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The Impact of Web 2.0 Tools on Children's Vocabulary Acquisition: A Quasi-Experimental Study

Web 2.0 Araçlarının Çocukların Kelime Öğrenmesi Üzerindeki Etkisi: Yarı Deneysel Bir Çalışma

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ABSTRACT

In line with the immense developments in technology recently, Web 2.0 tools have been prevalently adopted and used in language education both in intramural and extramural settings. Previous research mostly investigated this issue from various perspectives, including learners' and teachers' attitudes, learners' motivations, focusing mostly on older learner settings such as middle and high schools and tertiary education. Focusing on young learners, an under-researched area in language education, this study examines the effect of use of Web 2.0 tools on learners' English vocabulary attainment through quasi-experimental method. A pre-test was applied to both control and experimental groups, consisting of 20 small children studying in the 2nd grade (eight year olds). This was followed a 4-week intervention of teaching the same topics with and without the use of Web 2.0 tools. Finally, a post-test was applied to both groups. Findings revealed that the scores of experimental group were far better than those of control group, indicating that Web 2.0 tools had a positive impact on their vocabulary acquisition. Pedagogical implications are provided for young learner education based on the findings of this study.

Anahtar Kelimeler
Web 2.0 araçları, bilgisayar destekli dil öğrenimi, kelime bilgisi edinimi, küçük İngilizce öğrenciler

ÖZ

Son zamanlarda teknolojideki hızlı gelişmelere paralel olarak, Web 2.0 araçları hem okul içi hem de okul dışı ortamlarda dil eğitiminde yaygın olarak benimsenmiş ve kullanılmaktadır. Daha önce yapılan araştırmalar çoğunlukla bu konuyu öğrencilerin ve öğretmenlerin tutumları, öğrencilerin motivasyonları dahil olmak üzere çeşitli bakış açılarından incelemiş ve çoğunlukla ortaokul, lise ve üniversite gibi daha büyük öğrenci ortamlarına odaklanmıştır. Dil eğitiminde yeterince araştırılmamış bir alan olan küçük çocuklara odaklanan bu çalışma, yarı deneysel yöntemle Web 2.0 araçlarının kullanımının öğrencilerin İngilizce kelime dağarcığına olan etkisini incelemektedir. 2.sınıfta (sekiz yaş) okuyan 20 küçük çocuktan oluşan kontrol ve deney gruplarına bir ön test uygulanmıştır. Ardından aynı konuların Web 2.0 araçları hem kullanılarak hem de kullanılmadan öğretildiği 4 haftalık bir uygulama yapılmıştır. Son olarak da her iki gruba da bir son test uygulanmıştır. Bulgular, deney grubunun puanlarının kontrol grubundan çok daha iyi olduğunu ortaya koymuş ve bu da Web 2.0 araçlarının kelime dağarcığı edinimleri üzerinde olumlu bir etkisi olduğunu göstermiştir. Bu çalışmanın bulgularına dayanarak küçük çocukların dil eğitimine yönelik pedagojik çıkarımlar sunulmaktadır.

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1. Introduction

With the immense developments in technology in today's world, it is almost impossible to see language education without the use of technology. No matter where language education occurs, namely, in intramural settings with the guidance of teachers or self-paced language learning in extramural settings, technology is widely used in different forms such as Web 2.0 tools. The use of Web 2.0 tools has revolutionised language education beyond traditional contexts in terms of providing interactive and engaging environments, enabling learners to have a personalised learning at their own pace, and providing instant constructive feedback (Kurilovas & Juskeviciene, 2015; Wang & Vásquez, 2012) and hence making the learning experience much more effective particularly for young learners who are more acquainted with technology than their predecessors (Garton & Tekin, 2022; Tekin, 2024a; Pinter, 2017). Considering these potentials of Web 2.0 tools and others for enhancing language learning process, particularly vocabulary acquisition, it has become a critical area of investigation from learners' and teachers' perspectives.

Vocabulary acquisition is regarded as the cornerstone of all skills in language education (Schmitt, 2019; Schmitt & Schmitt, 2020). Without necessary vocabulary knowledge, it would be challenging or even impossible for learners to improve the main skills of target language (L2). In this regard, efficient way of vocabulary teaching is necessary to ensure the successful acquisition of learners so that they can maintain communication in L2. Unlike traditional strategies of learning vocabulary such as memorisation and classroom-based activities in commonly used methods in the past (e.g., Grammar Translation Method), Web 2.0 tools offer more contemporary strategies for learners to have interactive, play-based (both competitive and collaborative), and multimodal experiences to attain a high level engagement during learning (Aşık & Gönen, 2020; Bozna & Yuzer, 2020; Golonka et al., 2014). Previous research has investigated the incorporation Web 2.0 technology into language education based on different aspects, including learners' motivation (Liu et al., 2016), teachers' attitudes (Arabaci & Akilli, 2021; Balbay & Erkan, 2018), with different age groups, including teenagers (Baytekin & Su-Bergil, 2021) and tertiary level learners (Costa et al., 2016). Previous research has admittedly contributed to enhancing our understanding of potentials of Web 2.0 tools in language education, however, the current research examines the impact of their use on young learners' vocabulary acquisition attainment. Having innovative aspects of going beyond investigating attitudes and working with children (an under-researched area in foreign language education), it aims to provide insights into possible correlation between the use of Web 2.0 tools and vocabulary acquisition through an intervention method. Ultimately, the study aims to contribute to the growing body of literature on the use of Web 2.0 tools for language education.

1.2. Technology-Enhanced Language Learning (TELL)

TELL is the study of implementations of technology in foreign language instruction. It alludes to "the use of the computer as a technological innovation to display multimedia as a means of complementing a teaching method" (Patel, 2014, p. 1) It encompasses a wide range of technological applications from basic digital platforms to the use of virtual reality and augmented reality or use of artificial intelligence. One of the key benefits is that TELL can create a student-centred classroom environment. It appeals to everyone, any kind of learning style, interest, background, and language level since it is versatile. Additionally, it provides learner independence, students can choose their own learning goals, learning pace, and their own content through TELL (Zainuddin, 2023) As mentioned and more, TELL has a great deal of positive aspects.

The importance of aligning technology with the learning process has grown in the rapidly changing field of education. Especially the field of language learning and teaching is one such field that profited greatly from technological advancements (Chapelle & Jamieson, 2008). The tremendous growth of technology in the last few years has made it promising as a useful and ever-evolving tool for language learners. In line with this technology-oriented shift in education, several countries have made huge initiatives to equip the educational settings with the latest technological infrastructure, including England (Hall & Higgins, 2005), South Korea (Park & Son, 2009), and Türkiye (Aşık & Gönen, 2020). It is a clear indication that educational policies and curriculum designs are expected to reflect a deliberate and evidence-based approach to technology integration in order to meet the evolving needs of 21st-century learners. The integration of technology into language education is regarded as an important component of contemporary pedagogical practices. Rather than serving as a supplementary tool,

technology has increasingly become central to fostering learner autonomy, enhancing engagement, and promoting authentic language use.

Despite the positive outlooking of the technology-integrated education, there are several concerns regarding the effective use of these tools. Apart from the infrastructural problems, he concerns mostly focus on teachers' lack of TELL skills, including very basic knowledge of specific features of the tools available in the classrooms (Aydın, 2013) and no knowledge of interactive white boards (IWBs) such as Web 2 tools, interactive games, songs, and online language exercises (Aşık & Gönen, 2020). Such problems can cause the misconception of using technology for the sake of its presence in the classroom. Cutrim Schmid (2016) labels this kind of technology use as "superficial interactivity" indicating the use of ICT tools for only displaying prepared presentational texts, moving pictures or textbooks, and revealing the answers of the activities. Therefore, it is important to effectively use technological tools to engage learners during the class and achieve a high level of learning.

1.3. Web 2 Tools in TELL

Technological tools used in language education are very diverse ranging from old school tools (e.g., cassette player) to more advanced ones (e.g., virtual reality) depending on the context. Among these, the use of Web 2.0 tools has been particularly emphasized recently. There are a great variety of tools that are commonly used in language education by learners and teachers such as Duolingo, Quizlet, Padlet, Kahoot, and so on (Manidaki & Zafiri, 2021). Depending on how and when they are used, Web 2.0 tools offer promising instructional avenues for efficient language education (Kessler, 2018).

There are several advantages of use of Web 2 tools reported in the previous research. According to Aikina and Zubkova (2015), for example, one advantage of using web tools is visual data that include animation, graphics, or images. These tools are of greater appeal to students than printed material. Moreover, Manidaki and Zafiri (2021) revealed these tools promote critical thinking, peer feedback and socialisation. Cephe and Balçıkanlı (2012) also revealed several other benefits, including collaborative knowledge construction, emergence of new ideas, knowledge sharing, high level of motivation, and creating a learner-centred teaching and learning environment. A similar argument regarding collaborative learning is also shared by O' Reilly (2007) who revealed that learners are trying to focus on the same goal and product from a social active environment with a common state of mind.

Despite the prevalent advantages outlined above, the use of Web 2.0 tools necessitates careful planning prior to actual practice. Several factors should be taken into considerations, including context-specific features such as learners' level and age, class size, focus of the lesson, as well as technology-specific ones such as what tools to use, duration of the activity, and so on. For example, in a recent study carried out with English teacher candidates in Türkiye, Tekin (2023b) found that their excessive use might have detrimental effect on learners' motivation and drew attention to how long Web 2.0 tools can be used with children.

1.4. Web 2.0 Tools and Vocabulary Acquisition

Vocabulary acquisition has been considered as a main and essential part of learning a second or foreign language for a long time. According to Krashen (1989), words constitute an important part of the meaning in a language. For this reason, lack of vocabulary is thought to be one of the biggest obstacles to using the target language effectively. To understand a language, vocabulary is an important component that goes together with the other four basic skills: speaking, reading, writing and listening (Kayaoğlu et al., 2011; Nam, 2010).

Web 2.0 tools have been used in vocabulary learning and teaching for a couple of decades. However, as technology advances, more advanced internet-connected tools are released and are widely used nowadays. Language learners can access a variety of tools, including both online and offline dictionaries, websites dedicated to language learning, video games, language apps, blogs, wikis, multimedia, social media, TV shows, chat rooms, and devices such as tablets and smartphones. uses a variety of sources (Golonka et al., 2014; Richards, 2015). These resources help students expand their vocabulary in the target language while also giving them more chances to practice their language skills. In this regard, Web 2.0 tools are regarded as a crucial part of vocabulary learning process nowadays.

There are several studies focusing on the relationship between the use of Web 2.0 tools and vocabulary learning in educational settings. Köse et al. (2016), for example, investigated tertiary level EFL learners' perceptions about using Quizlet for vocabulary learning for seven weeks and found that Quizlet quite useful particularly during the

initial stages of vocabulary learning in terms of L2 definitions, synonyms and pronunciation of target words. In another study with tertiary level students, Eren (2015) examined the feasibility of Web 2.0 tools as a supplementary tool for vocabulary learning in an experimental design supported by follow-up interviews. The findings were similar to those of Köse et al. (2016) in terms of positive attitudes towards the use of Web 2.0 tools for vocabulary learning. Similarly, but with younger learners, Vasileiadou and Makrina (2017) investigated the effectiveness of computer games on enhancing 4th graders' motivation to learn English vocabulary in a Greek primary school. The findings confirmed that computer games were found enjoyable and effective means of teaching English vocabulary.

Unlike previous research, the current study goes beyond investigating learners' attitudes or perceptions of Web 2.0 tools and focuses on the effect of the use of Web 2 tools on children's vocabulary achievement level through an intervention. The study possesses innovative aspects in terms of applying a variety of Web 2.0 tools with young learners which is an under researched area of language education and going beyond attitudes by investigating in-class practices as well as the effects on vocabulary attainment. With this aim in mind, the study is driven by one main research question.

1. To what extent does the use of Web2 tools affect small children's vocabulary acquisition attainment?

2. Method

This section presents information regarding the rigorous methodological framework of the study, including the research design, setting and participants, data collection methods, research procedures, ethical considerations, and data analysis process.

2.1. Research Design

This study employed a quantitative methodology that aims to evaluate variables systematically and establish relationships and patterns between them (Dörnyei, 2007). More specifically, the study utilised a quasi-experimental design to compare the attainment level of different groups and make comparisons between these after the intervention period (Creswell, 2016). More information was provided about quasi-experimental research design is provided below.

2.2. Setting and Participants

This study was carried out in a private primary school context in a small city in Türkiye. Despite the EFL setting of the country where learners do not mostly meet English out of school settings, private schools have their distinctive aspects in terms of equipping their learners with higher proficiency level compared to state schools. In this context, for example, children studying in this private school had 24 hours of English classes per week while their peers in state schools had only two. In this regard, child participants of this study were presumed to possess a certain level of English proficiency level.

The study included two classes at the same level and class sizes were 20 students in each one. Classrooms were equipped with the latest technology, including interactive whiteboards, and high-speed internet access, enabling students to learn effectively using technology.

Following discussions with the school administration and English teacher at the school, two 2nd grade classes were chosen for the study. Therefore, this study included 2nd grader children who were around eight years old, and there were 20 learners in each class.

2.3. Data Collection Method

Data were collected through an achievement test that was applied to control and experimental groups. The test was taken and adopted from a publicly available test that was prepared by the Cambridge University specifically young learners. Comprising 15 three-option multiple choice questions, it aimed to evaluate children's vocabulary knowledge on different topics, including fruits, clothes, animals, weather conditions, and house parts. Since it was specifically designed for small children, each question was accompanied with pictures, and a couple of questions were listening-based format.

Considering the participants' young age, particular attention was given to the application of the test. Detailed and clear instructions were provided in Turkish to ensure they were aware what to do. Individual support was provided for the ones who were in need.

2.4. Research Procedure

To ensure successful implementation of the research, each step was considered carefully. First, school administration was approached to carry out the research. Following securing the official permission from the school, a four-week class contents were prepared in line with the prospective participants' English curriculum and proficiency level. Each class was well planned, with objectives and exercises to keep students interested and promote learning. The themes were the same for each week was determined in line with the English teacher's recommendations based on the curriculum by creating a weekly calendar and they were the same for both control and experimental groups (Table 1). Each class had a 40-minute schedule that included a warm-up activity, main activities around the focus of the class, and wrapping-up activities. However, the way of teaching was planned differently for each group, one with the integration of Web 2.0 tools and the other with more book and paper based teaching. An expert opinion was sought about the suitability of these lesson plans for the target groups. Moreover, they were also negotiated with the English teacher at school, as he was familiar with the learners and the context.

Table 1. Teaching Schedule and Focus of the Lessons

Weeks	Focus	Activities for control group	Activities for experimental group
1.	Animals – There is/are	Coursebook, paper-based activities	Online competitive activities, videos (YouTube and Wordwall)
2.	Toys and Games – Have got/has got	Coursebook, paper-based activities	Interactive online games (YouTube and Wordwall)
3.	Weather – Clothes - Feelings	Coursebook, paper-based activities	Interactive online activities (YouTube and pbskids)
4.	My house – Where is…? - Shapes	Coursebook, paper-based activities	Online flashcards, videos, and games (YouTube and bilgeingilizce)

The classes were assigned as control and experimental groups randomly. Prior to beginning the intervention, a placement test was applied to both control and experimental groups to find out whether any initial differences existed in terms of proficiency level. Then, the classes were taught for four weeks, and each week's classes were taught by the same teacher for both groups to ensure the main difference between two groups was the inclusion or exclusion of Web 2.0 tools. Considering teacher's potential lack of knowledge about the use of specific tools, a prevalent concern highlighted in the previous research (Aydın, 2013; Aşık & Görnen, 2020; Cutrim Schmid, 2016), it was agreed what tools might be used for the determined topics in specified weeks so that they would have some time to work with these tools in advance. At the end of four weeks, the same placement test was applied to both groups.

2.5. Ethics

Ethics was paramount during all stages of the study. First, ethics approval was obtained from the related university's ethics committee with a confirmation number 2300028594 dated 27.04.2023, and official permission was granted from the school administration. Since participants were small children who were unable to give written consent, consent was granted from the families of the child participants. Children were orally informed the study. Both child participants and their families were aware that they were free not to take part or to withdraw from the study at any time without any negative consequences. No identifying information about them was collected nor no information was disclosed, including the name of the school. In summary, as the British Education Research Association (BERA) emphasises, it was ensured that participants of this research were "treated fairly, sensitively, with dignity…" (BERA, 2024 p. 11).

2.6. Data Analysis

Data obtained through achievement tests were analysed using SPSS 22. First, they were checked if there were any errors or missing information. It was found that 19 participants were present for both pre- and post-achievement tests. Then, all the data were put into SPSS and descriptive statistics were calculated, including mean, median, and

percentages. Following the application of the normal distribution test (Shapiro-Wilk), two way ANOVA was run to find out any potential differences between the two groups scores.

3.Findings, Discussion and Conclusion

In order to examine the significant difference between the achievement test scores of the students in the experimental and control groups according to their Web 2.0 tool usage status, firstly it was determined if the data were normally distributed or not. There were 19 students both in the experimental group and control group. Since the number of participants in the groups were less than 30, the Shapiro-Wilk test was used to assess normality, and it was determined that the data did not show a significant difference from a normal distribution at the group level ($p>.05$).

Table 2 shows the mean and standard deviation values for the pre-test and post-test achievement test scores of the students in the experimental (using the Web 2.0 tools) and control (no intervention) groups. As seen in Table 2, the mean score of the students using the web 2.0 tool was 6.37 before using the tool, while this value became 7.68 after the experiment. The pre-test and post-test score values of the students in the control group were 7.26 and 6.11, respectively.

Table 2. Mean and Standard Deviation Values of Achievement Scores by Groups and Tests

	Pre-test			**Post-test**		
Groups	N	X̄	S	N	X̄	S
Experimental	19	6.37	1.38	19	7.68	1.95
Control	19	7.26	1.56	19	6.11	1.05

The results of the two-factor ANOVA conducted to determine whether there is a statistically significant difference in the change in the achievement test according to the use of Web 2.0 tools in the experimental and control groups are given in Table 3.

Table 3. ANOVA Results of Pre-Test and Post-Test Scores of the Achievement Test

Source of Variance	**SS**	**Df**	**MS**	**F**	**p**
Between Subjects	95.908	37			
Group (Experimental/Control)	2.224	1	2.224	.85	.361
Error	93.684	36	2.602		
Within Subjects	101.500	38			
Measurement (Pre-test/Post-test)	.118	1	.118	.06	.810
Group * Measurement	29.066	1	29.066	14.47	.001
Error	72.316	36	2.009		
Total	197,408	75			

According to the findings obtained from Table 3, group [$F(1\text{-}36) = .85$, $p>.05$] or measurement [$F(1\text{-}36) = .06$, $p>.05$] factors do not have a significant effect on their own. However, the joint effect of group and measurement is statistically significant [$F(1\text{-}36) = 14.47$, $p<.01$]. This significant interaction may indicate that Web 2.0 tools become more effective over time, especially as learners get used to using them regularly. While using the tools alone or measuring progress at a single point may not show a strong impact, the combination of these over a period seems to create a meaningful difference. This could be because students gradually integrate these tools into their learning habits, which helps reinforce vocabulary gains across multiple sessions.

Based on this finding, it can be argued that the use of Web 2.0 tools contributes significantly to vocabulary achievement. This is quite in line with previous research; for instance, Salman and Akay (2022) reported improved vocabulary outcomes among middle schoolers through Web 2.0-based interactive games and collaborative activities. Similarly, Barrot (2022) emphasized that Web 2.0 tools not only support vocabulary growth but also foster digital literacy skills, which may indirectly enhance overall language achievement. Distinct from prior studies, however, the present research confirms these outcomes within a younger learner population using a quasi-experimental design and thus offering empirical support for their applicability in early-stage language education.

Previous research has highlighted various benefits of these tools such as personalised learning (Kurilovas & Juskeviciene, 2015; Wang & Vásquez, 2012), providing interactive and play-based environments (Aşık & Gönen, 2020; Bozna & Yuzer, 2020; Golonka et al., 2014), and enhancing learners' motivation (Liu et al., 2016) across different age groups and diverse educational contexts. The findings of this study contribute to the existing body of literature, revealing that the use of Web 2.0 tools had a positive impact on children's vocabulary attainment through quasi-experimental research design. However, it is worth noting that factors such as students' prior vocabulary knowledge, teacher's classroom management, or even group dynamics might have also contributed to the observed results. Therefore, while the impact of Web 2.0 tools appears significant, it should be interpreted within the broader context of classroom variables (Reinhardt, 2019).

These findings offer useful insights for both teachers and curriculum designers. For teachers, the results show that using Web 2.0 tools, particularly through playful and interactive tasks, can help young learners engage more efficiently with new vocabulary and remember it better over time. For those designing curricula, the study suggests that such tools shouldn't just be optional extras, but carefully planned parts of the language learning experience. When integrated carefully, Web 2.0 tools can support more personalized, enjoyable, and effective vocabulary learning in early education.

Although Web 2.0 tools have revolutionised language education regardless of contexts and age groups, there are a number of factors to take into consideration to exploit them at a maximum level, particularly with young learners who have distinctive characteristics. For example, Cutrim Schmid (2016) highlights the importance of the use of technology as an interactive means of language education by avoiding using it merely presentational purposes such as displaying textbooks. In case of lacking interactive features of Web 2.0 tools, it has the potential to not achieve the intended pedagogical purposes. As also highlighted by Reinders and Thomas (2010), task-based integration of technology fosters authentic language use and supports learner autonomy. In this study, the effective design of activities (rather than the mere use of digital tools) likely played a central role in enhancing learning outcomes.

Moreover, teachers' knowledge and proficiency of using technology in the classroom should not be ignored. This view is supported by recent studies such as Cutrim Schmid (2016) and Barrot (2022), who emphasize the necessity for teachers to receive continuous professional development in educational technologies to ensure effective integration. It is important to be familiar with different features of Web 2.0 tools that are intended to be used.

Furthermore, time allocation emerges as a critical factor in the effective use of Web 2.0 tools. As highlighted by Tekin (2023b), the amount of time dedicated to these tools significantly influences learning outcomes. While insufficient exposure may limit their pedagogical benefits, excessive use can lead to learner fatigue or diminished motivation, particularly among younger students with shorter attention spans. This suggests that overreliance on Web 2.0 tools, even when well-intentioned, may negatively affect student engagement and long-term learning process.

Therefore, teachers are encouraged to follow a balanced approach between technological integration and learners' developmental needs. One practical approach is to vary instructional activities, namely, alternating between screen-based and non-digital tasks, to maintain engagement and attention. In addition, professional development plays a vital role in ensuring that teachers do not engage with Web 2.0 tools at only a superficial level. Training programs should aim to familiarize teachers with a wide range of tools and guide them in selecting and using features that foster interaction, creativity, collaboration, and efficient language production (Liu et al., 2016; Reinders & Thomas, 2010). When used strategically, these tools can become powerful instruments for promoting learning process and deepening vocabulary learning in age-appropriate ways.

This study is not without its limitations. First, the findings are based on data collected from a single public primary school, which limits the generalizability of the results. The participants shared similar socio-economic and linguistic backgrounds, and the instructional conditions reflected the practices of one particular teacher. These contextual limitations may have influenced how Web 2.0 tools were implemented and perceived, reducing the diversity of learner experiences captured in the study.

Second, the intervention period lasted for only four weeks, which constrains the ability to observe long-term changes in learners' motivation, vocabulary retention, or long-term engagement with Web 2.0 tools. Time-related limitations also stemmed from curriculum pacing requirements, availability of class hours, and institutional scheduling conflicts that restricted the duration and frequency of tool use.

To address these limitations, future research could involve multiple schools with varied socio-economic and cultural contexts, enabling a deeper understanding of how contextual factors mediate the impact of Web 2.0 tools.

Additionally, longitudinal studies extending over an academic year or more would be valuable in examining how learners' attitudes, digital literacy, and vocabulary development evolve over time with continued exposure to technology-enhanced language learning environments.

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Etik, Beyan ve Açıklamalar

1. Etik Kurul izni ile ilgili;

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2. Bu çalışmanın yazar/yazarları, araştırma ve yayın etiği ilkelerine uyduklarını kabul etmektedir.

3. Bu çalışmanın yazar/yazarları kullanmış oldukları resim, şekil, fotoğraf ve benzeri belgelerin kullanımında tüm sorumlulukları kabul etmektedir.

4. Bu çalışmanın benzerlik raporu bulunmaktadır.