International Journal of Learning, Teaching and Educational Research
Vol. 21, No. 7, pp. 379-396, July 2022
https://doi.org/10.26803/ijlter.21.7.20
Received Apr 19, 2022; Revised Jul 6, 2022; Accepted Aug 2, 2022

Assessing Satisfaction of Science School Subject Teachers and Leaders in Rwanda on the Continuous Professional Development through Online Learning

Venuste Nsengimana
University of Rwanda, Rwanda

Opanga David
University of Rwanda, Rwanda
African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science, Rwanda
St John's University of Tanzania, Dodoma, Tanzania

Alphonse Uworwabayeho
University of Rwanda, Rwanda

Evariste Minani
University of Rwanda, Rwanda

Leon Mugabo
University of Rwanda, Rwanda

Théophile Nsengimana
University of Rwanda, Rwanda

Abstract. In Rwanda, social, economic, and educational activities have recently been affected by the COVID-19 pandemic. After its outbreak, schools closed, and one of the alternatives opted for was online learning. This study assessed the satisfaction of school subject leaders (SSLs) and school leaders (SLs) with online learning and identified opportunities and challenges for the improvement of online learning. The study was guided by a professional development framework and design for online teaching. Data were gathered through an online survey and a Zoom meeting with 158 SSLs and 120 SLs purposively chosen from the University of Rwanda's continuous professional development (CPD). Findings indicated that the most commonly used materials are laptops and mobile phones, while the most entertaining activities include doing online quizzes and interactive discussions. Furthermore, the study

revealed a high level of satisfaction with online facilitation, even though teachers still need support from facilitators. In addition, males are more motivated to continue with online learning than females. It was also revealed that both SSLs and SLs still have challenges in uploading assignments, contributing to forum discussions, and understanding the subject content. This study recommended the increase of videos, online quizzes, and face-to-face sessions to improve online learning.

Keywords: online learning; CPD; STEM; school leadership; subject leader

1. Introduction

Currently, there is a global spread of the coronavirus pandemic, officially named COVID-19 by the World Health Organization (Nghiem et al., 2020). Later, the virus was named severe acute respiratory syndrome coronavirus-2 (SAR-S-CoV-2) by the International Committee on Taxonomy of Viruses (Gorbalenya et al., 2020). Education is one of the sectors most strongly affected by COVID-19. The untimely closure of primary and secondary schools, as well as universities, was an immediate response to protect students from the possible risk of contracting COVID-19 (Sintema, 2020). In Rwanda, schools have been in unusual temporary closure since March 15, 2020. In this regard, more than three million students from nursery, primary, secondary, and high school education stayed out of school and were expected to learn at home. In this case, the Rwandan Ministry of Education had to evaluate schooling programsand came up with an online learning program as a solution to the challenge.

With regard to the above, online learning involved the use of radio and television, using the lessons developed by primary and secondary school teachers in collaboration with the Rwanda Education Board (REB), Building Learning Foundations (BLF), and the United Nations Children's Fund (UNICEF). In addition, learning materials have been uploaded on online platforms such as Moodle and made freely available to students. As in other countries worldwide, the integration of e-resources has since become the only alternative to supporting authorities to continue educating students during the COVID-19 emergency, which has profoundly impacted the global economy (Dhawan, 2020). In essence, face-to-face learning was gradually being replaced by online learning in the majority of African countries, in particular, Rwanda.

Moreover, programs that adopted online learning include all programs delivered by the University of Rwanda. One with an immediate start during COVID-19 is the CPD under the Multi-Year Leading, Teaching, and Learning Together $(LT)^2$ program, implemented in 2018. The program was supported by the Flemish Association for Development, Cooperation, and Technical Assistance (VVOB) in partnership with the University of Rwanda-College of Education (UR-CE) and the Rwanda Education Board (REB). Under LT^2, the programs with immediate online learning include a Continuous Professional Development (CPD) diploma and certificate in educational leadership, mentorship, and coaching for school leaders (SLs) and school subject leaders

(SSLs), respectively. Since neither institutions nor beneficiaries planned beforehand for the online mode of delivery, it is worthwhile to investigate the satisfaction of SLs and SSLs. This would enable institutions to identify the challenges and opportunities of CPD programs by means of online learning and make improvements.

Since the introduction of the aforementioned online programs, little is known about the perceptions of science school subject leaders and school leaders towards online learning. The study is being followed up by the following research questions: (1) To what extent are SLs and SSLs satisfied with the course delivery and online facilitation? (2) What are the challenges faced during the online learning and activities? and (3) What are the materials used by SLs and SSLs during the online learning?. The study provides the outcomes from a survey conducted on SLs and SSLs students supported by the LT^2 programme. Specifically, the study was interested in identifying the extent to which SLs and SSLs were satisfied with the course delivery and online facilitation in order to determine whether they were motivated to continue the training using online learning. The main goal of the study was to flag any challenges and improve the online training sessions and activities.

2. Review of Literature

2.1 Satisfaction in Education

In education, student satisfaction has been a concern in various studies as an important component in attracting and retaining students (Kotler & Clarke, 1987). In this regard, satisfaction is defined as the perception of enjoyment and accomplishment in the learning environment (Sweeney & Ingram, 2001). The assessment of education stakeholder's satisfaction started around the 1970s in European universities with the aim of assessing stakeholders' satisfaction with academic programs and learning achievements (Morstain & Kraft, 1979). At present, stakeholders' satisfaction is assessed at all levels of education, and it is appreciated to help learning institutions adapt to the needs of students and to develop a continuous monitoring system to meet student needseffectively (O'Neil, 2003). Owing to the shift from face-to-face to online learning during COVID-19, there is a need to assess the satisfaction of SLs and SSLs students in the CPD program with the online learning mode in Rwanda in order to improve and comply with their needs.

2.2 Continuous Professional Development (CPD)

CPD is defined as learning continuously throughout one's career to improve performance (REB, 2015). People working in different professions participate in CPD to learn and apply new knowledge and skills to improve performance on the job (Chikari et al., 2015). Research indicates that an employer that provides good opportunities for CPD and a positive learning environment for staff is more attractive to clients and more successful (McDonnell &Zutshi, 2010). In this regard, CPD is of great importance for the professional and personal development of staff. CPD outcomes include improved skills, comprehension of new techniques, retention of previously learned knowledge, and the facilitation of creativity and innovation (Ukachi& Onuoha, 2013).

Nowadays, teachers' CPD is of international growing interest and keeps adapting to changes occurring in education systems to the extent that the needs for teachers' in-service professional development are top on the educationists' agenda (Mphale, 2014). CPD is widely acknowledged to be important in the pursuit of improvement in teaching and learning processes (Harland & Kinder, 1997). Day (1999) argues that CPD consists of all-natural learning experiences from conscious to planned activities intended to be of direct or indirect benefit to an individual or group of teachers and schools, leading to the quality of education. During CPD, teachers review, renew, and extend their teaching practices (Ucan, 2016). In this regard, CPD is an ongoing process of education, training, learning, and support to maintain the knowledge, expertise, and competence of education professionals – both subject leaders and school leaders (Cleary et al., 2011).

According to Day and Sachs (2004), CPD serves three purposes in the education sector. The first is to align teachers' practices with educational policies. The second is to help teachers improve their performance to improve the learning outcomes of students**,** while the third is to improve the teaching profession. These are the reasons why CPD is being given increasing importance by various governments worldwide to respond to the needs of students (Swafford, 2000). In Rwanda, over the 2014-2016 period, the UR-CE, REB, and VVOB initiated a certified CPD program for primary school leaders on effective school leadership and for sector education officers on enabling head teachers' professional learning communities. At the same time, the program concerned tutors in teacher training colleges as well as trainers of pre-primary teachers on improving learner-centered pedagogy (VVOB, 2016). The program was later extended to a multiyear program (2016–2021) known as Leading, Teaching, and Learning Together $(LT)^2$ to enhance the implementation of the competence**-**based curriculum (CBC) and the learning outcomes. This was concerned with secondary school subject (mathematics, science-biology, chemistry and physics) teachers.

2.3 Online Learning in Education: Advantages and Disadvantages

Online learning was first used by large companies and later adopted in academic teaching and learning (Hubackova, 2015). It refers to the use of information and communication technologies to support and enhance teaching and learning in secondary schools (Melchor et al., 2020) and higher education. It is therefore considered as a process of extending learning, delivering instructional resources, and sharing learning opportunities to locations outside of face-to-face classrooms (Valverde-Berrocoso et al., 2020). The Internet, personal computers (Guri-Rosenblit, 2009) and mobile devices (Panzavolta & Laici, 2017; Vázquez-Cano, 2014) are some of the devices used in online learning. Online learning can be fully applied alone or combined with face-to-face teaching and learning (Rhema & Miliszewska, 2010). This combination is known as blended learning (Taghizadeh & Hajhosseini, 2020) and is appreciated as an innovative method for learners and a teaching process that is more comfortable and attractive for students (Kvavik, 2005).

Online learning offers institutions and students the flexibility of place and time for course delivery, reducing the travelling time and cost of attending classes (O'Donoghue et al., 2004), and enabling students to acquire new and upgrade existing skills at any time and place of their choice and availability (Arkorful&Abaidoo, 2014). It often involves audio-chatting, video conferencing, and online discussions (Hrastinski, 2008) which are appreciated for offering opportunities for learners to interact among themselves and with facilitators. However, some disadvantages of online learning were also indicated. These include a lack of material equipment, a lack of Internet connectivity in some areas, and a lack of sufficient knowledge for teachers and learners to use the new technologies (Arkorful&Abaidoo, 2014). Furthermore, the online teaching environment has been identified as a challenge for STEM in-service teachers who feel worried about their ability to succeed in what might be an unfamiliar learning environment.

2.4 Significance of the Study

Owing to COVID-19, the Government of Rwanda is speeding up the existing plans from face-to-face to online learning for all programs from undergraduate to postgraduate in higher learning institutions. Findings from this study clarify the opportunities and challenges related to changes in the mode of teaching and learning in higher institutions in Rwanda. They would specifically assist the Rwanda Ministry of Education (MINEDUC), the Rwanda High Education Council (HEC), and the administrators of Rwanda's various higher learning institutions, particularly the University of Rwanda, in creating an interactive and enjoyable online learning environment for all students. In addition, the recommendations from this study can be applied to the effective preparation of online learning. Globally, the study shows how particular individuals cope with unpredicted and non-desirable circumstances in the education sector, such as those imposed by COVID-19. Furthermore, the study clarifies how CPD programs can be implemented through improved online content and available online learning materials.

2.5. Theoretical Framework

This research was guided by the professional development framework for online learning (Baran & Correia, 2014). The framework indicates how successful online teaching and learning are a result of the complex interplay among personnel, pedagogical, contextual, and organizational factors with high education institutions. The proposed framework intends to recognize successful online teaching in higher education as an outcome of teaching, community, and organization levels (Table 1). Its purpose is to provide online faculty, university administrators, and program coordinators with a support framework that can guide the design, development, and sustainability of support for professional development. The framework considers support at various levels as a critical factor for faculty members' acceptance, motivation, and participation in online learning.

Table 1. Professional Development Framework for Online Teaching

Organization	**Rewards & Recognition** **Positive organizational culture towards online education**
Community	• College learning groups • Peer support programs (Peer-observation/peer evaluation) • Mentoring programs
Teaching (Technology, Pedagogy, Content)	• Workshops/Showcases • Training programs • One-on-one assistance

Note: Baran & Correia (2014)

By transposing the framework (Table 1) into the context of this study, the organizations were referred to as UR-CE and VVOB, which had the responsibility to plan for the CPD-STEM and CPD-DSL programs, and hence organize and implement the online learning. The community was referred to as SLs and SSLs, the learning groups being students under the College of Education that collaborate for online learning. The community was also referred to as UR-CE facilitators, who monitor and facilitate the program on a daily basis. Finally, teaching was referred to as technology, pedagogy, and online content. Specifically, the study was interested in assessing the teaching and learning materials used by SLs and SSLs, the level of satisfaction with the training program, and the assistance from facilitators. For effective monitoring of the program, the suggestions from the community members should inspire the organizational institutions to improve online teaching and learning.

3. Research Methodology and Design

3.1 Research Design and Participants

The aim of the study was to investigate the satisfaction of school leaders (SLs) and school subject leaders (SSLs), who are referred to in this study as science school subject teachers. Therefore, opportunities and challenges of CPD programmes via online learning were identified and research with a professional development research design was employed (Baran & Correia, 2014). At the organization level, the study was interested in determining the level of satisfaction with the course design. At the community level, the study was interested in assessing the opportunities and challenges faced by SLs and SSLs towards online learning, while at the teaching level, it was concerned with technology, pedagogy, and subject content. Participants coming from 17 districts, distributed in Southern, Eastern, and Western Rwanda, were involved in the study. The subject and school leaders enrolled in two CPD programmeswere targeted by the study. These included 120 (Males: 83.33%, N = 100, Females: 16.67%, N = 20) enrolled in Diploma-School Leadership (DSL) and 158 (Males: 82.28%, N = 130, Females: 17.72%, N = 28) enrolled in STEM (Mathematics and Science-Biology, Chemistry and Physics).

3.2. Data Collection Instruments

The survey questionnaire was administered through KoBo Toolbox, and a link was shared on the Moodle platform. For ethical purposes, when one of the SLs or SSLs did not want to participate in the study, the respondent was excluded from the next stage. SSLs and SLs willing to participate in the study were surveyed by completing the online survey. Data collected through online surveys were supplemented by the Zoom meeting with 20 SSLs and 20 SLs randomly selected from those who accepted to participate in the study.

3.3. Data Collection

The topics of discussion focused on opportunities, challenges, and satisfaction with online learning (Appendix 1). The survey questionnaire consisted of close-ended questions and rating scales. Specifically, questions focused on identifying the activities with which SSLs and SLs were more satisfied and those in which they were interested, as well as the reasons for their interest in those activities, the challenges they encountered in those activities, and suggestions to improve online learning. The rating questions focused on the level of enjoyment with online learning (1– not at all, 5 – very enjoyable), the usefulness and quality of videos and handouts resources (1 – not at all, 5 – very useful), and the level of satisfaction with facilitation (1– not at all, 5 – very satisfied). Furthermore, SSLs and SLs were asked to indicate whether they were motivated to continue with online learning or not and to justify their decision. Furthermore, data were collected through an online Zoom meeting with 20 SSLs and 20 SLs, where open-ended questions (Appendix 1) were discussed at length.

3.4 Data Analysis

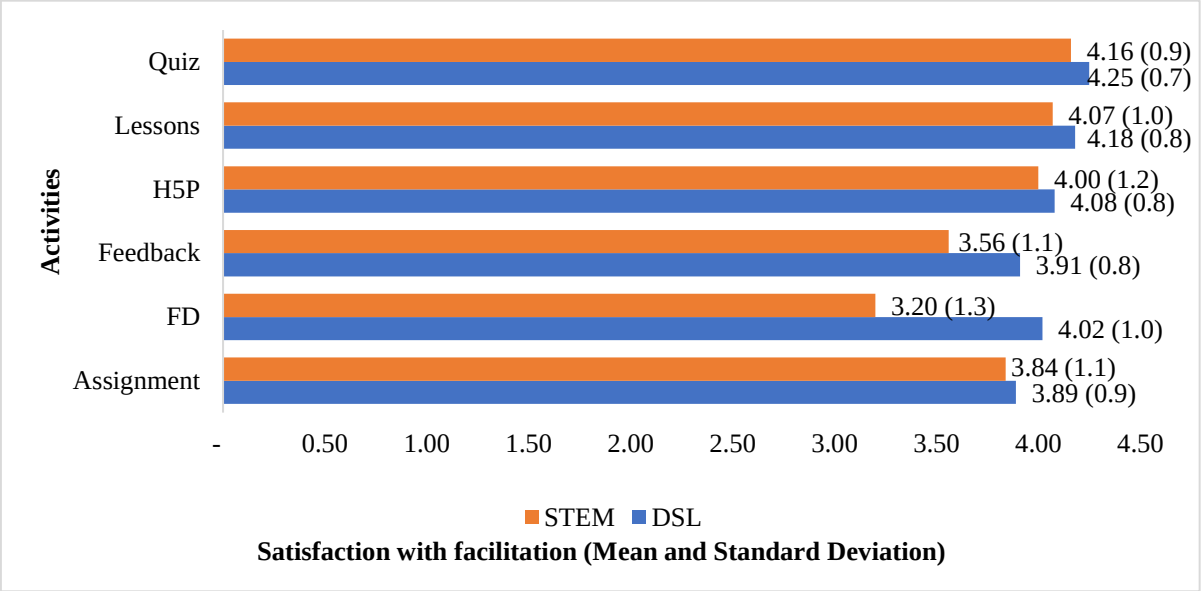
Quantitative data were analyzed using Excel 365 after removing duplicates. Percentages, means, and standard deviations were calculated and compared using bar graphs. Furthermore, thematic analysis was used for the analysis of qualitative data (Buetow, 2010).

4. Results

The current section provides evidence for the main question under the study, namely to what extent SSLs and SLs are satisfied with the course delivery and online facilitation.

In relation to the opportunities for online learning, the majority of SSLs who responded to the survey (73.4%) use mobile devices. Others (39.9%) use laptops, and a small number (2.5%) use tablets. On the other hand, it was found that the majority of SLs (59.2%) use laptops, compared to 53.3% who use smartphones and 0.8% who use tablets. Results indicated that the activities preferred by SLs and SSLs are mainly the interactive content (H5P), doing quizzes, and learning the subject content (Figure 1). In this regard, the most enjoyable learning resources are handouts (4.23 ± 0.9) for SLs, and videos (4.06 ± 1.0) for SSLs.

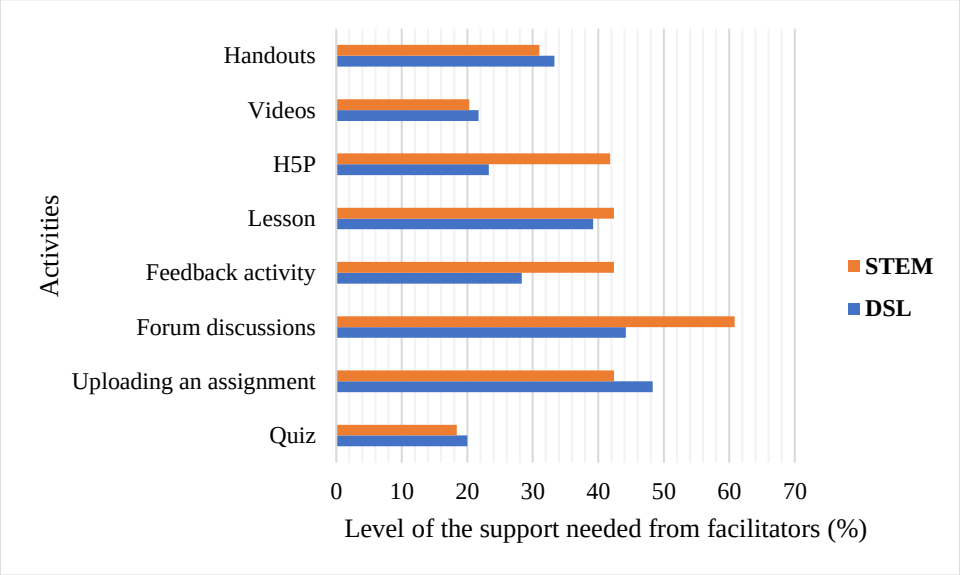
Figure 1. Mean Scores Satisfaction with Facilitation



Note:1 - not enjoyable at all, 5 – very enjoyable; Mean scores and standard deviations, FD: Feedback, H5P: Interactive Content

Results also indicated that SLs and SSLs are more interested in participating in the webinars (SLs: 86.7%; SSLs: 82.9%). The reported motivations to pursue webinars include getting answers to questions from facilitators, improving knowledge and skills, peer learning and sharing ideas, improving ICT skills to learn effectively online, giving opinions, getting help for less understood subject content, and interacting with others. The majority of respondents (SLs: 4.11 ± 0.9; SSLs: 3.77 ± 0.8) feel comfortable with online learning, and most of them (SLs: 4.00 ± 1.0; SSLs: 3.77 ± 1.1) are motivated to continue with online learning. From this perspective, males were more motivated (SLs: 4.1 ± 0.9; SSLs: 3.78 ± 1.2) than females (SLs: 3.70 ± 0.9; SSLs: 3.75 ± 1.0). The motivations to continue with online learning are linked to the availability of resources, namely Internet connectivity, support from online facilitators, and course design. Despite the identified opportunities, doing some activities remains a challenge for some SLs and SSLs. The most challenging activities comprise uploading assignments, organizing and participating in forum discussions, and understanding some of the content of the lessons (Figure 2). As a result, some respondents (SLs: 13.3%; SSLs: 17.1%) stated that they are unmotivated to continue with online learning. SLs and SSLs indicated during the Zoom meeting that a lack of motivation to continue with online learning is related to a lack of electricity, Internet connection, time for online learning, limited knowledge, and skills to use online learning materials;thus a lack of interest and motivation.

Figure 2. Activities Where SLs and SSLs Need More Support from Facilitators



The feedback from the Zoom meeting indicated that SLs and SSLS struggled initially and got used to it after a certain period of time. One of them stated that "At the beginning, it was hard as I did not even know which browser to use. As I could not move out of my home due to COVID-19, I had to call friends and facilitators to help me. From their guidance, I managed to log in for the first time and hence had access to the content. I followed the same process for the next time, until I got used to it". Another participant explained that "…online learning is enjoyable, despite some problems which might be linked with the lack of Internet and electricity. Several times, I failed to meet the deadlines for quizzes and assignments due to the lack of Internet access".

To improve online learning, SLs and SSLs suggested the organization of face-to-face sessions to support online learning. They also suggested the provision of more detailed training on online learning, particularly in scheduling and planning for onlinelearning activities. Furthermore, they indicated the need for daily continuous support and the provision of feedback from facilitators, in addition to more quizzes, videos, and webinars. They have also indicated the need for printed handouts, especially for those living in remote areas with limited access to the Internet and electricity. They wish they could go online only for submitting assignments and doing quizzes.

5. Discussion

The feedback from the Zoom meeting revealed that SLs and SSLS struggled initially but got used to it after some time. However, only a small number of people showed up. This was also accompanied by SLs and SSLS dropouts from the survey. This finding confirms that of Narul et al. (2015), who point out that the dropping out might be associated with the online learning style, culture, pedagogy, lack of technological and technical training, and time management. However, SLs and SSLs who managed to continue with online learning used different tools, mainly laptops and mobile phones. The availability of ICT tools

is an opportunity for the success of online learning as they facilitate personal learning environments (Humanante et al., 2015), which is consistent with the professional development framework for online learning.

In particular, the availability of personal computers facilitates the development of the cognitive skills necessary for educational achievement (Kuhlemeier&Hemker, 2007). They enable personal work in relation to time and personal ability to use the computer. On the other hand, nowadays the use of mobile phones in education is on the rise. First of all, mobile phones are available and accessible to many teachers and students as a tool actually used for communication. Furthermore, they are appreciated for their portability and ease of use (Liu et al., 2008; Vázquez-Cano, 2014). Modern Android phones can perform the same tasks as computers, such as receiving and responding to emails, downloading documents and videos, and taking photos (Mpofu, 2016). Therefore, they can be used for all of the activities planned in online learning programs. In essence, the possession of the mentioned devices requires personal willingness as one of professional development theoretical assumptions.

Nevertheless, the results of this study indicated a high level of satisfaction with online facilitation, even though teachers still need support from facilitators. This is in line with another study which indicated that a teacher's assistance and presence encourage online learning, especially when they provide timely words of motivation, affirmation, or validation of student contributions (Fikri Zulfikar et al., 2019). Another study indicated that the cognitiveand socialfactors as well as the presence of teachers facilitating online learning may result in an increase in students' social presence (Kozan& Richardson, 2014).This, in turn, motivates them to participate actively in various online activities through asking questions, joining forum discussions with peers and teachers, doing quizzes, and completing assignments (Blocher, 2005). The presence of facilitators is also helpful, especially when they have to provide technical support to learners, such as doing and submitting assignments and forum discussions, which are in line with the professional development framework guiding this study (Baran & Correia 2014).

Considering the satisfaction of the trainees, for effective CPD, SLs and SSLs recommended the organization of face-to-face learning to support online learning, a process known as blended learning (Karamizadeh et al., 2012). Several benefits of blended learning have been reported in the literature, the most common being flexibility (Shand &Glassett, 2017), reinforcement of learning, and engagement with peer students (Gedik et al., 2012). This is why blended learning is appreciated as an innovative method for learners, making the learning and teaching process more comfortable and attractive for learners (Kvavik, 2005). However, it has to be well organized and planned to avoid its over-valuation by students, which may reduce online engagement (Lopez-Perez et al., 2011). Moreover, teachers may be tempted to put less emphasis on the facilitation of the face-to-face part than on the online component (Jeffrey et al., 2014).

Blended learning can also reduce the number of SLs and SSLs who are discouraged from continuing with female-dominated online learning. It was found that blended learning increases learner satisfaction, which in turn leads to changes in attitudes and feelings (Wu et al., 2010). Furthermore, blended learning increases the motivation towards achieving learning outcomes (Kintu et al., 2017) as well as emphasising student characteristics such as gender (Hindal et al., 2013). In this regard, face-to-face sessions provide opportunities for students to learn from peers and facilitators. It is an opportunity to ask questions and get clarifications on the steps involved in online learning, such as accessing the content, doing quizzes, submitting assignments, and participating in forum discussions. It is also an opportunity to ask questions in relation to the subject content that seems difficult for them. This could enable SLs and SSLs to learn skills and access knowledge that would not be the case with online learning alone.Hence they could be motivated and encouraged to continue with online learning.

SLs and SSLs indicated the need for training on the use of modern technologies. Owing to the immediate shift from face-to-face to online learning, challenges related to modern technology are obvious. However, the success of online learning is mostly based on the experience and ability in using the Internet and computer applications. It also depends on computer literacy and management (Rovai 2003). We assume that the training could be provided before the start of the online learning. Owing to COVID-19, the training could be carefully prepared and provided online. During the training, all steps could be clarified, as could the structure of the online content, so that SLs and SSLs are skilled in all the steps followed in online programs.

In this study, the findings indicated that the design has a different influence on the preferences of SLs and SSLs. One program preferred the handouts, while another one preferred video. Course design was found to be of great significance in online learning (Kintu et al., 2017). It was found that design affects learning efficiency in ways such as technical quality, reliability, learning customization capabilities, ease of use, and effectiveness comprising system design, delivery, and outcome. In this regard, performance and self-efficacy are measurements of learning effectiveness and learning efficacy (Renner et al., 2014). The preference for the handout might be more influenced by face-to-face learning, as was found in another study (Paechter& Maier 2010), where students attended the class and heard lectures from facilitators. In this regard, teaching is enhanced by reading handouts. On the other hand, the preference for videos might be related to their importance in helping learners understand complex concepts and procedures that are difficult to explain with text and graphics (Hartsell and Yuen 2006). Furthermore, the combination of videos with other learning services has great potential to provide students with an integrated online learning space (Giannakos, 2013).

6. Study limitations

A small number of SLs and SSLs provided feedback on the survey. The small number might be related to the mode of data collection used in this study. The analysis of recorded data during the registration indicated that the majority of SLs and SSLs who did not provide feedback are located in remote areas with limited Internet access, mobile phone networks, and electricity. Therefore, it was not possible for them to have access to online surveys, and it was not possible to reach them by mobile phone. The low number of responses could also indicate that most SLs and SSLs struggled with online learning and dropped out of the program. Other reasons that possibly caused the dropout might be associated with the lack of Internet access and devices such as computers, laptops, and smartphones. Limited access to the Internet was found to be a major challenge, hence the reason for giving up on online learning. This is because the Internet is a basic tool, without which the availability of other tools indispensable for online learning might be useless. With regard to dropping out, the personal motivation and resistance to mind change from face-to-face to online learning cannot be ignored. In this study, this can be associated with rapid change, as during the registration SLs and SSLs enjoyed face-to-face learning. The shift from this mode of teaching delivery to online was caused by COVID-19. Hence, the majority of SLs and SSLs might not be ready to cope with the changes.

7. Conclusion

COVID-19 affected the methods of teaching and learning in Rwanda. The shift from face-to-face learning caused more students to drop out of the program.This can be indicated not only by the number of SLs and SSLs who provided feedback from the survey, but also by the number of active participants in online learning. Those who have been able to participate in online learning, on the other hand, primarily use computers, laptops, and mobile phones to follow online courses. Furthermore, they are satisfied with the online facilitation they receive from facilitators, even though the support might be improved and be accompanied by face-to-face learning to enhance online learning. Despite the challenges identified in this study, SSLs and SLs are motivated to continue with online learning.

8. Recommendations

We recommend training on the use of ICT tools and steps followed in online learning before the program is applied in other CPD and higher learning programs in Rwanda. We also recommend the organization of face-to-face learning by the end of the lockdown to support skills and knowledge and to overcome challenges faced by SLs and SSLs from online learning. Therefore, these findings can serve as a reference to improve not only the planning and implementation of effective online learning but also that of face-to-face learning.

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Appendix 1

Introductory message

Dear School Subject Leader and School Leader,

With COVID-19 pandemic, there was a shift from face-to-face mode of continuous professional development to online learning. The current study aims at assessing the satisfaction of the school subject leaders (teachers) and school leaders with the online learning and to identify opportunities and challenges for the online learning towards the improvement of the online learning. This study targets the trainees who are pursuing continuous professional development for school subject leaders and leaders (SLs).

We, researchers from the University of Rwanda, are interested in this particular study with intent of disseminating the outcomes of the study for improving the effectiveness of the new methodology in teacher education in the future. Further, anonymity will be kept throughout the report and your data will be only used for academic purpose. In this regard, we assure you that the provided information will be kept confidential. Therefore, feel free to provide frank and accurate information. For any question do not hesitate to contact the first author, Dr.Nsengimana Venuste (email: venusteok@gmail.com or Tel: 0788504218) or the main supervisor, Mr. Nsengimana Theophile (email: nsengimanafr@gmail.com or Tel: 0788614146).

We thank you very much for your cooperation.

Data collection tool

I. Respondent information

District: School: Age: Gender:

Material used for online learning:

II. Rating questions

Instruction: rate by ticking (√) from 1: Not enjoyable at all – 5: very enjoyable in appropriate cell your opinion with the online facilitation

1. To what extent are you satisfied with the online course delivery and online facilitation?

Extent of satisfaction	1	2	3	4	5
Satisfaction with online course					
Satisfaction with the online facilitation					

2. Rate your level of satisfaction with the following facilitation in online learning activities:

Learning activity	1	2	3	4	5
1. Quiz					
2. Lessons					
3. Feedback					
4. Assignment					
5. Interactive content					

3. Rate your level of satisfaction with activities and or learning resources in which you wish to get more support:

Learning activity/resource	1	2	3	4	5
1. Handouts					
2. Videos					

3. Interactive content					
4. Lessons					
5. Feedback activities					
6. Forum discussions					
7. Uploading assignment reports					
8. Quiz					

III. Open questions

Instruction: Please elaborate on the following questions:

1. What are the opportunities for online learning which enable you to attain the learning outcomes during the continuous professional development?

2. Vis-à-vis material and facilitation for learning, what challenges do you face with the online learning?

3. In relation to online learning material and facilitation, what do you suggest for improving the online facilitation?

4. Any other information to improve online learning programs?

…….We thank you very much for your collaboration……