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Full Length Research Paper

The children's book selection criteria: Evidence from preschool and primary school teachers

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The aim of this study is to comparatively examine the views of the preschool and primary school teachers about the criteria that qualified children books should have. The research group is comprised of 297 teachers (130 preschool teachers and 167 primary school teachers—of the first graders). The views of the teachers concerning the criteria that qualified children books should have were collected through the *"Principle of Suitability for Children Scale"*. The obtained data were analyzed in two stages. During the analyses, initially the general distributions of the answers of the teachers to the items of the scale were examined, and subsequently, it was examined how these answers differed based on certain personal and professional properties. In order to examine the general distributions of the answers of the teachers to the scale, item-based percentages and frequencies were calculated. For investigating how these answers differed based on certain personal and professional properties, a series of the Mann-Whitney U and the Kruskal Wallis tests were conducted. The findings demonstrated that the teachers are generally responsive to the basic criteria that qualified books children should have. In more detail, it was observed that there were statistically significant differences among the views of the teachers according to their professional teaching branch, age, and work experience. In light of the recent developments of children's literature, these findings were discussed in detail concerning the importance of children's literature for the preschool and primary school periods.

Key words: Children's literature, children books, book selection criteria, preschool teachers, primary school teachers.

INTRODUCTION

Children's literature is a notion, which is comprised of two notions such as child and literature that have an important relationship and which bring to mind the works produced for children. The children's literature, which is stated as the general title of the art products appropriate to the levels of children, is defined, for the period starting from the early childhood until the end of the adolescence, as the general name of all verbal or written books that are enriched with qualified visual and linguistic messages concerning the period that the sensations and thoughts of children are shaped (Lynch- Brown et al., 2011; Sever, 2015). Children's literature is an art branch aiming to help the child recognize and understand oneself, immediate surroundings, the society and culture that he/she lives in,

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and different aspects of life. In line with this purpose, it provides countless achievements to the child such as learning the native language and its particulars, developing the vocabulary, and gaining reading habit (Aslan, 2013a, b; Dickinson and Tabors, 2001; Saracho and Spodek, 2010; Sever, 2013, 2015).

It depends on their positive relationship with the literature for the children to become individuals, who can express themselves well, have the sensitivity to understand the interlocutor, can think and interpret about events and opinions, and recognize the diversity and beauty of the world (Kiefer, 2004; Landt, 2006; Louie, 2006; Saracho and Spodek, 2010). The main tool in this relationship is the children books. By means of the books, children will not only improve their knowledge about the world but also develop their sensitivity, imagination, creativity and communication skills (Aslan, 2013a; Dickinson and Tabors, 2001; Kiefer, 2004; Saracho and Spodek, 2010; Sever 2015). For the children's books to fulfill these important tasks, it is necessary to equip them with certain structural and educational properties (Dwyer and Neuman, 2008; Lukens et al., 2013; Sever, 2013). These are the pedagogic principles that the books involve through their inner and outer structural properties. Children books are a whole with their formal structures (size, paper quality, page layout, images, etc.), internal structures (theme, subject, hero, fluency, language, narration, etc.), and the pedagogic principles based-on (supporting the curriculum, relevant to the reality of life, supporting the emotional and cognitive development of the child, etc.). The holism and consistency of these properties and the principles are the most fundamental factors determining the quality of the children books (Lukens et al., 2013; Rudman, 1994; Russell, 1991; Sever, 2015).

In fact, the relationships of children with the literature start at very early ages. In this period, which starts as early as the early childhood period, children establish their relationships with the literature through the individuals in their family and relatives such as mother, father, sibling, and immediate surroundings (Bus and van IJzendoorn, 1997; Shoghi et al., 2013). In this period, with the existence of family members reading books, magazines and newspapers at the home environment, exposure of the child to these objects and acts at home, picture books are provided for the child appropriate to his/her age, stories told to the child, and encouraging the child to tell stories as well will be of importance for the child to develop an awareness for the literature and the literacy behaviors of the child will start to get off the ground (Hammett et al., 2003; Sénéchal and Young, 2008; Whitehurst and Lonigan, 1998). In this period, since the books provided for the child should compete with the attractive, colorful, and moving toys, the books should be at least as aesthetical as the toys, so attractive as to make the child prefer the books instead of the toys, and at the same time they should be artistically qualified, visually and linguistically enriched, in other words, they should be in line with the “for-children” principle (Sever, 2013, 2015). The children books prepared in accordance with the “for-children” principle for the childhood period, which starts from early childhood until the end of the adolescence period, support the linguistic, cognitive, and personality development of children in a positive manner.

Another key period for the development process of literacy is regarded as the preschool period (Morrow, 2009). This period coincides with another important process, in which children are met with the early literacy skills that are defined as the whole set of skills and prerequisite knowledge concerning literacy and that is the basis of reading, and in which positive attitudes concerning reading start to become a part of the life of the children (Mccathren and Allor, 2002; Kelman, 2006; Lefebvre et al., 2011; Shoghi et al., 2013; Whitehurst and Lonigan, 1998). At the beginning of the preschool education, if the children meet with teachers, who are aware of the relationship between the child and literature, it becomes possible to speak about a lifetime powerful bond between the children and literature (Morrow, 2009; Sever, 2015). In this period, the preschool teachers have important responsibilities such as knowing, selecting, and following the books appropriate to the ages and development characteristics of the children, creating a class library, introducing the books that should be read, supporting the early literacy of children by getting in touch with the families, and getting the children adopt the library habit. In order to fulfill these responsibilities, preschool teachers should be extremely conscious and equipped about children’s literature in general, and in particular, about the preference of literature works of quality for children and bringing these books to them (Morrow, 2009).

The child, who learns how to read and write in the primary school and whose literacy process officially starts, now gains the opportunity to get in touch with the books without needing anyone else. This period is an important transition phase, which is efficient throughout the lifetime literacy of the child, and in which the future literacy behaviors of the child are shaped. Considering its content, this is a period, in which the reading culture in children is started to be formed and the awareness about literacy turns into a reading habit in the short period, and the reading habits turn into reading culture in the long period (Black and Young, 2005; Mckinlay, 1990; Temple et al., 2005; Sever, 2013, 2015). The relationship between the child and the literature in the preschool period should be fed and empowered by the primary school teacher during the education in the primary school, and it should be consolidated as a reading culture rather than a habit (Sever, 2013). The aim of this phase is to help the child understand that the book has an important place in the life and it opens the doors of different worlds to the reader, and it is aimed that the

child accepts the book as an indispensable need, giving it an important place in his/her life (Aslan, 2013a; b). However, if the child has not experienced a qualified preparation period for literacy both at home and at preschool environments, a heavy task waits for the primary school teacher such as closing the gap created in the first six years, establishing the relationship between the child and literature, and turning this relationship into an indispensable habit. Most of the time, this heavy task turns into an inextricable problem for the primary school teachers. However, among the fundamental objectives of the education programs/curriculums, from the very first steps, is to help the children have a high-level awareness about reading, turn it into a habit, and bring it into a universal literacy level. In order to reach this objective, the curriculum allocates a wide place for the lessons, applications, and activities with children's literature from the very first steps. The success in putting this rich content into practice is completely is dependent on the competence of the teachers about the children's literature implementations. This fact, in return, brings forth the competence of the teachers both in the selection of qualified children's literature books that will support the development of children in all aspects and, after selection, to introduce them to the children with efficient implementation methods.

Rationale of the study

In light of the abovementioned information, it is obvious that both the preschool teachers and primary school teachers have a key role in bringing up qualified literate individuals. Considering the fact that, in the first school years, children attribute high value to their teachers and they take the teachers as a model, the meaning teachers assign to the children's literature books in the classroom environment and their criteria will be internalized by the children without any questioning. Starting from the preschool period, it is observed that, if the children have an opportunity to access to qualified children's literature books, it will be helpful for them to gain the reading habit in the short term, and to subsequently turn this habit into a learning tool (Black and Young, 2005; Mckinlay, 1990; Temple et al., 2005). Therefore, it is important that these teachers should have the competence to select the qualified children's literature books and to introduce them to the students efficiently, since these teachers give the first opportunity to the children in their formal education process to meet with the books and since they have the responsibility to be a role model for the children in an important phase which, starting from early literacy skills, paves the way leading to becoming individuals with reading culture. When previous studies conducted on children's literature field in Turkey were examined, they were observed to be numerous; however, it was also determined that, rather than the book selection criteria/behaviors of teachers, the majority of these studies were conducted on how should be the style and the content properties of the qualified children's literature books and quality/suitability description of children's literature books printed in Turkey (Aslan, 2006, 2007a, b, 2013a, b, c; Dilidüzgün, 2003, 2007a, b; Oğuzkan, 2001; Sever, 1995, 2004, 2005, 2007, 2013, 2015; Sever et al., 2011). The previous studies provided important pieces of information to the literature for creating the children's literature domain and determining the criteria of the qualified children books. However, when the studies are examined, a separate and primary research subject arises that there is vagueness about how to implement these pieces of information concerning the children's literature, in other words, to what extent are the teachers aware of these pieces of information and to what extent do they prioritize these criteria in determining the qualified children books. Based on this obligation, in this study, it was aimed at both closing an important gap in Turkish children's literature and comparatively examining the views of preschool and primary school teachers, who are in a key position in raising literate individuals, concerning the basic criteria of the qualified children books based on their professional and personal properties. The findings of this study will make contributions to the Turkish children's literature field and to its implementations in both theoretical and practical terms.

METHODOLOGY

This research, aims at comparatively examining the views of the preschool and primary school teachers about the criteria that qualified children books should have, is a descriptive study conducted on survey model.

Participants

The participants of the study were 297 teachers (130 preschool teachers and 167 primary school teachers-of the first graders) working in Ankara province. Two main criteria were considered in the selection of the teachers. The first criterion was the voluntary participation and the second one was working as a tenured staff in the public schools. Detailed information concerning the teachers volunteered to participate in line with these criteria is given in Table 1.

As is seen in Table 1, 230 female (77.4%) and 67 male (23.6%) teachers participated in the study. Among the teachers, 134 (45.1%) were in the 24-35 age group, 102 (34.4%) were in 36-45 age group, and 61 (20.5%) were 46 years old and over. 220 teachers (74.0%) were graduates of faculty of education, while 77 of them (26.0 %) were graduates of institute of education or teacher's training school. 56 participants (18.8 %) had been working as a teacher for 1-5 years, 66 of them (22.2%) for 6-10 years, and 175 (59.0 %) for 11 years and over. Among the teachers, 222 (74.7 %) stated that they had never participated in a training concerning children's literature, while 75 of them (25.3 %) stated that they participated. Among the ones who participated in a training, 27 (36.0 %) participated in the in-service training held by the Ministry of National Education (MNE), while 30 of them

Table 1. Demographic characteristics of participants.

Preschool teachers			
Variable	**Levels**	**n**	**%**
Gender	Female	124	(95.3)
	Male	6	(4.7)
Age group	24-35	102	(78.4)
	36-45	27	(20.7)
	46>	1	(0.9)
Graduation	Faculty of Education	128	(98.4)
	Teacher's Training School	2	(1.6)
Working experiences	1-5	46	(35.3)
	6-10	50	(38.4)
	11>	34	(26.3)
Training in children's literature	Yes	95	(73.0)
	No	35	(27.0)
	a) In-service training (MNE)	7	(20.0)
	b) Workshop, seminar etc.	19	(54.2)
	c) MA on children literature	4	(11.5)
	d) Unknown	5	(14.3)
Primary school teachers			
Variable	**Levels**	**n**	**%**
Gender	Female	106	(63.4)
	Male	61	(36.5)
Age group	24-35	32	(19.2)
	36-45	75	(44.9)
	46>	60	(35.9)
Graduation	Faculty of education	92	(55.0)
	Teacher's training school	75	(45.0)
Working experiences	1-5	10	(6.0)
	6-10	16	(9.5)
	11>	141	(84.5)
Training in children's literature	Yes	127	(76.0)
	No	40	(24.0)
	a) In-service training (MNE)	20	(50.0)
	b) Workshop, seminar etc.	11	(27.5)
	c) MA on children literature	2	(5.0)
	d) Unknown	7	(17.5)
Total			
Variable	**Levels**	**n**	**%**
Gender	Female	230	(77.4)
	Male	67	(23.6)
Age Group	24-35	134	(45.1)
	36-45	102	(34.4)
	46>	61	(20.5)

Table 1. Contd.

Graduation	Faculty of education	220	(74.0)
	Teacher's training school	77	(26.0)
Working experiences	1-5	56	(18.8)
	6-10	66	(22.2)
	11>	175	(59.0)
Training in children's literature	Yes	222	(74.7)
	No	75	(25.3)
	a) In-service training (MNE)	27	(36.0)
	b) Workshop, seminar etc.	30	(40.0)
	c) MA on children literature	6	(8.0)
	d) Unknown	12	(16.0)

participated in a trainings such as workshop, seminar, or program, and 6 of them (8.0%) had a masters' degree on children's literature. Twelve teachers (16.0%), stated to have a training, did not answer the type of their training.

Data collection tool

The data of this study were collected through the *"Principle of Suitability for Children Scale (PSCS)*", which was developed by the researcher. PSCS is a five point Likert scale, which presents the criteria that the qualified children books should have fewer than two headings and aims at determining the extent those teachers prioritize these criteria while selecting the children books. During the course of developing the PSCS, first of all, a wide literature review was employed to identify the elements of internal and formal structural features of books. Secondly, based on this literature review, all the related research were grouped according to their testing procedures (like using tools, scales, interviews, questionnaires, etc.) and all the items used in these studies for examining the structural features of books were listed. Third, the listed items were categorized with regards to their contents under two main factors (internal and formal structural features) and their expressions were corrected in terms of the linguistic features of the language. Lastly, all the potential items (n: 58) were written in a table format and sent to three independent experts, who were working as professors in the field of children's literature, to evaluate the content validity of the PSCS. The evaluators were asked to assess the form in terms of the content validity, fitness for the purpose of the language, style and expressions used. With regards to the content validity of the PSCS, majority of the items (84 %) in the scale were found to be very important by all three experts; according to their evaluations, only the items (n: 49), which were regarded as necessary by all of them, were included in the PSCS. Subsequently, data were collected from 245 teachers and reliability and validity tests of the scale were conducted. Before conducting the factor analysis of the PSCS, firstly, the Kaiser-Mayer Olkin (KMO) measurement of sample adequacy and Barlett's test were employed to determine the fitness of the data for the factor analysis. The results obtained from the KMO (0.88) and Barlett's test ($p<0.01$) showed a strong indication of sampling adequacy and suggested that the data supplied by the scale was appropriate for the factor analysis.

In order to test the factor structure of the PSCS, the explanatory factor analysis was conducted. Firstly, the principal component factor analysis and then the varimax rotation were administered orderly to determine the number of separate components under the appropriate number of factors. Based on an examination of the scree plots and rotation matrices for each item, a two-factor structure was determined to be the best overall descriptor of the PSCS. The explanatory factor analysis was started with 49 items in total. Then the 14 items were subsequently removed either for having low factor loading values or high factor loading values in multiple factors. As a result of these analyses, it was revealed that the PSCS consists of 35 items under two independent factor structures named as *Internal Structural Features* (17 items) and *Formal Structural Features* (18 items). The values of the factor loadings of 35 items under two independent factors varied ranging from 0.72 to 0.34.

Internal Structural Features (factor 1) consist of 17 items regarding *subject/message, character, language, conflict, coincidence, sentimentality, and curiosity* used in books and aim at evaluating the views of the teachers with regard to these internal structural features of books. On the other hand, *Formal Structural Features* (factor 2) consist of 18 items regarding *visualizations, consistency of front, book and back pages of books, images and the paper quality of books* and aim at evaluating the views of the teachers with regard to these formal structural features of books.

The reliability of the PSCS was evaluated by calculating (a) the internal consistency of the whole scale and its sub-factors, (b) split-half reliability score, and (c) test-retest reliability score of the PSCS. Initially, the Cronbach's Alpha and split-half scores of the PSCS were calculated. The Cronbach Alpha coefficients of the total (0.91) and sub-dimensions of the scale (0.90, 0.84 respectively) and split-half score (0.90) were found to be greater than 0.70. This result demonstrated that both the full scale and the sub-dimensions of the scale are highly reliable. Secondly, the test-retest reliability scores of 52 participants, who volunteered to fill the scale again two weeks after the first application, were calculated via the Pearson Correlation Coefficient. The test-retest reliability score was found 0.66. Thus, the calculated reliability scores demonstrated that the scale has a high level of reliability.

The highest possible score is 175 that can be gained from the PSCS, in which each item is scored between 1 and 5, while the lowest possible score is 35, and the average is 105. The highest possible score is 85, which can be gained from the 1st Factor, *Internal Structural Features*, while the lowest possible score is 17, and the average is 51. The highest possible score is 90 that can be gained from the 2nd Factor, *Formal Structural Features*, while the lowest possible score is 18, and the average is 54. High scores gained demonstrate that the teachers attribute importance to the relevant dimensions in the selection of children books.

Table 2. Averages concerning the whole scale and both the sub-scales.

	Max.	Min.	Mean of scale	Mean score	
				Preschool teachers	Primary school teachers
ISF	85	17	51	77,90	76,04
FSF	90	18	54	81,10	79,22
Overall	175	35	105	159,07	155,32

ISF: Internal Structural Feature; FSF: Formal structural feature.

Procedure

In the data collection phase, initially, the schools that the data would be collected from were decided. Subsequently, the researcher visited the schools; met with the management of the schools concerning the content, objectives, and discourse of the study, and gained necessary permissions to conduct the study. Eventually, the process of handing in the scales to the teachers started. All the scales were individually introduced to all teachers by the researcher. During the distribution of the scales, the researcher briefed the objective and content of the study to all the teachers, asking them to answer all the items of the scale frankly and completely. After the distribution of the scales, the teachers were asked to fill the scales in one week, all the schools were visited by the researcher after the prescribed time (one week), and all the scales were individually collected from the teachers.

RESULTS

The data obtained from this research were analyzed in two phases. The first one of these was to determine the distribution of the answers given to the items of the PSCS by the teachers, while the second one was to examine whether the answers of the teachers to the PSCS varied based on their personal and professional properties. Before the analyses of the study, the averages of the teachers concerning the PSCS were calculated (Table 2). When the average scores of the teachers were examined, it was observed that, from both sub-scales, the preschool and primary school teachers gained scores that are quite close and over the average.

In the study, secondly, in order to determine the distribution of the answers of the teachers to the PSCS scale, frequencies and percentages were calculated on an item basis, and the results are demonstrated in Table 3.

When the distributions of the answers of the teachers to the PSCS scale were examined in Table 3, it was understood that they agreed with the majority of the items of the scale and they regarded these items as important in the selection of children books. When the inter-group distributions of the answers of the preschool and primary school teachers were comparatively examined, it was observed that the distribution of the Internal Structural Feature sub-dimension was similar for both groups; however, it was also observed that the items of the Formal Structural Features sub-dimension were accepted/adopted more by the preschool teachers.

In the second phase of the analyses, it was examined that the PSCS answers of the teachers varied according to their certain personal or professional properties. Before the analyses, it was examined whether the data met the test of normality criterion (Table 4). When Table 4 was examined, it was observed that the PSCS scores of teachers in both groups did not demonstrate a normal distribution ($p<.05$). Therefore, it was decided to use the non-parametric tests in the analyses to be conducted for determining whether the PSCS answers of the teachers varied according to their certain personal or professional properties (Landau and Everitt, 2004).

Comparative examination of the PSCS answers of teachers concerning certain variables

In this phase, whether the PSCS answers of the teachers statistically differed according to their professional teaching fields was analyzed through the Mann-Whitney U test (Table 5). When Table 5 was examined, it was observed that there were statistically significant differences among the scores of the teachers ($z= -2,67$, $p<0.05$; $z= -2,05$, $p<0.05$; $z= -2,71$, $p<0.05$, orderly). When the mean ranks of the teachers from the PSCS were examined, it can be stated that preschool teachers agreed more with the items in both factors compared to the primary school teachers. Second, the gender variable was examined in the study and it was analyzed through Mann-Whitney U test whether the PSCS answers of the teachers statistically significantly differed according to the gender variable (Table 6).

When the results were examined, it was observed that there was statistically no significant difference between the PSCS scores of the teachers based on the gender variable ($p>0.05$). Although there was statistically no significant difference between the groups, when the PSCS mean ranks of the teachers were examined, it can be stated that the female teachers agreed more with the items in both factors compared to the male teachers (Table 6).

In this study, another variable examined subsequent to the gender variable was the age group of the teachers. It was analyzed through three different Kruskal Wallis

Table 3. Frequency and percentage distributions of the PSCS items.

Internal structural feature										
	Preschool teachers					**Primary school teachers**				
Items	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
	n(%)	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**
M1	-	-	-	16 (12.3)	114 (87.7)	-	-	1(.6)	40 (24.4)	**126 (75.4)**
M2	-	-	2(1.5)	8(6.2)	120 (92.3)	-	-	2(1.2)	46 (27.5)	**119 (71.3)**
M3	-	1(.8)	2(1.5)	17 (13.1)	110 (84.6)	-	1(.6)	3 (1.8)	58 (34.7)	**105 (62.9)**
M4	1(.8)	8(6.2)	4(3.1)	41 (31.5)	76 (58.5)	-	8 (4.8)	13 (7.8)	64 (38.3)	**82 (49.1)**
M5	-	20 (15.4)	14 (10.8)	**54 (41.5)**	42 (32.3)	3 (1.8)	23 (13.9)	18 (10.8)	**64 (38.6)**	58 (34.9)
M6	-	-	2(1.5)	34 (26.2)	94 (72.3)	-	1(.6)	5 (3.0)	62 (37.1)	**99 (59.3)**
M7	-	-	2(1.5)	31 (23.8)	97 (74.6)	-	1(.6)	6 (3.6)	72 (43.1)	**88 (52.7)**
M8	-	-	2(1.5)	53 (40.8)	75 (57.7)	-	1(.6)	6 (3.6)	64 (38.3)	**96 (57.5)**
M9	-	-	3(2.3)	38 (29.2)	89 (68.5)	-	-	2 (1.2)	42 (25.1)	**123 (73.7)**
M10	-	-	4(3.1)	27 (20.8)	99 (76.2)	-	1(.6)	-	46 (27.5)	**120 (71.9)**
M11	-	3(2.3)	7(4.4)	48 (36.9)	72 (55.4)	-	5 (3.0)	8 (4.8)	73 (43.7)	**81 (48.5)**
M12	1(.8)	1(.8)	1(.8)	29 (22.3)	98 (75.4)	-	4 (2.4)	2 (1.2)	52 (31.1)	**109 (65.3)**
M13	3(2.3)	1(.8)	4(3.1)	36 (27.7)	86 (66.2)	1 (.6)	5 (3.0)	6 (3.6)	63 (37.7)	**92 (55.1)**
M14	1(.8)	3(2.3)	3(2.3)	54 (41.5)	69 (53.1)	-	5 (3.0)	7 (4.2)	**91 (54.8)**	63 (38.0)
M15	-	8(6.2)	13 (10.0)	**58 (44.6)**	51 (39.2)	-	12 (7.2)	12 (7.8)	**88 (52.7)**	54 (32.3)
M16	-	-	-	23 (17.7)	107 (82.3)	-	1(.6)	2 (1.2)	50 (29.9)	**114 (68.3)**
M17	-	1(.8)	6(4.6)	47 (36.2)	76 (58.5)	-	2 (1.2)	11 (6.6)	**87 (52.7)**	67 (40.1)
Formal structural features										
	Preschool Teachers					**Primary School Teachers**				
Items	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
	n(%)	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**
M18	1(.8)	-	2(1.5)	38 (29.2)	89 (68.5)	-	-	3 (1.8)	67 (40.7)	**97 (58.1)**
M19	-	1(.8)	5(3.8)	37 (28.5)	87 (66.9)	-	-	4 (2.4)	71 (42.5)	**92 (55.1)**
M20	-	2(1.5)	2(1.5)	33 (25.4)	93 (71.5)	-	1(.6)	5 (3.0)	70 (42.2)	**90 (54.2)**
M21	-	-	2 (1.5)	30 (23.1)	98 (75.4)	1(.6)	1(.6)	3 (1.8)	59 (35.3)	**103 (61.7)**
M22	3(2.3)	10 (7.7)	15 (11.5)	42 (32.3)	60 (46.2)	2 (1.2)	9 (5.4)	27 (16.2)	**72 (43.1)**	57 (34.1)
M23	2 (1.5)	1 (1.8)	11 (8.5)	39 (30.0)	77 (59.2)	-	4 (2.4)	12 (7.2)	**76 (45.8)**	74 (44.6)
M24	1(1.8)	2(1.5)	2(1.5)	36 (27.7)	89 (68.5)	-	-	3 (1.8)	75 (44.9)	**89 (53.3)**
M25	1(1.8)	6(4.6)	10 (7.7)	47 (36.2)	66 (50.8)	1 (.6)	-	9 (5.4)	76 (45.8)	**80 (48.2)**
M26	-	2(1.5)	5(3.8)	45 (34.6)	78 (60.0)	-	-	4 (2.4)	75 (45.2)	**87 (52.4)**
M27	1(1.8)	5(3.8)	3(2.3)	44 (33.8)	77 (59.2)	-	2 (1.2)	10 (6.0)	75 (44.9)	**80 (47.9)**
M28	1(.8)	4(3.1)	17 (13.1)	53 (40.8)	55 (42.3)	2 (1.2)	6 (3.6)	23 (13.9)	**69 (41.6)**	66 (39.8)

Table 3. ContD.

M29	-	6(4.6)	3(2.3)	39 (30.0)	82 (63.1)	-	1(0.6)	-	71 (42.5)	**95 (56.9)**
M30	1(.8)	10 (7.7)	7(5.4)	45 (34.6)	67 (51.5)	1 (.6)	5 (3.0)	8 (4.8)	74 (44.3)	**79 (47.3)**
M31	1(.8)	1(.8)	5(3.8)	44 (33.8)	79 (60.8)	-	7 (4.2)	12 (7.2)	**81 (48.5)**	67 (40.1)
M32	1(.8)	2(1.5)	3(2.3)	42 (32.3)	82 (63.1)	1 (.6)	5 (3.0)	10 (6.0)	75 (44.9)	**76 (45.5)**
M33	2(1.5)	3(2.3)	1(.8)	39 (30.0)	85 (65.4)	-	2(1.2)	8(4.8)	74 (44.3)	**83 (49.7)**
M34	-	1(.8)	1(.8)	41 (31.5)	87 (66.9)	-	4 (2.4)	10 (6.0)	**80 (47.9)**	73 (43.7)
M35	-	-	3(2.3)	40 (30.8)	87 (66.9)	-	4 (2.4)	-	68 (40.7)	**95 (56.9)**

Table 4. Test of Normality Scores of the PSCS.

		Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	**df**	**p**	**Statistic**	**df**	**p**
Overall	Preschool teachers	0.157	130	0.000	0.920	130	0.000
	Primary school teachers	0.109	162	0.000	0.948	162	0.000
ISF	Preschool teachers	0.135	130	0.000	0.909	130	0.000
	Primary school teachers	0.100	162	0.000	0.939	162	0.000
FSF	Preschool teachers	0.158	130	0.000	0.919	130	0.000
	Primary school teachers	0.086	162	0.005	0.966	162	0.001

ISF: Internal structural feature; FSF: Formal structural feature.

Table 5. Mann-Whitney U test results concerning the professional teaching field.

		Mean rank	**Sum of**	**U**	**p**
ISF	Preschool Teachers (n:130)	162,96	21185,00	8780,00	0.00
	Primary School Teachers (n:165)	136,21	22475,00		
FSF	Preschool Teachers (n:130)	158,92	20660,00	9175,00	0.04
	Primary School Teachers (n:164)	138,45	22705,00		
Overall	Preschool Teachers (n:130)	161,46	20989,50	8585,50	0.00
	Primary School Teachers (n:162)	134,50	21788,50		

ISF: Internal structural feature; FSF: Formal structural feature.

Table 6. Mann-Whitney U test results concerning the gender variable.

		Gender	Mean rank	Sum of	U	p
Preschool teachers	ISF	Female (n:124)	65,44	8114,00	364,00	0.92
		Male (n:6)	66,83	401,00		
	FSF	Female (n:124)	63,93	7927,00	177,00	0.06
		Male (n:6)	98,00	588,00		
	Overall	Female (n:124)	64,47	7994,50	244,50	0.15
		Male (n:6)	86,75	520,50		
		Gender	**Mean rank**	**Sum of**	**U**	**p**
Primary School teachers	ISF	Female (n:106)	85,51	9064,00	2861,00	0.36
		Male (n:59)	78,49	4631,00		
	FSF	Female (n:105)	87,04	9139,50	2620,50	0.10
		Male (n:59)	74,42	4390,50		
	Overall	Female (n:105)	84,92	8917,00	2633,00	0.20
		Male (n:57)	75,19	4286,00		
		Gender	**Mean rank**	**Sum of**	**U**	**p**
Total	ISF	Female (n:230)	152,63	35104,50	6410,50	0.07
		Male (n:65)	131,62	8555,50		
	FSF	Female (n:229)	151,55	34705,00	6515,00	0.12
		Male (n:65)	133,23	8660,00		
	Overall	Female (n:229)	150,81	34535,00	6227,00	0.09
		Male (n:63)	130,84	8243,00		

ISF: Internal structural feature; FSF: Formal structural feature.

tests whether the answers of the teachers to the PSCS statistically differed according to the age group variable (Table 7). When Table 7 was examined, considering the teachers as one group, it was observed that there was statistically significant difference among the PSCS mean ranks of the teachers based on their age groups (χ 2= 9,18, p<0.05; χ 2= 12,75, p<0.05; χ 2= 14,12, p<0.05).

When their professional teaching fields were examined one by one, it was observed that there was statistically no significant difference among the PSCS answers of the preschool teachers based on the age variable (χ 2= 1,53, p>0.05; χ 2= 4,54, p>0.05; χ 2= 3,47, p>0.05); however, it was observed that there was a statistically significant difference in the 2nd Factor for the primary school teachers based on the same variable (χ 2= 6.81, p<0.05). Therefore, for the next analysis, it was decided to determine between which levels these differences were. In this purpose, the Mann-Whitney U test and the inter-level paired comparisons were conducted, and the findings of these analyses are presented in Table 8.

When the results of the analyses were examined, considering the teachers as one group and disregarding their teaching fields, it was observed that the teachers in the 46-and-over age group agreed with the PSCS items is statistically significantly different compared to the teachers in other age groups (p<.05). When the mean ranks were examined, it was observed that the teachers in the 46-and-over age group agreed with the PSCS items less compared to the teachers in other age groups (Table 8). When the PSCS answers of the teachers in the 24-35 age group and 36-45 age group were compared, it was observed that there was statistically no significant difference between the groups (p>0.05).

When the source of the significant difference of the primary school teachers based on the age variable was examined, it was observed that the results were consistent with the results obtained from the entire group. More clearly, it was observed that the agreement level of the primary school teachers in the 46-and-over age group concerning particularly the items in the second factor of

Table 7. Kruskal wallis test results concerning the age group variable.

		Age group	Mean rank	χ 2	p
Preschool Teachers	ISF	24 - 35 (n:102)	67.49		
		36 - 45 (n:27)	58.87	1,53	0.464
		46 >… (n:1)	41.50		
	FSF	24 - 35 (n:102)	69.14		
		36 - 45 (n:27)	52.65	4.54	0.103
		46 >… (n:1)	41.00		
	Overall	24 - 35 (n:102)	68.67		
		36 - 45 (n:27)	54.44	3.47	0.176
		46 >… (n:1)	41.00		
		Age group	**Mean rank**	**χ 2**	**p**
Primary School Teachers	ISF	24 - 35 (n:32)	89.61		
		36 - 45 (n:74)	85.64	2.07	0.35
		46 >… (n:59)	76.10		
	FSF	24 - 35 (n:31)	88.65		
		36 - 45 (n:75)	90.05	6.81	0.03
		46 >… (n:58)	69.46		
	Overall	24 - 35 (n:31)	88.24		
		36 - 45 (n:74)	87.75	5.55	0.05
		46 >… (n:57)	69.72		
		Age group	**Mean rank**	**χ 2**	**p**
Total	ISF	24 - 35 (n:134)	162.76		
		36 - 45 (n:101)	142.67	9.18	0.01
		46 >… (n:60)	124.01		
	FSF	24 - 35 (n:133)	162.66		
		36 - 45 (n:102)	146.35	12.75	0.00
		46 >… (n:59)	115.32		
	Overall	24 - 35 (n:133)	163.60		
		36 - 45 (n:101)	142.46	14.12	0.00
		46 >… (n:58)	114.32		

ISF: Internal structural feature; FSF: Formal structural feature.

the PSCS statistically significantly differed compared to those of other age groups ($p<0.05$), and it was also observed that the answers of teachers in the 24-35 age group were similar to those of the teachers in the 36-45 age group ($p>0.05$).

Another variable examined in the study concerning the book selection of the teachers was their working experience. It was analyzed through three different Kruskal Wallis tests whether the PSCS answers of the teachers statistically significantly differed according to the working experience variable, and the findings of these analyses are presented in Table 9. Considering the participants as one group, it was observed in Table 9 that there was a statistically significant difference among the PSCS mean ranks of the teachers based on their working experience (χ 2= 7.62, $p<0.05$; χ 2= 5.00, $p<0.05$; χ 2= 7.66, $p<0.05$). Therefore, for the next analysis, it was decided to determine between which levels these differences were. In this purpose, the Mann-Whitney U test and paired comparisons were conducted between the working experience figures, and the findings of these analyses are presented in Table 10.

Table 8. Mann-Whitney U test results concerning the paired comparisons of age groups.

Overall					
	Age group	**Mean rank**	**Sum of**	**U**	**p**
ISF	24-35 (n:134)	124.94	16742.50	5836.50	0.07
	36-45 (n:101)	108.79	10987.50		
FSF	24-35 (n:133)	123.72	16454.50	6022.50	0.14
	36-45 (n:102)	110.54	11275.50		
Overall	24-35 (n:133)	124.99	16624.00	5720.00	0.05
	36-45 (n:101)	107.63	10871.00		
	Age group	**Mean rank**	**Sum of**	**U**	**p**
ISF	36-45 (n:101)	84.89	8573.50	2637.50	0.16
	46-… (n:60)	74.46	4467.50		
FSF	36-45 (n:102)	87.30	8905.00	2366.00	0.02
	46-… (n:59)	70.10	4136.00		
Overall	36-45 (n:101)	85.83	8668.50	2340.50	0.03
	46-… (n:58)	69.85	4051.50		
	Age group	**Mean rank**	**Sum of**	**U**	**p**
ISF	24-35 (n:134)	105.31	14112.00	2973.00	0.00
	46-… (n:60)	80.05	4803.00		
FSF	24-35 (n:133)	105.94	14090.00	2668.00	0.00
	46-… (n:59)	75.22	4438.00		
Overall	24-35 (n:133)	105.61	14046.00	2579.00	0.00
	46-… (n:58)	73.97	4290.00		
		Primary School Teachers			
	Age group	**Mean rank**	**Sum of**	**U**	**p**
ISF	24-35 (n:32)	55.38	1772.00	1124.00	0.67
	36-45 (n:74)	52.69	3899.00		
FSF	24-35 (n:31)	52.63	1631.50	1135.50	0.85
	36-45 (n:75)	53.86	4039.50		
Overall	24-35 (n:31)	52.94	1641.00	1145.00	0.98
	36-45 (n:74)	53.03	3924.00		
	Age group	**Mean rank**	**Sum of**	**U**	**p**
ISF	36-45 (n:74)	70.45	5213.50	1927.50	0.24
	46-… (n:59)	62.67	3697.50		
FSF	36-45 (n:75)	74.19	5564.00	1636.00	0.01
	46-… (n:58)	57.71	3347.00		
Overall	36-45 (n:74)	72.22	5344.50	1648.50	0.03
	46-… (n:57)	57.92	3301.50		
	Age group	**Mean rank**	**Sum of**	**U**	**p**
ISF	24-35 (n:32)	50.73	1623.50	792.50	0.20
	46-… (n:59)	43.43	2562.50		
FSF	24-35 (n:31)	52.02	1612.50	681.50	0.05
	46-… (n:58)	41.25	2392.50		
Overall	24-35 (n:31)	51.31	1590.50	672.50	0.05
	46-… (n:57)	40.80	2325.50		

ISF: Internal structural feature; FSF: Formal structural feature.

Table 9. Kruskal Wallis test results concerning the working experiences.

		Working Experiences	Mean rank	χ 2	p
Preschool Teachers	ISF	1 - 5 (n:46)	75.05		
		6 - 10 (n:50)	64.83	6.42	0.05
		11 >… (n:34)	53.56		
	FSF	1 - 5 (n:46)	66.46		
		6 - 10 (n:50)	69.92	2.18	0.33
		11 >… (n:34)	57.71		
	Overall	1 - 5 (n:46)	70.53		
		6 - 10 (n:50)	68.27	3.93	0.14
		11 >… (n:34)	54.62		
		Working Experiences	**Mean rank**	**χ 2**	**p**
Primary School Teachers	ISF	1 - 5 (n:10)	59.20		
		6 - 10 (n:16)	95.91	3.66	0.16
		11 >… (n:139)	83.23		
	FSF	1 - 5 (n:10)	74.55		
		6 - 10 (n:15)	90.37	0.69	0.70
		11 >… (n:139)	82.22		
	Overall	1 - 5 (n:10)	64.20		
		6 - 10 (n:15)	92.27	2.15	0.34
		11 >… (n:137)	81.58		
		Working Experiences	**Mean rank**	**χ 2**	**p**
Total	ISF	1 - 5 (n:56)	168.68		
		6 - 10 (n:66)	159.94	7.62	0.02
		11 >… (n:173)	136.75		
	FSF	1 - 5 (n:56)	154.33		
		6 - 10 (n:65)	165.04	5.00	0.04
		11 >… (n:173)	138.70		
	Overall	1 - 5 (n:56)	161.38		
		6 - 10 (n:65)	163.88	7.66	0.02
		11 >… (n:171)	135.02		

ISF: Internal structural feature; FSF: Formal structural feature.

When the results of the analysis were examined, it was observed that the agreement levels of the teachers concerning the PSCS items were statistically significantly differed based on the working experience variable. When the P values obtained from the analyses were examined, it was determined that there was a statistically significant difference between the teachers with working experience of 11 years and over and the teachers with working experience of 1-5 years for the agreement levels of teachers concerning the items in the 1st Factor of the PSCS; similarly, it was determined that there was a statistically significant difference between the teachers with working experience of 11 years and over and the teachers with working experience of 6-10 years for the agreement levels of teachers concerning the items in the 2nd Factor of the PSCS ($p<0.05$). When the mean ranks of the teachers were examined, it was observed that the averages of the teachers with working experience of 11 years and over had lower averages compared to the others for the items in both factors (Table 10). The last variable examined in the study was whether the teachers had previous training about children's literature. It was analyzed through three different Kruskal Wallis tests whether the PSCS answers of the teachers statistically

Table 10. Mann-Whitney U test results concerning the paired comparisons of the working experience figures.

	Working experiences	Mean rank	Sum of	U	p
ISF	1 - 5 (n:56)	62.80	3517.00	1775.00	0.70
	6 - 10 (n:66)	60.39	3986.00		
FSF	1 - 5 (n:56)	58.43	3272.00	1676.00	0.45
	6 - 10 (n:65)	63.22	4109.00		
Overall	1 - 5 (n:56)	59.91	3355.00	1759.00	0.75
	6 - 10 (n:65)	61.94	4026.00		
	Working experiences	**Mean rank**	**Sum of**	**U**	**p**
ISF	6 - 10 (n:66)	133.05	8781.00	4848.00	0.07
	11 >… (n:173)	115.02	19899.00		
FSF	6 - 10 (n:65)	134.82	8763.50	4626.50	0.03
	11 >… (n:173)	113.74	19677.50		
Overall	6 - 10 (n:65)	134.94	8771.00	4489.00	0.02
	11 >… (n:171)	112.25	19195.00		
	Working experiences	**Mean rank**	**Sum of**	**U**	**p**
ISF	1 - 5 (n:56)	134.38	7525.00	3759.00	0.01
	11 >… (n:173)	108.73	18810.00		
FSF	1 - 5 (n:56)	124.40	6966.50	4317.50	0.22
	11 >… (n:173)	111.96	19368.50		
Overall	1 - 5 (n:56)	129.97	7278.50	3893.50	0.03
	11 >… (n:171)	108.77	18599.50		

ISF: Internal Structural Feature; FSF: Formal Structural Feature.

significantly differed according to their previous training, and the findings of these analyses are presented in Table 11. When Table 11 was examined, it was observed that there was no statistically significant difference for the PSCS answers of the teachers concerning whether they had previous training about children's literature ($p>0.05$).

DISCUSSION

This study aimed at determining the views of preschool and primary school teachers concerning the criteria that qualified children books and examining whether these views differed according to certain variables. To this end, initially, the general distributions of the answers of teachers given to the items of the scale of this study were examined, and subsequently, how these answers differed according to certain personal and professional properties was examined.

When the general distributions of the answers were examined, it was remarkable that all the participants agreed with the majority of the items of the scale (they marked 4 "I agree" and 5 "I strongly agree") and they regarded these items as important in the selection of children books. This is an important finding demonstrating that the teachers are responsive to the criteria that the quality children books should have (Tables 2 and 3). When the distributions of the answers were examined concerning the internal and formal structural features of the books, it was observed that, concerning the internal structural features of the books, the items that teachers mostly agreed on were *the subject / message should be appropriate to the interest and requirements of the child* and *the books should support the development of children in all aspects*. This finding is consistent with the literature and it is important since it demonstrates the positive views of the teachers concerning the content and the function that the children books should have. Based on the "for-children" principle of the literature for the children books, it is frequently

Table 11. Mann-Whitney U test results concerning whether the teachers had previous training about children's literature.

		Training	Mean rank	Sum of	U	p
Preschool Teachers	ISF	Yes (n:35)	70.74	2476.00	1479.00	0.33
		No (n:95)	63.57	6039.00		
	FSF	Yes (n:35)	71.81	2513.50	1441.50	0.24
		No (n:95)	63.17	6001.50		
	Overall	Yes (n:35)	71.84	2514.50	1440.50	0.24
		No (n:95)	63.16	6000.50		
		Education	**Mean rank**	**Sum of**	**U**	**p**
Primary School Teachers	ISF	Yes (n:39)	80.99	3158.50	2378.50	0.76
		No (n:126)	83.62	10536.50		
	FSF	Yes (n:39)	88.27	3442.50	2212.50	0.38
		No (n:125)	80.70	10087.50		
	Overall	Yes (n:38)	85.99	3267.50	2185.50	0.50
		No (n:124)	80.13	9935.50		
		Education	**Mean rank**	**Sum of**	**U**	**p**
Total	ISF	Yes (n:74)	152.93	11316.50	7812.50	0.56
		No (n:221)	146.35	32343.50		
	FSF	Yes (n:74)	159.29	11787.50	7267.50	0.16
		No (n:220)	143.53	31577.50		
	Overall	Yes (n:73)	156.97	11458.50	7229.50	0.22
		No (n:219)	143.01	31319.50		

ISF: Internal structural feature; FSF: Formal structural feature.

stated that the books should appeal to the imagination of the children, should involve a language and narration that children will simply read and enjoy, should discuss the subjects that are interesting for them, should feed them in terms of sense and opinion, should not have a complicated storyline so that the children can understand, and should be free from distracting details (Aslan, 2013a, c; Dilidüzgün, 2003; Sever, 2015; Sever et al., 2011). Becoming widespread, this view will ensure the production of qualified children books that appeal to the children, stir up their interest and encourage them to read, endear reading, and on the other hand, help them feel the meaning particulars of the native language. When the distributions of the answers of the teachers were examined, it was observed that, concerning the formal structural features that the books should have, the items that teachers mostly agreed on were *the images used in the text should be appropriate to the age of the child*, *should be original, should support them to visualize the content,* and *should be colorful to attract their interest*. These results reflect that, rather than regarding as shapes that are easy on the eye, teachers regard these images as an important element that completes the content and meaning, opening a door for the child to imagine, so as to support and activate comprehension during reading. The views of the teachers are also observed in the literature, and in this period, since the books provided for the child should compete with the toys, which are at the center of attention for children, the books should be at least as colorful, aesthetical, and richened with qualified messages as the toys (Sever, 2013, 2015). On the other hand, the most remarkable detail is that the importance of preschool and primary school teachers attributed to the internal and formal structural features of books statistically significantly differed. In this regard, it was observed that the preschool teachers prioritized more the internal and the formal structural features of books compared to the primary school teachers (Table 5). Considering the teaching levels of the teachers (preschool and first grade) and the content of the curriculum of each level, this fact is regarded as a predictable finding although it is not ideal

for the primary school teachers.

Considering the preschool education, it is known to be a critical school period, in which an organized book reading activity is firstly experienced and books are firstly encountered not as a game, in Turkey, where this education is given within classrooms with a wide range of socioeconomic and cultural structures. In this period, introducing the children to qualify for children books that are prepared in line with their age, development features, interests, and requirements is an important start both for literacy skills and for future literacy behaviors of children (Aslan, 2013a, 2013c; Dilidüzgün, 2007b; Sever, 2015). As known, rather than learning how to read and write before primary school, early literacy is the whole set of prerequisite knowledge, skills, and attitudes that should be acquired by the child in the preschool period in order for a faster learning how to read and write in the primary school (National Early Literacy Panel, 2008; Whitehurst and Lonigan, 1998). Qualified children books are an indispensable element in this period to support the literacy skills of children (Whitehurst et al., 1988; Whitehurst et al., 1994a,b). Previous research emphasized that children, who were exposed to qualified children books in preschool period, are more successful than their peers particularly concerning expression style, vocabulary knowledge, and comprehension skills (Armbruster et al., 2003; Beck et al., 2002; Greene and Lynch-Brown, 2002; Hart and Risley, 2003; Huebner and Payne, 2010). These are the prerequisite skills that will support the children for the formal literacy process in learning how to read and write faster and easier, having a successful comprehension performance, and better expressing themselves both in written and verbal terms (National Reading Panel, 2000). In this process, the architects of success are the teachers who accurately select the qualified children books and introduce them to the children through efficient implementations (Hargrave and Senechal, 2000). With these views becoming widespread in recent years in Turkey, it is observed that, in the preschool education implementations, there is increasing importance attached to the selection of qualified children books, and with the help of these books children are supported starting from early literacy skills to all development aspects. This fact, in return, charged the preschool teachers in Turkey with certain responsibilities such as selecting qualified children books and introducing them to the children, and as a consequence, the awareness of teachers in this subject has increased in the last 15 years (Aslan, 2013a, b; Sever, 2015). Considering the results of the preschool teachers from this point of view, it is practical that the results are shaped in line with the development of children's literature studies conducted in Turkey, and it is also observed that the preschool teachers are responsive about the internal and formal structures that the qualified children books should have, which they prioritize in book selection.

On the other hand, from the standpoint of the primary school teachers, it is observed that the views of the primary school teachers about the criteria that the qualified children books should have are statistically significantly different from those of the preschool teachers. When the findings are examined, it is observed that the primary school teachers had lower scores in both factors compared to the preschool teachers, in other words, it was observed that they agreed less with the items under both factors compared to the preschool teachers. However, this finding should not be interpreted in a way that the primary school teachers are not responsive about the criteria that the qualified children books should have. When the general distributions of their answers to the scale were examined, it was observed that they answered the majority of the items as 4 (I agree) and 5 (I strongly agree); however, their general averages are less than those of the preschool teachers. In fact, the role of the children books are of vital importance in teaching the structure, rules, and narration alternatives of the native language to children during the literacy learning process starting from the first grade in the primary schools. This period, in which the sensitivity and love will be gained about the native language, is, at the same time, the first step in acquiring the reading habit for the children (Sever, 2004). When the reflections of language teaching processes to the primary school period in Turkey are examined, it is observed that there is a traditional teaching approach, in which the only source is the textbook sent to the schools from the Ministry of National Education. The objective of the traditional approach in this grade level is mostly to help the children learn how to read and write, and in this process, the texts in the official textbook are used as the only source. In this teaching, in which the one-sided/sourced approach is embraced, it is observed that the quality of the texts in the textbook, their suitability to children, in other words, the internal and formal structural features are not questioned by the primary school teachers. When the findings of the study are examined from this point of view, it can be stated that, due to the roughly non-flexible viewpoint, the general agreement averages of the primary school teachers concerning the criteria that qualified children books should have are lower compared to the preschool teachers, who have more flexible and creative viewpoints based on their teaching age level. However, the main objective of the first grade in the primary school is to simultaneously develop the linguistic skills (listening, reading, speaking, and writing) of students (Sever, 2004; Sever et al., 2011). It is known that the most important tool to use in this development process is the qualified children books. In this context, instead of limiting the children only to the official textbook, it is important to introduce qualified children books that are appropriate to the development levels of children in terms of both internal and formal structural features.

Another remarkable finding of the study is that the

views of teachers concerning the criteria that the qualified children books should have are statistically significantly different based on the age level and working experience (Tables 8 and 10). When the findings are examined, it is observed that as the age level and working experience of teachers increase, their agreement levels decrease. In fact, this finding is coherent with the developments in the children's literature in Turkey. As mentioned before, with the positive developments experienced in the last 15 years in the children's literature field and the increasing number of implementations, this subject is embraced with increasing interest by teachers studying in the field, Ministry of National Education, and particularly the academicians. When the importance of preschool education is frequently emphasized, with the support of studies on the development of early literacy skills, the requirement of child-book interaction from the early periods becomes prominent. In such an ambiance, it is an expected outcome that the teachers, who have been graduated in the last 15 years, have higher levels of responsiveness about the criteria that the qualified children books should have compared to their colleagues, who have been working in the field for longer periods. Additionally, it is considered that the teachers with younger ages and less working experience have higher agreement levels with the criteria that the qualified children books should have resulted from the fact that these teachers have more updated knowledge about children's literature and they follow the academic studies (articles, projects, conferences, etc.) conducted on children's literature field with more zeal and excitement. However, that there was statistically no significant difference among the answers of the teachers concerning the children's literature training they attended both in the undergraduate education and in-service training is an important subject that should be examined in further studies concerning the contents, functions, and implementations of the training.

Conclusion

Considering the findings of this study, it should be stated that the teachers have a certain level of responsiveness about the criteria that the qualified children books should have. It is considered that the findings of the study provide important clues about the children's literature field in Turkey and its implementations in the schools. Although it is observed that the teachers have positive views about the criteria that the qualified children books should have, it is obvious that these views differ according to their professional teaching fields, age, and working experiences. In line with this result, it can be suggested that, initially, the content, function, and importance of the in-service training about children's literature given to the actively working teachers in Turkey should be revised, and subsequently, the children's literature training should be given as a compulsory course to the prospective preschool and primary school teachers.

In this study, there are certain limitations that should be conveyed to the reader. Initially, considering the total population of Turkey, the study was conducted with a limited number (totally 297) of teachers. It is considered that conducting further studies on larger sample sizes and on teachers from fields and grade levels as diverse as possible, the generalizability of the findings will increase. Second, in this study, the scale used in data collection and the criteria that the qualified children books should have were presented to the teachers by the researcher, and they were asked to state their views concerning these criteria. Such an implementation might involuntarily have had a positive influence on the teachers concerning the criteria that the qualified children books should have. Therefore, for further studies, the views of the teachers concerning the criteria that the qualified children books should have can be evaluated with different measuring styles (that is, individual interview, etc.) without providing them any reminder or clue. Lastly, this study only focused on the criteria that the qualified children books should have. Therefore, it is considered that further studies focusing on examining how these criteria are reflected to the classroom environment by the teachers in the education life will make contributions to the children's literature field in Turkey and its implementations.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

REFERENCES

Armbruster BB, Lehr F, Osborn J (2003). Put reading first: The research building blocks for teaching children to read: Kindergarten through grade 3. Jessup, MD: National Institute for Literacy.

Aslan C (2006). Türk çocuk yazınında çocuk-yetişkin çatışmasının yer aldığı kimi yapıtların incelenmesi. Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi 39(2):193-216.

Aslan C. (2007a). Yazınsal nitelikli çocuk kitaplarının çocuğun gelişim sürecindeki yeri. II. Ulusal Çocuk ve Gençlik Edebiyatı Sempozyumu: Gelişmeler, Sorunlar ve Çözüm Önerileri. Ankara: AÜ Basımevi.

Aslan C (2007b). Yaşam gerçekliğinin çocuklara iletilmesi bakımından '100 Temel Eser'deki öyküler üzerine bir inceleme. İstanbul Üniversitesi İletişim Fakültesi 4. Uluslararası Çocuk ve İletişim Kongresi Özetler Kitapçığı. İstanbul.

Aslan C (2013a). Çocuk edebiyatı yapıtlarının temel işlevleri. Eğitimci Öğretmen Dergisi 17:6-9.

Aslan C (2013b). Duyarlık ve düşünceyi geliştirmede çocuk edebiyatı. Çoluk Çocuk Anne Baba Eğitimci Dergisi 12:29-32.

Aslan C (2013c). Çocuk ve gençlik edebiyatı yapıtları yoluyla düşünme. Kum Edebiyat Dergisi 72:11-18.

Beck IL, McKeown MG, Kucan L (2002). Bringing words to life: Robust vocabulary instruction. New York: Guilford Press.

Black A, Young J. (2005). Attitudes to Reading: An Investigation across the Primary Years. Conference Proceedings, Pleasure, Passion Provocation AATE/ALEA National Conference.

Bus AG, van IJzendoorn MH (1997). Affective dimension of mother–infant picture book reading. Journal of School Psychology 35(1):47-60.

Dickinson DK, Tabors PO (2001). Beginning literacy with language: Young children learning at home and school. Baltimore, MD, US: Paul H Brookes Publishing.
Dilidüzgün S (2003). İletişim odaklı Türkçe derslerinde çocuk kitapları. İstanbul: Morpa Kültür Yayınları.
Dilidüzgün S (2007a). Çocuk kitaplarının çocuğun sanat eğitimine katkısı. II. Ulusal Çocuk ve Gençlik Edebiyatı Sempozyumu: Gelişmeler, Sorunlar ve Çözüm Önerileri (Yay. Haz. : S. Sever). Ankara: AÜ Basımevi, pp. 111-115.
Dilidüzgün S (2007b). Çağdaş çocuk yazını. İstanbul: Morpa Kültür Yayınları.
Dwyer J, Neuman SB (2008). Selecting books for children birth through four: A development approach. Early Childhood Journal 35:489-494.
Greene BE, Lynch-Brown C (2002). Effects of teachers' reading aloud styles on vocabulary acquisition and comprehension of students in the early elementary grades. Journal of Educational Psychology 94(3):465-473.
Hammet L, Van Kleeck A, Huberty C (2003). Patterns of parents' extratextual interactions during book sharing with preschool children: A cluster analysis study. Reading Research Quarterly 38:442-468.
Hargrave AC, Sénéchal M (2000). A book reading intervention with preschool children who have limited vocabularies: The benefits of regular reading and dialogic reading. Early Childhood Research Quarterly 15(1):75-90.
Hart B, Risley T (2003). The early catastrophe. American Educator 27(4):6-9.
Huebner CE, Payne K (2010). Home support for emergent literacy: Follow-up of a community-based implementation of dialogic reading. Journal of Applied Developmental Psychology 31(3):195-201.
Kelman ME (2006). An investigation of preschool children's primary literacy skills (Unpublished doctoral thesis). USA: University of Wichita State.
Kiefer BZ (2004). Children's literature and children's literacy: Preparing early literacy teachers to understand the aesthetic values of children's literature. In O. N. Saracho & B. Spodek (Eds.), Contemporary perspectives on language policy and literacy instruction in early childhood education (Vol. V). Greenwich, CT: Information Age Publishing.
Landau S, Everitt BS (2004). A handbook of statistical analyses using SPSS. Boca Raton, FL: Chapman & Hall.
Landt SM (2006). Multicultural literature and young adolescents: A kaleidoscope of opportunity. Journal of Adolescent and Adult Literacy 49:690-697.
Lefebvre P, Trudeau N, Sutton A (2011). Enhancing vocabulary, print awareness and phonological awareness through shared storybook reading with low-income preschoolers. Journal of Early Childhood Literacy 11(4):453-479.
Louie BY (2006). Guiding principles for teaching multicultural literature. Reading Teacher 59:438-448.
Lukens RJ, Smith JJ, Coffel CM (2013). A critical handbok of children's lirerature. New York: Pearson.
Lynch-Brown C, Tomlinson CM, Short KG (2011). Essentials of Children's Literature. New York: Pearson.
McCathren RB, Allor JH (2002). Using storybooks with preschool children: Enhancing language and literacy. Young Exceptional Children 5(4):3-10.
McKinlay S (1990). Children's Attitudes to Reading: Do Teachers Know? Reading 24(3):166-178.
Morrow L (2009). Literacy development in the early years: Helping children read and write (6th ed.). Boston: Pearson.
National Early Literacy Panel (2008). Developing early literacy: Report of the National Early Literacy Panel**,** National Institute for Literacy, Washington DC (2008).
National Reading Panel (2000). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implication for reading instruction: Reports of the subgroups. Washington, DC: National Institute of Child Health and Development.
Oğuzkan F (2001). Çocuk edebiyatı. Ankara: Anı Yayıncılık.
Rudman MK (1994). Children's Literature: An Issue Approach (3rd Edition). Massachusetts: D.C. Health and Company, Lexington.
Russell D (1991). Literature for children: A short introduction. Reading: Order Dept., Addison-Wesley.
Saracho ON, Spodek B (2010). Families' selection of children's literature books. Early Childhood Education Journal 37(5):401-409.
Sénéchal M, Young L (2008). The effect of family literacy interventions on children's acquisition of reading from kindergarten to Grade 3: A meta-analytic review. Review of Educational Research 78:880-907.
Sever S (1995). Çocuk kitaplarında bulunması gereken yapısal ve eğitsel özellikler. ABECE Eğitim, Ekin ve Sanat Dergisi 107:14-15.
Sever S (2004) Türkçe Öğretimi ve Tam Öğrenme. Ankara: Anı Yayıncılık.
Sever S (2005). Çocuk edebiyatı ve eleştirisi. Cumhuriyet Kitap. Ankara pp. 16-17.
Sever S (2007). Çocuk edebiyatı öğretimi nasıl olmalıdır?. II. Ulusal Çocuk ve Gençlik Edebiyatı Sempozyumu: Gelişmeler, Sorunlar ve Çözüm Önerileri. Ankara: AÜ Basımevi.
Sever S (2013). Çocuk edebiyatı ve okuma kültürü. İzmir: Tudem Yayıncılık.
Sever S (2015). Çocuk ve edebiyat. İzmir: Tudem Yayınları.
Sever S, Kaya Z, Aslan C (2011). Etkinliklerle Türkçe Öğretimi. İzmir: Tudem.
Shoghi A, Willersdorf E, Braganza L, McDonald M (2013). Let's Read Literature Review. Parkville, Vic.: The Royal Children's Hospital Centre for Community Child Health, Murdoch Children's Research Institute.
Temple C, Ogle D, Crawford A, Freppon P (2005). All Children Read: Teaching for Literacy in Today's Diverse Classrooms. New York, Pearson Education.
Whitehurst GJ, Lonigan CJ (1998). Child development and emergent literacy. Child Development 69:848-872.
Whitehurst GJ, Arnold DS, Epstein JN, Angell AL, Smith M, Fischel JE (1994a). A picture book reading intervention in day care and home for children from low-income families. Developmental Psychology 30(5):679-689.
Whitehurst GJ, Epstein JN, Angell AL, Payne AC, Crone DA, Fischel JE (1994b). Outcomes of an emergent literacy intervention in Head Start. Journal of Educational Psychology 86(4):542-555.
Whitehurst GJ, Falco FL, Lonigan CJ, Fischel JE, DeBaryshe BD, ValdezMenchaca MC, Caulfield M (1988). Accelerating language development through picture book reading. Developmental Psychology 24:552-559.

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The role of the principal is developing an instructional leadership team in school

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The instructional leadership role is one of the most critical and necessary roles of a school leader to promote students' learning. However, it is a common notion that the principal solely is the instructional leader in a school. Thus, this paper aims to discover who else works as an instructional leader and how an instructional leadership team can be formed. Findings from a semi-systematic literature review show that the principal is not alone the instructional leader in a school. Instead, he/she is the leader of the instructional leadership team, and the assistant principals and the content experts are the members of this team. Moreover, the paper also finds that the principal's role is critical to forming an instructional leadership team for the students' better academic outcomes.

Key words: Instructional leader, principal, teaching-learning, learners, instructional leadership team, school.

INTRODUCTION

In the K-12 school, a principal performs many duties and responsibilities to run a school. Among the duties a school principal performs are: creating a mission and vision, policy implication, budgeting, operation and management, connecting community, communication, continuous professional development for the teachers and staff. The primary role of the principal is to facilitate teaching and learning. According to Wagner et al. (2006), the primary purpose of schooling is teaching the students to help them achieving knowledge for their academic success. The principal leads the teaching-learning being an instructional leader. So, instructional leadership is the most vital role of a school leader to show effective teaching-learning, and it has risen to importance as a guiding principle of leadership in education over the previous twenty to thirty years (Boyce and Bowers, 2018; Gurley et al., 2015; Salo et al., 2015).

In the 1990s, the principal used to set up academic goals, manage resources for instructions, monitor curriculum and lesson plan as the instructional leader in a school (Lashway, 2002). According to Horng and Loeb (2010), traditional instructional leadership was a strong directive principal focused on curriculum and instruction. The authors also said that conventional instructional leadership was not afraid to work directly with the teachers. The leader used to go to the classroom very often. In the past, instructional leadership was principal-centered with the image of a heroic leader (Lashway, 2002).

In the 21st century, there is a different definition of instructional leadership. The school leader's role and responsibilities have notably changed after the No Child Left Behind (NCBL) Act (Thessin, 2019). According to the author, the school principal does not focus narrowly only

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on classroom instruction; rather, the principal facilitates teaching-learning being an instructional leader, carries a more sophisticated view of professional development, and takes data-driven decisions for teaching-learning. Boyce and Bowers (2018) say that the relentless growth of standards-based accountability puts heavy pressure on the school principal to bring out tangible academic success.

The National Association of Elementary School Principals (2001) defines instructional leadership as a "leading learning community," and says that the instructional leadership means motivating teachers to teach and create a safe teaching-learning condition in the school. Horng et al. (2010) conducted a study in three large urban school districts on instructional leadership. They conclude that schools show growth in academic achievement for strong instructional leadership of the leadership team in teaching and learning. The authors also comment that as an effective instructional leader, the principal in the school, hire, support, and retain good teachers while developing or removing the less effective ones for successful classroom instruction.

According to Edmonton Public Schools (2018), instructional leadership involves principals becoming leading-learners who successfully collaborate with other school leaders and nurture a learning community that supports and improves student achievement. Thus, the role of the principal in instructional leadership is critical for a school. This leadership role in the school is neither new nor straightforward. It is evolving day by day, and it is not confined to the principal. A school leader's instructional leadership can be compared to the captain of a ship who leads the crews and passengers to the right destination. So, this study aims to explore the role of the principal who works as the building administrator in forming an instructional leadership team in a school. The research question is, "How can a principal form an instructional leadership team to bring out the learners' academic success in a school?" The findings of this study will provide an understanding of the school leaders regarding instructional leadership in the 21st century to meet the students' academic needs.

RESEARCH METHODOLOGY

This article's methodology consists of a semi-systematic literature review (Snyder, 2019). According to the author, a semi-systematic study focuses on the progress and development of a research topic overtime. The author also added that this methodology aims to identify and understand relevant research that has implications for the topic and synthesizes using narratives.

Search strategies

For finding relevant literature of this study, three electronic databases are searches for obtaining free of cost research or scholarly articles. The first electronic database was the Educational Resources Information Center Search Engine (ERIC). Then Google Scholars and Open Journals in Education (OJED.ORG) were also searched.

Search limit

The author of this paper did not confine the search in a time limit to explore the researchers' and scholars' understanding of instructional leadership in the past. It also gave the author a scope to compare with the present researches on instructional leadership. Moreover, the author did not limit the search only to the United States. The author wanted to discover how the researchers evaluated instructional leadership in the different parts of the world since the schools everywhere have the same underlying purpose.

Search term and key words

The following terms/keywords are used to search for literature: Instructional leadership; Effective school leader; Instructional leadership team; Leadership for student success.

Selecting sources

After collecting articles from the database, the abstract was read first, and then the whole paper (when necessary). These readings gave the selection of 10 empirical research papers, 3 scholarly articles, 3 dissertations, 1 policy paper, and 1 meta-analysis that were relevant to this research paper.

Data

After reading and reading the secondary sources' abstract, findings, and conclusions, a summary for each source was recorded as data for this study.

Analyzing

Interpretive thematic analysis (Clarke et al., 2015) was used in this study to analyze data. According to the authors, interpretive thematic analysis finalizes themes from the meaning and the interpretation of the data. The following six steps of the analyzing process (Braun and Clarke, 2019) were used to finalize the themes: Familiarization: Reading and rereading the data; Coding: Identifying patterns or code from reading; Initial theme: Clustering codes and developing themes; Reviewing theme: Rereading theme from the previous step for better generalization; Defining theme: Finalizing themes; Reporting: Writing the report.

Positionality

The researcher was a high school assistant principal and principal. Besides, the researcher was a teacher trainer. Additionally, the researcher is now a scholar in an educational leadership program. The researcher was aware of his bias based on his experiences. However, the researcher has taken his positionality as a form of reliability (Creswell and Poth, 2018). Thus, the researcher’s experience has given an extra lens to conduct the study with reliability.

RESULTS

From the aforementioned analysis process, the following

three themes came out.

(1) Forming an instructional leadership team with experts.
(2) Managing instructional mismatch.
(3) Fostering teacher leadership to support the instructional leadership team.

Forming an instructional leadership team with experts

A team is a group of contributors who work together to provide a promising solution for a shared mission and vision (Forsyth, 2018). Thus, in the school, the principal's collaboration with other curriculum and instruction experts forms an instructional leadership team (Heffernan and Longmuir, 2019). According to the authors, the principal solely is not the instructional leader in a school and cannot achieve the academic target alone; instead, he/she is the leader of the instructional leadership team. Thus, an instructional leadership team is crucial to guide teaching-learning to attain student academic success (Stamper and Elder, 2019).

The principal needs to take the leading role in forming an instructional leadership team in a school. According to Edwards and Gammell (2016), "by bringing a small group of teachers and instructional coaches together to form an instructional leadership team, a principal can tap into the collective wisdom and energy of the staff to help move a school forward" (p. 20). Thus, the principal must acknowledge that the school needs an instructional leadership team with a group of assistant principals and content expert teachers to meet students' academic achievement needs. The principal must make sure that the instructional leadership team has an expert in each content area taught in the school. The different assistant principals should have expertise in a separate subject of teaching. Then the principal should include experienced and competent teachers based on the needs of the team. Besides, the principal can include the resource teachers of the core subjects (e.g., math, reading) in the team contacting the school district to form a balanced and effective instructional leadership team.

Additionally, the principal can form an instructional leadership team collaborating with other schools in the district. Liou and Daly (2020) define this team as the "Network for the instructional leadership team." According to the authors, this kind of leadership approach brings variety in coaching and guides teachers for various classroom approaches as experts from the different schools with different expertise work on that team.

The motto of creating a leadership team in a school is to support the classroom teachers for their useful classroom instructions. As the team leader, the principal should ensure that every classroom teacher is getting coordinated and balanced support from the instructional team members. The team members also should keep in mind that their work should be learner-focused, and their contribution can make a positive change in the students' academic achievement (Godden, 2019). However, some issues might come up if any member of the leadership team shows authority while supervising rather than support the teachers (Weiner, 2016). Thus, the principal must be careful about these kinds of issues, affecting the teaching-learning environment.

So, in a nutshell, the principal should look for collaboration with one content and pedagogy expert in the subjects taught in the school to form an instructional leadership team. This collaboration might be intraschool and interschool based on the needs of the school.

Managing instructional mismatch

It is uncommon that the principal and the assistant principals have expertise in all subjects they supervise. A supervisor might have in-depth content and pedagogical knowledge in one discipline but has to oversee a grade-level where he/she needs to guide several teachers in several content-based courses. This supervisor will not be able to monitor, coach, or guide all teachers in that grade level, and it is called an instructional mismatch (Fuentes and Jimerson, 2019). According to the authors,

most leaders end up working either with teachers in grade levels they did not teach (e.g. a secondary teacher who becomes an elementary school administrator) or with teachers in unfamiliar content areas (e.g. a former mathematics teacher who supervises social studies and English language arts teachers) (p. 32).

This instructional mismatch is not uncommon, and the instructional leadership team needs to minimize this issue with the following initiatives.

(1) Recruiting assistant principal on content-based (Chitamba, 2019): The principal must hire assistant principals based on their expertise in the subject area that a school needs.
(2) Managing content expert (Ermeling and Yarbo, 2016): Only a principal and a few assistant principals cannot cover all subjects taught in a school. The principal must include content experts (skilled and experienced teacher, resource teacher) in the instructional leadership team for every subject.
(3) Supervising based on content, not the grade level (Fuentes and Jimerson, 2019): As the leader of the instructional leadership team, the principal must make sure that, the instructional team members supervise and assist based on their expertise. An instructional team member should not oversee teaching and learning a subject area where he/she does not have enough knowledge.
(4) Gaining knowledge of a different content-based subject (McNeill et al., 2018): The principal and the assistant principals should gain knowledge on different subjects other than their expertise. When there is a

shortage of experts in the instructional leadership team, they can manage it.
(5) Fostering relationship with content experts outside of the school (Robinson, 2020): The principal should make a good connection with the content experts outside of the school. This relationship will help the principal in including experts in the instructional leadership team.

From the aforementioned discussion on managing instructional mismatch, it is evident that subject-based experts are necessary to assist teachers with content and pedagogy in an instructional leadership team. It will be a mismatch when a person supervises without expertise in that subject. Thus, the principal should manage or develop experts for all subject areas taught in the school to manage instructional mismatch in the supervision.

Fostering teacher leadership to support instructional leadership team

The classroom teacher is one of the most influential persons in students' lives. Thus, the role of a classroom teacher should not be confined only to classroom instruction. These teachers need a leadership role in the overall development of the students (Wilson, 2016). According to the author, teacher leadership refers to the teachers' initiatives to support and improve teaching beyond their classroom. Teacher leadership forms learning teams that engage in a learning cycle that includes analyzing data, setting learning goals, and implementing new instructional strategies to bring students' academic success. Lowery-Moore et al. (2016) say that teacher leadership is not parallel leadership with the school leadership team. It is "just a teacher" to "teacher leader." The authors define teacher leadership as the teachers' "perceptions of personal and professional growth in knowledge, skills, and dispositions, as well as confidence in abilities as change agents who positively influence school environments" (p. 1). According to these authors, teacher leadership can bring out the teachers (a) confidence and well-being as a teacher; (b) a better use of research and assessment to drive curricular and instructional decisions with a concomitant greater awareness of multicultural decision points; and (c) a deeper understanding of the relationship of the classroom and the classroom teacher to the school and the community (p. 5).

The importance of teacher leadership is unquestionable. They are the leader of change in school. Researches show that teacher leadership helps to form professional learning communities to move the school forward and promote students' academic achievement (Jacobs, 2016; Wilson, 2016). Sebastian et al. (2016) say that the school leadership team can promote teacher leadership by engaging teachers in the organizational decision-making process. Berg et al. (2019) propose three programs that the school leadership team can apply to form teacher leadership. These are

(1) Arranging preparatory programs for teachers to enhance their skills that help them to lead teaching-learning.
(2) Positioning the teachers in leadership role based on their expertise.
(3) Formally recognizing the teacher through the award, or other forms of appreciation for their leadership role teaching-learning and other activities that foster students' learning.

Teacher leadership has a positive effect on student outcomes as it has a significant contribution in developing curriculum, designing instructional practices, and assessing learning outcomes in the school (Shen et al., 2020). Similarly, Sebistian et al. (2016) showed that teacher leadership helped the principal to achieve better academic outcomes in the school through their influential works related to classroom instruction.
Thus, teacher leadership is essential in school. This leadership role will empower teaching and learning as the teacher directly connects with the students. They can identify collaboration with other experts and provide significant support to the instructional leadership team. When a teacher gains expertise in a subject area can contribute to the instructional leadership team.

DISCUSSION

The literature review research aims to find answers to how a principal can form an instructional leadership team to bring out the learners' academic success in a school. After reading and rereading a number of scholarly works, this study has found three final themes, and these are (1) forming instructional leadership team with experts, (2) managing instructional mismatch, and (3) fostering teacher leadership to support instructional leadership team.

The first theme shows that the main task of a principal is to lead teaching and learning to achieve the students' academic success. However, a principal alone cannot accomplish this task as the principal does not have expertise in all subject areas taught in a school. Thus, the principal should not be the instructional leader alone. He/she should form an instructional leadership team with the assistant principals and the content experts (e.g., experienced and skilled teachers, resource teachers) to lead teaching-learning.

The second theme shows that the principal must recruit members in the instructional leadership team on each content area that is taught in school. The principal should be strategic in hiring assistant principals based on their expertise in the subjects. Two assistant principals must not be hired who have expertise in the same subject. The

principal then recruits or manages content and pedagogy experts other than the assistant principals' and principal's subject area. As the instructional leadership team leader, the principal should make sure that a specific content expert is monitoring and assisting teachers on that subject.

The instructional leadership team can excellently foster teacher leadership to promote teachers to be creative and make them more meaningfully active in teaching-learning. Lumpkin et al. (2014) say that teacher leadership motivates the teachers to "transform classrooms into learning laboratories where every student is engaged in relevant and well-designed curricular content, every teacher embraces the use of more effective instructional strategies, and authentic assessments provide evidence of rich student learning" (p. 59). The instructional leadership team should engage the teachers in achieving school goals' by promoting teacher leadership. Additionally, through the teacher leadership program, new instructional leaders will come out and serve in the instructional leadership team.

So, the principal's role in forming an instructional leadership team is the most crucial as student academic outcome is the focus of a school. The principal's well-planned activities and well-communication with the assistant principals and the senior teachers who have expertise in the content are needed. The principal should lead the instructional leadership team with integrity. The leadership team must create policies that make them accountable for the activities and so the teachers.

Limitations

The first limitation of this study is that it has used secondary sources as data. Secondly, all of the scholarly works were not empirical studies. Third, this study has not shown any possible challenges for the principal to form an instructional leadership team. So, research can be done to understand the principal's perception and challenges in developing an instructional leadership team in a school.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Berg JH, Horn P, Supovitz JA, Margolis J (2019). Typology of teacher leadership programs. CPRE Research Report. https://repository.upenn.edu/cpre_researchreports/109

Boyce J, Bowers AJ (2018). Towards an evolving conceptualization of instructional leadership as leadership for learning. Journal of Educational Administration 56(2):161-182.

Braun V, Clarke V (2019). Reflecting on reflexive thematic analysis. Qualitative Research in Sport, Exercise and Health 11(4):589-597.

Chitamba N (2019). The role and experiences of deputy principals with instructional leadership in Zimbabwe (Doctoral dissertation, University of the Free State). https://scholar.ufs.ac.za/bitstream/handle/11660/10408/ChitambaN.pdf?sequence=1&isAllowed=y

Clarke V, Braun V, Hayfield N (2015). Thematic analysis. Qualitative psychology: A practical guide to research methods pp. 222-248.

Creswell JW, Poth CN (2018). Qualitative Inquiry and Research design: Choosing among five approaches (4th ed). Sage.

Edmonton Public Schools (2018). Principals as instructional leaders: A review of the literature. Retrieved from https://cassalberta.ca/wp-content/uploads/2018/11/Principal- Leadership-Literature-Review-Final-Version.pdf

Edward B, Gammell J (2016). Building strong school leadership team to sustain reform. Leadership 45(3):20-22.

Ermeling BA, Yarbo J (2016). Expanding instructional horizons: A case study of teacher team-outside expert partnerships. Teachers College Record 118(2):1-43.

Fuentes SQ, Jimerson JB (2019). Tackling instructional mismatch: Targeted intentional learning can build learners' content knowledge. The Learning Professional 40(5):32-35.

Forsyth DR (2018). Group dynamics (7th ed.). Cengage.

Godden K (2019). Hoe principal supervisors build principal capacity for instructional leadership (Doctoral dissertation, Western University). The Organizational Improvement Plan at Western University. https://ir.lib.uwo.ca/oip/81

Gurley DK, Anast-May L., O'Neal M, Lee HT, Shoes M (2015). Instructional leadership behaviors in principals who attended an assistant principals' academy: Self reports and teacher perceptions. Planning and Changing 46(1-2):127-157.

Heffernan A, Longmuir F (2019). 'A school full of instructional experts': Share instructional leadership in rural schools. Leading and Managing 25(2):1-13.

Horng E, Loeb S (2010). New thinking about instructional leadership. Kappamagazine.org 92(3):66-69.

Horng E, Leob S, Minditch D (2010). Teachers support seeking behavior and how they are influenced by school leadership. School Leadership Research, Working Paper 10-5. Institute for Research on Education Policy and Practice, Stanford University.

Jacobs M (2016). Teacher leadership and curriculum studies: A course profile. Liberal Arts 21(1):12-19.

Lashway L (2002). Developing instructional leaders. ERIC digest. ERIC Clearinghouse on Educational Management Eugene OR, ED466023.

Lowery-Moore H, Latimer RM, Villate VM (2016). The essence of teacher leadership: A phenomenological inquiry of professional growth. International Journal of Teacher Leadership 7(1):1-16.

Liou Y, Daly AJ (2020). The network leader: understanding peer influence in a system wide leadership team. School Leadership and Management 40(2-3):163-182. https://doi.org/10.1080/13632434.2019.1686611

Lumpkin A, Claxton H, Wilson A (2014). Key characteristics of teacher leaders in school. Administrative issue Journal 4(2):59-67.

McNeill KL, Lowenhaupt RJ, Katsh-Singer R (2018). Instructional leadership in the era of the NGSS: Principals' understandings of science practices. Science Education 102(3):452-473.

National Association of Elementary School Principal (2001). Leading learning communities: Standards for what principal should know and be able to do. Virginia, Alexandria.

Robinson M (2020). Instructional Leadership of Elementary School Principals Regarding Proficiency in Mathematics (Doctoral Dissertation, Walden University). Walden university scholarly works.

Salo P, Nylund J, Stjernstrøm E (2015). On the practice architectures of instructional leadership. Educational Management Administration and Leadership 43(4):490-506.

Sebastian J, Allensworth E, Huang H (2016). The role of teacher leadership in how principals influence classroom instruction and student learning. American Journal of Education 123(1):69-108.

Sebistian P, Nylund J, Stjernstrøm E (2015). On the practice architectures of instructional leadership. Educational Management Administration & Leadership 43(4):490-506.

Shen J, Wu H, Reeves P, Zheng Y, Ryan L, Anderson D (2020). The association between teacher leadership and student achievement: A meta-analysis. Educational Research Review 100357.

https://doi.org/10.1016/j.edurev.2020.100357
Snyder H (2019). Literature review as research methodology: An overview and guidelines Journal of Business Research 104:333-339.
Stamper J, Elder S (2019). Building impactful instructional leadership team that bolster student growth and achievement [Session 3]. National Youth At-Risk Conference, Savannah, GA, United States.
Thessin RA (2019). Establishing productive principal/principal supervisor partnerships for instructional leadership. Journal of Educational Administration 57(2):463-483. https://doi.org/10.1108/JEA-09-2018-0184
Wagner T, Kegan R, Lahey L, Lemons RW, Garnier J, Helsing D, Howel A, Rasmussen HT (2006). Change leadership: A practical guide to transforming our schools. John Wiley and Sons.
Weiner JM (2016). Under my thumb: Principal's difficulty releasing decision-making to their instructional leadership team. Journal of School Leadership 26(2):334-364. https://doi.org/10.1177/105268461602600206
Wilson A (2016). From professional practice to practical leader: Teacher leadership in professional learning communities. International Journal of Teacher Leadership 7(2):45-62.

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Influence of cultural values on rural girls' education in Zambia: A pairwise case of the Bemba and Tonga ethnic groups

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The aim of the study was to profoundly gain understanding into specific cultural values that underlie traditional practices which pose as barriers to rural girls' education in Zambia. A pairwise case study approach was used to identify and describe types of cultural values prevalent in the Bemba and Tonga ethnic groups of Zambia. A total of 28 interviews (16 focus group discussions and 12 key informant interviews) were carried out with community members and school heads in Choma and Kasama, to verify specific proximate barriers associated with school-going girls. Thematic data analysis was performed using NVivo 12. The study identified six broad values that the two ethnic groups mutually desired. Security and protection, purity and propriety of a woman, conformity, respect, generosity and hard work. Conversely, power and possession, and unity were specific to Tongas and Bembas, respectively. The value of "unity" portrayed more impetus than that of "power and possession" to restrain girls from attending school. While both social groups indicated desire to uphold these values, modes of value expression and collective practices were clearly differentiated. The study established that specific practices and norms chocking rural girls' education are performed through the process of cultural value activation. Further, the study demonstrates that cultural values have underlying associations with rural girls' education advancement especially at higher ages. Gaining detailed knowledge of cultural values underpinning specific social groups through case study research is important in order to inform the design of more effective girls' education promotion interventions.

Key word: Cultural values, rural girls' education, ethnic groups, traditional practices, norms, Bemba, Tonga.

INTRODUCTION

Education presents some of the vivid examples of discrimination and barriers that women encounter. Everyday, more than 62 million girls in developing countries face hurdles that stand in their way to achieving an education (Plan International, 2019). Among several barriers, poverty, the need for girls to help with family

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chores, cultural assumptions and norms, informed by underlying cultural values, frequently play a complex role in inhibiting girls' school attendance in many regions and communities especially rural ones. Access to quality education is one most potent equalizer of opportunity for both rural and urban adolescents. But the magnitude of challenges rural girls face is enormous. While poverty and house minding roles could be addressed through select programme interventions, cultural norms are inflexible and difficult to change (Rahman and Westley, 2001). Fundamentally, norms are rules about what persons ought to or not to do in given circumstances, enforced by the threat of sanctions in the case of transgression (Thome, 2015). Community and family norms are typically anchored on various (and often competing) values. These values are considered to play crucial roles in motivating and guiding human action and to be constitutive elements in the construction of personal and collective identities (Thome, 2015). Values stand at the very core of human decision-making. The traditional value emphases express conceptions of what is good and desirable, the cultural ideals (Hofstede, 2001; Markus et al., 1991; Schwartz, 1999; Yu and Yang, 1994).

The effect of cultural misgivings about girls education is evidenced to account for a considerable proportion of absenteeism and dropouts in many regions because of practices such as young girls serving as principal caregivers for younger siblings or forced child marriages (Kainuwa and Najeemah, 2013; Moletsane, n.d.; Stark, 2018; UNICEF, 2015). School dropout rates have remained worrisome to the advancement of girls education in Zambia. In 2014, the number of out-of-school girls doubled that of boys at 44, 451 to 22,590 among lower secondary school pupils with rural children more likely to be out-of-school at 14.6% in rural areas compared with 8.1% in urban areas (UNICEF-Zambia, 2014). At the regional level, initiatives like the 2010 Global Initiative on Out-of-School Children have been launched to create a regional impetus to accelerate efforts to achieve primary education for all children (UNICEF, 2013). To augment regional efforts, a number of country initiatives have been implemented to curb entrenched intricacies, including cultural norms that constantly deter anticipated progress. In 1997, Zambia's Ministry of Education introduced a school re-entry policy as a strategy to bring back school-going girls that dropped out due to pregnancies (MOE, UNICEF, 2004). While the re-entry policy has had its positive scores, the effect of cultural practices and norms like child marriages are a tenacious deterrent to rural girls' schooling. Another intervention, Keeping Girls in School (KGS), was aunched in 2016 targeting 14,000 secondary school girls to remain in school (MoGE, 2017). However, besides regional and government initiatives, family support acts as a powerful tool for boosting student motivation, and is one crucial element in improving girls' education outcomes. This study aimed to investigate the underlying cultural values expressed as practices that affect rural girls' school progression in Zambia.

METHODOLOGY

Study design

A pairwise case study approach was used to explore and identify types of cultural values practiced among the Bemba and Tonga ethnic groups and further understand the underlying essence of such values. The pairwise case was appropriate considering differences in social systems of lineage. Bemba's are a matrilineal group where, among other things, a prospective husband is expected to pay bride-wealth and after marriage, the marital residence for the couple is a woman's village. By contrast, Tongas are patrilineal, where newlyweds take up a man's village as the marital residence.

Study setting

The study was conducted in Kasama and Choma districts, the main provincial towns of Northern and Southern provinces of Zambia. Kasama is predominantly inhabited by the Bemba ethnic group and Choma, by the Tonga people. In 2015, Northern province had a population of 1,430,543 with a population density of 18.4 persons/km^2 and a total of 1,421 schools (CSO and MOH, 2014; Global Data Lab., 2015). In 2011, the annual number of Out of School children between ages 7 and 15 was 22,348 (Central Statistical Office (CSO) [Zambia], Ministry of Health (MOH) [Zambia], 2015). Southern province had a slightly higher population (1,852,361) with population density of 27.1 persons/km^2 (Central Statistical Office, 2010). Education statistics show that in 2010, the province had a total of 1, 155 schools; 30,390 out of School Children between the age 7 and 15 (MoGE, 2010).

One urban and one rural community site were selected from each town for investigation. Considering that the target districts are largely rural, the criteria for selection of a rural community were location. The community had to be located at least 45 km away from the main town and a minimum of 15 km away from the main road. In terms of amenities, the selected community had no access to piped water, electricity, postal services and a police station and the opposite was considered for selection of urban communities.

Participant recruitment and procedure

The study used a purposive sampling technique to recruit the participants. Two types of participants targeted by the study were community members, who participated in focused group discussions (FGDs) and in-depth interviews (IDIs), and teachers, who were interviewed as key informants. A description of the study,including the purpose, the voluntary nature of participation and how to register to participate, was shared with would-be participants in community gatherings such as church meetinggroups and central trading areas. Individuals who expressed willingness to participate in the interviews were invited to participate and recruited. Courtesy visits were paid to community/traditional leaders; this opportunity was used to extend invites for interviews. Altogether, 12 FGDs, 12 key informant interviews (KIIs) and four IDIs were carried out with an equal number in each of two study sites. Homogeneity in sex composition of FGDs was necessary to allow for open discussions. Therefore, interviews were stratified into three groups: "women group", "men group" and "mixed group" for

Table 1. Value type and central motivational goal.

Value type	Central motivational goal
Achievement	Personal success through demonstrating competence according to social standards.
Benevolence	Preserving and enhancing the welfare of those with whom one is in frequent personal contact
Conformity	Restraint of actions, inclinations, & impulses likely to upset or harm others & violate social expectations or norms.
Hedonism	Pleasure and sensuous gratification for oneself.
Power	Social status and prestige, control or dominance over people and resources.
Security	Safety, harmony, and stability of society, of relationships, and of self.
Self-Direction	Independent thought and action; choosing, creating, exploring.
Stimulation	Excitement, novelty, and challenge in life.
Tradition	Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self.
Universalism	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

Source: Adapted from Schwartz & Bilsky, 1990's ten value motivational goals of the Values Theory

both rural and urban communities.

Research instruments

To facilitate group discussions, semi-structured discussion guides were developed for the three types of interviews. The guides were decisive for maintaining consistency across all levels of interviews in the two locations. To validate for cultural equivalence in meaning, an instrument validation discussion session was held with community leaders in two study sites: Kasama and Choma. Participants to this discussion were selected on the criteria of competence and experience to comprehend, translate, and speak in relation to the two languages.

Data analysis

Analysis of data was performed in NVivo 12. All 28 voice recordings were transcribed from Bemba and Tonga to English. Seven major nodes were created for data processing. They included cultural values on family, death, marriage, rites of passage, education and livelihood. These were helpful in ensuring that small pieces of important information from participants were captured for analysis.

In order to understand and present gathered data, the study utilized the Values Theory in which values are defined as desirable, trans-situational goals, varying in importance whilst serving as guiding principles in people's lives. The theory describes ten motivationally distinct values based on three human conditions requisites regarded as universal (schwartz and bilsky, 1990). Table 1 describes the ten basic values that social groups seek and their motivational goals.

The Values Theory is further used in the discussion in form of the Values Conceptual Framework to exemplify the linkage between cultural values and the effect they present on girls education prospects. The study identifies some important values that align with those in the theory although not in perfect order and specificity as enlisted in Table 1.

RESULTS

Background characteristics

A total of 105 participants took part in interviews, 89 in 12 FGDs, 12 in KIIs and 4 in IDIs. The age range for urban participants was wide (23 to 76 years) compared to the rural participants (34 to 70 years). Over three-quarters (77.5%) of participants indicated that they were married with few (9.0 and 5.6%) reporting having ever been married but were currently widowed or divorced, respectively (Table 2). Results also reveal that about 35% of Tonga men were in polygamous marriages compared to less than 5% Bemba men.

Table 2 further illustrates that overall, the majority (34.8%) of participants had attained primary as highest level of education. More (14.6%) participants from Choma rural had attended primary than secondary education (5.6%), while 31.5 and 6.7% had attended secondary and primary level education, respectively among Choma urban Choma discussants. Education attendance proportions were similarly higher for primary (10.1%) and secondary (10.1%) for rural and urban Kasama participants, respectively.

Cultural values identified in the Bemba and Tonga ethnic groups

In line with Schwartz and Bilsky's value types in Table 1, the study identified two categories of values: *common values* – desired cultural goals which were generally comparable between the Bembas and Tongas, and *distinct values* – goals that seemed quite discrete between the two social groups in terms of emphasis and expression.

Common values

Six broad values commonly practiced by the Bemba and Tonga ethnic groups were identified. They include: security and protection, purity and propriety of a woman, conformity (to expected ignorance on matters of sex and

Table 2. Summary of interview types and background characteristic.

Type of Interview	Overall, (%)	Proportion (%)			
	n=105	All Tonga Males	All Tonga Females	All Bemba Males	All Bemba Females
FGDs	89 (84.8)	19 (18.1)	24 (22.9)	18 (17.1)	28 (26.7)
KIIs	12 (11.4)	2 (1.9)	4 (3.8)	5 (4.8)	1 (.95)
IDIs	4 (3.8)	2 (1.9)	0 (0.0)	2 (1.9)	0 (0.0)
Total	105 (100)	23 (21.9)	28 (26.7)	25 (23.8)	29 (27.6)
Characteristics	**n=89**	**Choma Urban**	**Choma Rural**	**Kasama Urban**	**Kasam Rural**
Sex					
Male	37 (41.6)	7 (7.9)	11 (12.4)	8 (9.0)	11 (12.4)
Female	52 (58.4)	12 (13.5)	16 (18)	10 (11.2)	14 (15.7)
Marital status					
Single	7 (7.9)	2 (2.2)	0 (0.0)	4 (4.5)	1 (1.1)
Married	69 (77.5)	15 (16.9)	24 (27.0)	12 (13.5)	18 (20.2)
Widowed	8 (9.0)	2 (2.2)	1 (1.1)	0 (0.0)	5 (5.6)
Divorced	5 (5.6)	0 (0.0)	2 (2.2)	1 (1.1)	1 (1.1)
Educational level					
No education	22 (24.7)	1 (1.1)	8 (9.0)	2 (2.2)	11 (12.4)
Primary	31 (34.8)	6 (6.7)	13 (14.6)	3 (3.4)	9 (10.1)
Secondary	28 (31.5)	9 (10.1)	5 (5.6)	9 (10.1)	5 (5.6)
Tertiary	8 (9.0)	3 (3.4)	1 (1.1)	4 (4.5)	0 (0.0)

reproduction among children), respect, generosity and hard work. Although both social groups indicated desire to attain these motivational goals as eminent, ways in which they expressed the desire and primacy assigned to each of these goals or values was varied.

Security

Enlisted as one of the value types of the Values Theory, security refers to the state of feeling safe from danger and harm (Brauch, 2011). In the Bemba and Tonga traditions, ensuring security and protection for households, possessions and assets were essential and a preserve of men. Upon marriage for example, in the Bemba culture, a man is presented with an axe and a hoe from the wife's family to denote relegation of the 'tools of security'. Similarly, in the Tonga culture, a spear is handed out to the groom. The perception of security in this sense is not narrowed to body harm protection but encompasses security for food and property.

Propriety of a woman

This value is highly accentuated in both the Bemba and Tonga tradition. During the FGD with Bemba rural women, they revealed that a woman is considered as 'an asset' of a household and a major factor to family unity. The assertion is stated as follows:

"in our culture, a woman symbolizes an important asset such that if that asset is missing in a home, then that home is incomplete. A woman's good character is therefore important in many aspects including marriage and family unity".
Bemba woman (Women FGD) – Kasama rural community

This value is much broader than the value types shown in Table 1. It actually embraces four different value types, namely achievement, benevolence, conformity and tradition. It was emphasized among men and women in rural Kasama and Choma that "*propriety"* represented good behaviour, and a crucial selection criterion for a bride by the man's family.

Conformity (to expected ignorance on matters of sex and reproduction among children)

Both ethnic groups believed details reproduction are better saved for grown up and more mature children in order to maintain sound morals among young people and within society. For this reason, any aspect of life that attempts to unsettle this belief becomes undesirable. Education, in this sense turns to be the major culprit.

"school interferes with our norms because children are taught a lot of things that we would otherwise prefer to withhold or delay to share with children until they are of age. For instance, what sex is, how children are conceived and so on…in school children are taught all these as around fourth or fifth grade when they are really young"
Bemba man (Men FGD) – Kasama Urban Community

Generosity (Benevolence)

Generosity is identified as an independent value type in the Values Theory. And this value came out as one prominent value desired in both Bemba and Tonga cultures. Generosity was particularly a required virtue in women. It was also highly perceived as a motivational goal for unity in families and communities especially for the Bembas.

"we are different from other tribes because when [somebody] visits a home in the Bemba land and you find us eating, we will not ask you to wait until we prepare you your own food because we did not count you in. Even when food is little, we believe in sharing; Bemba people would rather leave the food for visitors to eat than not share"…
Bemba man (All FGD) – Kasama rural community

Respect

This value was found to invoke esteem and confidence in the recipient. Even if the Values Theory categorizes respect under the 'tradition' value type, 'respect' was perceived more than simply tradition in the Bemba and Tonga cultures. This signified control or dominance over people and resources and was mainly a responsibility of girls and women to ensure boys and men were highly respected.

"we Tongas, … when a girl child reaches puberty we keep that girl in the house and in that house she is taught how she is supposed to grow up, the respect that she is supposed to have for [towards] people and in her home when she is married".
Tonga woman (mixed FGD)-Choma rural community

"respect is very important in our culture, to emphasize the importance we Bemba people use the proverb "ubufumu buchindikwa nabene" [translated as "a chiefdom is respected by its own people"] which means that if a wife respects her husband, it becomes easy for such a man to command the respect of other people. Lack of respect from a wife brings shame and disunity in the family".
Bemba woman (Women FGD) – Kasama rural community

Hard work

In both traditional customs, hard work was greatly revered. Often times, hard work was as a yardstick for choosing a suitable future wife. If a prospective husband is proved not hard working enough, the girl's family would rescind their approval to give their daughter for marriage. For Tongas, hard work is an important value. A woman considered not hardworking enough can even jeopardize her marriage by making the husband seek out for additional spouses.

Distinct values

Power and possession, as a motivational goal among others, stands out as a core value type in the Value Theory. In the study, Tongas were found to believe a great deal in the accumulation and ownership of property as a sign of hard work and wealth. Almost every household in rural Choma owned at least a dozen cattle, goats and tens of chickens. This somewhat explains why average sized farming plots seemed approximately three times larger than those of the Bembas. Whereas having more than one wife in the Bemba culture was not widely accepted, polygamy was a sign of power and wealth for Tonga men.

"*the main reason for marrying more than one woman is that you want to increase the family in terms of labor. It is not our culture to pay for extra labor required, like other cultures do, you need to simply own enough of it".*
Tonga man (All FGD) – Choma Rural Community

Both men and women felt polygamy was a desired practice for farming and many household chores. Since values are said to assume a hierarchical system (Caldwell, 1982; Sen, 2007a), although the study did not specifically identify components of the values order, power and possession especially among Tongas showed prominence relative to other values types.

It was observed that of all values mentioned, *Unity* was highly emphasized among the Bembas. Despite that this value is not represented as a core value type in the Values Theory; *Unity* is believed to be a central motivational goal that embraces sub values such as benevolence, respect, security and hard work. To promote unity in the Bemba tradition, a special hut called "Insaka" is built. Members of the extended family regularly meet in the "Insaka" for communal meals and social times. Three or four households within a village would have meals prepared separately but all brought to the "Insaka" to eat together, although it is rare for women to eat with men in the same "Insaka", women would sometimes join men on special times for socializing. "Insaka" are places used by elderly people to pass knowledge, share cultural values and give counsel to

younger generations or even fellow elders. Respect, generosity, hard work and security which are the other values significantly desired and at the same time reinforced by the unity value and motivational goal.

How values are activated into expressions and actions

The crucial content aspect that distinguishes between values is the type of motivational goal they express. Norms, beliefs, actions and attitudes are modes of expression used for the purpose of coordination among cultural group members in the pursuit of goals that are deemed important. In congruent with this view, the study established that even with values identified to be common in the Bemba and Tonga cultures, variations in the type of actions and practices stimulated in pursuant of different motivational goals were evident.

The central value of tradition in the Values Theory, which embodies respect, hard-work and unity as motivational goals identified as core values in this study, is activated through, among other actions, rites of passage practices. In the Bemba culture, when girls become of age they are put on house detention for no less than a month. This is to allow for proper initiation from childhood to adulthood by elderly women. The study established that Bembas place a higher priority on respect, hard work and unity motivational goals than Tongas do. The Bemba ethnic group expresses great emotional attachment to rites of passage and is willing to keep a girl in a house for a possibly longer period. This practice helps to build, in young women, characters that bring honour to her family and is desired for marriage and in society.

"*according to the Bemba custom, when a girl becomes of age, we teach her about her own hygiene and that of those around her. Most importantly, she is taught how to respect a man [husband-to-be] and how well to receive her husband-to-be's family.*"
Bemba woman – Kasama rural community

"*in our culture when a girl is of age, elderly women keep her in the house for about 4 weeks where she is taught on matters of life and well- being. During the period of incubation in the house, the girl is taken to the bush for at least a week, there they teach her to dance and she is also oriented to different traditional medicines that women use in marriage.*"
Bemba woman – Kasama rural community

"*the time a girl begins to menstruate, she is kept in the house for a few days. This is where she is taught how to take care of a family especially the husband and also how to be charming in receiving the husband-to-be's relations…"*
Tonga woman – Choma rural community

It was observed that in rural compared to urban areas, girls are kept in the house for longer periods within the same ethnic group.

"*yes, a girl is kept in the house for just about three to four days and she's ready to go even go to school unlike in the village where a girl would be locked up in the house for a month. It is an important practice for orientation into adulthood…*"
Bemba woman – Kasama urban community

In order to activate values of power, respect and unity, both the Bembas and Tongas assign distinctive roles to men and women. It was observed that even though identified values were collectively desired goals, pursuing the achievement of social motivational goals depends on what goal or value it is. Values such as power and possession and security, were defined as masculine while benevolence, conformity and tradition as largely feminine. A man is considered the sole head of a household and his task is to provide basic needs while that of a wife is subservience to the husband and managing the welfare of a home.

"as a Bemba tribe, it is our culture that a man is the head of the house; thus, it is also our culture that a woman is submissive and respectful to her husband…"
Bemba man (Men FGD) - Kasama rural community

Given that men are traditionally assigned a superintendent role over the affairs of a household and communities, it was evident that parents in both social groups felt permitting boys and young men to take up opportunities which assured better income prospects in future was desirable. It was observed that men were less supportive of the idea of sending girls to school than were women contending that women are subservient beings and encouraging education would lead to an extinction of this important virtue about them. On the contrary, women participants in both ethnic groups consistently referred to the benefits that accrue to the family when a girl is educated as more important.

"a man is the head of the house and his role is to provide for his household and larger family circle. So, parents prefer that the head of the household should be educated in order for him to provide adequately and remain in control."
Tonga man (Men FGD) - Choma rural men community

"just as my friends have already said, a boy child whether he is educated or not does help but not as much as a girl child. When he gets married, he cares more for the wife's family while a girl child will help you should you face any problem…"
Bemba woman (Women FGD) Kasama urban community

Education for girls was perceived to conflict with the

achievement of power for men, benevolence and tradition values. In both cultures, education gives women much leverage to challenge men's social roles which is a clear conflict with the values of tradition and conformity.

"nowadays a man has become less powerful because of education… a woman is not supposed to be at the same level [social and economic] as a man. A man should be able to ask his wife not to do something and she should obey. But at the moment, because of rights and education, a wife can even answer her husband back … If possible, let women be uneducated so that we can live as one [in unity]".
Tonga man (All FGD) - Choma rural community

The study found that Tongas were more engaged in medium to large scale farming than Bembas who mainly engaged in subsistent farming. For Tongas, polygamy was a norm practiced in tandem with the prominent values of power, wealth accumulation, security and possession. To achieve these values, Tonga men are encouraged to marry several women and have more children. Although polygamy existed among Bembas, it was not as widespread and mainly practiced as a result of death, sickness or old age of a married woman.

"polygamous marriages are encouraged especially in villages [rural communities] because there is too much work so men need to marry more than one wife so that they help each other in farming."
Tonga man of Choma (Men FGD) - Choma urban community

"we Tongas are in polygamous marriages because of too much work. Each family has several farms such that one woman would not manage to work all by herself; for example, in a field or farm as big as 10 ha. Therefore, we marry more women in order for them to help with farming…"
Tonga man (mixed FGD) - Choma rural community

The practice was enlisted as a norm of selecting a future wife and more prominent in the Tonga culture than was in the Bemba. Parents of a man have a task to search in the village for a woman with virtues befitting their desired son's wife. Among merits considered for selection were good behavior, respect and hard work. For this reason, it was incumbent upon families with daughters to ensure their girls are nurtured right. If girls of a particular family were perceived to fall short of the ascribed standards, the family was ridiculed.

"*the reason why parents choose that their son marries a certain family is because some families have problems such as mental illnesses, bad behavior and so on… parents would rather choose for their sons because they better understand more about the conduct of families and behavior of girls in their localities"*.
Bemba man (Men FGD) – Kasama rural community.

"*parents can tell that that home is peaceful, which means that is the home where our son should marry from. The decision was only reached after consultation with the traditional fortune teller. Then, when they did that, you would find that marriages lasted a lifetime."*
Tonga man (All FGD) – Choma rural community.

"parents would organize a girl for you without you knowing. You only came to know her when your parents inform you … Usually you cannot reject your parents' choice, so you just go ahead to marry."
Tonga man (All FGD) – Choma rural community.

At times girls are secured for marriage by a man's family long before their puberty. The girl could be as young as five to eight years old. As soon as the girl reaches menarche, her family gives her in for marriage. This is mainly done to avoid premarital sex. The practice helps to preserve the value of 'purity and propriety of a woman' which brings a sense of pride and honour to the woman's family.

"*girls do not go far in school because they get engaged for marriage even before they become of age, the parents to the girl would not allow her to go to school because they wanted to enjoy the dowry…"*
Bemba woman (All FGD) – Kasama rural community.

"pregnancies are not rampant; we only get like two cases each year or sometimes we do not even record any but still dropout rates are high for girls. It's like girls just do not have interest in school."
Head teacher, Kasama urban.

"… from grade 1 to 4 we hardly lose any of the [girl] children except for transfers and deaths, but not dropouts. We start having challenges from grade six, that's where we lose more girls because they go into early marriages"
Head teacher, Kasama rural.

DISCUSSION

In order to fully understand the effect of cultural values and value judgments on girls schooling, we used the four linking processes as stipulated in the Values Theory. The Values Conceptual Pathway in Figure 1 elaborates the process.

Upholding traditional stereotypes such as the 'son preference' for educational support are subtle ways through which the study finds value activation to occur. This finding is consistent with several studies and specifically what Mollel and Chong (2017) found in Tanzania, where 70% of parents preferred to educate boys than girls (Hatlebakk, 2017; Mollel and Chong,

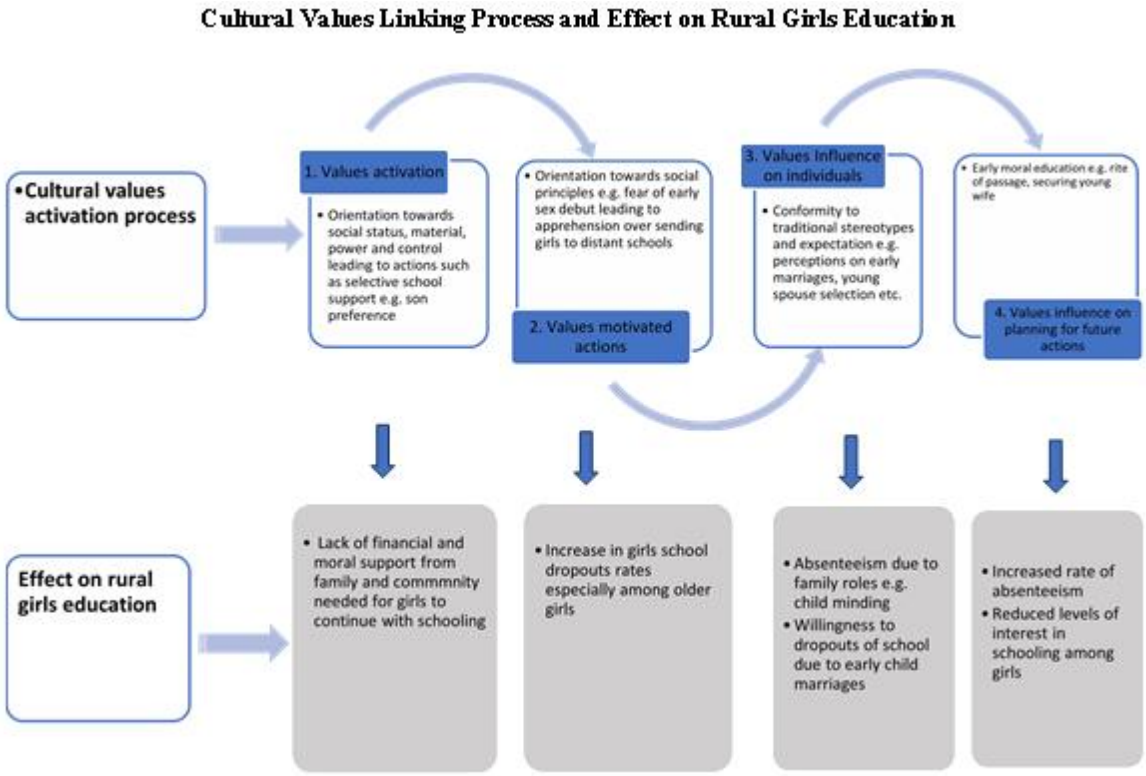

Figure 1. Cultural values linking process and effects on rural girls education.

2017; UNFPA, 2010). Parents in the Tonga culture particularly, revealed that sending a girl to school would not benefit them much because even if she were educated, upon marriage, the husband and his family would become primary beneficiaries of their daughter's future earnings. As shown in Figure 1, orientation towards material gain and fear of uncertain repercussions for supporting daughters' education make parents less willing to send girls to school. Withdrawal of financial and social support by parents leaves many girls without options but to drop out of school.

According to Feather (1988), individuals or social groups are improbable to act unless they are assertive about their capacity to undertake an action and that it will produce preferred results (Feather, 1988). This element explains the fear that parents expressed during the study for unsanctioned sexual debut or premarital sex. Sending girls, especially teenage girls, to school in the rural areas means allowing them freedom to walk long stretches to and from school without a watchful eye (UNGEI, 2014; World Bank Group, 2015). Study participants expressed that overtime girls become acquainted with regular interactions with males, a habit which ultimately predispose them to indulge in premarital sex. This phenomenon is not alien per se. Another study by, Burde and Linden (2013) discovered that demand for education for both boys and girls was present in a small village in Northwestern Afghanistan, yet because of conservative cultural norms, a family would not be willing to send their daughters to school if the school was located outside the village (Burde and Linden, 2013). The second link (2. Values Motivated Actions) in Figure 1 illustrates imminent consequences.

Parsons and Bales (2014) also argue that the allocation of women to nurturing roles reduces competition and preserves family harmony, both important factors in attaining the unity value (Parsons et al., 2014). Women assume more "expressive," person-oriented roles whereas men engage in and learn more "instrumental," task-oriented roles. Childbearing, for example, assures continuity of an ethnic group and thus brings stability in a marital union. This expectation fulfils the central value of security of culture. Because of the type of roles women are assigned, psychoanalytic theorists contend that "*women are more related and more affiliated with others than men, whereas men are more autonomous and more individuated*" (Chodorow et al., 2013). Even if parents understand the value of sending girls to school, so long as they are unable to control for or prevent adverse effects, they will remain diffident about supporting their daughters (Saraswati, 1999). Such altitudes contribute substantially to girls school dropout rates (UNFPA, 2010). A report by UNICEF (2014) reaffirms that among children aged 14 to 15, the proportion of females who were out-of-

school was almost twice that of males, 14.8% compared to 8.9%, an outcome attributed to high drop outs of girls from fifth grade onwards leading to fewer girls than boys transitioning to eighth grade in Zambia (UNICEF, 2014).

The third linking process illustrates that cultural values influence individuals' and social groups' definition of situations in light of values they hold important. Different values usually suggest different actions and as such, attention, perceptions and interpretations of situations will depend on the underpinning values of a specific social group. Two cultural practices found in both Bemba and Tonga traditional groups that can be explained using this process are parents' interest and support for early marriages and young spouse selection. In order to curb premarital sex, parents perceive early marriage as a desired solution. The Overseas Development Institute (ODI) report on early marriages in Ethiopia found parental preoccupation with the risk of rape, premarital sex and unwanted pregnancy were among key drivers of early marriage (Jones et al., 2014). To an extent where parents perceive early marriage as a way to 'protect' their daughters from defamation or shame, but more importantly, to protect their reputation or family honour (Boyden et al., 2012; Bunting et al., 2016; Erulkar, 2013; Jones et al., 2014; Tefera et al., 2013). Similar study results have been reported in Tanzania (Mmari, 2013; Stark, 2018), Malawi (Clark and Poulin, 2007; Swidler and Watkins, 2007), South Africa (Moletsane, n.d.) and several other countries in the African region (Bayisenge, 2010; Johnson-Hanks, 2007; Juma, 2014; Kainuwa and Najeemah, 2013; Stephens, 2000; Temba et al., n.d.; UNICEF, 2015). The effect of these practices on the advancement of rural girls' education is appalling. No sooner are girls informed they are brides-in-waiting, than they lose interest in school and anxiously begin to anticipate marriage life. This situation, again, directly contributes to increased school dropouts among girls especially those who reside in rural areas (UNICEF, 2015).

The fourth process of the value theory reveals the influence cultural values have on planning for action such that important goals induce stronger motivations to plan thoroughly. This process helps to explain why in our study both the Bemba and Tonga cultures plan to coach girls at young ages about taking care of their wellbeing and those of others particularly men. We find that Bembas regard '*Unity*' as a central value in their matrilineal system, all factors that matter in ensuring that this value is upheld are effectively planned for. One prime opportunity observed is the rites of passage when girls attain menarche. A girl is detained in a house for up to a full month, to adequately prepare her for responsibilities of motherhood and being a wife in ensuring that the values of '*unity*' and '*respect*' are comprehensively tutored and internalized. The effect of this practice on education is twofold. In the immediate term, it will contribute to absenteeism from school which later affects performance depending on the length of time the girl is kept in the house and away from school (Mollel and Chong, 2017). In the intermediate term, the practice contributes to loss of interest in school as girls are overwhelmed with new information. Tongas with their patrilineal system and central focus on '*power and possession*' values also shared the view that it was imperative to marry off a girl as soon as she attained menarche. The preoccupation here includes bride price. Bride price among Tongas often comprises several cattle and money which add to the girl's family possession and wealth. If at the moment of menarche, the girl was enrolled in school, the chances are that pressure from family and her peers for marriage would raise the chances of her dropping out of school (UNICEF, 2014).

From a capability perspective, Sen (2007a, b) argues that poverty, "*is a 'capability failure' in achieving certain vital functioning up to a minimally adequate standard*" (Sen, 2007b). Although what constitutes basic capabilities is not absolutely clear, value judgments of individuals and groups of people are essential in distributing resources and opportunities to potential beneficiaries. Understanding specific values that make social groups hold certain value judgments is important for social development. The study findings suggest a causal link between cultural values and behaviour towards a variety of stimuli. It identifies some common values in the Bemba and Tonga cultural groups and the deep commitment they possess to uphold these beliefs. Such cultural inclinations ignore the lifelong benefits that come with educating girls. The World Bank in 2013 estimated that, an extra year of secondary schooling for girls could increase their future wages by 10 to 20%; women with secondary education had, on average, 1.5 fewer children than those with primary schooling; and that secondary education reduced the vulnerability of girls from several forms of abuse, among other benefits (World Bank, 2013). In this study, we find that both groups initially allude to education for girls as conflicting with the achievement of values of '*benevolence and tradition*' and '*power and possession*'. When a girl is educated, the two cultural groups remonstrate the difficulty to completely own their girl and adequately inculcate values of '*respect*' and tradition (Rihani, 2006; UNGEI, 2014). Therefore, any kind of intervention aiming to promote girls' education in these communities, would not have an auspicious outlook if implementers do not keenly understand the value make up of ethnic groups especially rural ones.

Conclusion

The study was to gain detailed understanding of cultural values that underlie traditional practices and norms which pose as barriers to rural girls' education using the case of the Bemba and Tonga cultural groups of Zambia. The

study finds fundamental association between education attainment for girls in rural areas and entrenched cultural values which activate a variation of actions often expressed as practices, beliefs or norms. These traditional actions align with different motivational goals to an extent where even ethnic groups thought to have related traditional customs may possess distinctive underlying cultural values. Evidence from this study revealed such distinctions among the Bembas and Tongas which ultimately impede girls education. Therefore, in order to inform the design of effective and target specific girls' education advancement interventions, cultural obstacles specific to regions and communities of interest must be fully and accurately investigated through case study research.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Bayisenge J (2010). Early marriage as a barrier to girl's education: A developmental challenge in Africa. Girl-Child Education in Africa.

Boyden J, Pankhurst A, Tafere Y (2012). Child protection and harmful traditional practices: female early marriage and genital modification in Ethiopia. Development in Practice. https://doi.org/10.1080/09614524.2012.672957

Brauch HG (2011). Concepts of Security Threats, Challenges, Vulnerabilities and Risks. https://doi.org/10.1007/978-3-642-17776-7_2

Bunting A, Lawrance BN, Roberts R (2016). Something Old, Something New? Conceptualizing Forced Marriage in Africa." In Marriage by Force? Contestation over Consent and Coercion in Africa.

Burde D, Linden LL (2013). Bringing education to afghan girls: A randomized controlled trial of village-based schools. American Economic Journal: Applied Economics. https://doi.org/10.1257/app.5.3.27

Caldwell JC (1982). Wealth Flows Theory of Ferility Decline. In R. Mackensen (ed) Determinants of fertility trends: theories re-examined. In R. Mackensen (Ed.), International Union for the Scientific Study of Population. Liege: International Union for the Scientific Study of Population.

Central Statistical Office (CSO) [Zambia], Ministry of Health (MOH) [Zambia], and I. I. (2015). Zambia Demographic and Health Survey 2013-14. Retrieved from http:www.zamstats gov.zm;

Central Statistical Office (CSO) (2010). 2010 Census of Population and Housing Aurora. pp. 1-99.

Chodorow NJ, Rocah BS, Cohler BJ (2013). What is the relation between the psychoanalytic psychology of women and psychoanalytic feminism? In The Annual of Psychoanalysis. https://doi.org/10.4324/9780203778487

Clark S, Poulin M (2007). The Marital Process and HIV / AIDS in Rural Malawi.

CSO, MOH (2014). Zambia Demographic and Health Survey 2013-2014.

Erulkar A (2013). Early marriage, marital relations and intimate partner violence in Ethiopia. International Perspectives on Sexual and Reproductive Health 39(1):6-13. https://doi.org/10.1363/3900613

Feather NT (1988). From values to actions: Recent applications of the expectancy-value model. Australian Journal of Psychology. https://doi.org/10.1080/00049538808259076

Global Data Lab (2015). Indicators (2015) - Subnational HDI - Global Data Lab.

Hatlebakk M (2017). Son Preference, Number of Children, Education and Occupational Choice in Rural Nepal. Review of Development Economics. https://doi.org/10.1111/rode.12237

Hofstede G (2001). Culture's Consequences: Comparing Values, Behaviors, Institutions and ... - Geert Hofstede - Google Books. In SAGE Publications.

Johnson-Hanks (2007). Uncertain Honor. Modern Motherhood in an African Crisis. European Journal of Population / Revue Européenne de Démographie. https://doi.org/10.1007/s10680-007-9118-6

Jones N, Tefera B, Stephenson J, Gupta T, Pereznieto P (2014). Early marriage and education: the complex role of social norms in shaping Ethiopian adolescent girls' lives. Journal of the Optical Society of America. Retrieved from https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9183.pdf

Juma LSA (2014). Impact of Cultural Factors on Girl Students' Academic Achievement in Secondary Schools in Kenya: A Case Study of Kisumu East District. Educational Research.

Kainuwa A, Najeemah BMY (2013). Cultural Traditions and Practices of the Parents as Barriers to Girl-child Education in Zamfara State Nigeria. International Journal of Scientific and Research Publication.

Markus HR, Cross S, Fiske A, Gilligan C, Givon T, Kanagawa C, Trian H (1991). Culture and the Self." Implications for Cognition, Emotion, and Motivation 98(2):224-253.

Mmari K (2013). Young people's lives and sexual relationships in rural Africa: Findings from a large qualitative study in Tanzania. Global Public Health 8(2):240-241. https://doi.org/10.1080/17441692.2012.762413

MOE, UNICEF F (2004). Guidelines for the re-entry policy . What happens if a school-girl falls pregnant?

Ministry of General Education (MoGE) (2010). Zambia 2010 Educational Statistical Bulletin: Enrolment in All Schools by Gender and Year.

Ministry of General Education (MoGE) (2017). Keeping girls in school Initiative. Retrieved 30 January 2020, from https://www.moge.gov.zm/keeping-girls-in-school/

Moletsane R (n.d.). 'Cultural' practices continue to force girls out of school: Time to act decisively. Retrieved 25 August 2019, from https://www.brookings.edu/blog/education-plus-development/2017/03/07/cultural-practices-continue-to-force-girls-out-of-school-time-to-act-decisively/

Mollel NS, Chong R (2017). Socio-cultural Constraints of Girls' Access to Education in Mtwara District, Tanzania. Khazar Journal of Humanities and Social Sciences. https://doi.org/10.5782/2223-2621.2017.20.3.108

Parsons T, Bales RF, Olds J, Zelditch M, Slater PE (2014). Family: Socialization and interaction process. In Family: Socialization and Interaction Process. https://doi.org/10.4324/9781315824307

Plan International (2019). Eliminating the barriers to girls' education in rural Bangladesh - Plan Canada _ Plan Canada. Retrieved from https://stories.plancanada.ca/eliminating-barriers-to-girls-education-in-bangladesh/

Rahman A, Westley J (2001). The challenge of ending rural poverty. Development Policy Review 19(4):553-562. https://doi.org/10.1111/1467-7679.00152

Rihani MA (2006). Keeping the Promise: Five Benefits of Girls' Secondary Education. Academy for Educational Development.

Saraswati TS (1999). Culture, socialization and human development : theory, research, and applications in India. 438. Retrieved from https://books.google.co.in/books?id=DB-SAAAAIAAJ&q=CULTURE,+SOCIALIZATION+AND+HUMAN+DEVELOPMENT:+THEORY,+RESEARCH,+AND+APPLICATIONS+IN+INDIA&dq=CULTURE,+SOCIALIZATION+AND+HUMAN+DEVELOPMENT:+THEORY,+RESEARCH,+AND+APPLICATIONS+IN+INDIA&hl=en&sa=X&ved=0ahUKE

Schwartz SH (1999). A Theory of Cultural Values and Some Implications for Work. Applied Psychology, 48(1), 23–47. https://doi.org/10.1111/j.1464-0597.1999.tb00047.x

Schwartz SH, Bilsky W (1990). Toward a Theory of the Universal Content and Structure of Values: Extensions and Cross-Cultural Replications. Journal of Personality and Social Psychology. https://doi.org/10.1037/0022-3514.58.5.878

Sen A (2007a). Capability and well-being. In The Philosophy of

Economics: An Anthology. https://doi.org/10.1017/CBO9780511819025.019
Sen A (2007b). Capability and well-being. In The Philosophy of Economics: An Anthology (pp. 270–294). https://doi.org/10.1017/CBO9780511819025.019
Stark L (2018). Early marriage and cultural constructions of adulthood in two slums in Dar es Salaam. Culture, Health and Sexuality 20(8):888-901. https://doi.org/10.1080/13691058.2017.1390162
Stephens D (2000). Girls and basic education in Ghana: A cultural enquiry. International Journal of Educational Development. https://doi.org/10.1016/S0738-0593(99)00044-9
Swidler A, Watkins SC (2007). Ties of dependence: AIDS and transactional sex in rural Malawi. Studies in Family Planning. https://doi.org/10.1111/j.1728-4465.2007.00127.x
Tefera B, Pereznieto P, Emirie G (2013). Transforming the lives of girls and young women. Case study: Ethiopia.
Temba EI, Warioba L, Msabila DT (n.d.). Assessing Efforts to Address Cultural Constraints to Girls' Access to Education Among the Maasai in Tanzania: A Case Study of Monduli District.
Thome H (2015). Values, Sociology of. International Encyclopedia of the Social & Behavioral Sciences: Second Edition (December 2015) pp. 47-53. https://doi.org/10.1016/B978-0-08-097086-8.32167-5
United Nations Population Fund (UNFPA) (2010). The Case for Investing in Young People as Part of a Poverty Reduction Strategy. 2010. Retrieved from https://www.unfpa.org/sites/default/files/pub-pdf/investing_young_2010.pdf
United Nations Girls' Education Initiative (UNGEI) (2014). Accelerating Secondary Education for Girls : Focusing on Access and Retention. (April), 1-8.
UNICEF-Zambia. (2014). Country Report: Global Initiative on OUT-OF-SCHOOL CHILDREN ZAMBIA. Retrieved from https://www.unicef.org/zambia/media/601/file/Zambia-out-of-school-report.pdf
UNICEF (2013). Eastern and Southern Africa Regional Report Global Initiative on Out-of-School Children.
UNICEF (2014). Barriers to Girls' Education, Strategies and Interventions. Broad Strategies pp. 1-4.
UNICEF (2015). A Profile of Child Marriage in Africa. Retrieved from https://www.unicef.org/UNICEF-Child-Marriage-Brochure-low-Single(1).pdf
World Bank (2013). World Development Indicators | The World Bank. Retrieved 4 January 2020, from http://wdi.worldbank.org/table/2.8
World Bank Group (2015). Preparing the Next Generation in Tanzania (Arun R. Joshi and Isis Gaddis, Ed.). https://doi.org/10.1596/978-1-4648-0590-5
Yu A-B, Yang K-S (1994). The nature of achievement motivation in collectivist societies. Individualism and Collectivism: Theory, Method, and Applications pp. 239-266.

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The effects of the authentic learning approach with a course management system (moodle) on students' mathematics success and online authentic learning self-efficacy

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This study was conducted to determine the effects of the "Moodle LMS which was based on authentic learning approach" and "online learning which was based on authentic learning approach environments" on "mathematics achievement" and "online authentic learning self-efficacy" levels of students in a basic mathematics course. In accordance with the purpose of this study, an experimental design with pre-test and post-test control group was used as the research design. Within the framework of the experimental model, two experimental and one control group were formed with random assignments and were included in different learning environments. Two data collection tools (Mathematics Achievement Test and Online Authentic Learning Self-Efficacy Scale) were developed. As a result, it was seen that there was a significant difference between the mathematics achievement test scores and between the online authentic learning self-efficacy scores when the experimental and control groups were tested later. They had all been doing a Basic Mathematics course in three different learning environments. The significant difference within the context of the two variables was in favour of the working group of the study's students who had their education in a blended learning environment (both traditional face to face and online learning) which was based on the authentic learning approach on Moodle LMS.

Key words: Distributed learning environments, human-computer interface, improving classroom teaching, interactive learning environments, post-secondary education.

INTRODUCTION

The use of internet in education has led to several innovations and developments. In the beginning, these innovations and developments helped to expedite and increase communication, particularly the interaction between student-student and student-teacher, and also brought about the dissemination of educational services.

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Along with face to face education, supported by instructional technologies, gaining widespread day-to-day use, traditional educational methods with online education materials or combining and enriching completely online education is called blended education (Baz, 2016). With the Covid-19 pandemic, which affects many countries in the world and face-to-face education was interrupted a long time ago and the distant education system was introduced. Thus, distance education applied at different levels entered into our lives when most of the stakeholders (such as teachers, students, instructors, managers) were foreigners (Dikmen and Bahceci, 2020; Yamamoto and Telli, 2020).

The most important factors in a face to face learning environment are solving immediately the problems encountered during the education process and also the development of behaviours when the problem is solved by being helped immediately. There are limitations to the different conditions of learners' face to face learning, such as not being able to adapt to the obligations of the activities of face to face learning students who have the responsibilities of family and work, the decrease in the performance dependent on attendance because there is no opportunity to have the lesson again, the hardships in planning the lesson to respond to the needs and the details of what kind of activities will be done in face-to-face learning, depriving the students of their autonomous learning ability (Swan, 2017; Kaya, 2002; Usun, 2006). Despite all these limitations, face to face learning has never lost its prevalence and reputation in the teaching and learning process (Yapıcı and Akbayın, 2012). In addition to these learning environments, today, there are also implementations such as distance education programmes and activities and methods of e-learning combined with face-to-face learning.

With the developments of the digital era, blended education has begun to be used instead of traditional education and online teaching methods (Lin et al., 2017). Blended education, which is one of the implementations of learning using internet services, includes both a face to face and an online combination of materials (Kwak et al., 2013). Within this context blended education, which has many advantages and opportunities, is preferred because it meets the class objectives, it is easy to evaluate at the end of designed courses, it allows for effective time management in class, it develops computer literacy between teachers and learners, it provides flexible schedules for the classes, as well as infinite sources of materials for teachers and learners, twenty-four hour access to the lesson materials, supported classroom activities with the use of www. sources and the opportunities to attend the lesson whenever and wherever the students want (Tierney, 2020). It encourages both cooperative and independent working between learners, provides additional learning materials, a decrease in the unnecessary responsibilities of teachers, an increase in the quality of communication and interaction between teacher-learner and learner-learner, the observation of the attendance and development process of the students, quick feedback, interactive programs, corrective actions by the institutes of education and teachers or instructors (Hijazi et al., 2006; Hubackova and Semradova, 2016).

Online learning, which involves only the internet services, comes out as one of the implementations of distance learning within this context; distance education must not be ignored as it has many advantages for online learning, such as being independent of space and time, there is an interactive and quick feedback, it provides more sources as well as the opportunity to study again, supported by multimedia materials and helping the student to search. Today online education must be used not only as a way to have information which depends on distance technologies but also to have an alternative chance to strengthen the information learned and to analyse the scientific information (Khoroshko et al., 2018). Online learning platforms are strong tools for providing important developments in terms of performance and supporting the student to gain learning skills (Rozano and Romero, 2016).

Online learning environments are classified under four titles (Park and Jo, 2017; Weller, 2007). These titles are Learning Management System, Learning Content Management System, Course Management System and Virtual Learning Environment. Learning Management System includes management of courses, presenting learning materials, sharing and discussing of these materials, having homework, exams and feedback from teachers or instructors, recording and reporting the system records. With these functions, Learning Management System is a system that provides access of information to the users and the means to share them and a supporting online system for independent work and also cooperation (Al-Busaidi and Al-Shihi, 2010). Platforms such as Moodle, Blackboard, Sakai, Docebo, A Tutor have been used widely in many schools, especially in higher education in universities, as the base of course management systems and have been a great support to teaching (Caputi and Ganrido, 2015). In the study in which Baimurzayev and Tekedere (2019) analyzed the availability of the cloud-based Moodle Learning Management System, it is stated that the website of the Cloud-Based Moodle is well available.

According to Onal et al. (2006), one of the most common open source software in LMIS is Moodle. When considered generally, the biggest advantage of Moodle is open source software and also the need for a single access for users. Therefore, the users get used to only one user interface. Today, especially in online courses, with an easy registration and the account information gained by this registration, this provides an easy way to use the Moodle platform. In broader terms, the users of this platform can access the online courses easily anytime and anywhere they want in the world. Also,

course design and management in Moodle include enriched multimedia materials, several communicative and cooperative activities (forum, chat, wiki, etc.) guidance and communication interaction of teachers together with feedback, evaluation, controlled learning by statistics of observation and support.

When Moodle is considered from a theory perspective, it is grounded in the social constructivist theory (Downes, 2006; Robinson et al., 2017). According to this theory, led by Vygotsky, learning and cognitive development are social and cooperative activities, happening in meaningful contexts and they cannot be thought of as disconnected from the real world's developments. It is focused on the relationship between the students' experiences both in school and out of school (Senemoğlu, 2011). Social constructivist theory is grounded in what kind of environment is needed to help the learners to learn better instead of what or how the teachers will teach when the environments are designed (Fer, 2009). The learners, whose interests and background information are considered, study in small cooperative groups in the social constructivist environments and therefore they learn from each other. The teachers or instructors take the role of guides in providing the information in these environments.

Today, one of the other approaches which is said to be effective for student success is the Authentic Learning Approach (Lombardi, 2007; Lucua and Marin, 2014). Maxwell et al. (2003) defined the authentic learning approach as "content based learning which provides the usage of information in real world environment and implementations". Authentic learning includes the constructivist theory and, thus, the authentic learning process guides the learners to have information and skills about what and how to learn in the real world environments. From this point of view, the learner, who realises what and how to learn, makes learning as their objective even if they are under the guidance and observation of the teachers (Watters and Ginns, 2000). Also, the learners will gain the qualification of using the information they learned in the real world, out of school, and lifelong skills.

Today, the authentic learning approach is in a situation that is combined with technology and integrated in multimedia implementations (Güngören and Horzum, 2014). Multimedia is seen as a sort of technology supported environment and the learning in this environment is also defined as multimedia environment learning. Within this context, authenticity and authentic learning concepts have important roles. The focus of technology-supported environments on problem and learning ensures that learning environments close to real-world learning are supported. Increasing the focus and learning of the learners, and developing their skills of transfer; it is possible to benefit from authentic, real, close to real multimedia learning environments (Grabinger and Dunlop, 2003).

When the literature is considered, it is seen that the authentic learning approach was used in the design of several courses in educational institutes. Mathematics courses have also their place in the courses which can be carried out with an authentic approach and its activities. When the mathematics course is considered with the connection to real life, it is emphasised that, in the frame of the authentic learning and teaching approach, experiences in daily life, examples of daily life must be dependent on the contexts of learning (Schreglmann and Karakuş, 2017). When the related literature is considered, the motivation and the success of the students, lifelong learning and other contributions of education were seen to have limitations in education institutes or universities, which include higher education, in both mathematics courses and other content of the courses and their studies. This situation was seen as a deficiency and, to make up for this deficiency, it was decided in this study that, in the basic mathematics courses which will be given to the university students, the following should be included; starting out from the real world, its situation and problems, the learners' thoughts on these authentic situations; designing activities for authentic learning which will make the students gain the qualification for lifelong learning and its opportunities in both daily life and in other parts of life.

In this study, "traditional face-to-face learning which was based on the authentic learning approach", "blended learning" (both traditional face-to-face and online learning which was based on the authentic learning approach on Moodle LMS) and "online learning which was based on the authentic learning approaches" were included as three learning environments. It was to be determined whether there was a significant difference between the mathematics success mean scores and the "online authentic learning self-efficacy" mean scores of the students who had mathematics course instruction in these three different learning environments. When the literature was considered, these three learning environments have advantages in the education process. Within these contexts, there was an attempt to find which one of them had more effect on the success of a basic mathematics course and online authentic self-efficacy.

Today's technologies have affected and changed the teaching and learning processes related to mathematics as in all other fields. In this context, it is pointed out that teachers need to use technological tools or environments in order to increase the interest of learners and help them understand mathematics. With this study, it is aimed to gain all these learning skills to the learners with the communication technologies tools and multimedia elements used information in the course. The research is thought to contribute to the field in this context.

The purpose of this study

The essential aim of this study is to specify the effects of

Table 1. Experimental research model.

Group	Pre-test	Experimental process	Post test
Experimental Group I	T1, T2	Based blended learn.	T1, T2
Experimental Group II	T1, T2	Based online learn.	T1, T2
Control	T1, T2	Based traditional learn.	T1,T2

T1: Math achievement test**, T2:** The scale of online authentic learning self-efficacy.

Table 2. Comparison of the pre-test online authentic learning self-efficacy Scale Mean rank scores of the experimental and control groups.

Groups	N	Mean rank	df	X^2	p	Significant difference
Control	60	88.42	2	0.285	0.867	No significant difference between groups
Experiment I	60	89.76				
Experiment II	60	93.33				

the "Moodle LMS which was based on the authentic learning approach" and "online learning which was based on the authentic learning approach environments" both on the success and “online authentic learning self-efficacy" levels of the students in a basic mathematics course. With the objectives defined above, the following question was put forward:

(i) Is there any significant difference between the post-test mathematics achievements mean scores, experimental groups I and II and of the control group students who had their basic mathematics course in blended, online and traditional face-to-face, learning environments respectively?

METHODOLOGY

Research design

In accordance with the purpose of this study, an experimental design with pre-test and post-test control group was used as the research design. Randomised design with pre-test and post-test control group is one of the most common research designs in education and psychology. Initially, subjects are assigned to groups randomly. Later, the subjects’ measurements with dependent variables were taken before the implementation. The experimental process, whose effect was tested during the implementation process, was not applied to the control group while it was applied to the experimental groups. Finally, the measurements in the dependent variables of the subjects in the groups were taken again by using the same tools or peer form (Buyukozturk, 2018; Ferguson and Takone, 1989). When the concept of the research design of this study was considered, the groups were formed in the concept of random design with pre-test and post-test control groups and learning environments as follows (Table 1).

The independent variables of the research

The education of mathematics was adapted with the authentic learning approach, blended education supported with Moodle LMS, online learning based on Moodle LMS, face to face education.

The dependent variables of the research

The dependent variable is success in mathematics, online authentic learning self-efficacy.

Participants of the study

The subject group of this study consisted of one hundred and eighty students who were in the first class and were doing a basic mathematics course in the Vocational School of Health at a private University in North Cyprus in the 2016-2017 autumn semester. Ninety-three of the students were males and eighty-seven of them were females in the subject groups. The students were assigned to experimental Groups I, II and control groups randomly and in an equal manner (sixty students in a group). The findings about evaluation of the experimental groups and control group students meant rank scores in a pre-test online authentic learning self-efficacy are given in Table 2. As the p value, according to the Kruskal-Wallis H test is 0.867>0.05, this means that there was no significant difference in Experimental Groups I, II and the control group students’ online authentic learning self-efficacy pre-test’s mean rank scores. Also, as the p value according to the Kruskal-Wallis H test is 0.174>0.05, this means that there was no significant difference in Experimental Groups I, II and Control group students’ mathematics achievement test mean rank scores (Table 3). It was determined that there were no significant differences between the pre-test mathematics achievement test and the authentic learning self-efficacy mean rank scores (p>0.05) of the experimental groups and the control group. So, the assignment of individuals to the experimental groups and the control group were made objectively and/or randomly.

Data collection tool

Mathematics achievement test

Considering the objectives and knowledge of the basic mathematics course’s subjects, the forty question achievement test was developed by the instructors of this course. In the development

Table 3. Comparison of the pre-test mathematics achievement mean rank scores of the experimental and control groups.

Groups	N	Mean rank	df	X^2	p	Significant difference
Control	60	99.84				
Experiment I	60	82.17	2	3.494	0.174	No significant difference between groups
Experiment II	60	89.49				

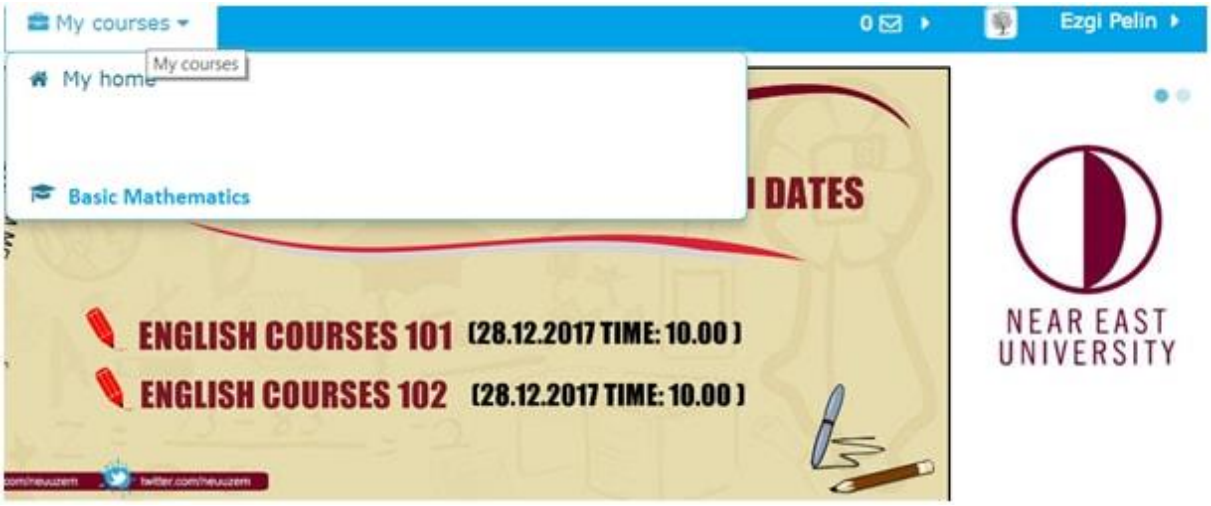

Figure 1. Home Page of the basic mathematics course.

stage, the instructors prepared the scenario and the questions, which the students would encounter in real life environments and which were suitable for the authentic learning approach. Except for this, the rest of the questions were developed according to the subjects in the syllabus for the university entrance examination. The originality of the questions was considered in the development stage. The developed questions were revised in accordance with the opinions of experts to determine whether they measured the objects and behaviours in the concept of the basic mathematics course. At the end of the item analysis, 0.30 and over 0.30 discrimination index of the item (r) was taken for achievement of the test and the two questions which were under 0.19 were removed from the test and the achievement test with thirty-eight multiple choice questions was developed. At the end of the item analysis, there were corrections to six questions whose item difficulty index was 0.20 – 0.29 and these questions were prepared for future use. With the collected data, the alpha reliability coefficient of the achievement test was calculated as .96. This result was evaluated to be quite sufficient for the reliability of the test. The results of the alpha reliability coefficient such as .70 and over are considered to be enough for a psychological test (Büyüköztürk, 2013).

The scale of the online authentic learning self-efficacy

The scale of the online authentic learning self-efficacy used in this research was developed by Tezer et al. (2018). The scale has nine factors (problem-solving skills and bonding, supra-cognitive skills and persistence in learning, interaction with real-world environments and interaction in the online environment, interaction and learning experiences with the real world, social bonding in online collaborative learning environments, structured support for internalising effective knowledge, multiple evaluation and feedback, collaborative work skills and product development). The scale was developed with a 5-point Likert type scale such that 5 points represented “absolutely agree” and 1 point represented “totally disagree”. This scale’s internal consistency coefficient calculated with Cronbach Alpha was determined as 0.97. According to many researchers, when the reliability coefficient is closer to 1, the reliability increases (Huang, 2002; Sekaran, 2013). Fraenkel and Wallen (2006) determined that, when the reliability coefficient is lower than 60, it is weak, when it is between .60 and .70, it is within acceptable limitations and when it is over 0.80 it is good.

The implementations and environment of the study

First, in the development stage of the environment, in order to provide the use of Moodle LMS on the internet, the Distance Education Centre’s (DEC) university web address, which has a ready-made Moodle setup, was open for students (to have a new basic mathematics course- SMO 105) (Figure 1). After the course was opened, the necessary information for registration of the students, who would have the course in blended and online environments, was opened by the instructors. The registered number of students was one hundred and twenty: sixty of them had the course in the blended education environment; sixty of them had the course in the online education environment. The other group, who had traditional (face to face) education, did not have registration on the Moodle LMS system, although the authentic learning approach was used in the basic mathematics course education as with the other groups. The date rates in the Moodle system were used for the start and expiry date of the course. The course notes and interactive videos about the course were added

Figure 2. SMO 105 Code Basic Mathematics Facebook Group.

according to these dates.

Panapto is a course registration software (lecture capture) that is used in universities, and also is an assistive platform to form the content of the course in a combined course management system with LMS (blackboard, Moodle, etc.). The access to the course activities (online), interactive videos and course notes determined in the screen shoots were provided from the students' phones to a DEC system supported by Moodle, and provided their participation particularly for mobile learning, "Photon Flash Player and Browser" was also used. Photon flash player and browser was developed for android devices and is an internet browser. Unlike other internet browsers, it allows the use of Flash contents in android devices without downloading any extra add-on.

Within the study concept, "BigBlueButton" online conference environment, which is in the Moodle platform, was used to communicate with the students simultaneously (synchronously), and in addition, to provide course notes and interactive videos, as well as providing live course support. With these environments, the students had the opportunity to ask the instructors about the lessons or the example questions that they did not understand, and they were supported also with collaborative learning activities so that they could communicate with each other. The forum about the course for student activities is included via a module to the learning environment. With this module, the students were given the chance to get to know and socialise with each other (Çevik, 2008; Donaldson et al., 2017; Elmas et al., 2008). Within the research concept, a forum in Moodle page was provided so that the students had a voice in the course management.

Within the study concept, with the help of a social networking website (Facebook) group as SMO Basic Mathematics Course DEC group, a continuous communication was provided. The announcements, information and instructions about the course or the use of the learning environment supported by Moodle LMS are given on this page (Figure 2). Within the scope of the study, a group was established on Facebook for better communication with students and lecturers. The membership was provided for groups I and II students.

Interactive lesson videos for authentic learning

Interactive lesson videos were prepared, scenarios based on authentic learning and using animations, images, texts and audio from multimedia components. The students, who were in the experimental groups, watched these videos online; they had the opportunity to watch them again with the recordings on the system (Figure 3).

Data analysis

The evaluation of the data collected in this research and tabulation were done with Statistical Package for Social Science (SPSS) version 23. To answer sub-objectives, the data obtained were analysed with the percentage (%), mean ($\bar{X}$), frequency (f) and standard deviation (Sd.). The comparisons of the grades of the students before and after the education were done via Kruskal Wallis-H and Mann-Whitney U non-parametric tests in the experimental and control groups separately. It was accepted that there was not a normal distribution in the data with $p<0.5$ value within the Kolmogorov-Smirnov test concept. In the explanation of the differences in data, the general average was considered. In all statistical analysis, the significance level was accepted as .05. The distribution and the frequency of the findings of the students' opinions about Moodle LMS, which is an online educational environment, were presented with the help of frequency and percentage distribution tables.

FINDINGS

The findings about the evaluation of the experimental groups and the control group students' mathematics achievement test results in post-test are in Table 4. According to the Kruskal-Wallis H test conducted in Table 4, the p value is .004 < .05 and that means there was a significant difference between the post-test mathematics achievement test mean ranks of Experiment I, II and the Control groups. In order to specify which groups were significantly different, the researchers used the Mann-Whitney U test. Tables related with the Mann-Whitney U test (Tables 5 to 7) are given below.

According to the Mann-Whitney U test, the p value in

Figure 3. Teaching of subjects with multimedia content (such as images, texts and audio).

Table 4. Kruskal-Wallis H-test result for the post-test mathematics achievement test of the experimental groups and the control group.

Groups	N	Mean rank	df	X^2	P	Significant difference
Control	60	77.13				
Experiment I	60	107.65	2	10.914	0.004	p<0.05
Experiment II	60	86.72				

Table 5. Mann-Whitney U test result for the Post-test Mathematics achievement test of the Control Group and the Experimental Group I.

Groups	N	Mean rank	Sum of ranks	U	p	Significant difference
Control	60	50.53	3032	1202	0.002	p<0.05
Experiment I	60	70.47	4228			

Table 6. Mann-Whitney U test result for the Post-test Mathematics achievement test of the Control Group and Experimental Group II.

Groups	N	Mean rank	Sum of ranks	U	p	Significant difference
Control	60	57.10	3426	1596	0.281	p>0.005
Experiment II	60	63.90	3834			

Table 7. Mann-Whitney U test result for the post-test mathematics achievement test of Experimental Group I and Experimental Group II.

Groups	N	Mean rank	Sum of ranks	U	p	Significant difference
Experiment I	60	67.68	4061	1369	0.023	p<0.05
Experiment II	60	53.32	3199			

Table 5 is 0.002<0.05 and that means that there is a significant difference in the mathematics achievement test mean rank scores of the control group and the Experiment I group students' post-tests. The results showed a significant difference in favour of Experiment I students who had blended education. As the p value is 0.281>0.05 according to the Mann-Whitney U test in Table 6, it means that there is no significant difference between the mathematics achievement test mean rank scores of the control and the Experiment II group

Table 8. Wilcoxon Signed Rank Test results for the Pre-test and Post-test mathematics achievement test of the Experimental Groups and the Control Group.

Groups	Pre-test- post-test	N	Mean rank	Sum of ranks	z	p	Significant difference
Experimental Group I	Negative order	0	0	0	-6.737	0	p<0.05
	Positive order	60	30.5	1830			
	Ties	0					
Experimental Group II	Negative order	0	0	0	-6.737	0	p<0.05
	Positive order	60	30.5	1830			
	Ties	0					
Control Group	Negative order	4	4.88	19.5	-6.593	0	p<0.05
	Positive order	56	32.33	1810.5			
	Ties	0					

Table 9. Kruskal-Wallis H test results for the post-test online authentic learning self-efficacy of the experimental and control group's.

Groups	N	Mean rank	df	X^2	p	Significant difference
Control	60	80.27				
Experiment I	60	106.65	2	8.866	0.012	p<0.05
Experiment II	60	84.58				

students' post-test. In this situation, it was shown that there was no significant difference between the mathematics achievement test mean scores of the control group who had traditional education and the Experiment II group students who had online education. As the p value is 0.023<0.05 according to the Mann-Whitney U test in Table 7, this means that there is a significant difference between the Experiment I and II group students' mathematics achievement test mean rank scores in post-test. The results were significantly different in favour of Experiment I group students who had blended education. The findings about the difference in evaluation between the mathematics achievement test mean scores of the experimental and the control group students pre-test and post-test are given in Table 8.

Wilcoxon signed rank test was used as the statistical test with the aim of presenting the differences between the pre-test and post-test mathematics achievement test mean rank scores of the experimental group and the control group students. The related test was used to show whether there was a difference between the data of the same sources with two rates measurement results (Büyüköztürk, 2013). According to Table 8, in addition to positive and negative ranks and the sum of ranks reporting depending on the Wilcoxon signed rank test, the values which were useful for us were the z value and its significance level. The z values were found to be -6.737, 6.737 and -6.593, and they were under the critical significance level which is .05. Within this context, it was found that there was a significant difference between the mathematics achievement test mean rank scores of the experimental group and the control group students' pre-tests and post-tests. In order to calculate the effect size, r = Z / √N formula was used. The results were as follows;

Experimental Group I, r = Z / √N (r= -6.737 / √180), r = -0.51
Experimental Group II, r = Z / √N (r= -6.737 / √180), r = -0.51
Control group, r = Z / √N (r= -6.593 / √180), r = -0.50

The effect was that the size in the results was bigger than 0.50, therefore it proved that there is a large effect between the pre-tests and post-tests mathematics achievement test mean rank scores of the experimental groups and the control group students. The findings of the analysis of the experimental group and the control group students' online authentic learning self-efficacy post-test's mean rank scores are given in Table 9. As the p value, according to the Kruskal-Wallis H test, is 0.012<0.05, this means that there is a significant difference between the experimental groups I and II and the control group students' online authentic learning self-efficacy post-test's mean rank scores. According to the findings of this test, there was a significant difference and the Mann-Whitney U test was used to show in which group there was a difference. The test results can be seen in Tables 10 to 12).

Table 10. Mann-Whitney U test results for the post-test online authentic learning self-efficacy of the control group and Experimental I.

Groups	N	Mean rank	Df	U	P	Significant difference
Control	60	51.25	3075	1245	0.004	p<0.05
Experiment I	60	69.75	4185			

Table 11. Mann-Whitney U test results for the post-test online authentic learning self-efficacy of the control group and Experimental II.

Groups	N	Mean rank	Df	X^2	p	Significant difference
Control	60	59.52	3571	1741	0.756	p>0.05
Experiment II	60	61.48	3689			

Table 12. Mann-Whitney U test results for the post-test online authentic learning self-efficacy of the Experimental I and Experimental II Groups.

Groups	N	Mean rank	Df	X^2	p	Significant difference
Experiment I	60	67.40	4044	1386	0.030	p<0.05
Experiment II	60	53.60	3216			

The p value, according to the Mann-Whitney U test, is 0.004<0.05 and that means there was a significant difference between the experimental group I and the control group students' online authentic learning self-efficacy post-test mean rank scores. The results showed significant difference is in favour of the experimental group I students who had blended education. The p value according to the Mann-Whitney U test is 0.756>0.05, this can be interpreted that there was no significant difference between the experimental group II and the control group students' online authentic learning self-efficacy post-test mean rank scores. This finding showed that there was no significant difference between the control group who had traditional education and the experimental Group II students who had online authentic learning self-efficacy post-test grades. The p value according to the Mann-Whitney U test is 0.030<0.05 and this means that there was a significant difference between the experimental Group I and experimental group II group students' online authentic learning self-efficacy post-test mean rank scores; the results showed that the significant difference was in favour of the experimental Group I students who had blended education. The findings about the analysis of the difference between experimental and control group students' online authentic learning self-efficacy pre-test and post-test are given in Table 13.

The Wilcoxon signed rank test was used as the statistical test with the aim of presenting the difference between the pre-test and post-test Online Authentic Learning Self-Efficacy mean rank scores of the experimental group and the control group students. The z values were found to be -6.628, 6.781 and -6.780, and they were under the critical significance level 0.05. In this regard, it was found that there was a significant difference between the pre-test and post-test Online Authentic Learning Self-Efficacy mean rank scores of the experimental group and control group students. The calculated effect sizes were as follows;

Experimental Group I, $r = Z / \sqrt{N}$ ($r = -6.628 / \sqrt{180}$), $r = -0.50$
Experimental Group II, $r = Z / \sqrt{N}$ ($r = -6.781 / \sqrt{180}$), $r = -0.51$
Control group, $r = Z / \sqrt{N}$ ($r = -6.780 / \sqrt{180}$), $r = -0.51$

As the effect size calculated was bigger than 0.50; therefore it proved that there is a large effect size between the pre-tests and post-tests online authentic learning self-efficacy mean rank scores of the experimental groups and the control group students.

DISCUSSION

In this study of two dependent variables (mathematics achievement and online authentic learning self-efficacy), the significant difference was in favour of the students (experimental group I) who had had the course in blended education supported by Moodle LMS in the education of a basic mathematics course adapted authentic learning approach. The results that came out according to these statements show that the research results were both similar and different from the literature.

However, for this study, the results of the mathematics

Table 13. Wilcoxon signed rank test results for the pre-test and post-test online authentic learning self-efficacy of experimental groups and control group students.

Groups	Pre-test-post-test	N	Mean rank	df	z	p	Significant difference
Experiment I	Negative order	1	33.50	33.50	6.628	0.000	p<0.05
	Positive order	58	29.94	1736.50			
	Ties	1					
Experiment II	Negative order	0	0.00	0.00	6.781	0.000	p<0.05
	Positive order	59	30.00	1770.00			
	Ties	1					
Control pre-test post-test	Negative order	0	0.00	.00	6.780	0.000	p<0.05
	Positive order	59	30.00	1770.00			
	Ties	1					

achievement test result were in favour of blended education learning environments. If the literature is considered, there are many advantages to a blended education environment; these include having both the strong and weak sides of web based and class based learning (Osguthorpe and Graham, 2003), availability of technology support (Oliver, 2015), effective time management in class, flexible schedules, infinite sources of materials for teachers and learners, 24 h access to the lesson materials, supported classroom activities with the use of www sources, opportunities to attend the lesson whenever and wherever the students want, the cooperative and independent work between the learners, providing additional learning materials, decrease in the unnecessary responsibilities of the teachers, increase in the quality of communication and interaction between teacher-learner and learner-learner, observation of the attendance and development process of the students, quick feedback, interactive programs, corrective actions (Hijazi et al., 2006) by education institutes and teachers or instructors are possible. In this context, several educational institutions, which designed courses depending on blended education, had successful results (Olapiriyakul and Scher, 2006). In fact, blended education, which was given for the basic mathematics course achieved successful results in the context of this study. In addition to blended education, having a basic mathematics course education adapted with the authentic learning approach and face to face courses which are appropriate for presenting this approach, integrating technology combined with multimedia environments via Moodle LMS and within the concept, the concept of "authentic multimedia learning environments" was accepted. These benefitted from the Moodle LMS modules (forum, survey, homework, modules), the "BigBlueButton" tool support which is in the DEC system and is used in Moodle LMS's teacher-learner and learner-learner; the Facebook group page serving the same purpose (SMO basic mathematics course DEC group), the videos prepared online with authentic learning were the aim of this study and they were structured as the factors which supported this success.

Conclusion

Within the scope of evaluating the self-efficacy of the online authentic learning and mathematics achievement results before and after the education of the students in the experimental groups and the control group of the study; it was found that the post-test mathematics *achievement* test scores and online authentic learning self-efficacy scores of the students who had their basic mathematics education supported by different learning methods (blended, online learning and traditional) are higher compared to the pre-test mathematics achievement scores and online authentic learning scores. *This was interpreted as a result of the "authentic learning approach" adapted to each group.*

Recommendations

The results of the study show that supporting the basic mathematics course with the authentic learning approach has a positive effect. With this result, it can be suggested that the implementations and evaluations of the authentic learning approach theory must be given more place in the development of academic skills in different course concepts. Also, this study has proved that a basic mathematics course using the online authentic learning approach has a positive effect on online authentic learning self-efficacy of the students. Therefore, it is suggested that the implementation and evaluation of the authentic learning approach must be included more often in different course concepts for developing students'

online authentic learning self-efficacy.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Al-Busaidi KA Al-Shihi H (2010). Instructors' acceptance of learning management systems: A theoretical framework. Communications of the IBIMA pp. 2-10.

Baimurzayev B, Tekedere H (2019). Usability Analysis of Cloud-Based Moodle Learning Management System. TÜBAV Scientific Journal 12(4):16-25.

Baz FÇ (2016). The effect of Adaptive Online Web Based Material on Student Acedemic Success. PHD Thesis. Mustafa Kemal University, Institute of Science, Hatay, Turkey.

Büyüköztürk Ş (2013). Sosyal bilimler için veri analizi el kitabı. Ankara: Pegem Akademi.

Caputi V, Garrido A (2015). Student-Oriented Planning of E-learning Contents for Moodle. Journal of Network and Computer Applications 53:115-127. http://dx.doi.org/10.1016/j.jnca.2015.04.001.

Çevik A (2008). Moodle öğrenme yönetim sistemi yönetimindeki karşılaşılabilecek olası sorunlar ve çözüm önerileri. In 8th International Educational Technology Conference pp. 31-34.

Dikmen S, Bahceci F (2020). Covid-19 Pandemisi Sürecinde Yükseköğretim Kurumlarının Uzaktan Eğitime Yönelik Stratejileri: Fırat Üniversitesi Örneği. Turkish Journal of Educational Studies 7(2):78-98. https://doi.org/10.33907/turkjes.721685

Donaldson L, Matthews A, Walsh A, Brugha R, Manda-Taylor L, Mwapasa V, Byrne E (2017). Collaborative Tools to Enhance Engagement in a Blended Learning Master's Programme. AISHE-J: The All Ireland Journal of Teaching and Learning in Higher Education 9(1):2921-29220.

Downes S (2006). Learning Networks and Connective Knowledge. Instructional Technology Forum: Paper 92. Retrieved May 19, 2017, from: http://it.coe.uga.edu/itforum/paper92/paper92.html.

Elmas Ç, Doğan N, Biroğul S, Koç MS (2008). Moodle Eğitim Yönetim Sistemi İle Örnek Bir Dersin Uzaktan Eğitim Uygulaması. Bilişim Teknolojileri Dergisi 1(2):53-62.

Fer S (2009). Social Constructivism and Social Constructivist Curricula in Turkey for The Needs of Differences of Young People: Overview in light of the PROMISE project. In: T. Tajmel & S. Klaus (Eds.), Science education unlimited: Approaches to equal opportunity in learning science (179-199). Munster: Waxmann Verlag Co.

Fraenkel R, Wallen NE (2006). How to design and evaluate research in education (6th ed.). New York, NY McGraw-Hill.

Grabinger RS, Dunlap JC (2003). Rich Environments for Active Learning: A Definition. Association for Learning Technology Journal (ALT-J) 3(2):5-34. DOI: 10.1080/0968776950030202

Güngören ÖC, Horzum MB (2014). Otantik Çoklu Ortam. M. Bektaş ve M.B. Horzum (Ed.). Otantik öğrenme içinde (s.55-83). Ankara: Pegem Akademi.

Hijazi S, Crowley M, Smith ML, Schaffer C (2006) Maximizing Learning By Teaching Blended Courses. Proceedings of the 2006 ASCUE Conference, Myrtle Beach, South Carolina. Retrieved May 10, 2017, from: http://fits.depauw.edu/ascue/Proceedings/2006/Papers/p67.pdf.

Huang H (2002). Toward Constructivism for Adult Learners In Online Learning Environments. British Journal of Educational Technology 33(1):27-37. DOI: 10.1111/1467-8535.00236

Hubackova S, Semradova I (2016). Evaluation of Blended Learning. Procedia-Social and Behavioral Sciences 217:551-557. DOI: 10.1016/j.sbspro.2016.02.044

Lucua RB, Marin E (2014). Authentic Learning in Adult Education. Procedia - Social and Behavioral Sciences 142:410-415. DOI: 10.1016/j.sbspro.2014.07.702

Kaya Z (2002). Uzaktan Eğitim, Ankara: Pegem Akademi.

Khoroshko L, Ukhov P, Khoroshko A (2018). The Use CAD/CAE Systems to Cre-ate E-Learning Courses on Technical Subjects at University. International Journal of Engineering Pedagogy 8(2):64-7. https://doi.org/10.3991/ijep.v8i2.8134

Kwak DW, Menezes FM, Sherwood C (2013). Assessing The Impact of Blended Learning On Student Performance. Educational Technology & Society 15(1):127-136. https://doi.org/10.1111/1475-4932.12155

Lin YW, Tseng CL, Chiang PJ (2017). The Effect of Blended Learning in Mathematics Course. Eurasia Journal of Mathematics, Science and Technology Education 3:13. https://doi.org/10.12973/eurasia.2017.00641.

Lombardi M (2007). Authentic Learning for the 21st Century: An Overview, ELI Paper 1: 2007, EDUCAUSE Learning initiative.

Maxwell D, Watkins B, Wheeler R, Collins G (2003). Coping Strategies Index: A Tool for Rapid Measurement. Field Methods Manual.

Oliver M (2015). Blended MOOCs: University Teacher's Perspective. In EC-TEL-WS-2015: Trends in Digital Education 18:11-25.

Onal A, Kaya A, Draman SE (2006). Açık kaynak kodlu çevrimiçi eğitim yazılımları. Akademik Bilişim (s. 251-254). Pamukkale University, Denizli in Turkey.

Olapiriyakul K, Scher JM. (2006). A Guide To Establishing Hybrid Learning Courses: Employing İnformation Technology To Create A New Learning Experience, And A Case Study. Internet And Higher Education 9:287-301. DOI: 10.1016/j.iheduc.2006.08.001

Osguthorpe RT, Graham CR (2003). Blended Learning Environments Definitions and Directions. The Quarterly Review of Distance Education 4(3):227-233.

Park Y, Jo IH (2017). Using log variables in a learning management system to evaluate learning activity using the lens of activity theory. Assessment & Evaluation in Higher Education 42(4):531-547 DOI:10.1080/02602938.2016.1158236.

Rozano M, Romero J (2016). Skill Acquisition in Blended Learning Courses: Influence on Student Performance. International Journal of Learning and Teaching 8:30-39. https://doi.org/10.18844/ijlt.v8i1.372

Robinson HA, Sheffield A, Phillips AS, Moore M (2017). "Introduction to Teaching Online": Usability Evaluation of Interactivity in an Online Social Constructivist Course. TechTrends pp. 1-8.

Sekaran U, Bougie R (2003). Research Methods for Business: A Skill-Building Approach. 4th Edition, John Wiley & Sons, New York.

Schreglmann S, Karakuş M (2017). Eğitsel Arayüz Destekli Eğitim Yazılımlarının Eleştirel Düşünme ve Akademik Başarı Üzerindeki Etkisi. Mersin Üniversitesi Eğitim Fakültesi Dergisi 13(3):839-855. DOI: http://dx.doi.org/10.17860/mersinefd.290420

Senemoğlu N (2011). Gelişim, öğrenme ve öğretim. PegemA Yayıncılık. 2. Baskı, Ankara.

Swan JG (2017). The Challenges of Online Learning: Supporting and Engaging the Isolated Learner. Journal of Learning Design 10(1):20-30. DOI: 10.5204/jld.v9i3.293.

Usun S (2006). Uzaktan Eğitim, Nobel Yayınları, Ankara.

Watters JJ, Ginns IS (2000). Developing Motivation to Teach Elementary Science: Effect of Collaborative and Authentic Learning Practices in Preservice Education. Journal of Science Teacher Education 11(4):277-313. DOI: 10.1023/A:1009429131064

Weller M (2007). Virtual learning environments: Using, choosing and developing your VLE. Routledge.

Tezer M, Yildiz EP, Uzunboylu H (2018). Online authentic learning self-efficacy: a scale development. Quality & Quantity 52(1):639-649. DOI: 10.1007/s11135-017-0641-1.

Tierney K (2020). How Technology in the Classroom Is Shaping the Future of Education. Retrieved from 14.10.2020 from https://www.jotform.com/technology-in-the-classroom/.

Yapıcı İÜ, Akbayın H (2012). Harmanlanmış Öğrenme Ortamında Moodle Kullanımı. Eğitim ve Öğretim Araştırmaları Dergisi 1(2):92-100.

Yamamoto GT, Altun D (2020). Coronavirüs ve Çevrimiçi (Online) Eğitimin Önlenemeyen Yükselişi. Üniversite Araştırmaları Dergisi 3(1):25-34. https://doi.org/10.32329/uad.711110

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Manifestations and meanings of cognitive conflict among mathematics students in Embu, Kenya

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Establishing how cognitive conflict is manifested by students is an important first step in understanding how teachers can utilize cognitive conflict to improve students' learning experiences. This paper presents findings from the analysis of qualitative data drawn from a larger study that explored the role of cognitive conflict in promoting students' conceptual development in mathematics. The study participants were secondary school mathematics students and their teachers drawn from twenty-five public secondary schools in Embu West Sub-County in Kenya. Data were gathered through surveys and semi-structured interviews. The interviews were transcribed and coded, followed by organization of the codes into categories that were used to develop themes. The findings indicate that students experienced cognitive conflict in three significant ways: a moment to (co) construct one's mathematical meaning, confusion as a result of teacher's behaviorist stance, and a fleeting moment of magic. The paper recommends that teachers should take advantage of cognitive conflict as a strategy for scaffolding mathematics learning by giving students tasks that provoke critical thinking so that as students work on the tasks, their naïve understandings of the concepts are challenged.

Key words: Cognitive conflict, manifestations, mathematics, meanings, students learning.

INTRODUCTION

Cognitive conflict is a widely recognized important factor in the process of conceptual change and can be effectively utilized as a teaching-learning strategy to promote the conceptual development of students (Mufit et al., 2018). The notion of cognitive conflict has recently been receiving much attention in teaching and learning, particularly in the area of mathematics education. There is evidence in the mathematics education literature that significant numbers of students are often confronted with contradictions between their way of describing and explaining concepts and the way such concepts are explained by their peers, teachers, or textbooks. As a result, there is currently great interest among mathematics educators in the issue of conceptual change through the use of cognitive conflict, as it has been found to be instrumental in promoting deeper learning and conceptual understanding in mathematics (Adnyani, 2020; Watson, 2002, 2007).

Cognitive conflict refers to a situation where a student is confronted with a discrepancy between their existing cognitive elements (such as attitudes, perceptions, knowledge, and behaviors) and new information or idea

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(Waxer and Morton, 2012; Zazkis and Chernoff, 2006). During mathematics learning, cognitive conflict occurs when students have a preconceived idea about how a mathematical problem should be solved which differs from the way it is being solved (Maume and Mathews, 2000). Cognitive conflict can be viewed as a learning strategy that is interactive, inspiring, fun, and challenging to students (Lee and Kwon, 2001). In mathematics education, cognitive conflict has been observed by several researchers as a situation that can play an important role in students' acquisition of mathematical concepts that can also act as evidence of mathematics learning (Baddock and Bucat, 2008; Fraser, 2007; Lee et al., 2003; Maharani and Subanji, 2018; Sayce, 2010; Susilawati et al., 2017; Tall, 1977; Zazkis and Chernoff, 2006).

Utilizing cognitive conflict during mathematics lessons can help promote the idea of Cognitively Guided Instruction (CGI) which underscores the need for teachers to pay more attention to students during mathematics learning to improve students' thinking as well as teacher skills in explaining concepts (Jacobs et al., 2007). Also, teachers are encouraged to use Cognitive Acceleration through Science Education (CASE) and Cognitive Acceleration through Mathematics Education (CAME) as programs that help to scaffold mathematics learning based on cognitive conflict (Swan et al., 2005). Furthermore, teachers need to appreciate and understand students' existing ideas and understandings, and to present students with situations that provoke cognitive conflict to reveal the inadequacy of the students' ideas and to encourage the formation of new knowledge.

Mathematics teaching based on cognitive conflict can as well improve students' ability to solve mathematical problems, develop critical thinking, and improve their communication skills (Gal, 2019; Hermkes et al., 2018; Putra et al., 2019; Webb et al., 2019; Widada et al., 2018). However, the use of cognitive conflict as a teaching-learning strategy has not been sufficiently studied in the area of mathematics education. The few studies in this line have emphasized the need for mathematics teachers to possess knowledge about cognitive conflict and its role in mathematics teaching and learning. With this knowledge, the teachers will be better placed to scaffold students learning and to improve students' critical reasoning skills (Li, 2019; Makonye and Khanyile, 2015).

As noted by some researchers, there is a need to extend and deepen teachers' professional understanding of teaching and learning practices and strategies that support students' conceptual understanding (O'Brien and Iannone, 2018). Furthermore, there is a need for research on teaching-learning strategies that improve students' achievement in mathematics (Cho et al., 2015; Tinto, 2012). Indeed, researchers have also underscored the need for an investigation into how teachers modify their teaching methods towards responding to the needs of their students, as well as on how teachers can incorporate a variety of teaching methods to ensure students' active engagement during the learning process (Murphy et al., 2019; Sutopo, 2014; Webb et al., 2019). This paper seeks to provide valuable insights into how students experience cognitive conflict during mathematics learning to enrich the teachers' strategies for scaffolding student learning of mathematical concepts using cognitive conflict. In particular, the paper reports on the findings from the analysis of qualitative data drawn from a larger study that explored the role of cognitive conflict in promoting students' conceptual development in mathematics. In the following section, a review of relevant literature is presented, followed by a description of the methodology adopted in the study.

LITERATURE REVIEW

In their review of the literature on cognitive conflict, Lee and Kwon (2001) synthesized the signs that students are likely to exhibit when confronted by cognitive conflict. The signs outlined include anxiety, hesitancy, uneasiness, tension, vacillation, doubt, perplexity, frustration, confusion, and reappraisal of the situation to try and resolve the conflict. Therefore, the teacher needs to check for these signs in students during mathematics teaching and learning with a view to assist them to overcome the cognitive conflict and thereby gain a deeper understanding of the concepts involved (Piaget, 1985; Vygotsky, 1978; Wyrasti et al., 2016). In the absence of such support, cognitive conflict can lead to students experiencing mathematics anxiety, which in turn can lead to low self-esteem and, ultimately, poor performance in the subject (Devine et al., 2018). In addition, mathematics teachers need to acquire competencies on how to utilize cognitive conflict moments to support students learning to guarantee conceptual understanding by students (Ashman and Conway, 2017; Mulungye et al., 2016).

Cognitive conflict occur when students experience a contradiction between their existing knowledge and new experiences during their interaction with peers and teachers (Piaget, 1932). The utility of cognitive conflict in promoting reasoning skills can only be realized if students are supported to reconcile the conflicting ideas by examining, explaining, justifying, and questioning their preconceived ideas and beliefs (Lee and Kwon, 2001; Lee et al., 2003; Peled and Shahbari, 2015; Putra et al., 2019). In the teaching-learning situation, cognitive conflict moments should be viewed as motivational moments to ensure knowledge transfer and skill development in problem-solving (Akpinar et al., 2009; Chow and Treagust, 2013).

The role of cognitive conflict in mathematics teaching and learning has been explored from different

perspectives by different researchers. Some researchers have studied the phenomenon based on resolving it in a realistic situation with modeling characteristics as well as its role in developing students' understanding of specific mathematical concepts (Peled and Shahbari, 2015; Watson, 2007). Some other researchers have examined the role of cognitive conflict in improving spatial visualization based on student ability, sources of students' errors, and misconception in algebra (Mulungye et al., 2016; Susilawati et al., 2017). Others have analyzed the characteristics of students' cognitive conflict when solving problems based on information processing theory (Pratiwi et al., 2019). In addition, others have examined the effects of a mathematics cognitive acceleration program on student achievement and motivation (Finau et al, 2018). This paper adds into this repertoire of literature on the role of cognitive conflict in mathematics teaching and learning by considering how cognitive conflict is manifested by students and what meanings are embedded in these manifestations, with a view to inform how teachers can utilize cognitive conflict to improve students' conceptual understanding in mathematics.

METHODOLOGY

Research design

This study adopted a mixed methods research design, as it helped in organizing the research data as well as in viewing the phenomenon under study as a whole. This design was appropriate since it allowed the researchers to gather and analyze detailed information from the research participants (Creswell, 2014), and thereby answer the research questions exhaustively. This paper reports the findings from the analysis of qualitative data, as well as the implications of these findings for teachers, educators, and policy makers.

Research context

The study was carried out in Embu West Sub-County in Embu County, Kenya. In Kenya, there are forty-seven counties, and in each county, there are two categories of secondary schools: public and private. The public secondary schools are further grouped into four categories: National, Extra County, County, and Sub-County schools, depending on students' performance and teaching-learning resources available. The secondary education system in Kenya consists of four grades, called Forms (Form 1, 2, 3, and 4). There are 25 public secondary schools in Embu West Sub-County, 6 of which are single-sex boarding schools and 19 are co-education secondary schools.

Sampling procedures and sample size

The study used purposive sampling (Creswell, 2013) to select the sub-county and the participants for the study. Form Two students aged between 15 and 16 years were purposively selected because it is a critical stage in secondary school mathematics in Kenya, where students need to be supported as they develop critical thinking and problem-solving skills. It is also the stage at which new mathematical concepts are introduced following the transition from primary school mathematics. The students were purposively selected based on their performance in recent mathematics examination, whereby the top performers were selected since they were found to possess an interest in mathematics and thus their participation was considered crucial in answering the research questions for the study. This is because students who enjoy mathematics always make use of deeper learning strategies, which results in better grades, and vice versa (Pekrun, 2006). The sample size was determined using the Yamane model to arrive at a sample of 350 students from 2800 targeted form two students (Yamane, 1967). To get the exact number of Form Two students who participated in the study per school, the researcher calculated this value depending on the number of Forms Two students in the school relative to the total. For instance, if the total number of Form Two students in a given school was 232 then only 29 students were selected. All teachers of mathematics for form two class or classes in the school participated in the study by giving their valuable information in questionnaires.

Research methods and instruments

The study used surveys and one-on-one semi-structured interviews to collect research data. The two methods were used as they complemented each other: the surveys allowed gathering of a huge amount of data within a short time, while the interviews allowed in-depth investigation of the phenomenon of interest (Creswell, 2014). An interview guide was used to obtain students' manifestations and meanings of cognitive conflict in mathematics teaching and learning. In addition, questionnaires were used to gather information on participants' demographics as well as their perceptions of the research topic. The questionnaires had both open- and close-ended questions. Based on the methods and instruments discussed, this paper has reported on qualitative information obtained from participants interviewed.

Pretesting of the research instruments

A pilot study was done to test the validity and reliability of research instruments for the study. The validity of the instruments was prepared by information obtained from different articles online by the researcher in consultation with supervisors. The instruments were piloted in one randomly selected secondary school outside the study area and the school was not included in the actual study sample. The result from the piloting study gave a Cronbach's Alpha of 0.74, which indicated that the instruments were valid to obtain valuable information for the study. The data collected at this stage was useful in the modification of the instruments so that they could yield valuable data needed to answer the research questions.

Data collection procedures

Approvals to conduct the study were obtained from the National Commission of Science, Technology, and Innovation (NACOSTI) in Kenya. Access to the target schools was approved by the Sub-County Director of Education in Embu County, while permission to contact the teachers and students was granted by the school principals. Initial interactions with the research participants were aimed at creating rapport, explaining to the research participants the purpose of the study, and familiarizing with the research contexts. The research participants were assured of confidentiality and anonymity. At least four students were engaged in a one-on-one semi-structured interview from each school until the point where data saturation was attained; that is, until that point when the participants' responses were not adding any new information to the

previous data collected (Bernard, 2012). In total, 68 students (32 females and 36 males) drawn from 17 secondary schools (6 single-sex and 11 mixed-sex) participated in the interviews. The interviews were conducted in a quiet place within the school compound outside the participants' class time. The 20 to 30 min long interviews were audio-recorded and later transcribed. The students' interviews focused on their self-concepts as well as their experiences and meanings of cognitive conflict in mathematics. The teachers' interviews explored the strategies employed by teachers to support students' learning of mathematics as well as the teacher's level of awareness of the strategy of cognitive conflict in teaching mathematics.

Data analysis and coding

The interview transcriptions were read and re-read before they were coded following thematic analysis of Terry et al. (2017). The analysis entailed reading and re-reading the whole text and developing codes. The codes were then organized into larger categories and finally, the categories were organized into four overarching themes that are now presented in the subsequent sections. An illustration of how one of the themes was arrived at is shown in Appendix Table 1.

RESULTS AND DISCUSSION

Through the process of thematic analysis, three themes were identified from the data. These are: a moment to (co) construct one's mathematical meaning, confusion as a result of a teacher's behaviorist stance, and a fleeting moment of magic. These themes are described in the next subsections.

A moment to (Co) construct one's mathematical meaning

Students' experienced cognitive conflict as opportunities to (co) construct their mathematical knowledge through group discussions so that they can get a better conceptual understanding of contradicting concepts. Besides, some students viewed the cognitive conflict as an opportunity to individually make sense of mathematical concepts by consulting their teachers and peers as well as reference materials. Therefore, this indicates that cognitive conflict strategy made students develop three important values in their character while learning for conceptual development; namely, hardworking, curiosity, and responsibility. During the interviews, some students explained that as they consult their teachers they always found different solutions to ideas that contradicted their long-lived skills during mathematics learning. For instance, a male student argued that they got introduced to some topics in Form Two that he was unable to understand in Form One. Consequently, the student stated that he sought assistance from his peers to understand the concepts. The student said:

I can say that in Form One there were some topics we *were having challenges. For example, Simultaneous Equations, I came to understand this topic just another day in Form Two when I consulted a friend* (Student. 33, 2020).

The student argued that the reason to seek help from the peers as opposed to his mathematics teacher was due to difficulty in understanding his teacher's concept explanation. As observed by Sayce (2010), some of the manifestations of cognitive conflict reported by the students include low self-esteem and stuck moments where students were unable to understand and follow what the teacher was explaining during teaching. During the study, a student argued as follows:

I just feel low because I may see I am in class, the teacher is teaching and I feel just low because I am unable to understand due to confusion, but at last, I must find help from the students who got the concept from the teacher and finally solved the problem (Student. 3, 2020).

Students can also react to cognitive conflict by using revision materials available. The students claimed that as they read ahead of the teacher, they experienced cognitive conflict as a result of connecting the method learned from the books and the one which the teacher presented during teaching. During the interview, one of the participants argued that when he encountered cognitive conflict he would consult his peers and as a group, they would consider a simpler method to solve the problem. The student stated that:

Some of us read ahead of the teacher and you find that if you read ahead of the teacher, the teacher might come with a different formula but the answer is the same, but under that condition, the teacher may understand and leave you with your formula but later the student may be confused on which method to use, but we make use of our group and try to adopt a shorter method so that we can all understand it and use (Student. 67, 2020).

Cognitive conflict provides opportunities for students to (co)construct their understanding of mathematical concepts. As such, teachers should encourage cooperative learning approaches by providing opportunities for group discussions, and by encouraging students to consult from their peers and the teacher whenever they encounter challenges with problems in mathematics (Makonye and Khanyile, 2015; Sayce, 2010; Webb et al., 2019). Also, teacher educators should equip student-teachers with skills on how to set mathematical tasks that require higher-order reasoning skills so that students can have deeper conceptual understanding and thereby achieve the intended learning outcomes (Bloom and Krathwohl, 1956). Finally, teacher educators should enhance student-teachers with skills in group work so that they can group students based on their vabilities that promote productive work among the

Step 1: Write the numbers at the top of the Common Factors Grid, leaving some space to the left of the numbers as well as below the numbers.

Step 2: Find the least prime number which is a factor of at least one of the given numbers and write it in the space to the left.

Step 3: If the prime number in Step #2 is a factor of the number on the right, then divide the number by the prime and write the quotient below each number.

Step 4: Repeat Steps #2 and #3 until the only common factor for the numbers is 1.

Box 1. Division method of determining LCM.

groups.

Confusion as a result of the teacher's behaviorist stance

Behaviorists view learners as passive individuals and, hence, teachers who subscribe to this approach tend to make the lesson teacher-centered (Pange et al, 2010). This study found that the teachers embraced behaviorism in teaching mathematics by not considering students' methods. This is because the students argued that teachers failed to articulate their ways of solving mathematical problems during teaching. As a result, the students found it difficult to follow the teacher's methods and felt confused when instructed to use such methods in problem-solving. Some students also reported that they at times experienced difficulties when they attempted solving mathematical problems using the teacher's prescribed methods. For example, in one instance, a student explained that in applying the teacher's method, they were required to look for a smaller fraction, which was confusing as compared to their method. During the interview, the student explained that the teacher's method of solving problems in *Ratio and Proportions* made him get more confused because he would get stuck when trying to apply the teacher's method. The student argued as follows:

The teacher forced me to stop using my primary method and use the one he has taught that needs one to hide and search for a smaller value and multiply that with the other. In the process of using the teacher's method, I get confused and get stuck on what I should do next (Student. 63, 2020).

The students also described the discrepancy they noticed between the procedure for determining the Least Common Multiple (LCM) in their primary school (Box 1) and the one used in secondary school (Box 2) as described below.

During the interviews, a female student claimed that her secondary school teacher regarded the method in Box 1 as a time-consuming method and advised her to better use the one in Box 2. The student stated as follows:

The teacher told me that this method (pointing at Box 1) *although it is correct, it is time-consuming and he stressed to me that it is better to use the one he had taught about power forms* (the one in Box 2) (Student. 21, 2020).

The student argued that in applying the method in Box 2 she always experienced cognitive conflict in cases where the exponents are greater than one to identify the least value of the numbers given. This indicates that the teacher's behaviorist stance can discourage students from exploring diverse ideas while solving problems in mathematics, thereby hindering their mathematics learning. It is therefore important for the teacher to appreciate students' ideas and opinions in the learning process by adopting a constructivist approach (Graffam, 2003; Vosniadou and Verschaffel, 2004). This will help transform cognitive conflict moments into learning moments since students will develop more interest in the concepts for which they experience cognitive conflict. Furthermore, teachers should employ cognitive conflict to facilitate students' mastery of content and guide the students to develop skills for better conceptual understanding (Chambers and Timlin, 2019; Adnyani,

Step 1: Find the prime factorization of each number then write it in exponential form.

Step 2: For the numbers with a common prime factor base, select the prime number that has the highest power.

Step 3: If a distinct prime factor has **NO** matching prime factor base in the list, immediately include this factor with its exponent in the collection of numbers that you will multiply later.

Step 4: To determine the Least Common Multiple (LCM), multiply all the numbers that you have collected or gathered from steps #2 and #3.

Box 2. Prime factorization method for determining LCM.

2020; Hermkes et al, 2018; Kang et al., 2010; Rahim et al., 2015). There is thus a need for teachers to adopt appropriate pedagogical strategies for supporting students to overcome cognitive conflict in mathematics. Moreover, this study found that students have experience with much of the content covered at lower levels in secondary school from their primary school knowledge but in secondary school, the concepts are the same but only with some variations. Therefore, this paper has emphasized that teacher educators should prepare teachers based on the challenges they are likely to face when they meet high school students, especially at the lower levels.

A fleeting moment of magic

Some students experienced cognitive conflict as a fleeting moment of magic based on how new strategies of problem-solving were introduced to them by the teacher. The students argued that the teacher made mathematics concepts appear abstract based on how the teacher explained them. Although the teachers viewed fast concept explanation as a strategy for developing problem-solving skills in students, the students indicated that they were uncomfortable with this approach, arguing that the situation did not help them accommodate and use the gained skills. In addition, the students indicated that their teacher needed to link the concepts with the students' experiences for better conceptual understanding. One of the participants said:

The teacher has guided me in the method there but If I come to calculate the area by trying to separate the figures using the separation method taught, I find it difficult because without capturing the method of the teacher which is different from mine, and it was explained fast, I find it stressful (Student. 3, 2020).

This student attributed his experiencing of cognitive conflict to the teacher's hasty explanation of the concept. The majority of the students expressed the need for a step-by-step concept explanation by the teacher to facilitate their understanding of the concepts and thereby aid in resolving cognitive conflict. The students further advocated for contextualization of concepts by the teacher to ensure that the students develop conceptual understanding. One student said:

Yes, the teacher should explain concepts step-by-step so that I can understand the ideas well without getting stuck on the way (Student. 30, 2020).

Teachers who move fast while explaining mathematical concepts without considering students' experiences sometimes omit important steps that students could utilize in problem-solving. At times, this omission failed to recognize that students had their way of solving the problem. For example, one of the students experienced cognitive conflict simply because the student had his way of solving the problem, which was different from the one the teacher used. During the interview, the student shared a mathematical problem in *Commercial Arithmetic* whose solution during her primary school days differed from the solution in secondary school. The question was framed as follows:

Calculate the profit received by a farmer if he sold his bags for about KShs 1,800 at a 20% profit. The student explained that her primary school mathematics teacher told them that in solving such a problem, they should start by saying that KShs 1,800 = 100%, and then asking

themselves the question: what about 120%? She reported that using her primary school knowledge the answer to the question can be calculated as follows:

$$profit = (120 - 100)\%,$$
$$KShs\ 1{,}800 = 100\%, 120\% = ?$$
$$\frac{1{,}800 \times 120}{100},$$
$$= KShs\ (2{,}160 - 1{,}800) = 360.$$

From the above student calculations, it is clear that the student can apply her primary school knowledge in determining profit for the question given. As she proceeded to secondary school, the student reported that her secondary school mathematics teacher solved and instructed them to always solve such mathematical problems as follows:

$$\frac{20}{100} \times 1800 = 360$$

The student revealed that as a result of the teacher's abstract explanation shown above, she experienced cognitive conflict in understanding the new method and failed to know what was happening during teaching.

The sentiments from the students call upon teachers of mathematics to ensure that students are systematically taken through problem-solving to develop better skills in solving mathematical problems. The explanations provided during problem-solving should resonate with students' experiences to ensure that the students do not view the concepts as abstract. However, the findings also indicated that teachers of mathematics should ensure that they do not leave some of the students as they move along, otherwise they will be doing an injustice to the struggling students. Finally, the findings from this study emphasized that teachers should make use of contextualization in mathematics teaching so that students can identify with the school mathematics and thus develop better problem-solving skills.

SUMMARY OF THE STUDY

This paper has examined students' manifestations and meanings of cognitive conflict in mathematics from the perspective of the research participants. Based on the research findings, three themes were identified to characterize students' experiences of cognitive conflict in mathematics. Several implications for teachers and teacher educators have been identified. In particular, the paper encourages teachers to check for signs of cognitive conflict during the teaching-learning process and to seize such moments to scaffold students' learning. The paper also emphasizes that teachers should provide tasks that promote cooperative learning so that students can learn from each other. The paper has also emphasized the need for the teacher to encourage students to seek help from reference materials, peers, and the teacher to help them build their repertoire of mathematical tools and techniques. As noted by other scholars, cognitive conflict has great potential in promoting conceptual change in mathematics and, as such, teachers and teacher educators should endeavor to orchestrate opportunities of cognitive conflict in mathematics to encourage critical thinking among students.

RECOMMENDATIONS

This paper recommends further studies to assess the role of gender and cognitive conflict in mathematics. Also, this study supports the argument by Maker (2020) that studies should be done on how education programs can be enriched with strategies that can improve students' performance in Science, Technology, Engineering, and Mathematics (STEM) careers.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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REFERENCES

Adnyani LPAP (2020). Applying cognitive conflict strategy to develop mathematical critical thinking ability and character of students. Journal of Mathematics Education 5(1):30-38.

Akpinar E, Erol D, Aydogdu B (2009). The role of cognitive conflict in constructivist theory: An implementation aimed at science teachers. Procedia-Social and Behavioral Sciences 1(1):2402-2407. https://doi.org/10.1016/j.sbspro.2009.01.421.

Ashman AF, Conway RN (2017). Using cognitive methods in the classroom. London: Routledge.

Baddock M, Bucat R (2008). Effectiveness of a classroom chemistry demonstration using the cognitive conflict strategy. International Journal of Science Education 30(8):1115-1128. https://doi/full/10.1080/09500690701528824.

Bernard RH (2012). Social research methods: Qualitative and quantitative approaches. (2nd). Thousand Oaks, CA: Sage.

Bloom BS, Krathwohl DR (1956). Taxonomy of educational objectives: The classification of Educational Goals, by a committee of college and university examiners. Handbook I: Cognitive Domain. New York

NY: Longmans, Green.
Chambers P, Timlin R (2019). Teaching mathematics in the secondary schools. Thousand Oaks, CA: Sage Publications.
Cho S, Yang J, Mandracchia M (2015). Effects of M3 curriculum on Mathematics and English proficiency achievement of mathematically promising English language learners. Journal of Advanced Academics 26(2):112-142. https://doi/abs/10.1177/1932202X15577205.
Chow T-C, Treagust D (2013). An intervention study using cognitive conflict to foster conceptual change. Journal of Science and Mathematics Education in Southeast Asia 36(1):44-64.
Creswell JW (2013). Qualitative inquiry and research design: Choosing among five approaches (3rd ed). Thousand Oaks, CA: Sage Publications.
Creswell JW (2014). Research design: Qualitative, quantitative, and mixed methods approach.Thousand Oaks. The United States of America. Sage Publications.
Devine A, Hill F, Carey E, Szűcs D (2018). Cognitive and emotional math problems largely dissociate: Prevalence of developmental dyscalculia and mathematics anxiety. Journal of Educational Psychology 110(3):431-444. https://doi.org/10.1037/edu0000222.
Finau T, Treagust DF, Won M, Chandrasegaran AL (2018). Effects of a mathematics cognitive acceleration program on student achievement and motivation. International Journal of Science and Mathematics Education16(1):183-202.
Fraser D (2007). Using cognitive conflict to promote a structural understanding of grade 11 algebra.Thesis of education in science (Master's thesis). Simon Fraser University. Canada.
Gal H (2019). When the use of cognitive conflict is ineffective-problematic learning situations in geometry. Educational Studies in Mathematics 102(2):239-256.
Graffam B (2003). Constructivism and understanding: Implementing the teaching for understanding framework. Journal of Secondary Gifted Education 15(1):13-22. https://doi.org/10.4219/jsge-2003-439.
Hermkes R, Mach H, Minnameier G (2018). Interaction-based coding of scaffolding processes. Learning and Instruction 54:147-155. https://doi.org/10.1016/j.learninstruc.2017.09.003.
Jacobs VR, Franke ML, Carpenter TP, Levi L, Battey D (2007). Professional development focused on children's algebraic reasoning in elementary school. Journal for Research in Mathematics Education 38(3):258-288. https://doi/10.2307/30034868.
Kang H, Scharmann LC, Kang S, Noh T (2010). Cognitive conflict and situational interest as factors influencing conceptual change. International Journal of Environmental and Science Education 5(4):383-405.
Lee G, Kwon J (2001). What do you know about students' cognitive conflict: A theoretical model of cognitive conflict process? Costa Mesa, CA: 309-325. Proceedings of 2001 AETS Annual meeting, Korea National University of Education.
Lee G, Kwon J, Park S, Kim J, Kwon H, Park H (2003). Development of an instrument for measuring cognitive conflict in secondary-level science classes. Journal of Research in Science Teaching 40(6):585-603. https://doi.org/10.1002/tea.10099.
Li Y (2019). Mathematics education and mathematics culture-training mathematics literacy in mathematics education. 5th International Conference on Education Technology, Management and Humanities Science.doi:10.25236/etmhs.2019.374. Shandong Jiaotong University, Weihai, China.
Maharani IP, Subanji S (2018). Scaffolding based on cognitive conflict in correcting the students' Algebra errors. International Electronic Journal of Mathematics Education 13(2):67-74.
Maker CJ (2020). Culturally responsive assessments of spatial analytical skills and abilities: Development, field testing, and implementation. Journal of Advanced Academics. https://doi/full/10.1177/1932202X20910697.
Makonye JP, Khanyile DW (2015). Probing grade 10 students about their mathematical errors on simplifying algebraic fractions. Research in Education 94(1):55-70. https://doi.org/10.7227%2FRIE.0022.
Maume K, Mathews P (2000). A study of cognitive accelerated learning in science. Irish Educational Studies 19(1):95-106. https://doi.org/10.1080/0332331000190110.
Mufit F, Festiyed F, Fauzan A, Lufri L (2018). Impact of learning model based on cognitive conflict toward student's conceptual understanding. Conference Series: Materials Science and Engineering 335(1). https://doi.org/10.1088/1757-899X/335/1/012072.
Mulungye MM, O'Connor M, Ndethiu S (2016). Sources of student errors and misconceptions in Algebra and effectiveness of classroom practice remediation in Machakos County-Kenya. Journal of Education and Practice 7(10):31-33.
Murphy L, Eduljee NB, Parkman S, Croteau K (2019). Gender differences in teaching and classroom participation methods. Journal of Psychological Research 13(2):317-319. https://doi.org/10.32381/JPR.2018.13.02.5.
O'Brien B, Iannone P (2018). Students' experiences of teaching at secondary school and university: Sharing responsibility for classroom engagement. Journal of Further and Higher Education 42(7):922-936. https://doi.org/10.1080/0309877X.2017.1332352.
Pange J, Lekka A, Toki E (2010). Different learning theories applied to diverse learning subjects. Procedia Social and Behavioral Sciences 9(2010):800-804. https://doi.org/10.1016/j.sbspro.2010.12.237.
Pekrun R (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. Educational psychology review 18(4):315-341. https://doi.org/10.1007/s10648-006-9029-9.
Peled I, Shahbari JA (2015). Resolving cognitive conflict in a realistic situation with modeling characteristics: Coping with a changing reference in fractions. International Journal of Science and Mathematics Education 13(4):891-907.
Piaget J (1932). The moral judgment of the child. London: Free Press.
Piaget J (1985). The equilibration of cognitive structures: The central problem of intellectual development. Chicago. University of Chicago Press.
Pratiwi E, Nusantara T, Susiswo S, Muksar M, Subanji S (2019). Characteristics of students' cognitive conflict in solving a problem based on information processing theory. International Journal of Learning, Teaching and Educational Research 18(2):76-88. https://doi.org/10.26803/ijlter. 18.2.6.
Putra R, Fauzan A, Habibi M (2019). The impact of cognitive conflict based learning tools on students' mathematical problem solving ability. International Journal of Educational Dynamics 2(1):209-218. https://doi.org/10.24036/ijeds.v2i1.247.
Rahim RA, Noor NM, Zaid NM (2015). Meta-analysis on element of cognitive conflict strategies with a focus on multimedia learning material development. International Education Studies 8(13):73-78. https://doi.org/10.5539/ies.v8n13p73.
Sayce L (2010). The way out of cognitive conflict: A planning toolkit for teachers. National Center for Excellence in the Teaching of Mathematics. London.
Susilawati W, Suryadi D, Dahlan JA (2017). The improvement of mathematical spatial visualization ability of student through cognitive conflict. International Electronic Journal of Mathematics Education 12(2):155-166.
Sutopo S (2014). Counterexample in cognitive conflict as factor influencing conceptual change.Qudus International Journal of Islamic Studies 2(2):198-218.
Swan M, Wake G, Joubert M (2005). Developing conceptual understanding through cognitive conflict and discussion in mathematics and science education. Centre for Research in Mathematics Education University of Nottingham: FaSMEd Position Paper.
Tall DO (1977). Cognitive conflict and the learning of mathematics. Proceedings of the First Conference of the International Group for the Psychology of Mathematics Education. Utrecht, The Netherlands.
Terry G, Hayfield N, Clarke V, Braun V (2017). Thematic analysis. The Sage handbook of qualitative research in psychology pp. 17-37.
Tinto V (2012). Enhancing student success: Taking the classroom seriously. The International Journal of the First Year in Higher Education 3(1):1-8.
Vosniadou S, Verschaffel L (2004). Extending the conceptual change approach to mathematics learning and teaching. Special Issue of Learning and Instruction 14(5):445-451. https://doi.org/10.1016/j.learninstruc.2004.06.014.
Vygotsky LS (1978). Mind and society: The development of higher

mental processes. Cambridge, MA: Harvard University Press.
Watson JM (2002). Inferential reasoning and the influence of cognitive conflict. Educational Studies in Mathematics 51(3):225-256.
Watson JM (2007). The role of cognitive conflict in developing students' understanding of average. Educational Studies in Mathematics 65(1):21-47.
Waxer M, Morton JB (2012). Cognitive conflict and learning. In: N. M. Seel (Ed.), Encyclopedia of the sciences of learning pp. 585-587. Boston: Springer.
Webb NM, Franke ML, Ing M, Turrou AC, Johnson NC, Zimmerman J (2019). Teacher practices that promote productive dialogue and learning in mathematics classrooms. International Journal of Educational Research 97:176-186. https://doi.org/10.1016/j.ijer.2017.07.009.
Widada W, Herawaty D, Lubis ANMT (2018). Realistic mathematics learning based on the ethnomathematics in Bengkulu to improve students' cognitive level. Journal of Physics: Conference Series 1088(1):012028. Universitas Bengkulu, IOP Publishing.
Wyrasti AF, Sa'dijah C, Anwar L (2016). The assessment of students' cognitive conflict by using student's cognitive map in solving mathematics problem. Proceeding International Conference on Education pp. 72-82. Universitas Negeri Malang, Indonesia.
Yamane T (1967). Statistics: An introductory analysis; 2nd Edition, New York: Harper and Row.
Zazkis R, Chernoff E (2006). Cognitive conflict and its resolution via pivotal/bridging example. In: J. Novotná, H. Moraová, M. Krátká, & N. Stehlíková (Eds.), Proceedings of the 30th Annual Conference of the International Group for the Psychology of Mathematics Education 5:465-472. Prague: PME. http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.615.9518.

Appendix Table 1. Thematic analysis process showing how one of the themes was arrived at.

Codes	Examples of participants quotes	Categories	Theme
Seeking teacher(s) help	I consult the teacher to maybe explain the method to me or use another simpler method	Conceptual development through teacher's guidance	A moment to (co)construct one's mathematical meaning
	I do consult the teacher many times and practice more so that I can understand		
	I do consult teachers of mathematics in the school in areas of confusion		
	The ones which are hard and I am unable to solve I go and consult my teacher		
	…when I go to consult I find that the teacher uses a different method from one I know in finding the solution of the sum		
	…was consulting my friends to solve it		
	I consult from peers on difficult areas		
Seeking peer(s) help	I go and consult my fellow students who know the concepts	Acquisition of knowledge from peers	
	I consulted my desk mates and my other classmates		
	Many times I consult my fellow students		
Employ reference materials	I use different books and I check on how the question is solved	Use of reference materials to learn	
	I got the method in a revision book		
	Mostly I borrow books from the library		
Learn individually	I train on my method	Individual commitment and responsibility	
	I practice more and more on it		
	I do keep doing practices continuously until I understand the method		
	I just practice it often by doing some questions		
Group discussion	I do discussions with my fellow students	Skill development through group discussion	
	I do discuss because like this is a group we formed so that we can discuss mathematics together every evening before we go home		

Related Journals: