



EXPERIENCES OF ONLINE TEACHING IN SOUTH AFRICAN UNIVERSITY: TOWARDS TEACHER PROFESSIONAL DEVELOPMENT

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ABSTRACT

Teacher professional development is important to improve the standard of teaching and learning. In-service teachers are required to move with changing times, change their teaching and learning strategies to meet the requirements of the 21st-century learners and be relevant to the Fourth Industrial Revolution. The distressing experience of COVID-19 has made the need for continuing professional teacher development. Over the past few years, there has been a gentle movement towards online teaching, but COVID-19 has urgently demanded these reforms. The theory of reasoned behaviour was used for the study. The purpose of the study was to investigate the importance of teacher professional development in the implementation of online teaching as a tool for distance learning since the onset of COVID-19. The study adopted qualitative methodology and employed the case study. The study conducted interviews with four university lecturers, who were chosen through a purposeful sampling technique. The data was analysed using thematic data analysis, and the data revealed that most teachers perceived online teaching as a good intervention during the period of COVID-19. However, teachers lacked training and experience when it comes to online teaching. This resulted in a lot of uncertainty when it came to online teaching, and frustration for older teachers. In conclusion, the paper highlighted the need for teacher development in the form of in-service training.

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1. Introduction

The outburst of the coronavirus pandemic required a drastic change from face-to-face contact sessions to online teaching, without allowing any opportunity for schools and universities to conduct workshops for their teaching staff and students. The serious challenge that affected both students and lecturers was the limited connectivity as well as data. Nevertheless, the teaching and learning had to continue despite the complications encountered. To most teachers, particularly those teaching in rural, that was not an easy task because they were merely used to teach using face-to-face contact sessions (Teachers Thematic Group, 2020). The shutdown affected mostly teachers and students living in rural areas as they were disrupted by the lack of connectivity. Chakanika, Sichula, Sumbwa, and Nduna (2012) suggest that rural areas are deprived of a better education because there is a lack of teaching and learning material as well as educational resources. In the 21st century, the new trends of technology, economy, and politics influence social life, workplace and people's lifestyle. This, therefore, compels Higher Education Institutions (HEIs) to restructure their teaching strategies and innovate the curriculum as well.

However, 21st-century students need to be encouraged to be critical thinkers and problem solvers who need to develop cross-cultural understanding, creativity, and innovation (Hue, 2019). Therefore, the demand to fall for online learning persuaded the universities to provide laptops and free data to their students.

Technology proficiency is demonstrated worldwide across all age stages. Social media platforms such as Facebook and Instagram as well as Twitter have totally changed the way we socialize and interact with one another (Oke & Fernandes, 2020). It is exceptionally clear in our schools and HEIs that teachers/lecturers deal with young citizens that are groomed to be responsible adults. It is then imperative that professional teachers be developed through workshops and training either by the employee or through short courses offered by Higher Education Institutions (HEIs). More platforms such as LinkedIn and other Massive Open Online Courses (MOOC) are massively transforming the diffusion of professional information including teaching and learning. The ethical, pedagogical, as well as epistemological implications of digital technology in the education sector remain uncertain (Oke & Fernandes, 2020).

Thus, this clearly displayed that professional teachers need to be developed to be on the same level as the changing times. The Faculty of Education has the fundamental task to introduce their pre-service students to face-to-face and online teaching methods as well. The purpose of the study was to investigate the importance of teacher professional development in the implementation of online teaching as a tool for distance learning since the onset of COVID-19. The effectiveness of teacher professional development, online teaching, and challenges experienced by teachers and learners during online teaching. Professional development programs are organized for teachers who have long service in the field of education. The newly employed professional teachers go for induction first before they can be developed professionally. Some teachers were there before the new curriculum, Curriculum 2005 (C2005) was introduced in South Africa, and others joined the profession at the time C2005 was implemented. However, most of them are the product of the old curriculum in which the teaching approach was teacher-centred; hence, the PD is necessary for them too.

2. Literature Review

2.1 Teacher Professional Development (TPD).

Teachers play a significant role in the education of each country hence the teaching profession is considered a noble profession. They are therefore obliged to move with the changing times, such as changing teaching strategies to suit 21st-century teaching and learning, and finally to be considered relevant to the Fourth Industrial Revolution (4IR). Professional Development (PD) is a priority for

teachers because they are dealing with students who are, surrounded by a digital environment. We are in the 4IR era and teaching 21st-century learners hence the teachers' professional development is an essential requirement for effective teaching and learning. A PD has been associated with in-service training, the purpose being to develop skills and to impart new knowledge in various subjects offered by teachers. Teacher professional Development (TPD) is even more necessary today because there is much emphasis on Technology. Technology is at the forefront in teaching and learning to keep learners well-informed, and ready to compete with their counterparts worldwide. Concurrently, teachers need to be relevant during the 4IR era. The current learners' social life is glued in cellphones and television; hence, the teachers need to advance their teaching strategies to avoid boring lessons. At the same time, aligning their strategies with the current situation may not be enough if they are not accommodative to all diverse learners in that classroom.

When Outcomes Based Education (OBE) was introduced in 1997, there was a lot of confusion among teachers, which was triggered by the fear of the unknown, among others. OBE is the learner-centred approach that was introduced in South Africa in place of the traditional approach, which was a teacher-centred approach. Many complaints were voiced out, including the lack of informative workshops and or trainings (Ngibe, 2016). Muthivhi (2019) concurs with Ngibe (2016) by arguing that teachers were not trained enough for quality teaching and learning, because of apartheid. Different researchers outline TPD differently. However, all definitions are centred on the improvement of the teaching strategies that teachers apply in their classrooms and the improvement in learners' learning. Avalos (2011) postulates that teachers' professional development refers to the way in which teachers learn and how they apply the newly acquired knowledge in the classroom. On the other side, Pedder and Opfer (2011) posit that TPD has to do with the growth and development of teachers' expertise, which is displayed in their improved lesson presentation in the classroom. The Great Schools Partnership (2014) defines professional development as a wide variety of specialized training, formal education, and advanced professional learning to improve administrators' and teachers' knowledge and skills. The curriculum at schools changes with time, same as the students that are taught, therefore, teachers are bound to be relevant at all times. The new teachers as well as the old teachers need to improve their teaching strategies.

In research conducted on 1259 teachers in China, it came up that there must be leadership for TPD to which the school management will put all the trust (Liu, Hallinger, & Fang, 2016). It was confirmed also by 1011 teachers and 60 principals in Thailand that trust between the TPD team and school management plays a significant role in developing teachers (Piyaman, Hallinger, & Viseshsiri, 2017).

This TPD program should be done locally first before outsourcing. From within the school, there may be an expert in the field that needs to be developed. Even the neighbouring schools may group each other, either according to phase or according to the subjects as long as there is a team that is responsible for that.

2.2 Effectiveness of teacher professional development

The quality of teaching is the most central in-school factor impacting the performance of the learners. For teacher development to be effective there must be changes in teacher practices and visible improvements in student learning as the outcomes for structured professional learning (Darling-Hammond, Hayler & Gardener, 2017). It is therefore renowned as the most important tool that ensures that teachers are skilled and informed about the current curriculum developments. The programs scheduled for developing teachers provide valuable opportunities to all teachers (Thomson & Turner, 2019). Effective PD has a positive influence on teachers' and learners' development in the teaching and learning process. Teachers effectively increase the quality of their instruction by adapting to the teaching strategies relevant to the 21st century and which will accommodate the 4IR demands.

Teachers are professionals and they are quite confident of what they are doing in their classrooms given the chance to prove themselves. Nevertheless, they need to be developed so that their skills meet the requirements of that current situation. For instance, the level of 21st-century learners and the 4IR requirements. What is worse and most demanding is the outbreak of coronavirus, which required the immediate closing of schools in both Basic Education and Higher Education. There was a demand for the use of online or distance learning. All the factors: 21st-century learners, 4IR, and the schools' shutdown, mentioned above completely required the change in teaching strategies. Guess what, most teachers particularly those in rural areas are far from meeting these requirements of 4IR as well as 21st-century teaching and learning skills (Ngibe, 2016). This is due to the lack of resources as well as limited knowledge of some teachers, hence the need for teacher professional development. De Putter-Smits, Nieveen, Taconis, and Jochems (2020) believe that PD should focus on teachers' classroom practice and develop their own learning in an active setting. Teachers know their work; only professional and developmental support is required so that their confidence is stimulated.

Teachers are not bad or stubborn when it comes to professional development, but they need to be clear about the purpose and be addressed by well-informed facilitators. In a study conducted in South Africa on the effects of the new curriculum, they emphasized the issue of facilitators who do not have much information about the new curriculum (Ngibe, 2016). De Putter-Smith et al (2020) suggest that the

experts in the field that needs to be developed are the ones that should be responsible for teacher professional development. For example, if the teachers are to be developed in context-based education, the experts in context-based education should be responsible for that. What the researcher means is that the teacher in the classroom is responsible for classroom discipline. This includes the teaching and learning process that is supported through operative classroom management, the development of classroom materials, and the teaching and learning strategies that are relevant to the 21st century.

The Secondary Principal's Association of New Zealand contends that the effectiveness of PD cannot be measured by the perceptions of the teachers, but instead by the influence it has on learners' performance as well as on as teachers' improved practices (Timperly, Wilson, Barrah, & Fung, 2007). Teachers' current practices and their teaching philosophies are acknowledged in the education sector, particularly in the classroom, however, professional development is equally necessary for teachers. Thus, they improve their teaching strategies and allow the teachers to develop their learners to match the demands of the world around them. In the teacher professional development process, teachers are learning new teaching strategies and new knowledge is acquired. Same with students, they learn more from their teachers and are also current with the new innovations if their teachers manage to develop them. This relationship between teacher learning as well as learner learning is termed the 'black box' by (Timperly et al., 2007).

In-service training also understood as teacher professional development is always a priority for each organization to sustain. When referring to development, it does not mean that the old knowledge or strategies are discarded but they are modernized for relevance to the current situation, in this case, the new curriculum. For instance, with Outcomes Based Education, the change is that teaching is learner centered unlike before whereby teaching was teacher centered. It is then necessary that teachers go for training or workshops to align their teaching practices to the developed curriculum teaching practices. We cannot run away from the fact that the use of technology in teaching, which is in line with the 4IR as well as online teaching, is a less familiar technique to some teachers.

South Africa found itself in a competitive world, in which the focus was on the development of knowledge and skills. The situation demanded professional development for teachers, who were going to implement the new curriculum (Botha, 2010). Darling-Hammond, Hayler, and Gardener (2017) concur with Botha (2010) in that the aim of developing professional teachers is to support the learners to develop critical thinking skills. The drastic switch from face-to-face to contact classrooms to online teaching or distance learning did not favour any teacher or lecturer. The section that follows will be

focusing on online learning and teaching.

2.3 Online Learning and Teaching

Šolc, Legemza, Sütőová and Girmanová (2012) define online education using different versions from literature, which are: distance education; e-learning; online learning; blended learning; computer-based learning; web-based learning; virtual learning; tele-education; cyber learning; internet-based-learning; and so on. Currently, the world is faced with the 4IR, which is characterised by a blending of technologies that seems to be confusing to some teachers (Schwab, 2016). The confusion is due to a lack of experience from teachers on how to instill technology in their planning or a lack of resources for instilling technology in learning and teaching.

Online teaching and learning are becoming more effective in several ways the students learn faster online because e-learning use between 40 percent and 60 percent less time to learn than in a physical setting (Li & Lalani, 2020). It would be pleasing to all education systems if ever the teachers and or lecturers were conversant with using technology in their planning. The world now is operating in technology, which makes life easier, therefore as teachers, our learners should be prepared to face the world with confidence. That depends on the hands of teachers, the way they have trained or taught their learners to deal with the outside world, and how to solve their problems.

Information Technology influences every sphere of life, including education nowadays. Online learning also known to be e-learning is the type of learning that takes place outside the formal classroom setting, using the Internet. It is learning that utilizes electronic technologies to access educational curricula outside of a traditional classroom. Online learning may be new to some but familiar to others. The reason is the lack of resources such as laptops/computers, data and internet connectivity. On the other side, the teachers who are responsible for teaching and learning are comfortable with or familiar with traditional learning approaches or face-to-face contact sessions.

Teachers were faced with a challenge as the outbreak of coronavirus has resulted in a dramatic shift from the normal way of teaching (face-to-face). They had to take on a new way of teaching in the form of online teaching, which placed new demands on the teacher in terms of organization and delivery of the curriculum. This experience with COVID-19 has made us see the need for professional teacher development in the form of online education. Worldwide the application of online teaching became an alternative option to avoid the spreading of coronavirus during the lockdown period, and all students had to be in possession of laptops, which is a huge challenge to those students from poor families.

It is high time that all educators as well as lecturers change their focus and consider the significance of online teaching and learning. Teachers need to be encouraged to foster a critical learning space where students are encouraged to research and bring ideas for discussion. Sun and Chan (2016) hypothesize that students can increase their capacity for creative expression when given the opportunity. For most of 21st-century students, online learning is much more accommodating than face-to-face contact sessions. These students are said to be screen generation, all-knowing learners, and or literature learners, Onderwys Monitor (2016); therefore, they feel comfortable when given a chance to do research for themselves.

2.4 Challenges experienced by teachers and learners during online teaching.

As was mentioned earlier on in this paper, the world is now busy with the 4IR, which means that we are moving from one stage of living to the next. Technology is being modernized to fit the style of life of that time. Imagine, during the old days when firewood and three-legged pots were used for cooking, and today electricity and microwaves are used. Gillet-Swan (2017) posits that teaching with technology is not one size fits all approach because it depends on the types of technologies that are used in that period, and the curriculum that is followed in that country. First, with the South African curriculum, teachers are still settling with NCS (Grades R-12), because they claim that they are familiar with its content (Ngibe, 2016). However, those that are in rural areas are most exposed to face-to-face interaction with their learners, and only a few of those are familiar with the technology. The same applies to some lecturers in some universities whereby they use lecture methods, in which they stand in front of their students and do presentations. Kumar (2015) suggests some factors that may be challenges to online learning such as resistance to change; technical issues; computer literacy; time management; and self-motivation. As mentioned earlier on, most teachers and learners are used to the traditional face-to-face approach, so they cannot afford to move from their comfort zones.

3. Statement of the problem

The month of March 2020 was the last month for normal teaching in South Africa in the year due to the worldwide outbreak of coronavirus. There was a need for a complete shutdown for most of the working institutions including the education institutions. This left the teachers and lecturers no option except for switching to online teaching. A dramatic shift from face-to-face to online teaching has placed new demands on the teacher in terms of organization and delivery of the curriculum. This was not very easy for some lecturers because they had never practised online teaching. The sudden closure of schools during COVID-19 has left many teachers across several countries uncertain about their role, specifically because most of them were unable to use technology effectively (Teachers Thematic Group, 2020).

Online teaching and learning are becoming more effective in several ways in that students learn faster online because e-learning use between 40 percent and 60 percent less time to learn than in a physical setting (Li & Lalani, 2020). Most teachers particularly those in rural areas are far from meeting the requirements of 4IR as well as 21st-century teaching and learning skills (Ngibe, 2016). This is due to the lack of resources as well as limited knowledge of some teachers, hence the need for teacher professional development. De Putter-Smits, Nieveen, Taconis, and Jochems (2020) believe that PD should focus on teachers' classroom practice and develop their own learning in an active setting.

4. Theoretical Framework

4.1 Theory of reasoned action (Fishbein, 1960); the theory of planned behaviour (Ajzen, 1985)

The two theories suggest that a person's behaviour is determined by their action to perform the behaviour and that this intention is, in turn, a function of their attitude toward the behaviour and subjective norms. The difference between the two theories is that the latter includes behavioural control as an additional determinant of intentions and behaviour (Ajzen, 1985). Whilst the Theory of Reasoned Action (TRA) aims to explain the relationship between attitudes and behaviours within human action (Fishbein, 1960). It is used to predict how individuals will behave based on their pre-existing attitudes and behavioural intentions. An individual's decision to engage in a particular behaviour is based on the outcomes the individual expects will come as a result of performing the behaviour. Thus, the decision to use online teaching can be explained through the theory of reasoned action because it was developed to determine behavioural intent on behavioural outcomes. The intent (behavioural intention: which is the degree to which a person has formulated conscious plans to perform some specified future behaviour) of the primary schools, plus the subjective norm (which is brought on by COVID-19 which is generally approved by the university) and attitude can influence the use of online teaching.

Thus, the TRA theory comes full circle, as it is comprised of attitude, subjective norms, intent and behaviour. Therefore, due to COVID-19, the University has approved and supports the intended behaviour of changing to online teaching. Lectures have adopted a behavioural intention (conscious plan/decision to move to online teaching).

5. Research Questions

1. How do lectures perceive the use of online teaching?
2. What are the lecturers' attitudes towards the teacher's professional development?
3. What are the lecturers' attitudes towards online teaching?

6. Research Methodology

The study adopted a qualitative methodology as it employed the case study to better understand lecturers' perceptions in using online teaching as a tool for distance learning. The study conducted interviews with four university lecturers who were chosen through a purposeful sampling technique. Thematic analysis was the method used to analyse data from the participants.

7. Data analysis

Theme 1: Lecturers' perceptions about the use of online teaching.

"To me, online teaching is a good approach that we should have practised even before the shutdown, but we did not. Look now, the challenge that we are experiencing."

"Yes, online teaching is good, especially in times like this one. If we can have some workshops where we will be able to practise all the processes of online teaching as well as online assessment."

"Online teaching is good, but we cannot see the students if they are there or not, because when you ask them to respond or comment on a certain issue, most of them keep quiet, so you are not sure if they have a challenge or they have understood are not there, they logged in and left."

More than fifty percent of the participants saw online teaching as good as it was relevant during COVID 19 era, however, all of them noticed some challenges regarding it, in the sense that the lecturer is not in a position to know if the students understood or not. They also added that previously lecturers had not been trained for online teaching hence some experienced challenges as they lacked experience and expertise in the technology because they had never thought they would have to rely on online teaching before.

Theme 2: Lecturers' attitudes towards the Teacher Professional Development.

"As I have mentioned before, if we can be workshopped on this online thing, we can be happy."

"Teacher Professional development is a need especially now. We do teach our students online, but we are not sure if we are doing it the way that is supposed to be done."

Participants all concurred that there was a strong need for professional development to equip teachers for online teaching, therefore workshops are needed because teachers were experiencing uncertainty some of the time as they were not sure of what they were doing.

Theme 3: The lecturers' attitudes towards online teaching.

Participants responded differently as some had a negative attitude to it because some lectures do not like change and regard it as time-consuming since they are busy with their daily preparations. In

addition to this, they see it as an overload, since they must now train for something new-hence the negative attitude, especially for those who are older and have been teaching for a long time. While on the other hand, some participants said because it was a new thing it made them nervous nevertheless it made them eager to learn.

8. Discussion

The data revealed that most lecturers perceived online teaching as a good intervention in the period of Covid 19 although there were challenges as they lacked training and experience when it comes to online teaching. This resulted to a lot of uncertainty when it came to online teaching. This sometimes resulted in a negative attitude since some are older and bringing in a new way of doing things was frustrating for some of them. Kumar (2015) suggests some factors that may be challenges to online learning such as resistance to change; technical issues; computer literacy; time management; and self-motivation. However, participants agreed that there was a need for training to mitigate the uncertainty, as well as bridging the gap as some lecturers had been in the profession for a long time. The data revealed that online teaching was perceived as good since it was relatively easy to cover more ground in teaching in less time. This is further supported by Li & Lalani (2020) who note that online teaching and learning are becoming more effective in several ways in that the students learn faster online as e-learning uses between 40 per cent and 60 per cent less time to learn than in a physical setting. Lastly, participants noted challenges in the implementation of online teaching which was also echoed by Kumar (2015) and Gillet-Swan (2017) who posit that teaching with technology is not a one-size-fits-all approach where everyone will easily fit in.

9. Conclusion

The paper presented the teachers' perceptions about online teaching as well as highlighted the need for online teaching especially during the COVID-19 pandemic. It also highlighted the need for teacher professional development in the form of in-service training in order to capacitate teachers to align themselves with the demands brought by the COVID-19 pandemic.

References

- Avalos, B. (2011). Teacher professional development in teaching and teacher education over. Ten Years. *Teaching and Teacher Education*, 27, 10–20. doi: 10.1016/j.tate.2010.08.007.
- Botha, R.J. (2010). Outcomes Based Education and Educational Reform in South Africa. *International Journal of Leadership in Education*, 5(4): 361-374.
- Darling-Hammond, L., Heyler, M. E, & Gardner, M. (2017). *Effective Professional Teacher Development Learning Policy Institute*: Palo Alto, CA: Learning Policy Institute.
- de Putter - Smits, L.G.A, Nieveen, N.M., Taconis, R. & Jochems, W. (2020). A one-year teacher professional development programme towards context-based science education using a concerns-based approach, *Professional Development in Education*.

- <https://doi.org/10.1080/19415257.2020.1712616>
- Dhama, K., Sharun, K., Tiwari, R., Dadar, M., Malik, Y. S., Singh, K. P., & Chaicumpa, W. (2020). COVID-19, an Emerging Coronavirus Infection: Advances and Prospects in Designing and Developing Vaccines, Immunotherapeutic, and Therapeutics. *Taylor and Francis Public Health Emergency Collection*. 1-7. <https://doi:10.1080/21645515.2020.1735227>
- Chakanika, W.W., Sichula, N.K., Sumbwa, P.I., & Nduna, M. (2012). The Challenges of Rural Schools in Africa. *South Africa Rural Educator*, 2: 1-17.
- Finch, D., & Jacobs, K. (2012). Online education: best practices to promote learning. Proceedings of the Human Factors and Ergonomics 56th Annual Meeting.
- Gillett-Swan, L.J. (2017). Special Issue: Business Management The Challenges of Online Learning Supporting and Engaging the Isolated. *Journal of Learning Design* 10(1): 20-30.
- Great Schools Partnership. (2014). *Professional Development*. Creative Commons: Portland.
- Li, C. & Lalani, F. (2020). The COVID-19 Pandemic Has Changed Education Forever. This is How. *World Economic Forum*. <https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/>
- Liu, S., Hallinger, P., & Feng, D. (2016). Learning-centred leadership and teacher learning in China: Does trust matter? *Journal of Educational Administration*, 54(6), 661–682. doi:10.1108/JEA-02-2016-0015.
- Moore, M., & Kearsley, G. (2012). *Distance education: A systems view of online learning* (3rd ed.). Belmont, CA: Wadsworth.
- Muthivhi, M.J. (2019). *Professional Development of Teachers for Promoting Teaching and Learning in Rural Primary Schools of Tshinane Circuit*. University of Zululand: South Africa.
- Ngibe, N.C.P. (2016) *Teachers' perceptions on the effects of frequent change in curriculum on effective teaching in junior secondary schools at Libode Education District, Eastern Cape*. Unpublished PhD thesis. University of Fort Hare, East London.
- Oke, A. & Fernandes, F.A.P. (2020). Innovations in Teaching and Learning: Exploring the Perceptions of the Education Sector on the Fourth Industrial Revolution (4IR). *Journal of Open Innovation: Technology, Market, and Complexity*, 6(2):1-22.
- Pedder, D., & Opfer, V. D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research*, 81, 376–407.
- Piyaman, P., Hallinger, P., & Viseshsiri, P. (2017). Addressing the achievement gap. Exploring principal leadership and teacher professional learning in urban and rural primary schools in Thailand. *Journal of Educational Administration*, 55(6), 717–734. doi:10.1108/JEA-12-2016-0142.
- Schwab, K. (2016). *The Fourth Industrial Revolution. What it means, how to respond*. World Economic Forum <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>
- Šolc M, Legemza J, Sütöová A, Girmanová L. (2012). Experiences with utilizing e-learning in education process in university environment. *Procedia-Social and Behavioral Sciences*. 2012; 46:5201–5205.
- Sun, A.Q. & Chen, X. (2016). Online Education and its Effective Practice: A Research Review. *Journal of Information Technology Education Research*. 15: 157-190.
- Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher Professional Learning and Development: Best Evidence Synthesis Iteration [BES]*. New Zealand: New Zealand Education Ministry.
- Thomson, M.M. (2019). The Role of Emotions in Teachers' Professional Development: Attending a Research Experience for Teachers (RET) Program. *Education Research International*. 1-12. <https://doi.org/10.1155/2019/5856793>
- Teachers Thematic Group. (2020). *Three Principles to Support Teacher Effectiveness during COVID-19*. WORLD BANK. <http://documents1.worldbank.org/curated/en/331951589903056125/pdf/Three-Principles->

[to-Support-Teacher-Effectiveness-During-COVID-19.pdf](#)

Yue, X.Y. (2019). Exploring Effective Methods of Teacher Professional Development in University for 21st Century Education. *International Journal for Innovation Education and Research*. 7(5): 248-257