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# Local and External Stakeholders Affecting Educational Change during the Coronavirus Pandemic: A Study of Facebook Messages in Estonia

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**Abstract:** Education worldwide was affected by the coronavirus pandemic when many countries, including Estonia, had to switch to distance learning. It was an unexpected change in education and required a response from relevant stakeholders. This study aims to understand the activities of different stakeholders as revealed in the messages of the Facebook group 'Homeschooling with technology' from 6 March to 26 April 2020. A mixed method study design was used, including quantitative and qualitative content analysis of 872 messages posted by members of the Facebook group, which were divided into eight role groups. Teachers, educational technologists, principals and parents represented local stakeholders while external stakeholders included members from government institutions, supporters, teacher educators and members with other roles. The analysis covered activeness of each role group, emotional expressions, speech acts and topics represented in messages. The results indicate that educational technologists played a key role in handling the coronavirus pandemic situation in education. However, local stakeholders also received support from external stakeholders. The results help capture the roles, experiences and views of different stakeholders during the educational change caused by the coronavirus pandemic in order to learn from this and to be prepared for such situations in the future.

**Keywords:** stakeholders; Facebook; COVID-19; content analysis; educational change

## 1. Introduction

Education worldwide was affected by the pandemic of coronavirus disease 2019 (COVID-19) when all levels of education were transferred to distance learning. This transition was not smooth and required tremendous efforts from all stakeholders—teachers, students, parents, school principals, and government. As reported in different cases, it was not so much the technology but a lack of planning, coordination, communication and management that placed a heavy burden on students, parents and teachers [1]. Different roles at various levels of the education system had distinct needs, opinions, perspectives, and experiences during the pandemic. In addition, different stakeholders did various things to shape change in addressing their needs and priorities. It is important to provide information about this unanticipated situation due to the pandemic, ideally from different actors' perspectives [2]. By investigating that, we can learn from this and be prepared for such situations in the future.

### 1.1. Theoretical Framework

There are many different theories and models of educational change [3,4]. A critical theory of change caused by educational innovation is the Concerns-Based Adoption Model (CBAM), which shows how change affects people [5]. Another significant theory is Fullan's educational change theory, which focuses on human participants of the change process, such as teachers, students, parents, and policymakers, and offers a theoretical underpinning to understand how they can affect change [6]. Ellsworth [3] pointed out that Fullan's model

helps to answer the questions of what the implications of change are for people or organizations promoting or opposing it at particular levels, and what can different stakeholders (e.g., teachers, district administrators, parents) do to promote change that addresses their needs and priorities. Fullan [6] proposed that there are four phases in the change process: initiation, implementation, continuation, and outcome. The implementation phase usually includes the first 2 or 3 years of use and involves the first experiences of attempting to implement a change. Fullan [7] identified nine factors affecting implementation, which can be organized into three main categories: characteristics of change (need of change, clarity about goals and needs, complexity of change, quality and practicality of the program), local factors (school district, community, principal, teacher) and external factors (government and other agencies). In the current article, Fullan's educational change theory is used as a theoretical framework to capture how the different parties of the educational system influenced the changes in education caused by the coronavirus pandemic. This model was chosen because it focuses on how a person affects the change, unlike the CBAM model [5], which looks at how change affects a person.

### 1.2. Literature Review

The unforeseen change in teaching during the coronavirus pandemic can be characterized as a colossal and complex issue, with many different things to take into consideration, and even well-experienced teachers felt that they had to learn what and how to teach [8,9]. Teachers, their attitudes and perspectives are the major subjects of investigation during the educational changes [4] as educational change depends on what teachers do and think [7]. Similarly, teachers, their preparedness and experiences were targeted exploring the changes in teaching and learning due to the COVID-19 pandemic [8,10]. Teachers have used various applications and tools to facilitate distance teaching and learning. Previous research has found that no single application/tool is preferable to others and various technologies, used adequately and with purpose, can contribute to providing the education [1]. The most common tools were applications that enabled real-time videoconferencing, prerecorded seminars, communication and collaboration, sharing materials, digital learning resources, learning management systems, and live broadcasting features of social networking sites [1,8]. Subject teachers used special tools for teaching their subjects during the COVID-19 pandemic, for example, science teachers liked the tools that help create free interactive science simulations [11]. While choosing a suitable tool, issues with General Data Protection Regulation (GDPR) and cybersecurity should be taken into account [1,8]. Another issue during distance learning was the pedagogy of using various digital tools because, previously, the main emphasis has been on the technical aspects of tools rather than the pedagogical dimension [10]. As a result, teachers lacked the pedagogical strategies necessary in distance learning [8]. In addition, teachers were unsure of how to conduct diagnostic tests in distance learning as there was a lack of tools to support secure digital examination [8]. There have been hundreds of online webinars to upskill teachers in distance education [1,12].

Individual teachers are necessary, but insufficient for a wide change [7]. Accordingly, principals' actions should serve to support teachers both psychologically and with resources. School districts and countries with their histories of changes and positive or negative experiences can facilitate or incapacitate the change. School boards and communities should actively work together and develop strong parent–school relationships for achieving the change. Policymakers should not be preoccupied with policy and programs and should be aware of the problems and the process of implementation of the change by the practitioners. The different local and external stakeholders, e.g., respectively, students, parents and school leaders on the one hand and teacher educators and members of the school support system on the other, as well as their opinions, views and perceptions were also studied during the coronavirus pandemic [2,12,13]. Both school principals and teachers were waiting for the governments to provide clear guidance, guidelines and clarity for the organization of distance learning [12]. However, even teacher educators felt

that they were moving from knowingness to knowing-less and shared uncertainty about well-established practices and guidelines [13]. Non-teaching staff (e.g., parental) support was needed by teachers and played an important role in students' learning efforts and outcomes [2]. Different organizations provided digital content and materials, for example, book publishers gave free access to their textbooks [1,12]. However, using technology, students and teachers can access specialized materials beyond textbooks [14].

An important channel of communication among students, parents, educators, and school administrators during the coronavirus pandemic was social media, such as Facebook groups, forums, blogs [1,15]. Social media is publicly available data, which can be used to collect information and to capture public attention during a crisis [16,17]. Facebook has all the tools necessary to create an online community to share resources and experiences, interact with each other and provide support from experts desperately needed by struggling teachers [18]. With this intention, different professional Facebook groups have been created during the COVID-19 pandemic (e.g., [1,15]). It has been suggested that teacher collaboration can be an alleviating factor that reduces the perceived degree of stress of school staff, as opposed to the stress perceived by students and school leaders who may not have such cooperation [2]. Social media makes it possible to analyze different things, for example, speech functions and acts used in posts that can show what different stakeholders do and how they affect the implementation of the change. From the four primary speech functions ('statement', 'question', 'offer' and 'command'), teachers engaging in self-organized Facebook groups tend to use 'questions' and 'offers' [19]. Social media is used for sharing information and opinions, but also emotions and negative responses prevail after unpredictable calamities [20]. The same was found during the school closure in Chicago in 2012, where the capture of social media posts, describing the impact of the closure on students and their families, showed that two-thirds of posts expressed negative sentiment [16]. Social media topics and emotional expressions during the COVID-19 epidemic have been analyzed as well in order to grasp the public's subjective ideas and provide decision support for relevant departments [21]. However, social media data produced by different roles of the educational system have been underused for educational research during the coronavirus pandemic.

*1.3. Aim and Research Questions*

The review of recent literature reveals that there are studies on how teachers affect the change related to the COVID-19 situation. There are few studies about the role of the principals and other stakeholders handling this emergency situation. However, there is a lack of studies analyzing how different stakeholders affect and promote change during the COVID-19 situation. It is important because people are a crucial variable in the change process [6] and studies on educational change, such as Fullan's [7], deal mostly with planned changes undertaken to enhance learning. In spring 2020, the COVID-19 situation was an unexpected, forced and temporary change in education, in which we have had to learn how different stakeholders reacted at the beginning of the implementation phase of this change. Existing research has shown that public information in social media (e.g., Facebook) can reflect the situation during the crisis [16,17]. Therefore, this paper aims to understand the activities of different stakeholders as revealed in the messages of the Facebook group 'Homeschooling with technology' from 6 March to 26 April 2020.

Three research questions were posed. As previous studies [16,20] indicate that emotions and negative responses tend to prevail in social media after unpredictable calamities, but during change, all stakeholders take part in it by promoting or opposing the change [7], and the activeness of posting messages indicates the degree of interest in those topics at this time period [22], the first research question was: How active were the members in different roles and what sentiments were expressed in their messages?

As all stakeholders have their own roles and responsibilities in change and have to support some other counterparts [7], and some stakeholders can promote and others oppose the change [3], the two other research questions were: What did members with

different roles write about in the Facebook group? Who were the addressees of the messages in the Facebook group written by different roles?

## 2. Methods

Mixed methods quantitative-dominant design was used in this study to explore the Facebook group messages in detail. It promotes a deeper, more contextual understanding of content. Both quantitative and qualitative content analysis was used in this study.

### 2.1. Sample

The sample of the study consisted of members, who posted at least one message in the open Facebook group 'Homeschooling with technology'. The group was created by three members of the Estonian Union of Educational Technologists on 6 March when the first school in Estonia switched to distance learning after one student had been diagnosed with the COVID-19 virus. With more than 8000 members, this group became the largest Facebook group in Estonia, providing support for schools and homes alike. The number of members in the group increased sharply on 12 March, when the emergency situation was announced and all schools were required to switch to distance learning by 16 March [15].

Of all members, 348 posted at least one message in the group. Among these posters, 67 were (19.3%) male and 276 (79.3%) female. Five members (1.4%) posted from their organization's Facebook account. Each member was assigned a role based on Google search results and Facebook data. In total, eight different roles were determined: teacher, principal, educational technologist, teacher educator (university academic staff, who educates pre-service teachers), parent, supporter (people who work in institutions providing learning materials or tools for education), government (members from a ministry or a ministerial agency) and others. Others include members whose role could not be identified, but also members who do not work in schools or enterprises providing support (librarians, psychologists, secretaries, medical doctors etc.) and we did not find any evidence that they are parents. According to Fullan [7] teachers, educational technologists, principals and parents represent local factors, while members from governmental institutions, supporters and teacher educators are external factors in terms of affecting change. A description of the different roles is presented in Table 1.

**Table 1.** Description of the sample.

| Name of the Role Group | Number of Members with This Role *n* | Number of Males *n* (%) | Number of Organizations *n* (%) |
|---|---|---|---|
| Teacher | 133 | 18 (13.5) | |
| Other | 55 | 9 (16.4) | |
| Supporter | 51 | 17 (33.3) | 4 (7.8) |
| Educational technologist | 30 | 5 (16.7) | |
| Teacher educator | 28 | 7 (25.0) | |
| Parent | 23 | 8 (34.8) | |
| Government | 18 | 1 (5.6) | 1 (5.6) |
| Principal | 10 | 2 (20.0) | |
| Total | 348 | 67 (19.3) | 5 (1.4) |

### 2.2. Data Collection and Quantitative Analysis

As the first step, deductive quantitative content analysis was used for analyzing 872 messages, which were posted between 6 March to 26 April 2020, in the Facebook group 'Homeschooling with technology'. For coding the content of the messages, a quantitative content analysis was conducted using the elaborated coding manual with definitions, descriptions and decision-making guidance for encoders. Quantitative content analysis was used, because it uses exact words from the text and describes only the visible and obvious in the text [23] and therefore is more systematic and less subjective [24]. A unit of

meaning at this stage was one whole message. The following variables were determined for each message:

- Sentiments: the message was coded as expressing a negative sentiment if it included words with a negative connotation like 'problem', 'bad', 'failed', etc. Positive sentiments included words such as 'good', 'happy', 'succeeded', 'satisfied', etc., and neutrally written messages were coded as neutral sentiments.
- Speech acts: in this study, only messages without comments were coded and therefore, an adapted coding schema from previous studies [25,26] was used. All messages were coded using six codes of speech acts: providing resources (sharing hyperlinks, citations, files, research objects as sources without any comments, suggestions or information), informing (information based on facts or experiences), expressing an opinion (opinion(s), subjective assertions to other users), asking (direct questions seeking information or discussion), recommending (suggestion, advise, attempt to cause action), and inviting (invitation to join something, do something together). A more detailed description of the speech act codes is given in our previous study [27].
- Topics: nine codes (tool, learning material, webinar, collection, management, methodological idea, tool guide, cyber risk, and other) were used for identifying the topics in the messages.
- Addressees: the coding of message addressees was based on the explicit wording used in the message. Six codes (everyone, teachers, principals, schools, parents, and students) were defined.

To test the coding procedure, 91 (10.4%) of all messages were coded by two independent researchers and their codes were compared. The agreement between the researchers was at 0.80. After that, the messages were divided and coded independently by the two researchers. However, the researchers met and coded together each week to make sure that the degree of agreement between the coding judgments had not decreased in the meanwhile. In the case of coding differences between the researchers, a consensus was reached via negotiations. Also, whenever a researcher had doubts about a particular message, they reviewed that message together with the other researcher.

Quantitative data were analyzed using SPSS version 26.0. Descriptive statistics were used to describe the data. For comparing activeness of different roles, Welch's analysis of variance (ANOVA) with a Games–Howell post hoc test was used. The Welch test was used because groups had unequal variations. For comparing sentiments in messages, which were on an ordinal scale (coded $-1$, 0, 1), the Kruskal–Wallis test as a one-way ANOVA on ranks was used. If the Kruskal–Wallis test was significant, then the Mann–Whitney U-test (the non-parametric version of the Student *t*-test) was used to identify differences between individual role groups. The Chi-square test was used for comparing distributions.

### 2.3. Qualitative Content Analysis

Inductive qualitative content analysis was used for deeper exploration of the content of the messages by different roles in order to answer the second research question. Inductive content analysis is used if the phenomenon has not been previously studied or the previous studies are fragmented [28].

The second, qualitative stage of the study was largely guided by the results of quantitative content analysis. At first, based on quantitative content analysis, all messages were divided into groups according to the topic. The resulting nine groups were all coded separately.

As recommended by Elo and Kyngäs [28], first, the transcripts were read several times to immerse ourselves in the data; this was followed by the analytical process, which included open coding, creation of categories, and abstraction. The first step, familiarization with the data, started with quantitative coding and taking preliminary notes. The codes included names of the tools or learning materials, phrases that expressed the issue discussed in a message, etc. It was possible for each message to have several codes. The codes (words, phrases) that shared the same meaning were grouped under categories. For exam-

ple, the category of 'assessment' included messages about student assessment tools and codes like 'formative assessment', 'numerical assessment', 'focus on assessment'. In the abstraction phase, a general description of the research topic was formulated by generating and regenerating categories and subcategories.

The internal validity of content analysis was assessed by using two coders and re-coding. At first, one researcher coded the messages and a co-coder coded the text using the codes created by the first coder, with the possibility to add new codes if she wanted to. After coding the text by the co-coder, the result was reviewed together and, as there were no significant differences in coding, there was no need to change the codes after co-coding. One month later, the entire material was re-coded by one researcher to see if the codes entered seemed reasonable and meaningful after some time had passed. The second coding did not differ significantly from the first coding, so it could be assumed that the selected codes covered the selected meaningful units and were suitable for the analysis of the results.

## 3. Results

The results section is organized according to the research questions, presenting quantitative data. In the case of the second research question, quantitative results are explained in detail with qualitative data.

Of the members who posted at least one message, teachers constituted the largest group and posted the highest percentage of all messages (Table 2). However, taking into account the number of messages per member, there was a statistically significant difference in activeness of posting between the role groups (asymptotically distributed F = 2.479, $p < 0.05$). The Games–Howell post hoc test revealed that the most active members were educational technologists (difference from all other role groups $p < 0.05$). As mentioned in the methodology part, the Facebook group was initiated by members from the Estonian Union of Educational Technologists and the three initiators were the most active posters, with 127 messages in total. There were no other differences between the role groups in terms of activeness in postings ($p > 0.05$).

**Table 2.** Descriptive statistics of activeness of different roles in writing messages.

| Name of the Role Group | Number of Members with This Role  *n* | Number of Messages from This Role (% of All Messages) | Number of Messages per Member  *n* |
|---|---|---|---|
| Teacher | 133 | 259 (29.7) | 2 |
| Educational technologist | 30 | 237 (27.2) | 7.9 |
| Supporter | 51 | 108 (12.4) | 2.1 |
| Other | 55 | 93 (10.7) | 1.7 |
| Teacher educator | 28 | 67 (7.7) | 2.4 |
| Government | 18 | 58 (6.7) | 3.2 |
| Parent | 23 | 32 (3.7) | 1.4 |
| Principal | 10 | 18 (2.1) | 1.8 |
| Total | 348 | 872 | 2.5 |

The Kruskal–Wallis test indicated that there was a statistically significant difference in the tonality of statements by authors' roles (H = 30.229, $p < 0.01$). The Mann–Whitney U-test revealed that parents posted more messages with negative sentiments compared with other roles (all $p < 0.01$), except principals (see also Figure 1).
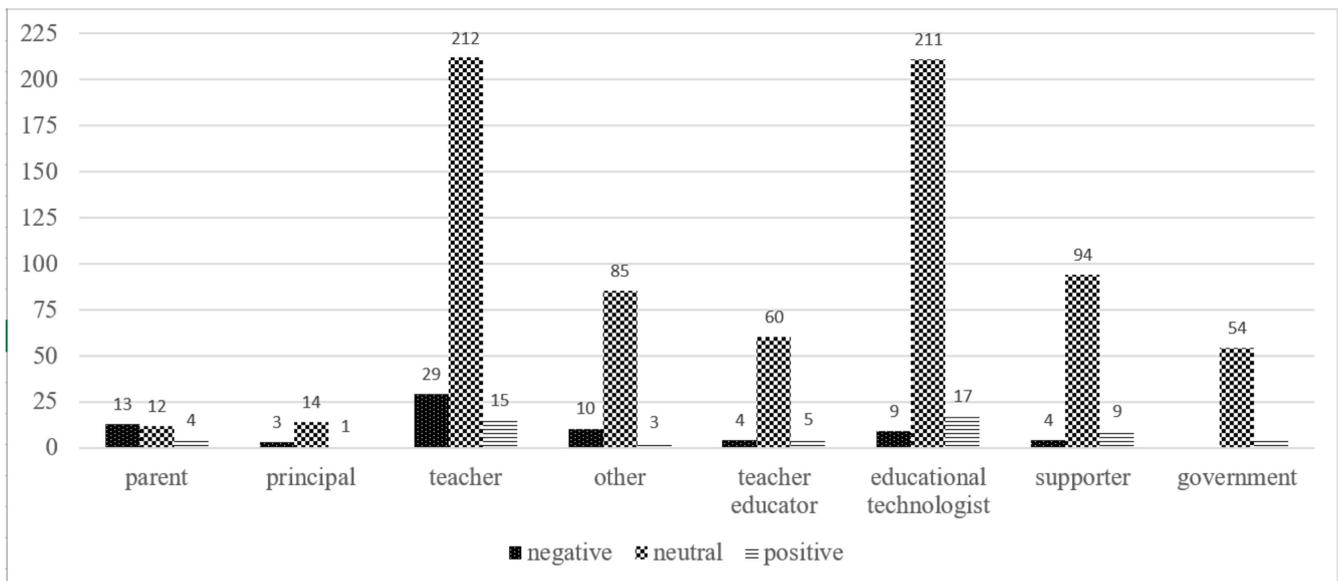
**Figure 1.** Positive, neutral and negative sentiments in the messages, by role.

There was a statistically significant difference in speech acts expressed in messages ($p < 0.01$) in different role groups, except principals and parents (see also Table 3). The Chi-square test revealed the most used acts by role (see also Table 3). There was one predominant speech act in the case of educational technologists and supporters. The greatest percentage of the messages by educational technologists (43.5%) were with the speech act of 'providing resources', whereas supporters mostly informed other members in the group (42.6% of their messages). In messages by teachers and members with other roles, the more prevalent acts included asking (34.0% and 29.0%, respectively) and providing resources (32.8% and 30.1%, respectively). Two distinguishing speech acts by members from government institutions and teacher educators were informing (29.3% and 28.4%, respectively) and providing resources (respectively 25.9% and 28.4% of their messages). All coded speech acts were represented in messages posted by different roles, except for principals whose messages never included invitations to participate in some activities.

**Table 3.** Speech acts represented in messages, by authors' role.

| Name of the Role Group | Providing Resources | Informing | Asking | Recommending | Inviting | Expressing Opinion | Chi-Square [a] |
|---|---|---|---|---|---|---|---|
| Teacher | **85** | 39 | **88** | 33 | 8 | 6 | 150.552 ** |
| Educational technologist | **103** | 62 | 17 | 31 | 18 | 6 | 169.658 ** |
| Supporter | 18 | **46** | 6 | 23 | 11 | 4 | 66.556 ** |
| Other | **28** | 13 | **27** | 13 | 7 | 5 | 31.194 ** |
| Teacher educator | **19** | **19** | 8 | 16 | 3 | 2 | 27.478 ** |
| Government | 15 | **17** | 5 | 9 | 11 | 1 | 18.759 ** |
| Parent | 4 | 7 | 10 | 6 | 1 | 4 | 8.875 |
| Principal | 6 | 4 | 2 | 4 | | 2 | 3.111 |

Note: Predominating speech acts are in bold. [a]—In the cases where the expected frequency was less than 5, Fisher's exact test was used. ** $p < 0.01$.

Again, there was a statistically significant difference in the topics represented in messages according to the chi-square test in each of the role groups (see also Table 4). All topics were represented in messages by teachers, educational technologists and members with other roles. Only four of the nine topics were identified in the messages posted by principals: tool, management, methodological idea, and other.

**Table 4.** Topics represented in different messages, by author's role.

| Name of the Role Group | Tool | Learning Material | Webinar | Management | Methodological Idea | Other | Collection | Tool Guide | Cyber Risk | Chi-Square [a] |
|---|---|---|---|---|---|---|---|---|---|---|
| Teacher | **107** | 46 | 8 | 17 | 20 | 41 | 6 | 11 | 3 | 302.718 ** |
| Educational technologist | 43 | 21 | **59** | 20 | 8 | 50 | 17 | 11 | 7 | 114.619 ** |
| Supporter | 21 | **26** | 8 | 10 | 7 | **28** | 6 | | 2 | 54.556 ** |
| Other | 16 | 16 | 9 | 11 | 6 | **30** | 2 | 1 | 2 | 67.548 ** |
| Teacher educator | **21** | 12 | 6 | 5 | 5 | 12 | | 2 | 3 | 34.364 ** |
| Government | 8 | 4 | **20** | 5 | 1 | 14 | 4 | | 2 | 41.586 ** |
| Parent | 4 | 5 | 1 | **16** | 3 | 1 | | | 2 | 36.250 ** |
| Principal | 2 | | | 7 | 1 | 8 | | | | 8.222 * |

Note: Predominating topics are in bold. [a]—In the cases where the expected frequency was less than 5, Fisher's exact test was used. * $p < 0.05$. ** $p < 0.01$.

Teachers and teacher educators posted mostly (respectively 41.3% and 31.8% of their messages) about tools. Teachers were the role group, whose messages were about various tools (mind maps, screencasting, photo editors and sharing, web-boards, e-learning platforms, web-conferencing tools etc.) but mostly about assessment tools (e.g., Kahoot, Quizlet, LearningApps etc.). Assessment tools were mentioned in messages by all roles, except parents. Messages by educational technologists and teacher educators about tools mostly referred to some web-conferencing tools. More fun tools, like music composition or learning games, were presented in messages by teachers and supporters. Tools, which are not so commonly used in schools, like audio editors, social bookmarks and programming, could be found in messages by educational technologists.

Members from ministerial agencies and educational technologists shared more webinars (34.5% of their messages). Educational technologists and supporters posted messages with varied content. However, one-quarter of the messages by educational technologists (25.0%) were about webinars. Also, the content of webinars shared in the Facebook group by educational technologists was varied, including the use of different tools, but also management at schools and at home, and health issues. Nevertheless, the management at school was the dominant topic in webinars distributed by educational technologists. Members from government institutions invited the other members mostly to participate in webinars about learning management systems and management at schools. More than one-third of the messages about webinars by teachers and teacher educators referred to webinars, where methodological ideas were introduced.

Almost a quarter of the messages by supporters (24.1%) were about learning materials. Also, in the case of learning materials, different assessments prevailed and learning material about assessments was posted by each role group at least once. Teachers and students were supported also with e-lessons and videos, which were distributed in this Facebook group. Only teacher educators did not post any e-lessons, and members from government institutions did not post any videos. E-lessons prevailed among the messages with the topic of 'learning material' by educational technologists, whereas supporters posted actively both e-lessons and videos. Again, less common and newer technological possibilities, like virtual reality, were introduced by educational technologists.

Half of the messages by parents (50.0%) were about management issues and this was one of the main topics of principals, too (38.9% of their messages). Principals, teachers and educational technologists from different schools posted mostly about their experiences of how to manage distance education in an emergency situation and gave suggestions for others. The content of the messages by parents on the topic coded as 'management' was also mostly about their experiences, how they cope with homeschooling, juggling their own work and supporting their children, and they gave tips for other parents, too. However, homeschooling was also mentioned in messages by all other roles, and parents gave suggestions to schools on how to manage teaching. Assessment issues were represented in the messages with the topic 'management' by all role groups, except principals. The need to reduce the diversity of digital tools used and to lower the workload was pointed out by parents, teachers, supporters and members with other roles. All role groups, but especially principals, supporters and members with other roles posted messages, which were coded as 'other' topics. These included different cartoons, jokes, wishes, thanks, etc.

Messages representing the topics coded as 'tool', 'management', 'methodological idea' and 'other' were posted by each role group. The category of methodological ideas included tips by teachers and educational technologists on how to use web-conferencing tools like Zoom. For example, it was explained how to use these tools for group work by creating breakout rooms. Supporters shared different websites (art, virtual museums, etc.) and offered ideas on how to use these in lessons. Parents shared methodological ideas, which had been given to their children and which the parents really liked.

Tool guides were shared only by teachers, educational technologist, teacher educators and members with other roles. In most cases, it was guidance on how to use web conferencing tools or learning management systems. Also, teachers and educational technologists

shared with others instructions on creating videos, including screencasts, and on using web-boards. It was also interesting that all roles discussed cyber risks, except principals. Cyber risk issues related to Zoom were pointed out by educational technologists, supporters, teacher educators and members with other roles. Supporters and members from government institutions also distributed general suggestions on how to avoid cyber risks. As children spent more time at their computers, educational technologists pointed out the health problems, while teachers and supporters warned about cyberbullying.

Members of different roles posted messages for different target groups. All role groups posted messages for everyone, schools and teachers (see Table 5). Messages for everyone were prevalent among the messages by educational technologists, supporters, parents and members with other roles. In addition to writing messages to everyone, teachers also wrote for other teachers. Members from government institutions addressed their messages mostly to teachers. There was no statistically significant difference in the case of teacher educators and principals.

**Table 5.** Addressees of the posted messages, by authors' role.

| Name of the Role Group | Everyone | Schools | Teachers | Principals | Parents | Students | Chi-Square [a] |
|---|---|---|---|---|---|---|---|
| Teacher | **93** | 58 | **93** | | 4 | 11 | 142.525 ** |
| Educational technologist | **91** | 44 | 75 | 6 | 10 | 11 | 170.570 ** |
| Supporter | **58** | 11 | 23 | | 3 | 13 | 86.074 ** |
| Other | **53** | 8 | 24 | | 4 | 4 | 94.151 ** |
| Teacher educator | 30 | 17 | 19 | | | | 4.455 |
| Government | 11 | 12 | **29** | 3 | 2 | 1 | 57.862 ** |
| Parent | **19** | 5 | 5 | 1 | 1 | | 33.000 ** |
| Principal | 9 | 3 | 5 | 1 | | | 7.778 |

Note: Predominating speech acts are in bold. [a]—In the cases where the expected frequency was less than 5, Fisher's exact test was used. ** $p < 0.01$.

Interestingly, principals were the addressee only in messages posted by educational technologists, parents, principals themselves, and members from government institutions. Principals were the group with the lowest number of messages addressed to them.

## 4. Discussion

This study aimed to understand different stakeholders' activities, as revealed in the messages of the Facebook group 'Homeschooling with technology' from 6 March to 26 April 2020. The results are discussed according to the local and external factors and different roles because success in changes depends on both local and external factors, and the people involved in the change process, and how they affect the change, is a crucial variable [7].

### 4.1. Local Stakeholders Affecting the Change

All roles representing local factors (teachers, principals, educational technologists, and parents) posted about their experiences of how to manage distance education in an emergency situation at school and at home and gave suggestions to others. Also, it was found that all these role groups addressed most of their messages to everyone.

**Teachers** can work with or oppose change, and it is important that teachers know the goal of the change [7]. Like previous studies about teaching in an emergency situation [8,9], indicating that even highly experienced teachers tend to have doubts about what and how to teach, our results also demonstrated that the share of questions was higher in messages posted by teachers. This result ties well with the findings of Liljekvist et al. [19], according to which teachers in Facebook groups used mostly 'questions' and 'offers', and indicates that teachers were not well informed in this unexpected change. However, only a little over one-tenth of the messages by teachers was with negative sentiments. Besides the messages for everyone, messages for other teachers were also prevalent among the messages by teachers. Teachers also provided resources to other members in the group

and such messages were predominantly about tools. Teachers wrote about varied tools, but mostly about assessment tools. Previous studies have also indicated that teachers can be unsure about how to conduct tests and assessments in distance learning and how to find suitable tools for that [8].

**Principals** should take a leading role in the change [7], however, principals were quite passive in the observed Facebook group. It might be that they were busy managing changes in their own school and were silently waiting for guidelines as has been found in previous studies [12]. Like teachers, principals shared both positive and negative statements. It was interesting that principals did not invite others to participate in any activities, whereas all other roles used this speech act in their messages. As with some of the coded speech acts that were not found even once in the content of messages by principals, there were some topics that were similarly absent. Only four of the nine topics—tool, management, methodological idea, and other—were represented in their messages. Management was one of the main topics for principals and they shared their own experiences and discussed the rules they had established. Fullan [7] points out that principals' actions should also provide teachers with psychological support. As principals also posted messages coded by topic as 'other'—a category containing cartoons, jokes, thanks, etc.—it seems that they wanted to support others emotionally and help them overcome the difficulties in handling the unexpected and unwanted change. However, it was interesting that all roles discussed cyber risks and assessment issues, except principals.

**Educational technologists** were the most active members of this Facebook group. Of course, one reason might be that the group was initiated by members with this role. However, as the change was heavily geared towards using more digital tools and environments, educational technologists were the most competent as local factors in this field. Educational technologists shared and suggested tools, which are not so commonly used in schools, like audio editors, social bookmarks and programming. In terms of learning materials, they shared mostly e-lessons. Previous studies have also indicated that technology makes it possible to use different specialized tools and materials, not only textbooks [11,14]. As educational technologists usually belong to the school management team in Estonia, it seems that they took the leading role in this change instead of principals. The share of negative messages from educational technologists was less than 5%, whereas it was a little over one-tenth in the case of teachers and one-sixth in the case of principals, indicating that educational technologists were more successful in coping with this unexpected change. In terms of speech acts, educational technologists provided mostly different resources and, as the analysis of message topics indicates, most of the information about webinars was posted by them. These webinars were mainly about management at schools. Previous studies have also indicated that there is no clarity on the management of distance learning in the case of unexpected change [12] and Fullan [7] notes that management issues are important in the case of change.

Keeping **parents** informed and involved is an important part of managing change and strong parent–school relationships are required to achieve the change [7]. The result that parents posted more messages with negative sentiments than any other roles, except principals, indicates that in our study parents were more opposed to the change. This result is in line with Rainey et al. [16] who claim that two-thirds of posts by students and their families expressed negative sentiment. Messages by parents were mostly coded under the topic of 'management'. Parents wrote about their experiences, how they cope with homeschooling, juggling their own work and supporting their children. They gave tips for other parents, but they also wrote about a lot of problems they faced supporting their children at home. Like teachers, they had several questions, which indicates that parents, too, were not well informed and, similarly to teachers, they felt the need to reduce the range of digital tools used and to lower the workload. However, as indicated in the previous study during the coronavirus pandemic [2], teachers need support from parents and this support plays an important role in students' learning efforts and outcomes.

### 4.2. External Stakeholders Affecting the Change

Our results demonstrate that the speech act of informing was more used by the roles representing external factors (members from government institutions, teacher educators, supporters).

**Members from government institutions** should be in touch with the process of implementation of the change by the practitioners [7] and being a member in this Facebook group gave them awareness of the experiences of local stakeholders. In our study, members from ministerial agencies informed and provided resources, which is important because, as has been found before, both principals and teachers were waiting for the governments to provide guidelines for the organization of distance learning during the pandemic [12]. Members from governmental institutions wrote mostly for teachers, but some messages were addressed to schools as well. Their messages were mainly about webinars with the intention to educate schools about learning management systems. Previous studies have also mentioned that learning management systems can contribute to providing education [1]. Members from governmental institutions were the only role group that did not post any messages with negative sentiments, indicating that they work with the change.

As with teachers, tools were the dominant topic in the messages by **teacher educators**. However, unlike teachers who wrote mostly about assessment tools, teacher educators shared more web-conferencing tools. The importance of web-conferencing tools has also been mentioned in previous studies [8] and teacher educators have more experiences with this tool. Surprisingly, there were only a few messages by teacher educators on the topic of methodological ideas. Previously, it has been observed that teachers were aware of digital tools and there is a lack of a pedagogical dimension [8,10]. It seems that teacher educators were unsure about well-established practices, theories and pedagogies, as has been observed in an earlier study [13]. However, more than one-third of the messages about webinars by teacher educators referred to webinars presenting methodological ideas. It was interesting that teacher educators only posted messages addressed to everyone, schools or teachers.

Outside support, from other external partners like R&D laboratories and centers, philanthropic foundations, etc., is needed to perform better during the change [7]. As has been mentioned previously [1,12], book publishers, IT companies, museums, etc., gave free access to their materials in Estonia as well, and **supporters** shared mostly this type of learning materials, including e-lessons and videos, different websites (art, virtual museums etc.) and more fun tools like music composition or learning games. Supporters also posted messages coded as 'other', which included different cartoons, jokes, wishes, thanks, etc.

Among the external stakeholders, **members with other roles** posted more negative statements. The difference was not statistically significant, but more than a tenth of the messages by this role group was with negative sentiments. Unlike other external stakeholders, members with other roles provided more resources and, like teachers, they had more questions. In terms of topics, messages coded as 'other' prevailed in their posts.

## 5. Conclusions

Change can come when it is forced upon us or when we voluntarily participate in, or even initiate it, being dissatisfied with the current situation. The outcome of change depends on how the people involved affect the change. This study tried to understand the stakeholders' roles in education during the coronavirus pandemic in Estonia, which was an unexpected and unwanted change. The results indicate that among local stakeholders, educational technologists were the catalysts of change instead of the principals. They suggested and shared tools, educated teachers, students and even principals through webinars and e-lessons. External stakeholders supported local stakeholders psychologically and created learning materials and webinars.

Some unexpected results also emerged. Principals in our study offered more psychological support and did not talk so much about the essential topics that emerged during the crisis in this Facebook group. Also, it is worth mentioning that, as teachers were confused

about how to teach, the teacher educators focused more on tools. This indicates that teacher training institutions were also not prepared for this unexpected change. Additionally, it was interesting that members from the governmental institutions wrote mostly for teachers, not so much for principals. It is an important finding because the leadership should go from the bottom upwards and it is more logical if the government communicates with principals who forward these messages to teachers and other local stakeholders. Maybe during this unexpected change addressing teachers directly was the right decision because then the information quickly reached the teaching process. However, it was important that all stakeholders were aware of the implementation process and, therefore, this kind of Facebook community can be beneficial.

The novelty of this study lies in the analysis of Facebook messages by different stakeholders based on real data collected during the actual pandemic. These messages indicate what was relevant and important at that time. However, our study has some limitations, too. First, the data were based on one Facebook group in Estonia and, therefore, the results are not generalized. Also the results are not generalized in Estonia as the data are based only on one Facebook group and the sample is not representative. Second, we only analyzed messages, leaving out comments. In future studies, it would be interesting to analyze comments as well. Also, as this study covers only the situation at the beginning of the coronavirus pandemic, and it would be interesting to analyze how these stakeholders affected the change in the autumn period, too.

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