Changes in activity and content of messages of an Estonian Facebook group during transition to distance learning at the beginning of the COVID-19 pandemic

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Abstract

Background: The coronavirus pandemic has affected education worldwide. Estonian schools moved to distance learning on March 16.

Objectives: This paper outlines the stages of unexpected and temporary changes affecting different stakeholders based on activity and content of the messages in the Facebook group ‘Homeschooling with technology’. Also the applicability of the concerns-based adoption model was explored to explain these changes.

Methods: The investigated timespan includes the week before the emergency situation and the weeks of the school term and school holidays during the emergency situation, with 52 days in total, divided into seven periods. The 872 messages were coded by two researchers and changes were examined.

Results and Conclusions: Four stages were identified, from low exposure and involvement with the change to focusing on collaboration and skipping the consequence stage. Furthermore, the new changes in the educational system might focus people again on personal concerns.

Implications: The results help capture the changes in teaching and learning situation caused by the coronavirus pandemic in order to learn from these changes and be prepared for such situations in the future.

KEYWORDS

concerns-based adoption model, content analysis, COVID-19, distance education, social network

1 | INTRODUCTION

The coronavirus pandemic has affected education worldwide, as all levels of education, including general, vocational and higher education, transferred to distance learning. Courses offered online in response to a crisis or disaster are not the same as a well-planned online learning experience (Hodges, Moore, Lockee, Trust, & Bond, 2020) and can be better described as emergency remote education (Bozkurt et al., 2020). Different countries have reported about actions taken during the transition to distance learning due to the coronavirus pandemic and have proposed solutions for the force majeure situations, for example, Zambia (Sintema, 2020), Ireland (Burke & Dempsey, 2020), China (Demuyakor, 2020), Sweden (Bergdahl & Nouri, 2020), United Arab Emirates (Al Darayseh, 2020), United States and Norway (Gudmundsdottir & Hathaway, 2020), and other countries.
The sudden change in teaching was tremendous, with a lot of things to take into account, and even well-experienced teachers were not sure what and how to teach (Bergdahl & Nouri, 2020; Zhang et al., 2020). Both school principals and teachers were looking for guidelines for the organization of distance learning (Burke & Dempsey, 2020). The pedagogical aspect of online teaching was also an issue because teachers indicated that previously they used to focus more on the technical aspects of using various digital tools rather than the pedagogical dimension (Gudmundsdottir & Hathaway, 2020). Consequently, teachers lack the pedagogical strategies needed in distance learning (Bergdahl & Nouri, 2020). Hundreds of online webinars for teachers to upskill them in distance teaching have been conducted (Bozkurt et al., 2020; Burke & Dempsey, 2020). The issues with GDPR and cybersecurity while choosing the suitable tool should be taken into account (Bergdahl & Nouri, 2020; Bozkurt et al., 2020).

Not only one, but continuing changes in educational management were made. In the first phase of the school closure in some countries educators were allowed only to recap previously taught content and teaching of new content was not intended (Huber & Helm, 2020). However, as the school closure continued, this has changed and new things had to be taught as well. During the pandemic many countries paid particular attention to providing digital “content” or “materials”, for example, book publishers have given free access to their textbooks (Bozkurt et al., 2020; Burke & Dempsey, 2020). Specialized materials well beyond textbooks can be accessed by teachers and students using technology (Schleicher, 2020). However, during the crisis, teachers can be focused on teaching knowledge rather than applying fruitful practices for knowledge acquisition (Al Darayseh, 2020).

2 | LITERATURE REVIEW

The primary object of investigation of distance learning due to the coronavirus pandemic has been teachers, their readiness and experiences (Bergdahl & Nouri, 2020; Gudmundsdottir & Hathaway, 2020; Moorhouse, 2020). However, the perceptions and opinions of different groups, for example, parents, students, school leaders, school authority, teacher educators, and members of the school support system, were also targeted (Burke & Dempsey, 2020; Demuyakor, 2020; Huber & Helm, 2020; Murray et al., 2020).

Surveys have been the main source of information in previous studies about COVID pandemic influence on education (Bergdahl & Nouri, 2020; Burke & Dempsey, 2020; Gudmundsdottir & Hathaway, 2020; Moorhouse, 2020). Interviews have also been conducted (Sintema, 2020) and self-experiences and observations have been described (Bozkurt et al., 2020; Moorhouse, 2020). However, social media (Twitter, Facebook, blogs, forums) has been used as an important means of communication among students, parents, educators, and school administrators during the COVID-19 pandemic (Bozkurt et al., 2020; Luik & Lepp, 2021) and as a publicly available resource, it can be used to collect information and to measure public attention (Rainey et al., 2016; Zhao & Xu, 2020).

Professional Facebook groups have been created during the COVID-19 pandemic with the intention to support each other and share expertise and ongoing experiences (e.g., Bozkurt et al., 2020). Teacher collaboration has been a relieving factor that reduced the perceived degree of stress in comparison to the stress perceived by school leaders and students who may not have access to these resources (Huber & Helm, 2020). However, it has been suggested that not only teachers but other stakeholders as well, would benefit from interacting in a Facebook group, especially during the school closure periods (Luik & Lepp, 2021).

The sudden change in teaching was tremendous, with a lot of things to take into account, and even well-experienced teachers were not sure what and how to teach (Bergdahl & Nouri, 2020; Zhang et al., 2020). Not only one, but continuing changes in educational management were made. In the first phase of the school closure in some countries educators were allowed only to recap previously taught content and teaching of new content was not intended (Huber & Helm, 2020). However, as the school closure continued, this has changed and new things had to be taught as well. During the pandemic many countries paid particular attention to providing digital “content” or “materials”, for example, book publishers have given free access to their textbooks (Bozkurt et al., 2020; Burke & Dempsey, 2020). Specialized materials well beyond textbooks can be accessed by teachers and students using technology (Schleicher, 2020). However, during the crisis, teachers can be focused on teaching knowledge rather than applying fruitful practices for knowledge acquisition (Al Darayseh, 2020).

3 | THEORETICAL APPROACH

Coping with unpredictable changes takes time and there are different theories on handling the changes in education. Fullan’s educational change theory focuses on human participants of the change process and how they can affect the change (Fullan, 1982). Another commonly used theory of change caused by educational innovation is CBAM, which offers a theoretical underpinning for the understanding how change affects people, such as teachers, parents, students and policymakers (Hall et al., 1973). In this article, CBAM is used as a theoretical framework helping to capture how the changes in teaching and learning situation caused by the coronavirus pandemic influenced the different stakeholders of the educational system. This model was chosen because it describes how change affects a person unlike the Fullan model (Fullan, 1982), which looks at how a person affects the change. CBAM has several dimensions, one of them is Stages of Concerns, which describes the different types of thoughts, feelings, perceptions and worries that people can have approaching and engaging in the process of change (Hall, 2013). CBAM identifies seven stages of concern, which can be grouped into self-concerns (stage 1, informational; stage 2, personal), task concerns (stage 3, management) and impact concerns (stages 4, consequence; 5, collaboration; and 6, refocusing) (Hord et al., 2006). In addition, there is stage 0, when persons are unconcerned about the change. Hord et al. (2006) explained that during the informational stage people want to know more about the
change. After this the personal concerns about skills and ability to work as expected appear. Expressions related to the management of time and materials are common to the management stage. The main question of the consequence stage is related to how the change will affect students. Concerns about collaborating with others to improve the outcomes belong to stage 5. Only some persons will reach the final, refocusing stage with ideas about the more effective versions of the change.

Previously it has been found that public attention to the changes or pandemic situation in social media can be divided into three stages: the first stage has low and unstable attention, the second has a concentrated increase and the third shows continued attention (Zhao & Xu, 2020), which is also in accordance with the CBAM model. CBAM also states that change is a process occurring over time and usually taking several years (Hord et al., 2006) and impact concerns can appear most probably with several cycles of experience of change (Hall, 2013). In addition, with every new (even small) change, the concerns can recycle and previous stages can launch again (Hord et al., 2006).

People tend to share information, opinions in social media platforms, but also emotions to cope with the uncertainty caused by unpredictable changes (Li et al., 2020). Measuring the emotional tendency of the public during the coronavirus pandemic in one of the most popular social media platforms in China showed that emotions have changed from negative to neutral, with negative emotions weakening and positive emotions increasing as a whole (Zhao & Xu, 2020). The same was found during the school closure in Chicago in 2012 where the capture of social media posts showed that the number of posts expressing negative sentiment was greatest on the first day of the school closure and decreased dramatically by day 3, and a relative change in negative versus positive sentiment of posts over time was discovered while estimating sentiment score (Rainey et al., 2016).}

4 | AIM OF THE STUDY AND RESEARCH QUESTIONS

Existing research has shown that public information in social media (e.g., Facebook) can reflect the situation during the crisis (Rainey et al., 2016; Zhao & Xu, 2020), but a review of recent literature reveals that there are few studies about public responses according to changes in education during the COVID-19 situation. Understanding how changes in society affect the messages in social media, like Facebook groups, and what kind of stages form, helps authorities learn the main issues of the stakeholders and react by providing support through influential users. This study aims to identify the stages of unexpected and temporary changes affecting different stakeholders based on the activity and the content of messages in the Facebook group “Homeschooling with technology” in the early part of the COVID-19 situation in Estonia.

We posed two research questions. As the activeness of posting messages indicates a degree of interest in those topics at this time period (Anwar et al., 2019), different stakeholders have different roles in educational changes (Fullan, 1982) and the social media can capture nearly real-time information and emotions in relation to the social changes (Rainey et al., 2016), the first research question was: What stages formed based on the changes in the level of activity, activeness of members with different roles and the content of messages?

As the CBAM model (Hall, 2013) explains how changes affect different people, the second research question was: How is the CBAM model applicable to explain unexpected temporary changes caused by the coronavirus pandemic?

5 | METHODOLOGY

5.1 | Context of the study

The 2020 school closures in Estonia started on March 6, 2020 when one school student was diagnosed with the COVID-19 virus and the school was closed. However, at the beginning of March, only a few schools were closed. The emergency situation was declared on Thursday, March 12, establishing that from Monday, March 16, all schools and universities have to move to distance learning for 2 weeks. The conversion of all learning processes to a distance mode occurred with immediate effect. The term of school closure was extended several times.

To support teachers’ work in the times of the COVID-19 crisis, several actions were conducted in Estonia. As one of such actions, three members of the Estonian Union of Educational Technologists created the Facebook group ‘Homeschooling with technology’, which became the largest Facebook group supporting people working in education in Estonia. The group was created on March 6, and was joined by more than 8000 people, including educational technologists, teachers from different school types and levels, headmasters, teacher educators, employees of the information technology foundation for education and Estonian ministry of education and research, students’ parents, grandparents and representatives of businesses and non-profit organizations.

Generally, Estonian teachers and schools had used technology in education even before the emergency situation. National tests at all school levels are conducted with the help of digital technologies (European Commission/EACEA/Eurydice, 2019). Furthermore, more than two-thirds of Estonian lower-secondary school teachers feel confident using ICT tools in teaching their subjects (Taimaluu et al., 2019).

5.2 | Sample

The data for the present study were collected from the Facebook group ‘Homeschooling with technology’ messages in the period from March 6 to April 26, 2020. The total number of members on April 26 was 8007. The gender and age of 92 members (1.1%) was not disclosed on Facebook. Most of the members (7896, which was 98.6%) were from Estonia. A more detailed description of the members of the Facebook group is given in our previous study (Luik & Lepp, 2021).
Messages were posted by 348 members, who form our sample. Among these, 276 (79.3%) were female and 67 (19.3%) were male. Five members (1.4%) made posts from their organization’s Facebook account.

5.3 Data collection and analysis

A total of 872 messages were posted during this period, on average 2.5 messages (SD = 5.18) per member who posted at least one message. Deductive quantitative content analysis was used. The quantitative content analysis only considers explicit content that can be obtained. It differs from a qualitative content analysis, which allows you to interpret and find meanings more deeply. Quantitative content analysis stays very close to the text, using words from the text and describing only the visible and obvious in the text (Bengtsson, 2016), which makes this analysis more systematic and therefore less subjective (Rose et al., 2014). At first, a coding manual was elaborated with definitions, descriptions and guidance for coders.

The data collected from the Facebook group included the name of the member, date of the message, number of comments, share count, reaction count. Using Google Search and Facebook data, each member was assigned a role: teacher, principal, educational technologist, teacher educator, parent, student, supporter (someone who work in an institution providing learning materials or tools for education), government (ministry and its subsidiaries) or other (a role could not be identified). If a message was posted by a teacher who was also a parent, the role was assigned according to the content of the message. For example, a member posting a message stating “I write as a parent, not as a teacher right now.” was coded with the role of a parent. Nine different roles were determined in total.

Analyzing the content of messages, different variables were elaborated. First, using explicit words, each message was coded as expressing negative (includes words with a negative connotation like ‘problem’, ‘angry’, ‘bad’, ‘horrible’, ‘failed’, etc.), positive (including words ‘good’, ‘positive’, ‘happy’, ‘succeeded’, ‘satisfaction’, etc.) or neutral (neutrally written) statements.

Second, codes were created for analyzing the content of speech acts in messages. Most of the previous studies (Herring et al., 2005; Jeng, Des Autels, He, & Li, 2017; Savolainen, 2020) have coded dialogues. In this study, only messages with no comments were coded and therefore, an adapted coding schema from previous studies (Herring et al., 2005; Jeng et al., 2017) was used. The coding manual specified nine codes, but three codes were not used (greet, thank and warn), resulting in a final selection of six codes for which explanations and examples are presented in Table 1.

Third, from the previous study (Luik & Lepp, 2020) where open coding was used, 10 codes were used to refer to topics (tool, learning material, webinar, collection, management, methodological idea, tool guide, information, cyber risk and other). As the fourth category, six codes were defined based on the addressee of the message (all, teachers, headmasters, schools, parents and students). The coding of addressees was based on explicit wordings in messages. In addition, the whole message was also recorded.

At the second stage, 91 (10.4%) of all messages were coded by two independent researchers. The codes of the two researchers were compared and the agreement between them was 0.80. After that, all messages were divided between the two researchers and both coded messages independently. However, they also held weekly coding meetings to ensure that the degree of agreement has not dropped in the meantime. If the researchers disagreed about a code, negotiation was pursued until a consensus was reached. Messages, about which a coder had doubts, were also discussed together.

The period of 52 days was divided into seven periods:

I. March 6–12: The period before the emergency situation where only some schools had to use distance learning. In the evening of March 12, it was announced that all schools have to use distance learning for 2 weeks, starting on March 16.

II. March 13–19: The first week of the emergency situation. At the end of this period (March 18) the ministry of education and research suggested to organize the learning in a new way, to support the coping of each group in a new situation, and to motivate students to learn and not focus so much on assessment.

III. March 20–26: The second week of the emergency situation. On March 26, it was announced that distance learning would continue for at least the two first weeks of April, but most probably until the end of April, the regulations became stricter.

IV. March 27–April 2: The third week of the emergency situation. On April 2, the basic schools and upper secondary schools act draft amendment was presented in the parliament to make it more flexible by providing regulations for the procedure for conducting state examinations and basic school final examinations. In all basic schools and upper secondary schools, it is possible to use descriptive verbal assessments to assess learning during the emergency period, which do not need to be converted to a five-point grading scale.

V. April 3–9: The fourth week of the emergency situation. The ministry of education and research announced on April 9 that, if the spread of the COVID-19 virus recedes, a less restricted educational arrangement would be restored in schools from 15 May to the end of the school year.

VI. April 10–17: The fifth week of the emergency situation and end of the school term. On April 14, the ministry of education and research called on everyone to share exciting and creative thoughts, ideas, activities or initiatives on how students can take a meaningful break in an emergency situation.

VII. April 18–26: School holidays during the emergency situation. On April 24, it was announced that distance learning continues until May 17 and after that, only small groups (not exceeding 10 students) will be allowed to schools and for most students, the academic year ends in distance learning.

After coding, the data was analysed using SPSS version 25.0. For comparing variables in interval scale (number of messages, number of comments, etc.) MANOVA with Bonferroni post-hoc test was used. Kruskal-
Wallis test was used for comparing the emotional tenor of messages on a 3-point scale, and chi-square test was used for comparing proportions.

6 | RESULTS

6.1 | Changes in the level of activity in the group

The most active period (35.4% of all messages) was the second period (see Figure 1). After that, the number of messages rapidly decreased. However, approximately 100 messages were posted each week during the school term during the emergency situation. Only the first period and the seventh period had fewer than 70 messages.

6.2 | Authors of messages and change in activity of different roles

Teachers were active posting messages in all periods. Only in the sixth period (the last school-week before the holidays) the proportion of messages posted by teachers decreased a little, but this change was not statistically significant (chi-squared = 1.815, }
p > 0.05, see also Figure 3). There were no statistically significant differences in the case of supporters, either (p > 0.05). Educational technologists posted more messages in the sixth period compared with the second, third and fourth periods (with chi-squared test, all p < 0.05). Teacher educators were more active in the first period compared with the fifth period and seventh periods (with chi-square test, p < 0.05). Teacher educators were more active in the first period compared with the second period (with chi-square test, p < 0.05). Interestingly, parents posted only from the period when the emergency situation began until the school holidays and principals did not post any messages in the first and sixth periods.

6.3 Content of messages and changes in content

Most of the messages (85.1%) expressed neutral statements, while 8.3% conveyed negative and 6.7% positive statements. There was no statistically significant difference in emotional tenor between the periods (with Kruskal-Wallis test H = 4.415, p > 0.05). The chi-square test revealed that the proportion of messages with negative statements was highest during the third and fourth periods (Figure 4). Comparing the percentage of negative statements between the third and the second periods chi-squared = 5.924 (p < 0.05) and between the fourth and fifth periods chi-squared = 4.130 (p < 0.05). Also, the proportion of messages with positive statements increased in the third period (difference with the second period chi-square = 5.338, p < 0.05).

The proportion of messages in the category of ‘informing’ increased in the third period (comparing with the second period chi-squared = 6.887, p < 0.01) and the percentage of messages ‘providing resources’ was lower in the fifth period comparing with the first, second and the sixth periods (with chi-square test, p < 0.5 in all cases, see also Figure 5). Compared to all other periods, the percentage of messages in the ‘asking’ category was lowest in the sixth period (with chi-square test p < 0.05 in all cases). In contrast, ‘inviting’ messages (6.8% of all messages) increased in the sixth period compared to the first four periods (with chi-square test p < 0.05 in all cases). Messages of ‘recommending’ decreased in the fourth period (comparing with the third period, chi-squared = 5.543, p < 0.05). The proportion of the messages belonging to the category ‘inviting’ was higher in the sixth period compared with the first two periods (p < 0.01).

Messages about tools decreased in the third period (comparing with the second period chi-squared = 4.935, p < 0.05, see Figure 6). Also, the first period had a higher level of information sharing compared to the fourth period (chi-squared = 4.316, p < 0.05). A significant difference was also found comparing the proportion of messages about management between the first and third periods (chi-squared = 7.182, p < 0.05). Further, the proportion of messages about webinars increased from the fifth period compared with the second period (all p < 0.05) and there was also a statistically significant difference between the third and the seventh periods (p < 0.05).

The proportion of messages for everyone increased in the third period (comparing with the second period chi-square = 4.969, p < 0.05, see also Figure 7). In each period, at least some of the messages were also written for students and in almost all periods (except the last week of the school term) for parents. The number of messages for students was relatively higher in the seventh period (compared to the first four periods, with chi-squared test p < 0.05 in all cases). While more than one-third of the messages were addressed generally for schools in the first period, the share of such messages decreased from the third period (chi-squared = 10.711, p < 0.01). Interestingly, there were no messages for principals in the third and fourth periods.
This study aimed to understand how changes in the teaching and learning situation in Estonia, caused by the coronavirus pandemic, affected the messages in social media in order to learn from these changes and be prepared for such situations in the future. The data in this study was collected from the messages posted in the Facebook group “Homeschooling with technology.” The data was collected in...

### FIGURE 5 Proportion of different speech acts found in messages by periods

| Speech Acts            | I     | II    | III   | IV    | V     | VI    | VII   |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| Providing resources    | 38.7% | 36.6% | 27.6% | 26.8% | 22.3% | 36.6% | 26.6% |
| Informing              | 16.1% | 15.5% | 25.6% | 32.4% | 35.1% | 26.8% | 31.3% |
| Asking                 | 21.0% | 21.7% | 17.9% | 15.2% | 22.3% | 7.3%  | 18.8% |
| Recommending           | 19.4% | 19.7% | 16.7% | 12.4% | 6.4%  | 12.2% | 10.9% |
| Inviting               | 3.2%  | 3.2%  | 6.4%  | 5.7%  | 11.7% | 17.1% | 9.4%  |
| Expressing opinion     | 1.6%  | 3.2%  | 5.8%  | 5.7%  | 2.1%  | 3.1%  |       |

### FIGURE 6 Proportion of the topics discussed in messages by periods

| Tool                  | I       | II      | III     | IV      | V       | VI      | VII     |
|-----------------------|---------|---------|---------|---------|---------|---------|---------|
| Tool                  | 32.3%   | 30.3%   | 20.5%   | 19.0%   | 23.4%   | 19.5%   | 29.7%   |
| Information           | 21.0%   | 16.9%   | 16.7%   | 9.5%    | 18.1%   | 19.5%   | 9.4%    |
| Learning material     | 9.7%    | 13.4%   | 17.9%   | 20.0%   | 13.8%   | 17.1%   | 10.9%   |
| Webinar               | 16.1%   | 6.5%    | 11.5%   | 13.3%   | 19.1%   | 19.5%   | 23.4%   |
| Management            | 3.2%    | 11.4%   | 16.7%   | 12.4%   | 8.5%    | 4.9%    | 4.7%    |
| Methodological idea   | 9.7%    | 7.2%    | 2.6%    | 9.5%    | 5.3%    | 3.7%    | 1.6%    |
| Other                 | 1.6%    | 2.0%    | 7.7%    | 5.7%    | 5.3%    | 9.8%    | 9.4%    |
| Collection            | 3.2%    | 5.9%    | 4.5%    | 2.9%    | 2.1%    | 1.2%    | 3.1%    |
| Guide of tool         | 3.2%    | 4.2%    | 2.9%    | 1.1%    | 1.2%    | 7.8%    |         |
| Cyber risk            | 2.3%    | 1.9%    | 4.8%    | 3.2%    | 3.7%    |         |         |

### FIGURE 7 Proportion of messages by addressee, by periods

| Addressee              | I       | II      | III     | IV      | V       | VI      | VII     |
|------------------------|---------|---------|---------|---------|---------|---------|---------|
| For all                | 25.8%   | 37.9%   | 48.7%   | 49.5%   | 46.8%   | 43.9%   | 35.9%   |
| For teachers           | 32.3%   | 34.3%   | 28.8%   | 31.4%   | 30.9%   | 29.3%   | 25.0%   |
| For schools            | 35.5%   | 21.4%   | 15.4%   | 13.3%   | 7.4%    | 13.4%   | 21.9%   |
| For principals         | 1.6%    | 1.3%    | 2.1%    | 3.7%    | 1.6%    |         |         |
| For students           | 3.2%    | 1.0%    | 3.8%    | 3.8%    | 8.5%    | 9.8%    | 14.1%   |
| For parents            | 1.6%    | 3.9%    | 3.2%    | 1.9%    | 4.3%    |         | 1.6%    |

7 | DISCUSSION

This study aimed to understand how changes in the teaching and learning situation in Estonia, caused by the coronavirus pandemic,
the period from March 6–April 26, which includes a period before the emergency situation when only some schools had to use distance learning, a school term, and also a week of school holidays during the emergency situation. Also in each of these periods, some changes in educational management were announced. The periods form four stages.

7.1 | Stages of unexpected and temporary changes affecting different stakeholders

7.1.1 | The first stage–low exposure and involvement with the change (I period)

In the first period, only some schools in Estonia had to convert to distance learning. This period is characterized by low activeness in posting messages in the Facebook group, indicating a low degree of interest (Anwar et al., 2019). Like in the study by Zhao and Xu (2020), low attention was noticed in this period. Only some stakeholders (teachers, teacher educationalists, teacher educators, members from government institutions, supporters, and members with other roles) posted some messages. Messages were mostly neutral in their statements. As all the parties were unsure, how to cope with distance learning, tools and information were provided focusing mostly on schools and teachers.

7.1.2 | The second stage–obtaining knowledge about demands of the change and impact on individuals (II period)

At the end of the first period, an emergency situation was announced in Estonia and all educational institutions had to convert to distance learning. As expected, our results indicate that this was the most active period (the first week of the emergency situation), when the number of posted messages and the number of shares per message was the highest. This result ties well with previous studies (Rainey et al., 2016; Zhao & Xu, 2020), too. The unexpected change in the whole educational system shook all stakeholders and all stakeholders posted some messages in this period. Furthermore, if in the first period messages were addressed mostly to schools and teachers, in the second period the proportion of messages for all stakeholders and for parents increased. However, while both teachers and educational technologists posted more than one third of the messages in the first period, messages by teachers prevailed in this period, indicating that the change affected teachers the most.

While the proportion of positive statements in messages did not differ from the first period, more negative messages appeared. Contrary to previous findings (Rainey et al., 2016; Zhao & Xu, 2020) we did not find that messages expressing negative sentiment dominate at the beginning of the emergency situation. The issues related to cybersecurity should be taken into account as an aspect of choosing a suitable tool and it was discussed in this group, too.

Whereas the activeness, emotional tenor and topics were different in this period, there was a similar pattern with the first period in speech acts. More than one third of the messages were ‘providing resources’, more than one fifth of the messages included the speech act of ‘asking’ and a little less than one fifth the act of ‘recommending’. Quite a high proportion of messages with direct questions in this and in the first stage might indicate that people wanted to know about the changes exactly at the time the changes happened. It has been found also in previous studies (Bergdahl & Nouri, 2020; Zhang et al., 2020) that even highly experienced teachers were not sure about what and how to teach. However, in this period the proportion of informative messages decreased.

7.1.3 | The third stage–uncertainty about the management of the change (III–IV periods)

At the end of the second period, the ministry of education and research suggested organizing the learning in a new way, to support the copings of each group in a new situation, but did not provide specific guidelines for that. Nevertheless, providing both school principals and teachers with guidelines for the organization of distance learning is crucial (Burke & Dempsey, 2020). The activeness in posting messages decreased in the third and in the fourth periods, which is in line with study by Zhao and Xu (2020). The proportion of messages with negative statements significantly increased, which is inconsistent with previous studies (Rainey et al., 2016; Zhao & Xu, 2020), which indicated that negative messages dominate in the beginning, but then decrease. However, the proportion of messages with positive statements increased significantly in the third period, too. The results of our study go beyond previous reports, showing that the speech act of ‘informing’ and the topic of management increased in this period, in the second week of the emergency situation. Based on these results, it can be assumed that in the second week of the emergency situation, members of the group posted more about their own experiences, both positive and negative. In the second period (the first week in the emergency situation), they did not have such experiences and therefore the messages tended to include neutral statements. As at the end of the third period it was announced that the distance learning continues, it did not reduce the proportion of negative statements but did decrease the positive ones.

Teachers and principals were worried about how to teach in these circumstances; they and others also realized that distance learning would not end within 2 weeks as was announced at the end of the first period. As a tendency noticeable from the third period, the proportion of the messages from supporters increased to provide help for schools and homes. Like mentioned previously (Bozkurt et al., 2020; Burke & Dempsey, 2020), book publishers, IT companies, museums, etc., gave free access to their materials in Estonia as well. While the proportion of messages by teachers was the highest in the second period, the proportion of messages posted by principals was the...
highest in the third period. It seems that this unexpected change affected teachers at first and then principals. The other explanation for such a result might be that compared with principals, teachers are more used to using professional groups in social media as is claimed in the study by Huber and Helm (2020).

In terms of speech acts in these periods, the proportion of messages with the character of ‘informing’ and ‘expression opinion’ increased, but the proportion of ‘asking’ messages decreased. The proportion of messages about tools decreased, but the proportion of messages related to management issues increased. Previous studies have also indicated that there is no clarity on the management of distance learning (Burke & Dempsey, 2020). However, it was interesting that the proportion of messages about methodological ideas did not increase in this stage. In a previous study (Gudmundsdottir & Hathaway, 2020) it was reported that the beginning of distance learning raised issues about the pedagogical aspect of online teaching. Similarly, Bergdahl and Nouri (2020) declare that teachers lack the pedagogical strategies needed in distance learning. Therefore, it was interesting that despite the group including teacher educators and members from government institutions, there were rather few messages about methodological ideas. Although the proportion of webinars decreased in the second period, it increased again a little starting from the third period. The proportion of other topics like cartoons, jokes, wishes, increased, too.

During the first stage, more than one third of messages were addressed generally to schools, this decreased in the third stage. On the other hand, almost a half of the messages from this stage were addressed to all stakeholders. However, interestingly, there were no messages directly addressed to principals.

7.1.4 | The fourth stage–focusing on collaboration (V–VII periods)

During these periods, the activeness in the Facebook group decreased further. Maybe it was because at the end of the fifth period it was announced that distance education would end in mid-May, and everyone hoped that the old situation will be restored. The proportion of posts with negative statements decreased significantly. There was no more blaming of other parties, which was noticeable in the third stage.

The results demonstrate that the collaboration continued. All stakeholders posted messages during the fifth period, but interestingly in the sixth period, the proportion of messages by teachers decreased and there were no messages from principals at all. The sixth period was the final week of the school term and teachers, as well as principals might have been tired, because they had the leading role in this unexpected change. The same might be the reason why there were no messages in the last period by parents. However, members with other roles were more active since the fifth period. In the middle of the sixth period, the ministry of education and research called on everyone to share ideas for spending school holidays in an emergency situation and it might also be the reason why educational technologists and members from government institutions posted more in the last two periods. Also, the proportion of messages with the speech act of ‘inviting’ increased since the fifth period, but especially in the sixth period.

As the Basic Schools and Upper Secondary Schools Act draft amendment was presented in the Parliament on the last day of the fourth period, the speech acts of ‘asking’ increased again in the fifth period. So our findings indicate that all major changes in the educational system increased asking. However, like in other periods, more than half of the messages represented ‘providing resources’ and ‘informing’ as it was in the third stage. It might be that the new broad changes in the educational system return people to previous stages as was also previously suggested by Hord et al. (2006).

In terms of topics, the proportion of the messages about the webinars increased. Similarly to previous reports (Bozkurt et al., 2020; Burke & Dempsey, 2020), several webinars were conducted but unlike in the previous periods, these were designed not only for teachers, but also for principals, parents, students and everyone, covering not only management issues, teaching tips, but also psychological coping. However, the proportion of messages about management decreased a little, but it was interesting that sharing methodological ideas did not increase. Despite that teachers in Estonia felt confident using ICT tools (Taimalu et al., 2019) even before the emergency situation, they still discussed more about tools than about methodological issues. Since this was a very rapid transition and their first experience with distance learning, it is possible that teachers were more focused on finding suitable tools rather than applying fruitful practices, as was found in previous research (Al Darayseh, 2020). An interesting result was that after messages about cyber risks appeared in the second period, there were no such messages during the school holidays. Nevertheless, it is important that even in spare time, students think about this issue.

Even though the majority of messages in these last three periods were still addressed to everyone and more than a quarter to teachers, the proportion of messages addressed to students increased from the fifth period. This indicates that all stakeholders started to think not only about how they manage with the change, what adjustments are needed for schools and homes in order to cope with this unexpected change, but also about producing e-lessons for students and sharing learning materials and websites, which might interest students. Whereas in the third stage there were no messages for principals, these messages again appeared in the last three periods.

7.2 | Applicability of CBAM model in the case of COVID-19 situation

For answering the second research question, we try to analyse the applicability of the CBAM model to explain the unexpected temporary changes caused by the coronavirus pandemic. The first stage identified in our study corresponds to the stage 0 in the CBAM model, which is described as low exposure and involvement with the change (Hord et al., 2006). Since this was a sudden and unplanned change,
the stage 2 of the CBAM model (Hord et al., 2006) with questions and personal concerns about the impact of the change on teachers, their learners and their schools began at the same time with the stage 1, characterized by interest of general nature and demands of change. This period represents self-concerns, i.e., stage 1 and stage 2 together (Hord et al., 2006). As the change, which happened at the end of the first period affected all educational institutions and homes; we noticed the growth of the involvement with the change. The third stage, with positive and negative experiences and worries, a lot of informing and expressed opinions about the management of the change, time, workload and materials, represents the management stage (stage 3) of the CBAM model (Hord et al., 2006). The same authors claim that stage 3 concerns indicate that for people it is difficult to do what is required by the change. The fourth stage, with joint actions among different roles to really make a difference, corresponds to the stage 5 (collaboration) of the CBAM model skipping the stage 4, where the focus is on the impact on students (Hord et al., 2006). The messages were more addressed to students, but just providing materials and ideas without thinking about how it affects students. There were few messages about methodological ideas, how to teach and learn in distance education settings and how it impacts on students. Also, the results demonstrated that there were some activities, which were common with the previous stage. It might be that each new change affects people differently and some may return to previous stages of concerns. In addition, the new changes, which emerged before impact concerns after the first change were reached, could have refocused people on personal concerns.

As our results indicate we identified four stages, which correspond to the CBAM model stages 0–5, but skipping the stage 4, where discussion is about how the change affects students. However, as Hord et al. (2006) claim that usually the process of changes takes several years, it seems that at least the first stages were reached quite quickly in case of this sudden change. Since impact concerns can appear in several cycles of change (Hall, 2013), it is possible that in a new situation all the stages start from the beginning. Nevertheless, our results demonstrate that the CBAM model is also applicable in explaining unexpected temporary changes.

8 | CONCLUSION

It was already obvious that the teaching and learning situation changed due to the coronavirus pandemic not only in Estonia but everywhere in the world. The changes in the educational system did not happen at once, but there were continuous changes, which affected different stakeholders. The results of this study have shown that the Facebook group with members performing different roles in the educational system can help to capture these changes, and the authors wish to recommend researchers from other countries to use publicly available data for examining the situation in education during the COVID-19 crisis. The findings of this study also show that the CBAM provides an effective and useful framework for understanding different people's reaction to unexpected temporary changes. Different CBAM stages were passed at a rapid pace; however, new changes brought back personal concerns and not enough impact concerns were raised.

Changes often happen in a crisis, but they bring new beginnings. Reflecting on the results of this study, we can state that even if teachers are confident in using technology in classrooms, they do not feel prepared to conduct distance learning and have several personal concerns. Based on our result we suggest placing greater emphasis on the preparation of distance learning methodologies and tools in teacher training. Also principals need more preparation, and national guidelines on the management of distance learning situations are needed. Otherwise it is difficult for people to adapt to the changes.

The study is important because it does not only describe what happened during the emergency situation but reports in-depth, what and how was discussed, what resources, materials etc., were provided or asked for, and how all these changed as the crisis progressed. The data-collection method is also essential as the study is based on real data gathered during the pandemic when members posted about actual and important problems. When participants are asked to answer a questionnaire at a later date, they may forget some things that were topical at the beginning. As a new approach, categorization of speech acts was also used for studying messages during the pandemic.

The study has some limitations that have to be taken into account. The data are based on one Facebook group and, therefore, cannot represent all actions taken in Estonia in all subjects. Also these results could differ in other countries where the confidence of teachers in ICT area and availability of technical equipment at home is different. Furthermore, only messages posted in the group were analysed. In future studies, it would be interesting to analyse comments to these messages as well. Moreover, this study reflects the beginning of the coronavirus crisis and does not describe the changes at the end of the emergency situation and beyond, when schools were opened again. Future studies should investigate this interesting period.

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DATA AVAILABILITY STATEMENT

Data available on request due to privacy/ethical restrictions

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