Examining Social Media's Use as a Transitional Tool for Online/Remote Teaching during the Early Weeks of the COVID-19 Pandemic

Beverly B. Ray
Idaho State University, United States

Abstract

Case research examined primary and secondary level teachers' use of a social media network during the early days of the COVID-19 pandemic. Specifically, the research sought to identify themes and sub-themes associated with these teacher networking efforts during the first three weeks of the transition to online/remote teaching. A blend of phenomenology, network analysis, and historical analysis was used to examine several social media hashtags used by teachers during this timeframe. Results are reported using three broad themes: 1) knowledge sharing/building, 2) skill building, and 3) affective, or dispositional issues and concerns. Emergent categories are identified as well allowing for explanation and exploration of the data. Examples of posts demonstrating alignment with major themes are shared. This data will be of interest to teacher educators and administrators interested in what was going on in schools during the early pandemic era. It will also be useful for instructional technologists, policy makers, and others interested in learning more about these issues and about how teachers' social media use early in the pandemic reflected the evolving situation in primary and secondary schools.

1. Introduction

In recent years, social media has emerged as a tool for teachers' self-directed learning [1]. In fact, some schools recommend the use of social media, such as X (formerly Twitter), as a professional learning tool for teachers [2]. Others report on social media's use to mitigate teachers' feelings of professional isolation [3]. Recently, some have reported on the efficacy of social media as a communication and collaboration tool for educators suddenly professionally and socially isolated by the rapid shift to remote online learning starting in March 2020 [4]. Recent research suggests that many teachers used social media as a tool to help mitigate the transition to online teaching. Specific to the early days of the pandemic, Greenhow, et. al, [5] reported that social media served to help teachers address specific issues of practice and seek out professional support. Many did so by developing affinity groups based on grade bands, academic subjects, or geographic variables [6], with social media being used to share advise and resources, discuss the ongoing transition to online teaching, and connect with others regarding a range of topics, including topics not directly related to teaching and learning [7]. Regarding teachers' integration of social media early in the pandemic, Carey, et al. [8] reported that social media functioned as a viable alternative for other social, face-to-face activities, stating that use "was helpful in not only generating innovative instructional practices, but in supporting emotional resilience among educators needed to provide social and emotional support to their students (p. 254).

2. Theoretical Framework

A theoretical framework grounded in elements of social and intellectual learning [9], learner engagement, and learner self-efficacy [10] informs the study. Further, aspects of positive motivation, meaningfulness, skill acquisition and self-efficacy [11] are important considerations as are elements of self-determination theory [12] with its emphasis on intrinsic and extrinsic motivation, as drivers for competence [13], and elements of autonomous learning [14], teacher self-efficacy [15], and reflection, including meta-reflection [16]. Finally, an understanding of the role of social media as a learning tool that can be used to create a sense of presence and a sense of control also informs this presentation.

3. Literature Review

Given its reported impact on learning [17, 18], research examining the primary and secondary response early in the COVID-19 pandemic is vital for understanding of successes and challenges faced. Understanding the impacts, positive and negative, including social media's role, is critical to identifying potential long term negative impacts that can directly influence students learning. Thus far, emerging

research suggests that the pandemic exposed a number of shortcomings and inequities existing within K-12 online learning [19]. This includes issues associated with the Digital Divide [20], the limited preparedness of many teachers to design for online instruction and to teach online [21], and teachers and students' limited exposure to digital tools, including, for many, online learning platforms, social media, and other digital tools associated with online learning [22]. As the COVID-19 Education Coalition Higher Education Working Group reported, rapidly teachers had "to identify a digital tool, understand how it works, plan and design instruction with the tool, and then implement it for their instruction" [23]. Out of this time of chaos and uncertainty, teachers often made instructional decisions based on what was available rather than what was known to work [24]. Decisions about synchronous versus asynchronous design and delivery were often made at the district level and did not automatically take into consideration the needs of learners [25], either collectively or individually. Nor were the needs of national or state standards, the curriculum, or academic content meaningfully considered in that initial shift to online instruction. Likewise, concerns about teachers and students' feelings of frustration and/or isolation were not often considered [26]. That these limitations impacted the quality of instruction, including the quality of early versions of K-12 pandemic pedagogy, as well as depths of learning is suggested, but not yet fully documented. Despite these concerns, there are some researchers who suggest that the innovations occurring during the pandemic may play a role in improving learning, including online learning. For example, Brown [27] reported that feelings of connectedness to the course and its use of a discovery based, virtual learning applications allowed learners to engage deeply with course content early in the pandemic. Brown also reported successes in terms of learner engagement and peer collaboration. Out of this uncertainty, research documenting the early pandemic era is important.

4. Methodology

Research examined primary and secondary teachers' use of social media during the early weeks of the COVID-19 pandemic. Specifically, research examined the use of social media, focusing on X (formerly Twitter), as a transitional tool for primary and secondary teachers as they transitioned to online/remote teaching. Because of the abrupt and often rushed nature of the transition in mid-March 2020, data generated during this timeframe (first three weeks of the pandemic) was deemed foundational to understanding many of events occurring in educational settings that followed. Further, research sought to identify themes and sub-themes associated with the emergence of remote/online teaching as a viable teaching practice during this timeframe. A blend of case study, phenomenology, and historical inquiry was used to examine specific social media hashtags, including the #remoteteaching hashtag, which serves as the case for results reported here. IRB approval was obtained in advance of data collection.

4.1. Research Design and Selection of Participants

Research involved the use of the social media platform X (formerly known as Twitter) and an X researcher account to conduct a census of publicly available posts using the #remoteteaching hashtag. Identified posts included only those created in English (99.7%) by primary and secondary level teachers during the designated timeframe (March 10, 2020, to March 31, 2020). This timeframe was selected because it was the period where teachers learned they would need to transition to and begin teaching (for most, Week 3) using online/remote technologies and strategies. Because these were practicing teachers experiencing real time uncertainty, chaos, and, in some cases, stress and frustration, anonymity was deemed important. As such, no attempt was made to collect any data associated with geographic location, specific grade level, educational organization, race, age, gender, or other socio-economic variables that could be used to identify or stereotype subjects or schools.

4.2. Data Collection and Analysis

A census of the #remoteteaching hashtag occurred during the fall of 2022. Posts, including commercial posts, not meeting established participant parameters were removed, resulting in a sample size of 842 posts. All data, sans personal and other identifiers, were stored in a cloud-based database program before being transferred to Microsoft Excel. Data for the three weeks were organized by day. Posts, along with comments for posts, were analyzed for emergent themes and sub-themes. Three broad theme themes emerged and were used to organize the data. Those are 1) knowledge sharing/knowledge building, 2) skill building, and 3) affective, or dispositional, posts.

4.3. Limitations

One major limitation for the study involves its use of English language only posts. Without further research, we cannot know whether teachers writing in other languages or located in non-English language regions had differing responses or experiences.

Likewise, other social media platforms may have been popular with older or younger teachers. A cross section from varied social media platforms may have resulted in a greater diversity of responses and, therefore, might result in conclusions differing from those reported here. Nor can results be generalized to non-social media. Furthermore, it is impossible to know everything a poster or a reader thought as we can only use what was written, or posted, to the selected social media platform. Given the limited characters available for many users, depth of thinking and quality of interaction may have been more limited than it would have been on a different digital platform. As such, while reflective of the literature base, results cannot be generalized to the entire population of educational posters and followers of the hashtag or to other similar hashtags. However, for the purposes of this case study, results remain useful to consider and should be of interest to instructional technologies and teacher educators.

5. Findings

Findings associated with frequencies along with an examination of the three major themes identified occur in this section.

5.1. Frequencies

The #remoteteaching hashtag was first used on Tuesday, March 10, 2020, with use of the hashtag continuing well beyond the timeframe examined. A total of 842 English language posts using the hashtag, were made by teachers between March 10, 2020 and March 31, 2020. The average number of posts per day was 32.2. Daily posts ranged from a low of one on March 10th to a high of 57 on March 15th (See Table 1).

Table 1. Frequency of posts by calendar week

Calendar Week	Number of Posts n=842	Key Dates
March 10 - March 15	170 (~20%)	3/10 – 1 tweet (Tuesday) 3/11 = 7 posts 3/15 = 57 posts (Sunday)
March 16 - March 22	296 (~35%)	3/21 = 55 posts (Saturday)
March 23 - March 29	292 (Nearly 35%)	3/28 = 55 posts (Saturday)
March 30 - March 31	84 (Nearly 10%)	3/31 = 44 posts (Tuesday)

While the daily frequency of posting started out low on March 10th, daily posts expanded rapidly from March 10 to March 11 (700%,) and from March 11 to March 12 (157%) and, again, from March 12 to March 13 (363%). The first weekend of the pandemic (March 14-15) generated the greatest frequency of weekend posts with 111 posts occurring. In fact, weekends generated five of the six largest daily tallies (n=312), with about 37% of all posts occurring over weekends (See Table 2).

Table 2. Weekend totals

	Frequency
Weekend 1 – March 14-15, 2020	111
Weekend 2 – March 21-22, 2020	107
Weekend 3 – March 28-29, 2020	94

Many teachers were also actively engaged with the hashtag across the dataset via the use of "likes" (n = 12, 604) and reposts (n = 4,886). However, written replies occurred with less frequency (n = 963), suggesting that time to process, reflect on, and reply or add to another teacher's thoughts may have been limited.

5.2. Major Themes

Three broad theme themes emerged and were used to organize the data. Those are 1) knowledge sharing/knowledge building, 2) skill sharing/skill building, and 3) affective, or dispositional, posts (See Table 3). However, most posts included more than one theme as is reflected in this first post from March 10, 2020:

"Social media pleas[e] help [praying hands emoji] - does anyone have experience with hybrid teac[h]ing (in-person with a camera in the room & some remote students) whilst wearing a mask? Masks stifle speech/sound as well as COVID – any tips or advice on managing th[is] would be welcome!

Response 1: --are you stationary or moving around? where is the mic?

Response 2: --I'm planning on placing the amplifier speaker in the back (sic) of the classroom/ but you could put it near your computer's speaker if you're trying to help your remote students zooming in to hear you better[.]"

A majority of posts reflected the knowledge building/knowledge sharing and skill building themes, with many reflecting both themes. For knowledge acquisition/ Knowledge sharing, information related to a variety of technology tools (e.g., software, apps, and online learning platforms) was most frequently shared.

Table 3. Themes by frequency

Category/Type	Theme	Frequency
Sharing varied resources associated with remote teaching (other types)	Knowledge Sharing/Building	359
Sharing of technology tool useful for online teaching	Knowledge Sharing/Knowledge Building; Skill Building	260
Sharing of other information related to online instruction	Knowledge Sharing/Knowledge Building; Skill Building	233
Pedagogy related posts	Knowledge Sharing/Knowledge Building	206
Experiencing or promoting camaraderie	Affective	168
Discussion of how to engage students or evidence of student engagement.	Knowledge Sharing/Knowledge Building; Affective	168
Managing the learning environment (in general)	Knowledge Sharing/Knowledge Building; Skill Building	154
Discussion Video Instruction	Knowledge Sharing/Knowledge Building; Skill Building	136
Nurturing self/others	Affective	130
Humor	Affective	114
Gratitude	Affective	91

NOTE: Posts often contained more than one theme.

Information regarding a handful of free professional development opportunities was repeatedly shared by teachers as well. Further, limited posts sharing information related to the creation and use of instructional video were shared along with a handful of posts outlining accessibility concerns, including Digital Divide issues (i.e., technology access). While the data across the timeframe reflected many aspects of the rapid shift to online learning, data collected for week 3 reflected a few emerging concerns. For example, management of the online learning environment rapidly emerged and developed into an important sub-theme during the final week of data collection. Further, the discussion of and the sharing of instructional strategies and pedagogies did not appear with great frequency until week 3, a point in time when many teachers were in their first week of online/remote instruction. Likewise, limited reflective posts were documented during the third week. Additional sub-themes, occurring with limited frequency, within this category included planning and delivering instruction, methods, concerns about time constraints for planning, and discussion of the need for flexibility in terms of preparedness for successfully online learning.

As a theme, skill development/skill sharing occurred frequently but was often integrated within knowledge building/knowledge posts. However, many posts within this theme addressed the skills needed for successful video production along with use of learning management systems, such as Google Classroom. Furthermore, this category focused on posts associated with the sharing, developing, and/or honing of skills, particularly the technology skills the teachers felt were needed as they made the shift from face-to-face to online/remote teaching. Teachers shared their own ideas about how to teach, motivate, and assess learning while online. Linkage to the established research base on online learning, however, was not apparent in these posts.

Affective, or dispositional, themes (i.e., the affective domain of learning) reflect feelings and emotions teachers expressed, including how they managed those feelings [48]. Across the timeframe examined, affective posts appeared frequently. In fact, many posts reflected a need to communicate with others on an emotional level. Even as challenges were often acknowledged, early in the pandemic, most posts were positive in nature as illustrated by this teacher's post:

"Today was just an okay teaching day. It wasn't terrible, it wasn't amazing. Hopefully, students walked away with some of the knowledge & skills I hoped they would. It is what it is[.]"

Many positive statements appear early in the dataset. However, negative posts increased in frequency (about 158%) from week 2 to week 3, the week when many teachers reported beginning to teach online or remotely. For example,

"Come for the lousy pay & dizzying anxiety, stay for the politely worded administrative emails".

"5 teachers out today because they're sick and 2 I know have Covid. 3 students I had in class were very sick…Please be safe everyone and keep schools in your thoughts[.]"

In total, 97 posts (11.5%) demonstrated a negative tone. However, a majority (about 76%) of those posts expressed frustration about technology, COVID itself, or administrative issues. There were no posts of a negative tone directed at students. In fact, by the end of the third week, 34 (about 4% of all posts) posts expressing missing students were documented.

Other dispositional topics emerging within the timeframe of the study included humor (114), particularly the use of humor to combat frustration, gratitude (91), the value of flexibility (83), and purposeful reflection (43). Occurring with less frequency were concerns about digital equity (12), accessibility (35), cybersecurity (11), and discussions about how to engage parents (33). Further, sub-themes included the need for kindness, missing thein person presence of students, evidence of peer-to-peer collegiality and emotional support, and statements of positive self-efficacy (e.g., I can do this!).

6. Discussion and Recommendations

Frequency data suggests some interesting findings. First, the rapid acceleration of posting starting on March 10th suggests that teachers were looking to social media to both obtain and share information in a collaborative way with colleagues, including those living beyond the boundaries of their local area. However, it should be noted that the weekly totals from the end of week 2 to the end of week 3 contracted 98.6%, suggesting time for reading and posting was greatly reduced. Further research would be needed to determine whether this trend continues into April 2020 and beyond. Second, the rapid acceleration beginning on March 11 (700%,) and continuing through March13th suggests a rapid move to social media by teachers seeking to connect with teaching peers and to use social media to find and share resources and to validate choices. Further, weekends generated five of the six largest daily tallies, with about 37% of all posts occurring across weekends, suggesting that many teachers used personal time to both obtain and share useful information in a collaborative way. Finally, the number of "likes" (n = 12, 604) and reposts (n = 4,886) suggest a strong level of active, but surface, engagement with other teachers' posts as most of these actions did not include written comments. While many teachers used "likes" to quickly signal positive support or agreement, many also used reposts to share, or validate, the information and ideas that they thought might be of interest to others.

Knowledge and skill posts occurred with frequency across the weeks examined. As some sub-themes decreased in interest, others increased. For example, teachers' initial focus was on identifying how to get online quickly, as demonstrated by the early focus on the sharing resources, including technology resources. By the third week, some teachers transitioned to a consideration of how learning occurs, focusing on pedagogical and classroom management issues. As such, it is useful for future research to identify how elements of pandemic pedagogy, often innovated in the moment, shaped, and continue to shape, how K-12 online instruction and learning occurred across the pandemic. How that looks across learners, content areas, grade bands, and learning environment is important for future research to understand. Further, management of the online learning environment rapidly emerged as an issue during week 3. Research examining its emergence, along with the depth of discussion of solutions offered, is recommended as management of the online learning environment is a critical consideration, particularly at the K-12 level. Further, many other sub-themes waxed and waned over time, often serving as documentation of events occurring early in the pandemic era. Documenting and aligning these posts with the range of current events occurring across the pandemic era would be useful for examining how specific events impacted teacher, parent, and student attitudes across the timeframe of the pandemic. It might also help explain why teachers quit or retired at unusual times, particularly during the fall of 2021. Further, it should be noted that concerns, while limited in frequency, about learning loss appeared as early as week 3 of the pandemic. Documenting a timeline of teachers' concerns about learning loss would be both interesting and useful for those seeking to learn from the pandemic and adopt policies that can prevent or mitigate learning loss in the future. Also, consideration of the pedagogies (e.g. problem based learning and cooperative learning appeared most frequently) and technologies used is vital to understanding what worked well for K-12 teachers during the pandemic. While the pandemic is most often viewed as a challenge for, or a stressor on learning and on teachers, some posits that also served as an opportunity to reconstruct teaching and learning to better meet the needs of the modern era [48]. Some evidence collected regarding the varied teaching strategies employed by teachers supports that assertion, but further research is needed for confirmation. Further, information regarding specific technology tools recommended by teachers often reflects consideration of issues such as the digital divide, student accessibility, and access to specific learning management platforms. These considerations need further consideration if we are to understand the impact of accessibility and other issues on students, particularly in terms of socio-economic factors and geographic location (e.g., rural vs. suburban learners). Finally, consideration of whether or to what extent evidence of transfer of practice om fact-to-fact to

online teaching can be documented on social media platforms, such as X, would be useful, particularly for instructional technologist and others who advocate for use of social media as an informal professional development tool.

Interestingly, dispositional data was largely positive in nature, with no negative posts directed toward students. Whether and to what extent that trend continued across the pandemic era remains unknown. As such, further research is needed. Furthermore, while this dataset does not document teacher trauma, it does document the beginnings of teacher frustration with online/remote teaching. Whether early frustrations led to teachers announcing their resignations at unusual times, particularly early in the 2021 fall term, is worthy of examination. Documenting the growth and evolution of teacher frustration, particularly whether or to what extend frustration led to teacher trauma is important. Periods of chaos, high stress, or national trauma can occur at any time. Learning from the COVID-19 pandemic can assist teacher educators and school administrators to prepare teachers to manage possible future high impact, low probability events, including possible pandemics. Identifying the stressors that resulted in teachers leaving the profession are important to know and understand if we are to learn from this experience and do a better job of meeting teachers' needs in the future. Periods of chaos, high stress, or national trauma can occur at any time. Learning from the pandemic will assist us to prepare for future high impact, low probability events.

Knowing and understanding what occurred across the early days of the pandemic is vital to identifying and understanding the resulting learning issues that children may face in the coming years. It also helps document strategies that may have mitigated learning loss. Building a research base on pandemic pedagogy is vital to our reflection on and understanding of the successes and challenges for learning. And while the pandemic is most often viewed as a challenge for, or a stressor on learning and on teachers, it is also an opportunity to reconstruct teaching and learning to better meet the needs of the modern era. Some evidence collected here (e.g., data regarding the varied teaching strategies employed by teachers) supports that assertion.

7. Conclusions

During the early stages of the pandemic, largely unprepared teachers shifted to online learning with little or no time for research or preparation in advance of that shift [50]. Many felt that they faced and, often, solved problems that no one else has ever faced or solved. Many felt that way because they did not know about online learning and its expansive research based.

But for many it truly was a novel experience unlike anyone else's experience. Many chose to engage with others experiencing similar challenges seeking to gain or distribute information (grassroots information diffusion). Some used social media to do so. While some recent research suggests that social media helped teachers address problems unique to the pandemic even as it helped support their shift to online teaching, it is also useful to consider what role social media served in the development of pandemic pedagogy, the innovative and creative teaching practices that K-12 and other teachers developed or adapted as a result of their move to online teaching during the early years of the COVID 19 pandemic.

8. References

[1] C. Reilly. "Twitter as a Professional Development Tool for Teachers and Aspiring Teachers: A Review of Literature," National Teacher Education Journal, 10(2), 2017, pp. 57-61.

[2] National Association of Secondary School Principals (NASSP). "Using Mobile and Social Technologies in Schools," National Association of Secondary School Principals, Reston, VA, 2021, https://www.nassp.org/policy-advocacy-center/nassp-position-statements/using-mobile-and-social-technologies-in-schools/ (Access Date: 12 June 2023).

[3] K. B. Staudt Willet. "Revisiting How and Why Educators use Twitter: Tweet Types and Purposes in# Edchat," Journal of Research on Technology in Education, 51(3), 2019, pp. 273-289.

[4] J. Harron and S. Liu. "Coronavirus and Online Learning: A Case Study of Influential K-12 Teacher Voices on Twitter," In E. Langran (Ed.), Proceedings of SITE Interactive 2020 Online Conference, Association for the Advancement of Computing in Education (AACE), Online, 2020, pp. 719-724. https://www.learntechlib.org/primary/p/218229/ (Access Date: 14 June 2023).

[5] C. Greenhow, C. Lewin, and K. B. Staudt Willet. "The Educational Response to Covid-19 Across Two Countries: A Critical Examination of Initial Digital Pedagogy Adoption," Technology, Pedagogy and Education, 2021, pp. 1-19.

[6] J. P. Carpenter and D. G. Krutka, D. G. "How and Why Educators Use Twitter: A Survey of the Field," Journal of Research on Technology in Education, 46(4), 2014, pp. -434, DOI: 10.1080/15391523.2014.925701.

[7] B. Ray and E. Ntuli. "Teachers' Experiences during the Early Pandemic Years: Twitter has a Role to Play in Telling the Story," In E. Langran (Ed.), Proceedings of Society for Information Technology & Teacher Education International Conference, Society for the Advancement of Computing in Education (AACE), San Diego, CA, United States, 2022, pp.

1164-1170. https://www.learntechlib.org/primary/p/220864 / (Access Date: 16 June 2023).

[8] L. B. Carey, W. A. Sadera, Q. Cai, and S. Filipiak. "Creating a Community of Practice for Educators Forced to Transition to Remote Teaching," Journal of Technology and Teacher Education, 2020, pp. 251-255.

[9] J. Piaget and B. Inhelder. The Psychology of the Child, Basic Books, New York, 1969.

[10] A. Bandura. "Perceived self-efficacy in Cognitive Development and Functioning," Educational Psychologist, 28(2),1993, pp. 117–148.

[11] A. Bandura. "Self-efficacy: Toward a Unifying Theory of Behavioral Change," Psychology Review, 84(2), 1977, pp.191–215.

[12] R. M. Ryan and E. L. Deci. "Self-determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-being," American Psychologist, 55(1), 2000, 68–78.

[13] R. M. Ryan and E. L. Deci. "On Happiness and Human Potentials: A Review of Research on Hedonic and Eudaimonic Well-being," In S. Fiske (Ed.), Annual Review of Psychology, 52, 2001, pp. 141–166.

[14] G. T. Betts and J. K Knapp. "Autonomous Learning and the Gifted: A Secondary Model. In A. Arnold, Secondary Programs for the Gifted, Ventura Superintendent of Schools Office, Ventura, CA, 1981, pp. 29–36).

[15] G. Gresham, G. "An Examination of Mathematics Teacher Efficacy and Mathematics Anxiety in Elementary Pre-service Teachers," Journal of Classroom Interaction, 2009, 44(2), pp. 22-38.

[16] J. Dewey, J. How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process, D. C. Heath & Co, Chicago, IL, 1933.

[17] K. Y. Middleton, "The Longer-term Impact of COVID-19 on K–12 Student Learning and Assessment, " Educational Measurement: Issues and Practice, 39(3), 2020, pp. 41-44.

[18] C. Huck and J. Zhang, J. "Effects of the COVID-19 Pandemic on K-12 Education: A Systematic Literature Review," New Waves-Educational Research and Development Journal, 24(1), 2021, pp. 53-84.

[19] Y. An, R. Kaplan-Rakowski, J. Yang, J. Conan, W. Kinard and L. Daughrity. "Examining K-12 Teachers' Feelings, Experiences, and Perspectives Regarding Online Teaching during the Early Stage of the COVID-19 Pandemic," Educational Technology Research and Development, 69(5), 2021, pp. 2589-2613.

[20] C. Greenhow, K. B. Staudt Willet, and S. Galvin, S. "Inquiring Posts Want to Know: #Edchat Supports for #

Remote Teaching during COVID-19," British Journal of Educational Technology, 52(4), 2021.

[21] M. Barbour, R. LeBonte, K. Kelly, C. Hodge, S. Moore, B. Lockee, T. Trust, A. Bond, and P. Hill, P. "Understanding Pandemic Pedagogy: Differences Between Emergency Remote, Remote, and Online Teaching," In State of the Nation: K-12 E-Learning in Canada project/Canadian eLearning Network, Half Moon Bay, BC, Canada, 2020.

[22] J. Code, R. Ralph, and K. Forde, K. "Pandemic Designs for the Future: Perspectives of Technology Education Teachers during COVID-19," Information and Learning Sciences, (121), 5/6, 2020, pp. 419- 431. DOI: 10.1108/ILS-04-2020-0112

[23] COVID-19 Education Coalition Higher Education Working Group. Educator Preparation Program: In Times of Crisis, UNESCO Global Education Coalition, Paris, 2020. http://learningkeepsgoing.org (Access Date: 2 September 2023).

[24] M. P. Murphy. "COVID-19 and Emergency eLearning: Consequences of the Securitization of Higher Education for Post-Pandemic Pedagogy," Contemporary Security Policy, 41(3), 2020, pp. 492-505, DOI: 10.1080/13523260.2020. 1761749.

[25] C. Blume. "German Teachers' Digital Habitus and Their Pandemic Pedagogy," Postdigital Science and Education 2(3), 2020, pp. 879–905. DOI: 10.1007/s42438-020-00174-9.

[26] C. B. Rippé, S. Weisfeld-Spolter, Y. Yurova, and A. Kemp, "Pandemic Pedagogy for the New Normal: Fostering Perceived Control During COVID-19," Journal of Marketing Education, 43(2), 2021, pp. 260– 276. DOI: 10.1177/0273475320987287.

[27] S. Brown. "Teaching Science Methods Online during COVID-19: Instructor's Segue into Online Learning," Electronic Journal for Research in Science & Mathematics Education, 24(3), 2020, pp.14-18.