114. doi:10.1080/00221320309597506
- Ambrose, S. A., Bridges, M. W., Pietro, M., Lovett, M. C., & Norman, M. K. (2010). *How learning works: Seven research-based principles for smart teaching*. John Wiley & Sons.
- Biggs, J., & Moore, P. (1993). *The Process of Learning* (3rd ed.). New York: Prentice Hall.
- Boulton-Lewis, G. M., Lewis, D., & Wilss, L. (2001). Changes in conceptions of learning of Indigenous Australian university students. *British Journal of Educational Psychology*, 71, 327-341. <https://doi.org/10.1348/000709901158550>
- Boulton-Lewis, G. M., Marton, F., Lewis, D. C., & Wilss, L. A. (2000). Learning in formal and informal contexts: Conceptions and strategies of Aboriginal and Torres Strait Islander university students. *Learning and Instruction*, 10(5), 393-414. doi.org/10.1016/S0959-4752(00)00005-0
- Burnett, P. C., Pillay, H., & Dart, B. C. (2003). The influences of conceptions of learning and learner self-concept on high school students' approaches to learning. *School Psychology International*, 24(1), 54-66. doi.org/10.1177/0143034303024001621
- Campbell, W. E., & Smith, K. A. (Eds.). (1997). *New paradigms for college teaching*. Interaction Book Company.
- Candy, P. C. (1990). How people learn to learn. In R. M. Smith et al., *Learning to learn across the life span* (pp. 30-63). San Francisco: Jossey-Bass.
- Cano, F., & Cardelle-Elawar, M. (2004). An integrated analysis of secondary school students' conceptions and beliefs about learning. *European Journal of Psychology of Education*, 19, 167-187. doi:10.1007/BF03173230
- Chiou, G.-L., Liang, J.-C., & Tsai, C.-C. (2012). Undergraduate Students' Conceptions of and Approaches to Learning in Biology: A study of their structural models and gender differences. *International Journal of Science Education*, 34(2), 167-195. doi: 10.1080/09500693.2011.558131
- Dart, B. C., Burnett, P. C., Purdie, N., Boulton-Lewis, G., Campbell, J., & Smith, D. (2000). Students' conceptions of learning, the classroom environment, and approaches to learning. *Journal of Educational Research*, 93, 262-270. doi:10.1080/00220670009598715
- Dart, B., Pillay, H., & Burnett, P. C. (2000). Australian and Filipino Students' Approaches to Learning, Conceptions of Learning, and Learner Self-Concepts: A Cross Cultural Comparison. *Educational Research Journal*, 15, 143-166.
- Drew, P. Y., & Watkins, D. (1998). Affective variables, learning approaches and academic achievement: A causal modelling investigation with Hong Kong tertiary students. *British Journal of Educational Psychology*, 68(2), 173-188. doi.org/10.1111/j.2044-8279.1998.tb01282.x
- Eklund-Myrskog, G. (1998) Students Conceptions of Learning in Different Educational Contexts. *Higher Education*, 35(3), 299-316. doi.org/10.1023/A:1003145613005
- Ellis, R. A., Goodyear, P., Calvo, R. A., & Prosser, M. (2008). Engineering students' conceptions of and approaches to learning through discussions in face-to-face and online contexts. *Learning and Instruction*, 18, 267-282. doi:10.1016/j.learninstruc.2007.06.001
- Entwistle, N. J., & Peterson, E. R. (2004). Conceptions of learning and knowledge in higher education:

- Relationships with study behaviour and influences of learning environments. *International Journal of Educational Research*, 41(6), 407-428. doi.org/10.1016/j.ijer.2005.08.009
- Hemati Alamdarloo, G., & Moradi, S. (2013). The relationship between students' conceptions of learning and their academic achievement. *Psychology*, 4(1), 44-49. doi: 10.4236/psych.2013.41006
- Hoffman, B. (2015). *The 5 most powerful self-beliefs that ignite human behavior*.
- Hussain, A., & Awan, A. G. Comparison of the achievements of public and private secondary schools in district Khanewal Pakistan. *Global Journal of Management, Social Sciences and Humanities*, 4(3), 574-605.
- Imran, M. (2008). *A comparative study of quality of education in public and private secondary schools of Punjab* (Doctoral dissertation, Arid Agriculture University, Rawalpindi Pakistan). ISSN 2520-7113 (Print), ISSN 2520-7121 (Online).
- Lai, P. Y. M., & Chan, K. W. (2005). *A structural model of conceptions of learning, achievement motivation and learning strategies of Hong Kong teacher education students*. Paper presented at the Australian Association of Research in Education Parramatta Conference, University of Western Sydney, Sydney, Australia.
- Lee, Y. (1998). *Assessing and fostering senior secondary school students' conceptions and understanding of learning through authentic assessment*. Master's Thesis, Hong Kong: University of Hong Kong. docid=U0029-1812201200001451
- Lin, M., & Tsai, C. (2008). Conceptions of learning management among undergraduate students in Taiwan. *Management Learning*, 39, 561-578. doi:10.1177/1350507608096041
- Lin, T. J., & Tsai, C. C. (2013). An investigation of Taiwanese high school students' science learning self-efficacy in relation to their conceptions of learning science. *Research in Science & Technological Education*, 31(3), 308-323. doi.org/10.1080/02635143.2013.841673
- Malik, K. S., & Zaheer, I. (2012). An Analysis of Pakistan Studies Question Papers at Secondary Level. *Interdisciplinary Journal of Contemporary Research in Business*, 4(5), 340-366.
- Marshall, D., Summer, M., & Woolnough, B. (1999). Students' conceptions of learning in an engineering context. *Higher Education*, 38(3), 291-309. doi.org/10.1023/A:1003866607873
- Marton, F. M., Watkins, D., & Tang, C. (1997). Discontinuities and continuities in the experience of learning: An interview study of high-school students in Hong Kong. *Learning and Instruction*, 7, 21-48.
- Marton, F., & Saljo, R. (1976a). On Qualitative Differences in Learning. I: Outcome and Process. *British Journal of Educational Psychology*, 46, 4-11. doi.org/10.1111/j.2044-8279.1976.tb02980.x
- Marton, F., & Saljo, R. (1976b). On Qualitative Differences in Learning II: Outcome as a Function of the Learner's Conception of the Task. *British Journal of Educational Psychology*, 46, 115-127. doi.org/10.1111/j.2044-8279.1976.tb02980.x
- Marton, F., Dall'Alba, G., & Beaty, E. (1993). Conceptions of learning. *International Journal of Educational Research*, 19, 227-300.
- McLean, M. (2001). Can we relate conceptions of learning to student academic achievement? *Teaching in Higher Education*, 6, 399-413. doi:10.1080/13562510120061241
- Morris, J. (2001). The conceptions of the nature of learning of first-year physiotherapy students and their relationship to students' learning outcomes. *Medical Teacher*, 23(5), 503-507. doi.org/10.1080/01421590120057067a
- Peterson, E. R., Brown, G. T., & Irving, S. E. (2010). Secondary school students' conceptions of learning and their relationship to achievement. *Learning and individual differences*, 20(3), 167-176. doi.org/10.1016/j.lindif.2009.12.004
- Pinto, G., Bigozzi, L., Vettori, G., & Vezzani, C. (2018). The relationship between conceptions of learning and academic outcomes in middle school students according to gender differences. *Learning, culture and social interaction*, 16, 45-54. doi.org/10.1016/j.lcsi.2017.11.001
- Prosser, M., & Trigwell, K. (1999). *Understanding Teaching and Learning: The Experience in Higher Education*. Buckingham: Open University Press
- Rahman, T. (2004). Denizens of alien worlds: A survey of students and teachers at Pakistan's urdu and English language-medium schools, and madrassas. *Contemporary South Asia*, 13(3), 307. doi.org/10.1080/0958493042000272212

- Saljo, R. (1979). *Learning from the Learner's Perspective. I: Some Common Sense Conceptions* (Rep. No. 76). Goteborg, Sweden: University of Goteborg, Institute of Education.
- Samuelsson, M., & Samuelsson, J. (2016). Gender differences in boys' and girls' perception of teaching and learning mathematics. *Open Review of Educational Research*, 3(1), 18-34. doi.org/10.1080/23265507.2015.1127770
- Sheikh, M. S., & Loan, F. A. (2010). Reading habits among college students of Kashmir across genders. *Trends in Information Management*, 2(2), 92-103.
- Steketee, C. N. (1997). Conceptions of learning held by students in the lower, middle and upper grades of primary school. In *Proceedings of Western Australian Institute for Educational Research Forum*.
- Trigwell, K., & Prosser, M. (1991). Improving the Quality of Student Learning: The Influence of Learning Context and Student Approaches to Learning on Learning Outcomes. *Higher Education*, 22, 251-266. doi.org/10.1007/BF00132290
- Tsai, C.-C. (2004). Conceptions of learning science among high school students in Taiwan: A phenomenographic analysis. *International Journal of Science Education*, 26(14), 1733-1750. doi: 10.1080/0950069042000230776
- Van Rossum, E., & Schenk, S. (1984). The Relationship between Learning Concepts, Study Strategy and Learning Outcome. *British Journal of Educational Psychology*, 54, 73-83. doi.org/10.1111/j.2044-8279.1984.tb00846.x
- Vedenpää I., & Lonka, K. (2014). Teachers' and teacher students' conceptions of learning and creativity. *Creative Education*, 5(20), 1821. Doi.10.4236/ce.2014.520203
- Vezzani, C., Vettori, G., & Pinto, G. (2018). University students' conceptions of learning across multiple domains. *European Journal of Psychology of Education*, 33(4), 665-684. https://doi.org/10.1007/s10212-017-0349-6
- Zeegers, P. (2014). Student learning in higher education. The path analysis of academic achievement in science education. *Higher Edu*, 23, 35-56.

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