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Article

A Snapshot of Children's Attitudes toward Machine Translation

Vilmantė Liubinienė [1,*], Donata Lisaitė [1,2] and Jurgita Motiejūnienė [1]

[1] Faculty of Social Sciences, Arts and Humanities, Kaunas University of Technology, 44249 Kaunas, Lithuania; donata.lisaite@ktu.lt or donata.lisaite@uantwerpen.be (D.L.); jurgita.motiejuniene@ktu.lt (J.M.)
[2] Antwerp School of Education, University of Antwerp, 2000 Antwerpen, Belgium
* Correspondence: vilmante.liubiniene@ktu.lt

Abstract: Technologies offered and used on the Internet play a significant part in the lives of children; nevertheless, little research has been done on how children view and use machine translation (MT). According to recent literature, there are various benefits to using MT in teaching/learning foreign languages, such as more fluent writing, more effective communication, and fewer errors. Nevertheless, the use of MT in classroom settings is often viewed as problematic by language teachers. Despite the fact that a vast number of students have used MT for various purposes or have tried experimenting with MT for certain academic or entertainment purposes, they seem to have mixed feelings about it. The present qualitative study is based on semi-structured interviews and aims to capture a snapshot of Lithuanian children's perceptions and awareness of MT technologies. The results of the interviews reveal that children mostly find out about MT as a result of their own efforts and employ MT tools for a variety of purposes; however, at school no systematic guidance and/or support in terms of MT use is provided and children tend to perceive that their teachers generally hold negative attitudes towards MT.

Keywords: children; education; Google Translate; machine translation (MT); media

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1. Introduction

Digital literacy, media, information and communication technologies and other modern technology-based skills are essential requirements for the education of 21st-century learners. There has been a noticeable increase in the digital engagement of children in all EU countries [1–3]. The main findings of the research on young children (0–8) and digital technologies across Europe [3] reveal that children's digital skills are developed from a very young age mostly in the home context by observing and mirroring parents and older siblings' digital behaviour. Children usually follow their interests and needs by using a trial-error path, not exempt from risks [3].

One of the questions that needs to be explored in a more comprehensive way is related to the use of machine translation (MT) in a pedagogical context as a supplementary tool. A commonly asked question in academic discussion is whether students could communicate better and/or learn more when reading and writing with the help of MT [4–6]. Differences between languages should also be taken into consideration as in some language combinations, due to their structural similarity, MT might be more efficient and helpful to students [4,5].

Currently, there are numerous studies with the focus on children's digital literacy practices and digital competencies [7–9], but there is a great lack of research exploring children's attitudes toward MT in general and its applications in various areas, such as education, entertainment or similar areas. Thus, the aim of the study is to provide a snapshot of children's awareness, perceptions and engagement with MT tools for various purposes. In order to achieve the aim set, the analysis relies on qualitative data obtained via semi-structured interviews of 10 families with children aged 12–17 ($n = 12$) accomplished in the autumn of 2021 in Lithuania. According to the legislative acts of the Republic of

Lithuania, a child is considered to be any person younger than 18 years old [10]. This study is part of a larger research project on perceptions of machine translation by various social groups, including a survey of adults ($n = 400$) and semi-structured interviews with adults ($n = 40$). The research questions of the present study aim to reveal children's perceptions and engagement with MT tools and applications in general and the purpose of using MT; family members', friends' and teachers' attitudes toward the use of MT by children and the degree of awareness of MT reliability. The paper is divided into several sections: following the introduction, the theoretical framework summarises recent research and issues related to the usage of digital technologies by children and incorporation of MT into teaching/learning environments; next, the methodological part clarifies the procedure used to collect and analyse the research data; and the results are presented, followed by a discussion, conclusions, and limitations and future perspectives.

2. Literature Overview

Previous studies of children's engagement with technologies, and media in particular, highlight some research directions. The first group of authors concentrate on the impact of the Internet on children from an early stage of life [2,3,11,12]. Studies indicate that digital technologies are mainly useful for young children for four main purposes: leisure and entertainment; information and learning; creation, and communication [3]. Another direction of studies focuses on research of challenges in relation to technology-enhanced teaching and learning [8,9,13] smart environments of classrooms as well as tools and/or study platforms that support smart education (e.g., Google Classroom [14]; EDUKA class [15,16] etc.). Although teachers are not likely to be replaced by robots, recent literature indicates a growing concern that machine-like processes will become more dominant in education [17].

With the development of artificial intelligence, there is a growing body of research related to datafication as big data clearly has benefits for many different sectors in society, including education [18]. If used effectively and ethically, data has become an integral part of education [19]. In many respects, datafication should be understood as a global phenomenon—not only because of the transnational nature of the companies (i.e., Google), but also due to the overwhelming process of the digitization of everyday life. The researchers [18] highlights the attempts of some educational sectors to support the development of online learning systems, whereas others, on the contrary, introduce social norms, such as the banning of mobile phones. Still, there are many individual schools or districts which use digital technologies to engage the interest and support for initiatives that teach young people about the risks and opportunities posed by datafication [18]. According to the authors, schools and educational institutions rely on digital platforms to deliver content to students, to process attendance data, and manage all schooling needs. However, educational platforms, like other digital platforms, are powered by data. The more teachers and schools depend on platforms, the more data is generated, collected and used by technology companies. Some of this data is personal and sensitive and concerns student health and well-being [18]. On the other hand, education in the form of "data literacy", has become the dominant response to the challenges of datafication [19]. As a result, Google has become one of the world's most prominent providers of educational hardware and software since its first entry into education in 2005. Specifically, Google Classroom gained its enormous popularity resulting from the COVID-19 pandemic [14]. Moreover, teachers and students are Google users not only in education settings but also in their free time, thus producing data from which Google receives a substantially big part of its income [14].

The datafication of education is closely related to MT, which is rapidly developing into a tool that is transforming language learning and teaching, whereas traditionally, professional translators and language teachers did not take MT-generated texts seriously [20]. The majority of schoolchildren and higher-education students have experimented with MT, but few know what it really takes to choose the right translation application and assess the quality of MT. Google Translate is the most extensively used and the most widely available MT tool that can quickly transform enormous amounts of text from one language

to another, although the degree of accuracy is different in different languages [20]. It has been estimated that around 500 million people use Google Translate, and the number of language pairs offered is increasing every year [21]. MT based on artificial intelligence has fundamentally changed the way society views multilingual communication. Despite the rapid advances in MT technology, in some languages, especially low-resource languages, the quality of MT can be poor because of low amounts of parallel data [22,23]. Recent research has found that public perceptions of the potential and quality of MT are inadequate [24,25]. Nevertheless, members of the public, possibly including children, often use MT and consider its quality to be acceptable and equivalent to human translation [26]. Thus, the main problem is the lack of awareness of the possibilities and quality of MT as well as risks of using MT on a daily basis and in different situations.

Recently, research has also focused on the challenges of efficient incorporation of MT into teaching/learning settings rather than on preventing or forbidding to consult MT applications [20,27–31]. MT can have a significant positive impact on the way languages are taught. The researchers [31] claims that the grammatical and lexical accuracy of MT is improving; therefore, students are increasingly using it when doing their homework tasks in a second language, which brings up certain challenges for language teachers. References [27,28] carried out a longitudinal study of the use of Google Translate, specifically on how it can help students learn a second language. It was found that MT could be beneficial to language learners when writing texts in their native language and then translating them into the second language as it might offer more choices in vocabulary, but it did not seem to contribute to retaining the active vocabulary over a period of time [27,28]. The researchers [32] explored whether the quality of Google Translate is high enough for students to write texts in their native language, translate them with Google Translate into English, submit them to their teachers, and see whether the teachers can determine how the assignment had been carried out. The researchers [32] also looked into the teachers' reactions after they had been informed that the scripts were MT-generated. The teachers agreed that it might become increasingly difficult to prevent pupils learning foreign languages from using Google Translate outside of (or even within) the classroom to translate their work from their native tongue. However, capturing nuances across languages by using MT is challenging. Another significant problem that may arise is students' motivation to learn to write (and read) in a foreign language if high-quality translations into the target language are available to them. There is little reason to expect that language learners will not take full advantage of the tools available to them in an era of rapidly growing artificial intelligence, which makes it challenging for teachers to come up with new teaching methodologies for reading and writing in a foreign language that incorporate Google Translate [32].

Research shows that students, in their language acquisition, rely on each other and admit to each other that they use Google Translate for homework and a variety of assignments, which, according to the author, reveals a lack of confidence in their own abilities and a reluctance to approach their teachers about it in many circumstances [33]. Moreover, in many cases, the practice of MT is even considered as cheating by language teachers [30,34]. Thus, it has been claimed that MT disrupts the process of foreign language education and that it is necessary to provide guidance to teachers and students on how to gradually and thoughtfully implement MT in the foreign language classroom [35]. In addition, it is, according to research, necessary to develop a dialogue among MT software developers, educators, children, parents, and researchers. The collaboration between industry and scholars could contribute to ensuring "the quality and safety of children's digital experiences" and making sure that children's "rights are taken into consideration in the development of digital media products and services" [36].

3. Materials and Methods

To address societal needs, the Joint Research Centre, i.e., the European Commission's science and knowledge service, providing scientific evidence throughout the whole policy cycle, developed a qualitative research project across Europe, "Young children (0–8) and

digital technology", which looked closely at the digital engagement of young children under the age of 8 in 21 countries in Europe [3]. Following the research methodology worked out within the project on "Young children (0–8) and digital technology", the present study focused on four research questions to conduct semi-structured interviews of 10 families with children aged 12–17. The interviews were held in the autumn of 2021. This study is part of an ongoing project, financed by the Research Council of Lithuania (LMTLT, agreement No S-MOD-21-2), aiming at understanding perceptions of use, quality, and impact on society of MT solutions. The permission to conduct the research was obtained from KTU Research Ethics Commission (No. M6-2021-06). The research questions addressed in this study are as follows:

- RQ 1: How do children (aged 12–17) make use of MT?
- RQ 2: What are the reactions of family members, friends and the school to the application of MT?
- RQ 3: What purposes is MT used for (entertainment, lessons, etc.)?
- RQ 4: How is the reliability of MT rated?

The core of the sample comprises 10 families with children between 12 and 17 years of age who use digital technologies regularly and who are familiar with MT. The goal was to get a diverse mix within the sample, in terms of children's ages and gender. Contact with the families was made by employing snowball sampling. Snowball sampling may be defined as a technique for gathering research subjects through the identification of an initial subject who is used to provide the names of other actors. It resulted in a total sample of 12 children from the target group aged 12–17 (8 boys, 4 girls): 4 interviewed children were under the age of 14 (2 boys, 2 girls), and 8 interviewed children (6 boys, 2 girls) were between 15 and 17. The interviews were conducted either at the home of the participants or in public spaces.

Although the questions mainly focused on four areas of MT usage, the interviews followed a protocol where each researcher had some freedom to make adaptations on the basis of specific interview needs, given the exploratory nature of the study. After a short introduction in which the family members participated, children were interviewed on their own by one of the researchers. All the interviews were recorded by using voice recorders. Later the interviews were transcribed and analysed by using thematic analysis [37]. The obtained data were coded and the qualitative analysis was performed. For the analysis, a list of codes (deductive/inductive) was developed together by three researchers (i.e., the authors of this article). To ensure intercoder reliability, the coding was discussed and adapted a few times during the coding process.

4. Results

The interviews were analysed by means of thematic content analysis. This was carried out by using NVivo software which facilitated the analysis of the full texts of interviews by means of codes ("nodes")> On the basis of the four research questions, nodes were created, which allowed relevant information to be grouped and synthesised efficiently.

4.1. RQ1 How Do Children Use MT?

To delve into the first research question, the following sub-questions were used:

- RQ 1: RQ 1a. Do you know what MT is? What MT applications/tools do you use? Why?
- RQ 1b. How often do you use MT? What language combinations do you use MT for? What types of MT do you use: text-to-text, image-to-text, etc.?
- RQ 1c. What devices do you use for MT?
- RQ 1d. What are your most and least favourite MT applications/tools? Do you perceive MT as positive or negative?

All the respondents ($n = 12$) said that they knew what MT was. The vast majority of the children indicated that they used Google Translate ($n = 11$), and some respondents also

mentioned DeepL ($n = 2$) and Google Lens ($n = 2$). Two respondents indicated two tools which were not MT tools: a girl (aged 13) said she used the Duolingo application and a boy (aged 16) identified Alkonas, an online English–Lithuanian dictionary, as an MT tool. This suggests that sometimes children tend to assume that all online language-learning tools are MT tools.

In terms of the most/least favourite MT tools (see Figure 1), four respondents could not identify their favourite/least favourite MT tool. In general, Google Translate, Google Lens, and DeepL were mentioned as favourite tools. Five respondents identified Google Translate as their favourite MT tool; one respondent gave three tools as favourite ones: Google Translate, Google Lens, and DeepL. Another respondent mentioned Google Translate and Google Lens as her favourite tools. One respondent said DeepL was her favourite one "because it gives exactly what you ask for, but in another language" (F8_G16). The remaining respondents did not provide any reasoning behind their choices. This might be partly due to the fact that the participants of our study were familiar with a relatively narrow scope of MT tools. Generally, it could be stated that some responses in terms of favourite MT tools had more to do with the frequency of use rather than the respondents' actual preference for the tool in question.

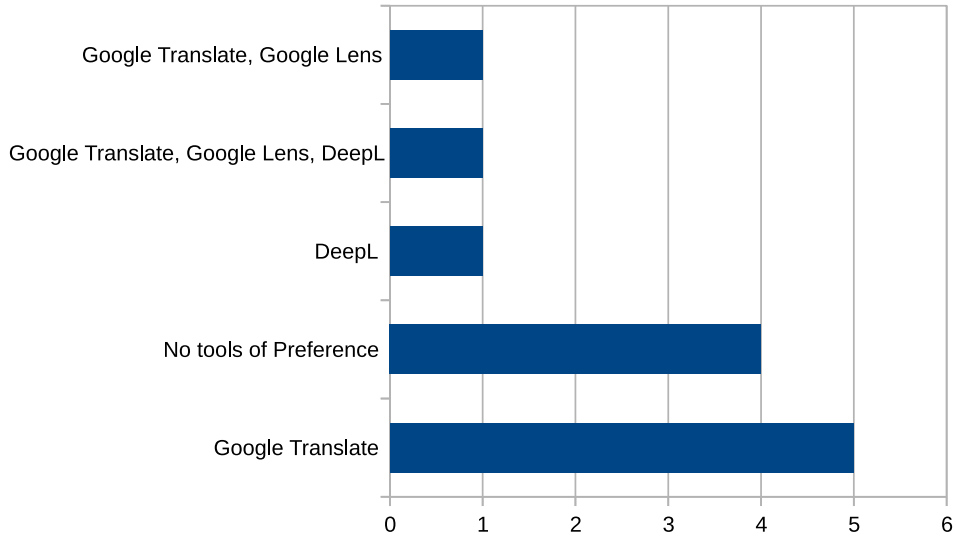

Figure 1. List of favourite MT tools.

In terms of the least favourite MT tools, only one respondent indicated that "Google Translate is the absolutely worst one...because it translates in a very bad way" (F8_G16). The interviewee did not provide any arguments to support this claim.

The question about the frequency of using MT generated a variety of responses. Out of 12 respondents, only one interviewee (F2_B12) said that he never used MT and one respondent (F1_B16) did not indicate how frequently he used MT. Based on the answers of the remaining interviewees, we devised the following scales of frequency: "often", "sometimes", "occasionally" and "rarely". Two children said they used MT often, without specifying a concrete number of times per day or week (F10_B17, F8_G16). One more respondent (F5_G13) also uses MT often (i.e., 2–3 times a day); three respondents (F4_B13; F7_B15, F9_B12) use MT sometimes (i.e., 2–3 times a week), while two respondents (F3_B16, F6_G12) use it occasionally (i.e., once a week). One respondent (F2_B17) uses it rarely (i.e., once in two weeks). Due to the relatively small study sample, it is difficult to see connections between the respondents' age and the frequency of usage.

Importantly, some respondents stressed that the frequency of their use of MT depended on several aspects: for example, one interviewee (F10_B17) stressed that MT tools could be used more often if one "is struggling with or is lazy about learning the language in

question". Another boy (F2_B17) indicated that his infrequent use of MT had to do with the teacher's attitude towards MT:

> *"I only use MT when doing homework; we are not allowed to use MT during lessons. If we use Google Translate in class, our German teacher deducts two points"* (F2_B17).

Another respondent (F8_G16) suggested that the use of MT was related to the nature of school work that was required and emphasised that she had started using MT more frequently as a result of having to write essays.

As far as the types of MT are concerned, 10 respondents indicated that they used a combination of two types of MT, i.e., image-to-text and text-to-text, whereas one respondent (F2_B12) said he was only familiar with and used text-to-text type of MT. All the participants who use MT said that they used it either on their smartphone or computer.

The respondents' use of MT involves a variety of languages and their combinations. All the respondents were native speakers of Lithuanian and translated from and/or into the following languages: English (n = 9), German (n = 4), Russian (n = 4), French (n = 2), and Italian (n = 1). One respondent (F3_16) did not indicate the language combinations for which he used MT. The following language combinations from/into which the study participants translated using MT were identified:

1. Foreign language ←→ native language (FL ←→ NL) (n = 4) (F1_B16, F2_B17, F8_B16, F9_B12)
2. Native language → foreign language (NL → FL) (n = 2) (F4_B13, F6_G12)
3. Foreign language → native language (FL → NL) (n = 2) (F10_B17, F5_G13)
4. Foreign language ←→ foreign language, foreign language ←→ native language (FL←→FL, FL ←→ NL) (n = 2) (F7_B15, F2_G15).

As can be seen, the participants most commonly use MT to translate both from and into their native language. Importantly, two participants (F7_B15, F2_G15) who used MT to translate from and into foreign languages elaborated on how and why they did that:

> *"[I do it] if I want the translation to be more accurate...[I translate from German into English] because in English there are so many more words, so many more options than in Lithuanian"* (F7_B15).

> *"I translate from French into Lithuanian and the other way round when the task is to translate. Otherwise, I use the English–French combination.... If the text is very long, I always translate it into English because people who use Google Translate can submit their translation and that is why the result is better. I know this because I saw the Help the Community button on Google Translate, it asks you to select the languages you know and provide your translation...."* (F2_G15).

These interviewees' responses illustrate that they are rather experienced in using MT as they can compare how different language combinations work and what differences they generate; on this basis the participants make informed decisions in terms of which language combination should be used in what type of situations.

4.2. RQ2: What Are the Reactions of Family Members, Friends and the School to the Application of MT?

RQ2 consisted of the following sub-questions:

- RQ 2a. How do children learn about MT (e.g., from family members (older siblings, parents), school, on their own (by exploring smart technologies), etc.)?
- RQ 2b. How do parents perceive MT? How do teachers perceive MT? Do they perceive MT to be positive or negative?

The responses as to how the children had learned about MT varied (see Figure 2): the respondents reported that they found out about MT from their parents (n = 3), friends (n = 2) or as a result of their own efforts (n = 3). Two respondents did not remember how they had learnt about MT. One respondent (F2_B17) said he had found out what MT was by himself, but had been taught how to use image-to-text translation by a friend.

Another respondent (F10_B17) said he had learnt about MT in school, but did not specify whether the information came from a teacher or friends/classmates. Strikingly, not a single respondent explicitly reported learning about MT from teachers.

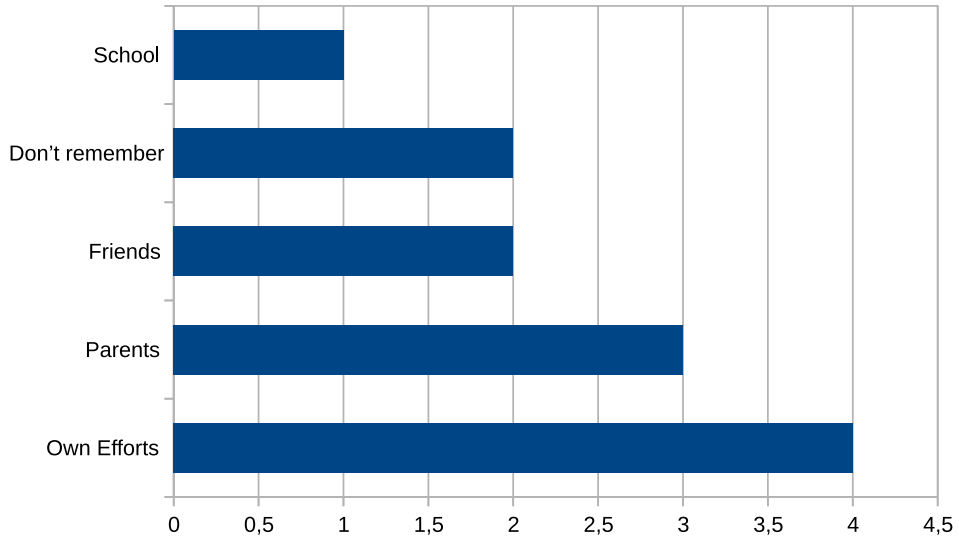

Figure 2. Ways of learning about MT.

As far as the attitudes of parents towards MT are concerned, the interviewees' responses revealed that they believed their parents to hold generally positive views toward MT. In total, six respondents commented on how their family members perceived MT: five respondents said that their parents saw it as a positive thing which, for example, MT "helps [me] to do homework and learn and understand better" (F7_B15). One respondent (F4_B13) mentioned that his parents also used MT when they needed translation. Another respondent (F5_13) reported feeling neither encouraged nor discouraged to use MT by her parents.

The responses regarding the attitudes of teachers toward MT as perceived by the respondents present a different picture. The responses were quite nuanced and could be categorised as follows:

- Teachers allow the use of MT and encourage it (n = 1);
- Teachers allow the use of MT, but do not encourage it (n = 5);
- Teachers allow the use of MT; the teachers' (perceived) attitude is not specified (n = 2);
- Teachers do not allow the use of MT (n = 3).

Although the majority of the respondents indicated that they were allowed to use MT in classes (n = 8); strikingly, only one respondent (F5_G13) specified that two of her teachers (Russian and English) encouraged the use of MT by explicitly telling to translate unknown words using MT. Rather surprisingly, two respondents indicated that as an alternative to MT, their teachers suggested and encouraged the use of paper dictionaries (F7_B15; F8_G16). According to one of the respondents (F8_G16), this is because "they [teachers] believe one remembers better in this way" and added that teachers seemed to be less opposed towards MT if students used it to translate separate vocabulary items rather than full-fledged texts. The other respondent (F7_B15) also mentioned that the teacher provided the students with translated word lists, which, in the eyes of the respondent, made MT unnecessary and irrelevant.

As indicated above, one of the respondents (F2_B17) who pointed out that the use of MT was not allowed in class also explained that the teacher would punish students for using it by deducting two points from the final grade. Another interviewee's (F2_G15) teacher warns her students that she "can tell when MT is used", presumably as a deterrent to those thinking of using MT. It should be noted that both children from this family (F2)

go to the same school: the school adheres to the policy of not allowing the use of MT in the classroom.

Importantly, the question did not aim to find out about the attitudes of teachers of specific subjects, but all of the children (n = 5) who provided more details regarding the question talked about their teachers of foreign languages. Therefore, it appears that MT is not considered as an option in other lessons.

As far as the attitudes of peers/friends are concerned, three children (F5_G13; F7_B15; F8_G16) answered the question and said that their friends used MT too and that it was perceived as a positive thing (F5_G13).

4.3. RQ3 What Purposes Is MT Used for (Entertainment, Lessons, etc.)?

To find out about the situations in which MT is used, we asked the respondents to answer the following sub-questions:

- RQ3a: What types of entertainment-related situations do you use MT for?
- RQ3b: What types of practical activities do you use MT for: online shopping, announcements, search for products, reading the news, etc.?
- RQ3c: Do you use MT when travelling, communication with friends, etc.?

Only three respondents indicated that they use MT in entertainment-related situations: F2_G15 relies on MT when watching movies, F2_B17 uses MT when he does not understand vocabulary items in songs, films, videos, or games and F9_B12 uses MT when surfing the social media. Six respondents said they did not use MT in such situations (F1_B16, F10_B17, F3_B16, F4_B13, F7_B15, F8_G16).

Eight respondents commented on the question of using MT to deal with practical activities. In total, four respondents said they used MT for practical activities. One respondent did not further specify the domain. Three respondents used it for shopping online. Two respondents (F5_G13; F8_G16) specified that they relied on MT when shopping online only on rare occasions: "normally I don't use MT unless it is a very peculiar product or word that I am dealing with" (F8_G16). Four respondents do not use MT when addressing practical activities.

Using MT when travelling and communicating with friends was not a frequent choice in our study population: although most of the respondents (n = 7) do not use it for these purposes, three children said they did use it. One of these respondents (F8_G16) said MT helped her to get the essence of what was said when conversing with a foreigner. Importantly, two respondents who indicated not using MT when travelling or communicating with friends, referred to their friends who had used it. A boy (F1_B16) talked about his Lithuanian-speaking friend meeting another child in Egypt and communicating in Russian using MT applications. Our respondent highlighted that his friend had learned "a lot of Russian and started understanding and communicating" thanks to MT.

School-related activities are the most important area for which the children in our study population used MT: the overwhelming majority of the respondents (n = 11) use MT for these activities. Specifically, the respondents use it for homework (n = 7), written tasks (n = 5), translation of texts or individual vocabulary items (n = 3), presentations (n = 1), or to check accuracy / for errors (n = 1). The fact that MT is so widely used for homework, but none of the respondents pointed out that using it in classes might be related to the previously discussed, generally negative teachers' attitudes toward MT as perceived by our respondents. For an overview of responses, see Figure 3.

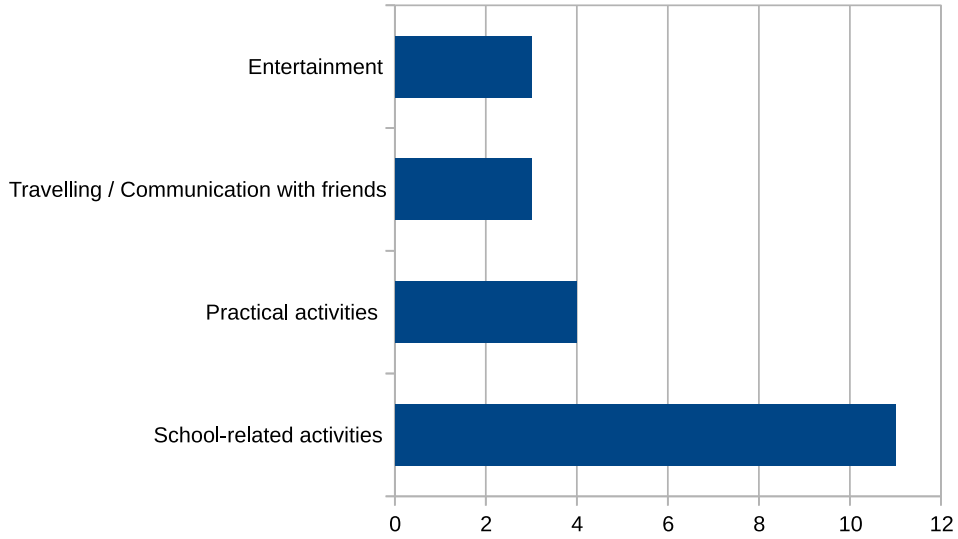

Figure 3. Purposes for which MT is used.

4.4. RQ4 How Reliable Do You Think MT Is?

To assess how children view the reliability of MT, the following questions were asked:

- RQ4a: What languages do you speak?
- RQ4b: Do you find MT reliable? What is your trust/mistrust related to?
- RQ4c: What do you do with the generated text: do you edit it?

All respondents in our study population were native speakers of Lithuanian and indicated learning at least two foreign languages. The most popular respondents' languages were English (n = 9) and Russian (n = 6), followed by German (n = 3), French (n = 2), and Italian (n = 1).

The interviews revealed some interesting trends in terms of how the children perceived the reliability of MT. The respondents provided nuanced answers to RQ4b and as a result a fragmented picture emerged: only one respondent (F3_B16) trusts MT, whereas most of the respondents find MT both reliable and unreliable, depending upon the situation and which foreign language is involved (n = 8). For example, two respondents (F6_G12, F9_B12) said they trusted the translation of individual vocabulary items, but not entire sentences; another respondent (F1_B16) also admitted not trusting sentences translated using MT. Importantly, four children said they were more prone to trust MT if they did not have a good command of the language in question (F5_G13, F7_B15, F8_G16, F10_B17). F10_B17 specified:

> *"If I don't speak the language in question, I am not even sure that I'm in the position not to trust [machine translation]"* (F10_B17).

Only one respondent said the opposite was true for him (F4_B13): he did not trust MT because of his good command of the language. Two more respondents (F2_G15; F2_B17) explained what they did if they suspected that MT generated an inaccurate translation. One of them (F2_G15) tries translating the same item into another foreign language or looks it up "in a 'real' dictionary online", while another respondent (F2_B17) tries modifying his search item or editing the translated text until he achieves an accurate translation to the best of his knowledge.

The respondents generally continue editing the items generated by MT. Only one respondent (F3_B16) does not try to improve the generated translation. Importantly, more than half of the respondents (n = 7) stressed that they did not merely use the generated translation when they needed to use it in a written task. When editing the translation, some respondents highlighted several aspects that they took into account: checking for accuracy (F5_G13), meaning (F7_B15), tone and style (in the words of F8_G16, "it should look like

the text is written by me, not a scientist"). Two respondents (F10_B17, F9_B12) said they only used MT for the purposes of grasping the meaning, but did not use the generated translation in their own written texts.

5. Discussion

The general context of smart pedagogy in Lithuania as outlined by [38] seems to be insufficient to assure integration and access to smart educational environments to all children. However, the situation is changing to the best at a quick pace (due to COVID-19 lockdowns and the shift to online education from March of 2020 onward). Moreover, the successful process of digitization in education in Lithuania, as concluded by the authors, depends on the qualifications of teachers, the involvement of students, parents and all other interested parties. Our research findings are in line with the ideas expressed by [38]. Moreover, to be useful in a school context, MT applications in education need to connect with what students already know and need to be supported by teachers in the first place. However, our findings indicate that our respondents feel that their teachers fail to introduce the opportunities of MT applications not only in foreign language classrooms, but also when studying other subjects if the study material is available in a foreign language. On the other hand, our results highlight that parents are generally supportive of their children using MT tools. Opposing attitudes of parents and teachers may confuse children with regard to the use of MT tools in educational settings.

Furthermore, children do not seem to distinguish the difference between online dictionaries and MT systems. Most of them use MT tools for looking up the meaning of separate words or sentences. Bearing in mind that school-related activities are the most important area of use for MT, in our sample, as the overwhelming majority of the respondents (n = 11) use MT for these activities, we find it problematic that, according to our respondents, some of their teachers have negative attitudes toward MT. Moreover, the recommendations of teachers to use paper dictionaries instead of at least online versions of the same dictionaries sound troublesome in the context of a digital media educational environment. Introducing MT tools and teaching children to creatively integrate them into smart educational environments would be beneficial for the learning process.

Another observation concerns the teaching staff, who still do not appear to recognize the overwhelming shift from print to digital media. The fact that children hardly distinguish the difference between online dictionaries and MT tools indicates that they have not been familiarised with the opportunities and benefits of relying on a wide variety of online dictionaries instead of picking up unknown foreign words from a printed dictionary. It is likely that this trend is related to the beliefs of the older generation of teachers who have heavily relied on printed dictionaries throughout their lives and still aim at keeping this tradition alive by transferring the same skills to the so-called digital natives. Thus, if children learn about the possibilities of MT tools from their parents or peers who also discover online tools themselves, the usage of MT tools may sometimes be inaccurate and suboptimal, including the false understanding that a MT engine is the same as a dictionary. On the other hand, our findings are in line with the research of [32] who claim that MT tools in the era of artificial intelligence create new challenges for teachers who should integrate new language teaching methodologies that incorporate MT tools, or Google Translate in particular.

Seeking for the touchpoints with other studies which investigate children's engagement with technologies, new media and MT in particular, we may state that our findings are only partially in line with the research of [2,3,11,12] who claim that digital technology is mainly used by children for four main purposes; namely, (1) leisure and entertainment; (2) information and learning; (3) creation; (4) communication. In our case, most of the respondents claim that they use MT tools for language learning purposes, i.e., to translate unknown words or sentences. Outside the school setting, our respondents' usage of MT is restricted to homework, but not so much to feed their other interests. Only three respondents indicated that they used MT in entertainment-related situations: for example, F2_G15

relies on MT when watching movies, F2_B17 uses MT when seeking for translation of song lyrics or some phrases in films, videos or games and F9_B12 uses MT when surfing the social media. No one in our sample mentioned creative activities as one of the fields where MT applications came in useful.

Summing up our findings, we support the ideas by [36], who claim that a dialogue among MT software developers, educators, children, parents, and researchers should be encouraged in order to enhance the quality of education.

6. Conclusions

After completing the research on children's (aged 12–17) attitudes towards MT applications, we have arrived at the following conclusions.

The most popular MT tool that children use is Google Translate. In some cases, children do not distinguish between MT tools and other online resources (e.g., online dictionaries). In general, the respondents of our study are familiar with a relatively narrow scope of MT tools, namely Google Translate, DeepL, and Google Lens. Due to the relatively small study sample, we were not able to establish connections between the respondents' age and frequency of use of MT. Concerning the types of MT, the majority of respondents indicated that they use a combination of two types of MT, i.e., image-to-text and text-to-text. All the participants use either their smartphones or computers to access MT tools. They employed MT for translation from the native language (Lithuanian) and/or into the following languages: English, German, Russian, French, and Italian. Our findings indicate that the respondents seem to be experienced in applying MT in different language combinations and are aware of the differences of generated results. Based on the final output, the children in our sample make decisions in terms of which language combination should be used in what type of translations.

The respondents stated that they had found out about MT from their parents, friends, or as a result of their own efforts. No one mentioned that teachers had guided them into the intricate world of MT applications. Thus, we may conclude that the occasional use of MT by children correlates with the perceived more negative rather than positive attitudes of their teachers' towards MT. The majority of teachers allow the use of MT, but do not encourage it, whereas some of them do not allow it at all. Moreover, some of them encourage the use of paper dictionaries as an alternative to MT. The study has revealed that MT tools are mostly used when studying foreign languages, whereas no one mentioned MT to be considered as an option necessary to obtain information for other study subjects. According to our study participants, contrary to their teachers, parents consider MT as a positive thing which they rely on themselves when in need and have shown their children how to use it.

The main reason why children use MT, as found by our study, is bound to be school-related activities. The majority of the respondents use MT for homework, written tasks, translation of texts or individual vocabulary items, presentations, and checking accuracy/for errors. The fact that MT is so widely used for homework, but not in class, can be related to the perceived negative attitudes of teachers toward application of MT tools. Additionally, some of the respondents mentioned several entertainment-related fields of MT application: e.g., while watching movies, trying to understand the meaning of song lyrics, videos or games, and when surfing the social media.

Concerning the respondents' perceptions of reliability of MT output, we have obtained a fragmented picture. Only one respondent claimed trusting the output of MT, whereas most of the respondents said they found MT both reliable and unreliable, depending upon the situation and the language pairs involved. Some respondents trusted the translation of individual vocabulary items, but not sentences. Importantly, those respondents who do not have a good command of the language in question, are more prone to trust MT. Some respondents try translating the same item into another foreign language or looking up for a proper meaning "in a 'real' dictionary online", while others choose to edit the translated text until they arrive at an accurate translation.

7. Limitations and Perspectives

The current study on children's perceptions of MT contributed to an ongoing larger, more comprehensive and representative study of an adult population in Lithuania, aiming at understanding perceptions of use, quality, and impact on society of MT solutions [25]. This is why the current research offers a snapshot of children's awareness and perception of MT. Nevertheless, the analysis of the semi-structured interviews with a relatively small sample of children points to some interesting venues for further research. Future studies could focus on educational settings, e.g., more comprehensive research into teachers' attitudes toward MT usage in classroom settings would be welcome. Moreover, future studies could be conducted using the participant observation method, i.e., observing children as they interact with one or more MT systems, thus gathering richer qualitative insights into the experience of machine translation.

Crucially, it should be noted that the general impression that our results revealed implies a certain confusion on the part of the respondents: while they are familiar with MT and know how to use it, they feel that their teachers hold generally negative attitudes towards MT and this seems to invoke our respondents' feeling that by using MT they are not meeting their teachers' expectations. This might also be related to the fact that most of the respondents did not present many details of their use of MT during the interviews: having not been properly familiarised with MT at school and using it in a rather half-hearted way, they lack a more in-depth understanding of the possibilities MT offers. Therefore, there is a clear need for more systematic and sustained guidance on the part of teachers, parents and possibly MT software creators.

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Institutional Review Board Statement: The permission to conduct the research was obtained from KTU Research Ethics Commission (No. M6-2021-06). Before starting the interview, parents and children were informed about the aim and object of research. We also provided information on how the data gathered are going to be used in our research study. The data were obtained without any possible individual identification. After the agreement of parents was obtained, the interview with the child started.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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Abbreviation

The following abbreviation are used in this manuscript:

MT Machine Translation

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