

1 The use of Technology in Pre-School Education: Teachers' and 2 Administrators' Views

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5

6 **Abstract**

7 The aim of this study is to examine the opinions of teachers and administrators about the use
8 of technology in preschool. For this purpose, the opinions of teachers and administrators
9 about the technological tools and equipment they use in their classrooms, the purpose and the
10 activities in which they use the technology, the advantages and disadvantages of the use of
11 technology in preschool education, their competence in the use of technology, and the support
12 they receive regarding the provision and use of technological equipment have been taken. The
13 study group consisted of 20 preschool teachers and 5 administrators, determined by
14 convenience sampling method, who work in public and private preschool education institutions
15 in the TRNC. Qualitative research method was used in the study. Data were collected
16 through an interview form consisting of semi-structured questions. Accordingly, 9 open-ended
17 questions were asked to teachers and 8 open-ended questions were asked to administrators and
18 their opinions were received. Content analysis technique was used in the analysis of the data
19 and interpreted in accordance with the relevant literature.

20

21 **Index terms**— technology, preschool education, teacher, administrator.

22 **1 Introduction**

23 s in many countries around the world, technological developments majorly affect the social life in our country
24 (Karip, 2016). Education is one of the fields where technological tools are preferred for the future of communities.
25 The relation between education and information technology was mainly discussed with regard to the use of
26 technology in education. This approach focuses on the ways of using various audio-visual materials during lessons
27 or how student would use computer (Jonassen, 2000; cited: Güven and Kartal 2006). However; after 1980s, this
28 perspective was evolved to the communication of students with information technologies, that students developed
29 a way of thinking on how they can solve problems via such technologies and that they developed their skills to
30 build and design what they want the computer performs (Papert, 1993). On the other hand, it is possible to say
31 that educational practices still bear the 1980s perspective.

32 A study on the use of educational technologies ???im?ek, 2005) shows that the problems on educational
33 technologies are not different in other countries. The problems are considered to be perceptual diversity due to
34 the scattered nature in almost every country, insufficiency in practices and developing technological products and
35 lack of momentum in academic literature.

36 The related literature emphasizes that the communities desiring to be successful in the future should keep up
37 with the developing technologies while using the technologies in the appropriate and effective manner (Robb,
38 2013; ??ayan, 2016; ???nç, 2015;Küçüko?lu, 2013). Pursuant to researches, the developments occurred due to
39 technology are one of the most significant indicators of development level in a community ??UNESCO, 2003).

40 Students need to develop their skills in safe and efficient use of technology as well as generate solutions for
41 their daily life problems. Hence; with the developing technologies, the integration of information technologies
42 into lessons from pre-school up to university has become a requirement ??UNESCO, 2003).

43 The educators state that the most suitable time in bringing children with technology and providing early
44 trainings on technology use is during the pre-school education ??NAEYC, 1996; ??ekcan, 2009; ??eengwe and

4 A) RESEARCH MODEL

45 Onchwari, 2009). The appropriate technology models to be determined by early childhood period contribute to
46 the learning of children. While technology is not the solution in the elimination of all educational problems,
47 it is nowadays required to be used in education and training (Erdemir, Bakırıcı, Eyduran, 2009; Keengwe and
48 Onchwari, 2009; Bahçekapılı, 2011; Kılıç, 2015; Karaoğlu, 2016).

49 Student encounter with a student group that have devices like computers, cell phones, tablets in their daily
50 lives. Educational technology promotes the curiosity of pre-school children and allows them to learn by living,
51 experimenting and failing while positively affecting the development of problem-solving, planning, reflective
52 thinking, visual thinking, logical thinking, creative and critical thinking skills, and psychomotor abilities and
53 vocabulary and memory developments. Therefore, technology is widely used in various fields of pre-school
54 education. When correctly used, technology has a crucial power in improving the success of students. The use of
55 technological tools from the early ages is noted to influence all development areas (Bahçekapılı, 2011; Keengwe
56 and Onchwari, 2009).

57 In addition to the studies emphasizing that technology use in pre-school education has a vital role in the
58 education of children (NAEYC, 1996 Cordes and Miller, 2000; en, 2013). Similarly in the year of 2000,
59 an American organization called "Alliance for Children" declared to stop purchasing computers to preschool
60 units except for disabled children (Kartal and Güven, 2006). Besides, the American Academy of Pediatrics
61 Council on Communication and Media mentioned the benefits of technology use under their statements on 2011
62 policies. They accepted the fact that quality interactive media improves "social skills, language skills and even
63 readiness to school levels" among children with educational benefits (American Academy of Pediatrics Council
64 on Communication and Media, 2011; Cit. Epstein, 2013). Under a publication, the National Association for the
65 Education of Young Children" (NAEYC) emphasized the significant place of technology in child development
66 (NAEYC, 1996). It is also indicated that children start "playing computers" in their early ages and adults
67 believe that "playing computers" contributes to mental development. The authors from various studies reflected
68 that technology assisted teaching significantly supports children in the acquisition of time and space concepts,
69 develops creative thinking skills, makes learning much fun, motivates children positively towards school and
70 allows children to actively participate in learning environment (Demir, 2007 Recently, "coding" courses provided
71 by primary education stand out in the world, Turkey and the Turkish Republic of Northern Cyprus. "Coding"
72 courses, which are considered as important in terms of showing the levels that the use of technology in education
73 can reach, and have increasingly become significant, have been added to the curricula of many departments at
74 universities (YÖK, 2018). Some of the private school in the Turkish Republic of Northern Cyprus have started
75 to include coding courses in their curricula starting with primary education in accordance with such innovative
76 practices in educational technologies (Halkınesi Gazetesi, 2018; Kibrıls Gazetesi, 2018).

77 Considering the related literature, there are limited number of researchers regarding the significance and use
78 of educational technologies in preschool education. This research, which aims to make a realistic assessment on
79 technology use in preschool education and suggest proposals highlighting its importance, is expected to make
80 contributions towards eliminating a major gap in the field.

81 Therefore, it is important to evaluate the views of teachers and administrators regarding technology use in
82 preschool education. Additionally, this study is also vital since it highlights the significance of sound and correct
83 use of technology in preschool education. Hence, this study aims to reflects the views of educators regarding
84 the significance of technology use in preschool education institutions and their adequacy in their knowledge on
85 such technologies and how to use them. Moreover, another aim of this study is to develop functional proposals
86 for further studies based on the findings. Within this framework, teachers are administrators were asked to give
87 their views on the definition and significance of educational technology, type of technology used by teachers in
88 their classrooms, their purpose and ways of using technology, advantages and disadvantages of technology use in
89 preschool education, their adequacy in technology use and type of assistance given to them in the provision and
90 use of technological tools.

91 2 II.

92 3 Method

93 This part of research covers study group, data collection tool, data collection and analysis respectively.

94 4 a) Research Model

95 This study is in general survey model as a descriptive study that analyzed with qualitative research model.
96 Qualitative research covers the use data collection tools such as acquisition of data from observations, interviews,
97 stories, myths, case studies and narratives, and document analysis where a qualitative process is followed to
98 reflect the perceptions and events in a realistic and holistic way. Qualitative researches aims to understand the
99 human behaviors that happen in natural environment. The views of interviewed individuals are dramatically
100 reflected with direct citations in order to present the findings collected under descriptive studies in an edited and
101 interpreted approach (Yıldız, 2011; Sönmez, Alacapınar, 2014).

102 **5 b) Study Group**

103 The study group is comprised of 20 preschool teachers and 5 administrators from public and private preschool
104 education institutions in TRNC. Convenience sampling was utilized since teachers and administrators were
105 selected from accessible and suitable units during the study group selection process. Convenience sampling means
106 to select the research population from the most accessible persons and groups (Büyüköztürk, K?l?ç Çakmak,
107 Argün, Karadeniz, Demirel, 2009; Sönmez and Alacap?nar, 2014).

108 Considering the demographic characteristics of teachers, majority of teachers (n=8) graduated from preschool
109 department of universities and child development departments of vocational schools (n=6). The majority of them
110 (n=11) also have 6-10 year and 1-5 year-experience (n=8). They are mainly (n=14) teachers at private schools.
111 Almost all of them (n=19) did not get any course or seminar on technology. Similarly almost all of them (n=18)
112 use more than one technological tools in their classrooms. In terms of the technological tools, many of them
113 use laptops, TV, radio, smart phones and electronic toys (n=11). Additionally, teachers use desktop computers,
114 projectors and smart boards (n=7) as well. However, overhead projector (n=2) is a less popular technological
115 tool.

116 In terms of the demographical characteristics of administrators, three of them graduated from a field that is
117 not related with preschool education, two of which graduated from primary school teaching and the other from
118 the department of literature. Majority of the administrators (n=4) have 6-10 and 11-15-year experience. 2 of
119 them attended to courses or seminars related with technology while 3 of them did not. All of them indicated
120 that more than one technological tools are used at their schools. They noted that the most frequently used tools
121 are laptops (n=5), desktop computers (n=5), TV, radio, smart phones and electronic toys (n=4) and projector
122 (n=3). Smart boards (n=2) and overhead projectors (n=1) are used less respectively.

123 **6 c) Data Collection Tool**

124 For this research, a scale with two parts was developed to collect data accordingly. The first part is comprised of
125 personal information while the second part includes 13-semi-structured interview questions. The related literature
126 and expert opinion were consulted during the development of questions. Three experts in the related literature
127 were consulted to check whether the questionnaire is understandable and viable. The expert feedbacks can be
128 summarized that the question statements are open-ended; the questions were not asked in the way to answer
129 with yes or no; "technology integration" concept might be added, and some modifications in the sentences. The
130 questionnaire were completed upon the amendments based on experts' feedback. Consequently, the questionnaire
131 covers the views on the definition of technology, care to use technology, activities where technology is used, types
132 of technological tools used in classrooms, utilization of technological facilities at schools, assistance provided at
133 schools for technology use, teacher adequacy for technology use, whether administrator were asked for assistance,
134 what type of assistance should be provided by the administrator, administrator adequacy for technology use,
135 preschool education curriculum in TRNC and support of the Ministry of Education towards technology use.

136 **7 d) Validity and Reliability of Data Collection Tool**

137 Within the scope of qualitative research, the researcher should use additional ways like participant confirmation,
138 peer confirmation in order to interpret the outcomes generated based on the data as much objective as possible.
139 As a peer review, the partial researcher triangulation was also used to check the reliability/validity in this
140 research (Creswell, 2014;Merriam, 2009). Therefore, data generated from all teachers and administrators
141 were analyzed separately by two researchers. Different methods like getting from experts, participant
142 confirmation and long term interaction for detailed interviews with participants were utilized to ensure internal
143 validity/trustworthiness. Additionally, the findings generated from the collected data were checked for consistency
144 to enhance trustworthiness with the aim of checking the compatibility between the theoretical framework as the
145 basis of questionnaire, and findings. Three different researchers attended to the interview process to prevent a
146 potential data loss. The process was described in all details from every dimension so that the external validity,
147 namely transmissibility of research can be ensured respectively.

148 In order to enhance the reliability, namely consistency of research, the generated findings were firstly presented
149 without discussion and interpretation. Moreover, the interview data were individually coded by both researchers
150 and a lecturer experienced in qualitative research field. Then these codes were compared for reliability calculation.
151 With the purpose of improving the external reliability or confirmability of research, detailed explanations on
152 the interest of researchers for the subject, their experience, contributions of participants, educational-social
153 environment where the research was held, theoretical framework used for the reference to generated data and
154 methodologies used in analyses were covered as well. Raw data were also stored to be used if needed for different
155 purposes at different times, which aimed to improve the external reliability of research.

156 **8 e) Data Collection**

157 The questionnaire was applied to a total number of 20 teachers and 5 administrators. It took 15-20 minutes to
158 answer the questions. The open ended questions developed for the research were asked through semi-structured
159 interviews. The interviews were held at the schools that the participants' work on the designated appointment

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160 time. The questions were asked to every participant with the same words in the way of giving same meaning.
161 Voice recording and note taking methods were used during the interviews with teachers.

162 **9 f) Data Analysis**

163 Descriptive analysis and content analysis techniques are used for this research. Descriptive analysis "is the
164 technique where the generated data are summarized by the designated themes; direct citations are widely
165 used to dramatically reflect interviewee, and the generated data are interpreted in the framework of cause and
166 effect relationship" (Yıldız, 2005). Descriptive analysis is comprised of three steps as data
167 reduction, data display and drawing conclusion and verification (Türnükli, 2000). In data display, the criterion
168 as "remarkability" (different view), "explanatoriness" (suitability to theme), "diversity" and "extreme examples"
169 were considered for the selected citations (Ünver, Bümen and Bay, 2010).

170 The data generated from interviews were firstly transferred to Office software and coded after being reviewed
171 several times. Afterwards, the related codes were gathered, which determined the themes/categories as the main
172 elements of research findings, and descriptive and content analysis were conducted respectively. The consistency
173 between coders was calculated to identify the reliability of content analysis. After drawing out interview minutes, a
174 coding key was developed based on interview questions. Two interview minutes were selected randomly in order to
175 identify the reliability of interview coding key, and researchers reviewed both minutes separately. The evaluation
176 of each researcher was calculated in accordance with "Agreements" and "Disagreements" formula where "same"
177 evaluations from researchers were deemed as agreements while "different" evaluations as disagreements. Lastly,
178 the reliability was calculated with agreement percentage as "Reliability = Number of Agreements/(Number of
179 Agreements + Number of Disagreements) x 100" (Miles and Huberman, 1994). Pursuant to Yıldız, 2005 and
180 ??im?ek (2005), the agreement percentage of 70% and above is considered as reaching to expected reliability.
181 For this study, the reliability of teacher data was determined as 82%.

182 The qualitative answers of teachers and administrators were quantified, which allowed researchers to make
183 comparison between categories and provided a perspective on the identification of emphasis in the answers.

184 25 pages of data were obtained from the analysis of interview in voice recording and note taking. Firstly, the
185 breakdown of data was verified through documentation; data was processed based on the certain themes, and the
186 interview records were analyzed respectively. The findings were interpreted through direct citation. The teacher
187 participants were coded as Ö1, ?, Ö20 and administrator participants as Y1, ?, Y5 for the analysis of answers
188 given to the questionnaire.

189 **10 III.**

190 **11 Findings**

191 The findings generated under this part were analyzed by the aim of research, sub-problems and related literature.
192 The themes and sub-themes on the views of teachers and administrators regarding the significance of technology
193 use in preschool education and their support are given under Table ??.

194 Table ??: Themes and Sub-Themes Generated from Teachers' Data 1.

195 **12 Teachers' views on educational technologies**

196 Tools assisting learning Tools integrated to education

197 **13 Teachers' views on the significance of technology use in education**

198 It is important/it should be used Table ?? covers the teachers' views on the significance of technology use in
199 preschool education and the assistance provided to them. Each question under the questionnaire comprises a
200 theme while each view is considered as sub-themes. The related literature was used for the determination of sub-
201 themes. Teachers use technological tools (laptops, desktop computers, projector, smart board, overhead projector,
202 smart phone, electronic toys etc.) and prefer using more than one technological tools in their classrooms. It is
203 identified that teachers perceive technology as "tools assisting learning" and "tools integrated to education".
204 Teachers stated that technology should be used in education to support "cognitive development, emotional
205 development and psychomotor development". Teachers noted that they prefer to use educational technologies
206 for "music/art, science-nature/mathematics and language/ foreign language" activities. They also indicated that
207 they use "visual, audial, audiovisual and electronic toys" as technological tools in their classrooms. All teachers
208 reflected that technology is important for education and it should be utilized. Pursuant to teachers, the advantages
209 of technology use in classroom as "they enhance motivation towards school and learning; they attract attention;
210 they materialize learning; they improve memorability; they improve creative thinking skills; they make learning
211 fun; they prepare students for higher-level institutions" while the disadvantages as "they prevent cognitive,
212 emotional and motor development; they prevent creativity". Teachers reflected that they mainly get support
213 and assistance from administrators and other colleagues with regard to technological equipment. Teachers stated
214 that the assistance from their administrators for technology use is towards "provision of educational technology
215

216 tools (reinforcement of school's technical facilities) and support for use (be an example, providing information
217 and guidance, giving advices). Teachers stated that they "find themselves qualified" and "need to improve/be
218 supported" on technology use.

219 **14 Teachers' views on the purposes of using technologies in the 220 classroom**

221 Table 2 covers the administrators' views on the significance of technology use in preschool education and the
222 assistance that they provide. Each question under the questionnaire comprises a theme while each view is
223 considered as sub-themes. The related literature was used for the determination of sub-themes. 3.

224 **15 4.**

225 5.

226 **16 6.**

227 7.

228 8.

229 **17 Administrators' views on the technological facilities in their 230 schools**

231 Qualified Need for improvement/support Table 2 reflected that administrators perceive technology as "tools
232 assisting learning" and "tools integrated to education". Administrators stated that technology should be used in
233 education to support "cognitive development, emotional development and psychomotor development". Some of
234 the administrators stated that using technology in education "is important and should be used while some said it
235 is not that much important and should not be used unless necessary". Administrators indicated that they provide
236 "provision of tools and user support" in classrooms and school for educational technologies and they supply the
237 required technological tools through "school budget and donations". The administrators considered themselves
238 as "qualified and need for improvement". While they noted that their school teachers are qualified in terms of
239 technological knowledge, skills and use, and particularly "new graduated teachers / teachers with undergraduate
240 degree, new generation teachers and teachers with interest in technology" are more qualified in this matter. In
241 terms of technological facilities, they identified their schools as "qualified and needed to be improved".

242 IV.

243 **18 Results**

244 The following results are generated through the research findings, and they were interpreted within the framework
245 of related literature.

246 In terms of the findings regarding the perception of teachers about technology, teachers consider it as tools
247 assisting learning and tools integrated to education, and the administrators gave similar answers too. Under the
248 related literature, there are studies compatible with research findings reflecting that technology should education
249 and training activities (Demiriz, Karada? and Uluta?, 2003; Keengwe and Onchwari, 2009; Sert, Kurto?lu,
250 Ak?nc?, Sefero?lu, 2012; Türk, 2012; Y?lmaztekin and Olgan, 2013; Gök, Turan, Oyman, 2016) and there are
251 some studies in parallel with the other finding arguing that technology should be properly integrated to all
252 stages of education (Akba?ba-Altun, 2002; UNESCO, 2003; Çava?, K??la and Twining, 2004; Altun, 2007). In
253 consideration with such findings, the views of preschool teachers and administrators on the types of educational
254 technologies are parallel with the related literature.

255 Pursuant to the findings on the significance of technology use in preschool education, all teachers and four
256 out of five administrators indicated that the use of technology in education is important and necessary, while
257 one administrator thinks that it should not be used unless necessary. In terms of the related literature, there
258 are a variety of views on the significance and necessity of using technology in preschool education. While some
259 views emphasize the benefits of using technology ??NAEYC, 1996; Demir, 2007; Akp?nar, 2005 Kol, 2016), some
260 studies underline its disadvantages (Weikart, 1995; Cordes and Miller, 2000; Kartal and Güven, 2006; American
261 Academy of Pediatrics-AAP, 2011; ?en, 2013). The most prominent point under the studies supporting to use
262 technology in preschool education is that it should be used in a "correct" and "effective" way and at "certain"
263 levels, which would bring many educational benefits at early ages. Otherwise, it may cause harms rather than
264 benefits (becoming antisocial, technology addition). Similarly, the researches underline that technology should
265 be suitable for the developmental characteristics of children and be integrated with curriculum. Additionally,
266 it is emphasized that technology cannot substitute one-to-one communication (Sayan, 2016; Halmatov, Akçay,
267 Ekin, 2017). Based on the related studies (Haugland, Wright, 1997; Espinosa, Laffey, Whittaker, Sheng, 2006,
268 Sayan, 2016) and results from this study, the general opinion is that the use of technology in preschool education
269 should be used appropriately where applicable.

270 Majority of teachers noted that they use technology to support cognitive development, and they mainly
271 use technological tools in science/nature/mathematics activities and secondly in music/arts activities. A few
272 of teachers mentioned that they use technological tools in language/foreign language activities. The related
273 literature includes some views that technology support cognitive development. ??orkmaz and Ünsal (2016)
274 concluded that where preschool stage developmental characteristics are taken by the mental development stages,
275 it is important to effectively use teaching materials that are suitable for cognitive, emotional and psychomotor
276 developments of preschool students.

277 The study by Gök, Turan and Oyman (2016) identified that preschool teachers effectively use the technological
278 tools frequently (%80) in Turkish language activities, reading activities, mathematics and science activities and
279 concentration activities. A study by Demir (2015) on the information technology levels among preschool teachers
280 concluded that teachers use such technologies for the activities in Turkish, Music, ??orkmaz and Ünsal (2016)
281 consider preschool materials as significant since they attract the attention of children; they are dynamic; they
282 stimulate more than one sense in the body; they materialize the topics and make learning more permanent.
283 They also emphasized the necessity to use technological tools in education stage. Similar studies indicate that
284 technology assisted education is effective in the development of different abilities and skills such as mental,
285 language, verbal and non-verbal abilities and conceptual development, problem solving, long term recall etc.
286 (Sayan, 2016; Li & Atkins, 2004 ?? Fish et.al, 2008). Moreover, a holistic approach on the role and significance of
287 using technology in classroom has become important ??Sayan, 2006; Kartal and Güven, 2006) since the objective
288 is to support all child development dimensions and that all developmental areas are considered and progress
289 together.

290 Teachers reflected that they mainly use audial/ visual tools like laptops, desktop computers, TV, radio,
291 electronic toys, projector and smart board together. Even a few, some of them mentioned that they use overhead
292 projectors. Other research findings that support such findings showed that computers, TV, projectors, smart
293 boards are used as classroom tools ??Kol, 2012; Demir, 2015 ?? Korkmaz, Ünsal, 2016; ??almatov, Akçay, Ekin,
294 2017). One the other hand, some studies even note that a number of different tools like cassette-players, radio,
295 overhead projectors, camera, fax, electronic story books and toys are also used (Sayan, 2016, ??orkmaz and
296 Ünsal, 2016). Hence, it is possible to say that study findings are in compliance with the related literature.
297 Consequently, it is interesting that some technological tools like overhead projectors, radio, which are behind the
298 high paced technological developments of our time, are still used at schools. Another interesting observation is
299 that some teachers refer to the intensive use of their smart phones in their classrooms, which can be considered
300 that teachers use technology only for the sake of using it without considering its educational value.

301 Under the related literature, one of the most crucial issues that majority of teachers is the adequacy of teachers
302 in using technology. Pursuant to the literature, it is important that teachers consider themselves as qualified in
303 using technology; they have positive attitudes towards technology; they want to learn how to use technological
304 tools frequently and actively, and they have a desire to keep up with the technological developments (Öztürk
305 Y?lmaztekin and Olgan, 2013; Demir, 2015; Gök, Turan, Oyman, 2016; Halmatov, Akçay, Ekin, 2017). Within
306 the framework of this study, majority of teachers deem themselves as having sufficient qualification on technology
307 use while they also state that they need improvement as well. The relevant literature also has other research
308 findings that complement findings from this study (Öztürk Y?lmaztekin and Olgan, 2013; Demir, 2015; Gök,
309 Turan, Oyman, 2016; Halmatov, Akçay, Ekin, 2017). Considering this study, teachers reflected that they have
310 a positive attitude towards using technology in education and consider themselves as qualified but also they
311 have the desire to be up-to-date with the latest developments, which are in parallel with study findings. Thus,
312 the teachers from this study stated that they perceive themselves as qualified on the knowledge, skills and use
313 of technology, and they need improvement on this matter. Additionally, the administrators indicated that the
314 technology qualifications of teachers in their schools vary whether they are "new generation", "undergraduate"
315 and "interested in technology". Institutions such as International Society for Technology in Education (2000),
316 Ministry of National Education (MEB) (2006) reiterate that in order to utilize information technologies efficiently
317 and effectively, teachers must be "technology literate", follow technological developments, open to cooperation
318 for professional sharing, be an appropriate example in using technology and have the awareness for effective
319 use of technology. The significance of pre-service and in-service trainings is underlined in the acquisition of
320 aforementioned qualifications by teachers and utilization of potential advantages of technology ??NAEYC, 1996).

321 Similarly, the administrators also indicate that they perceive themselves as qualified and need for improvement
322 in terms of knowledge, skills and use of technology. There are some studies (Akbaba- Altun, 2002; ??rtmer et.al,
323 2002), which emphasize the improvement in school efficiency with the improvement of technology qualifications
324 among administrators. Hence, it is possible to say that there is a direct effect of technological qualifications
325 among administrators on the technological qualifications of school.

326 With regard to the advantages of using technological tools in classrooms, teachers stated that such tools
327 materialize learning, enhance memorability, make learning fun, attract attention, improve creative thinking skills
328 and increase positive motivation towards learning. In terms of disadvantages, technology prevents development
329 areas of children and their creativity when it is not used properly and correctly. In consideration with these
330 findings that are in parallel with the related literature (Kacar, 2006 Teachers stated that they frequently get
331 support from their administrators about the provision of Volume XXII Issue I Version I 48 () technological
332 tools and their use. Some teachers mentioned that they get assistance from their colleagues at school or they

333 do not get any support at all. There are some studies that emphasize the support of administrators and other
334 teachers given to the teachers (Akbaba-Altun, 2002; Anderson and Dexter, 2005; Sincar, 2009; Gök, Turan,
335 Oyman, 2016). The related literature consider the support of administrators given to the teachers as important.
336 Pursuant to the literature, the administrators are expected to be examples in using and adopting technology, and
337 supporting teachers accordingly. The technological support of administrators is based on the school resources,
338 infrastructure and perspectives of teachers about using technology. The study findings showed that the answers
339 of administrators are parallel with teachers in terms of supporting teacher in providing technological tools and
340 how to use them. The administrators stated that they supply the technological tools required at their schools
341 from school budget and through donations. ??EB (2001 ??EB (, 2003) and the General Directorate of
342 Educational Technologies under the Ministry (2001) reflect some duties for school administrators for effective
343 use of information technologies at schools, one of which is about showing all kinds of efforts towards establishing
344 informatics infrastructure at schools and working towards finding necessary funding. The availability of budget
345 is also required respectively. Considering such findings, it is possible to say that the support of administrators
346 to teachers is vital in using and providing technology at schools.

347 According to research findings, four administrators mentioned that their school is sufficient in terms of
348 technological equipment while one of the administrators said there should be improvement. The related
349 literature covers some studies showing that the technological facilities at schools are directly correlated
350 with the technological qualification perception of administrators (Akbaba- Altun, 2002;Sincar, 2009). From
351 this perspective, the perception of administrators on technology qualification affect their perception on the
352 technological equipment sufficiency at their schools.

353 As a result of research findings, the views of teachers and administrators regarding the use of technology in
354 preschool education are positive, and teachers can get support from their administrators and their colleagues at
355 their schools as they need, which is in parallel with the related literature.

356 V.

357 **19 Recommendations**

358 A number of recommendation that may be proposed in accordance with the research findings can be summarized
359 as follows:

360 Teachers identified themselves as "qualified" about using technology yet they need improvement.
361 Therefore, the deficiencies and associated topics should be determined, and some activities and courses may be
362 organized to meet such need. Some of the teachers stated that they use "overhead projectors" and smart phones in
363 their classrooms. For such teachers, some adjustments that would allow them to use more modern and functional
364 tools may be undertaken. Since some teachers argued about disadvantages of using technology in preschool
365 education as it prevents cognitive, emotional and motor development as well as creativity, such teachers may
366 be provided with awareness raising activities that may lead them change their minds. Administrators indicated
367 that some teachers at different statuses require more need about technology. Trainings can be organized for
368 such teachers accordingly. Additionally, the contents of computer applications and technology courses, which
369 are taught to all departments under education faculties of universities may be reviewed per departments and
370 be restructured respectively. Some of the administrators indicated that the use of technology in education is
371 "important and it should be used while some think the opposite and should not be used unless necessary".
372 Different activities can be organized for the administrators, who deny the significance of technology use in pre-
373 school education. The future studies may cover the significance and use of technology in preschool education
374 from different dimensions with different study groups.

375 In consideration with the significance of innovative practices emerged by the technological developments,
"coding" trainings that have recently become popular and reflected in curricula may be ensured to grow more.

Figure 1:

376

administrators.

Through technology leadership, the administrators become examples for teachers by showing them how to use technology while supporting and giving them advices. In other words, the administrators support teachers in using technology while undertaking the mission to be an example for them, solve the associated problems or provide guidance for solution and follow new developments.

The school resources, infrastructure and teachers' perspectives towards technology use are crucial for administrators in providing technological assistance (Akbaba-Altun, 2002; Anderson and Dexter, 2005; Sincar, 2009).

actively

technologies music, Turkish and playtime activities. The introduction of technological tools to preschool children at their educational institutions under teacher guidance and the continuation of such guidance even when children are allowed to use technologi

Considering the previous re use infandation communication

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	2.
	Administrators' views on the significance of technology use in education
	It is important/it should be used
	It is not so important/it should not be used otherwise necessary
	Administrators' views on the purposes of using technologies in the classroom
	For cognitive development
	For emotional development
	For psychomotor development
	Administrators' views on the types of assistance that they provide at school and classroom on technology use
	To provide tools
	To provide user support
	Administrators' views on the provision of technological tools required by school
	From school budget
	Through donations
	Self-assessment of administrators on technological information, skills and use
	Qualified
	Need for improvement/assistance
	Administrators' view on how they evaluate teachers regarding technological knowledge, skills and use
	New graduated/ teachers with undergraduate degree
	New generation teachers

Figure 3: Table 2 :

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