

# Challenges of Physical Education Teachers using Online Learning Modality in Times of COVID-19 Pandemic

Ma. Shella R. Millan

mssmillan@sdssu.edu.ph

North Eastern Mindanao State University (Formerly Surigao del Sur State Universtiy) – Main Campus, Tandag City,  
Surigao del Sur, 8300, Philippines

---

## Abstract

The COVID-19 pandemic was primarily responsible for school closures and no face-to-face classes. Physical education classes were severely impacted because physical education teachers must not only teach theories but also perform actual movements. Due to this predicament, this research aimed to investigate the challenges encountered by teachers of Online Learning Modality (OLM) in physical education in times of the COVID-19 pandemic. The study utilized qualitative research design with the use of a phenomenological approach to collect and analyze the data. An in-depth interview was conducted to gather the data, involving six physical education teachers. Based on the data collected from participants using the online learning modality, five themes emerged: poor internet connection, difficulty in teaching, learning modalities, learning assessment, and health and well-being. Furthermore, an intervention plan was developed to address the gap needed to improve the areas of concern of physical education teachers in order to establish a quality of instruction in the university's field of physical education program using the online methods of teaching. Moreover, a similar study can be conducted on the basis of PE instruction and student performance in the field of physical education using an online learning modality.

Keywords: COVID-19 Pandemic, challenges, PE teachers, online learning modality

---

## 1. Introduction

The COVID-19 pandemic truly causes a massive effect on higher educational institutions, and to continue and provide quality learning to students, many have shifted to online and modular delivery modes for student learning in order to continue and provide quality learning to students. During the period of extended ECQ, HEIs must continue to exercise their judgment in the implementations of flexible learning options and other appropriate methods of delivery instead of in-campus learning, as mandated by the CHED COVID ADVISORY NO. 6 dated April 13, 2020. Significantly, many higher education institutions in the Philippines, including private and public colleges and universities, are unprepared for the sudden shift in learning caused by the COVID-19 Pandemic. So, this makes it hard for teachers to keep teaching their students in a way that helps them learn.

Consequently, teachers face significant challenges in adapting to the mode of teaching since they are used to meet their students face-to-face, particularly physical education teachers, who consciously make use of movement as the primary medium to teach the students, aside from learning the different theories. The researcher would like to learn about the challenges encountered by teachers in the online learning modality in

physical education as they progress through the process of sustaining teaching and learning in the face of the COVID-19 pandemic.

Several studies on the challenges of teaching in this COVID-19 pandemic have been conducted, one of which is the study conducted by Atmojo and Nugroho (2020), which stated that many use different online platforms, but a lot of problems arise between teachers and students due to a lack of preparation and planning. The study by Escobar & Morrison (2020) stipulated that the lack of experience in virtual education, lack of preparation, and expertise from both the school teachers and the university have also directly contributed to making this experience more challenging and frustrating. According to Pokhrel and Chhetri (2021), stated that the available pedagogy is not feasible for online learning. However, a variety of pedagogical approaches for online and distance learning have been developed, educators who are computer illiterate requires appropriate opportunities for career development to familiarize oneself toward to their students.

Despite the many studies on challenges using online learning as a modality in this time of the pandemic, there is no study on physical education about the challenges encountered by physical educators in online teaching. As a result, I am interested in conducting the study at Surigao del State University, Tandag Campus, because no study has been conducted on the challenges faced by PE teachers in the online learning modality. As a result, this research was conceptualized. The results of the research were very significant for this will serve as the basis for crafting an intervention plan that focus on formulating policies and strategies to hurdle the challenges encountered by the physical education teachers in teaching Physical Education subjects in the new normal education.

In view of the COVID-19 pandemic, the online learning modality serves as a classroom for students who are in their respective homes as well as the teachers who are also working at home. This research investigated the challenges encountered by teachers in teaching physical education with the sudden shift to online modality in times of COVID-19 pandemic Therefore, questions guided to the present inquiry are: (1) What are the challenges that Physical Education teachers face when teaching online in the midst of the COVID-19 pandemic? (2) Based on the study's findings, what intervention plan can be implemented to address the challenges that Physical Education teachers face when teaching online in the midst of the COVID-19 pandemic?

## **2. Methodology**

### **2.1. Research Design**

The study was a qualitative study that used the descriptive narrative method, specifically the phenomenology approach. Qualitative research aims to investigate, comprehend, and interpret social phenomena in their natural context (Creswell, 2002). I used the phenomenology approach to describe the substance of a phenomenon through exploring the perspectives of those who have experienced the same challenges as physical education teachers on online learning in physical education in times of the COVID-19 pandemic.

### **2.2. Environment**

The research was conducted at the Surigao del Sur State University-Main Campus in Tandag City. The SDSSU Main Campus housed four (4) colleges: the College of Teacher Education, the College of Arts and Sciences, the College of Business Management, and the College of Information Technology Education, Engineering, and Technology. The students were chosen from the College of Teacher Education. Surigao del

Sur State University is a non-profit public higher education institution in Tandag City, Caraga Region, Philippines. It has its main campus in Tandag City and six satellite campuses in Cantilan, Lianga, Cagwait, San Miguel, Tagbina, and Bislig City.

### **2.3. Participants**

The participants of this study are the six (6) faculty members teaching Physical Education. The participants were purposively selected for this study. I believed that the Physical Education teachers were knowledgeable in their field of specialization because they had been teaching Physical Education subjects at the university for many years. Their identities were hidden for confidentiality reasons for compliance with the research standard.

### **2.4. Instrument**

The main instrument I used in the conduct of the study was the interview, which focuses on the domain of inquiry. Physical education teachers were asked what their challenges are encountered by physical education teachers in online teaching in physical education in times of the COVID-19 pandemic. I helped collect data by using the interview protocol to guide me through the in-depth interview.

### **2.5. Data Analysis**

The Inductive Thematic Analysis Method was used to interpret the narrative report of the participants. Thematic analysis is a qualitative data analysis technique. It is typically used to refer to a set of words, such as transcriptions. I carefully examined the data to identify recurring themes – topics, ideas, and meaning patterns (Caulfield, 2019). There are steps of the thematic analysis used in analyzing the data. First, was the transcription of the data this refers to the written or typed data. The audio-recording needs to be repeatedly played in order to get the exact words of the participants by encoding each word coming uttered by the participants. Second, for each transcript, an open coding or sub-themes were extracted, and the statements were recorded. Third, significant statements were clustered into axial coding or analyzed into themes. Fourth, the study's findings were incorporated into an in-depth description of the phenomenon under investigation. Fifth, the fundamental structure of the phenomenon was described, and sixth, the research participants were asked to validate the results by comparing the researcher's descriptive results with the challenges encountered by Physical Education teachers on online teaching in Physical Education during the COVID-19 pandemic. The data validation was very important in the study to really get the exact answers given by the participants during the in-depth interview. Participant should hear their audio recording if this was properly transcribed by the researcher. The data was properly coded, and themes were identified based on its similarity.

### 3. Results and Discussions

#### 3.1 Challenges of Physical Education Teachers using Online Learning Modality in

##### Times of COVID-19 Pandemic

##### Theme 3.1.1 Poor Internet Connectivity

Internet connectivity connects people who give information through social media platforms. Teachers with internet connections use different platforms just to reach out to their students. Internet connectivity is the only way for physical education teachers to be able to communicate with their students since face-to-face is not yet allowed. However, four out of six participants viewed the same responses, and these followed:

*“My poor connection is unable to reach my students, and it can cause different problems during my class. I think we have to find some ways in order to reach our students, especially those who are living in a far-flung area.” ( PE T1 )*

*“During my online class in our place, we have an internet connection problem, so when I have a class suddenly, the connection is lost, so I have a problem in meeting my students.” ( PE T4 )*

*“Number one, the top one is the internet connectivity, especially if there are heavy rains or natural calamities. The signal is not good and it is blackout.”( PE T5 )*

*“First of all, it’s the internet connectivity. Okay, so although we have, although we can buy load, we can pay for internet connection, if we are situated in a location or geographical location where the bandwidth of the network is low, then it’s going to be a problem alright.” ( PE T6 )*

The above responses reveal that physical education teachers have difficulty in reaching out to their students due to the poor internet connectivity. According to Bhandari (2020), the internet plays a big role in facilitating to access information especially during the Covid-10 pandemic in which many people are confined in their respective homes in these trying times. According to Ribeiro (2020), the digital transformation of instructional delivery brought challenges and knowledge changes.

The poor internet connection is one of the challenges that Physical Education teachers encountered in this trying time of COVID-19 pandemic. The conduct of online classes is very difficult for Physical Education teachers if the connectivity is very slow and sometimes if there is a power interruption while conducting the online class. Physical Education teachers are very dependent on internet connection while meeting their classes online using the synchronous and asynchronous learning. They are meeting their students virtually and an online activity is being prepared them.

The results denote that in this pandemic time internet connectivity is the only remedy that physical education teachers could send digital modules and activities to their students since printed modules are not available. It is very evident that the unstable internet connection prevents the teacher to conduct synchronous and asynchronous learning. Hence, the results also demand increasing the wider bandwidth internet connection in school for the teacher to connect to their students during their class schedule. With the current situation, physical education teachers remain positive and patiently extending their time and effort to teach their students despite the challenge of the internet connections in their respective homes and the office.

### Theme 3.1.2 Difficulty in Teaching

The outbreak of the COVID-19 pandemic raises a lot of issues, particularly in the educational system. Aside from the internet issue, this time it has something to do with the difficulty in teaching that every teacher has experienced. The difficulty is something not easy to deal with, and the informants pointed out during the interview that they find it very hard to teach with the current situation. Participants had to say these responses:

*“So teaching physical education ma'am is really hard to teach, especially since we are facing a pandemic.” “So, it's really hard, especially not only for the teacher but also for the student.” (PE T2)*

*“It is very hard that we, the instructors, facing very difficult situations like no face-to-face instruction, so it is really difficult to deliver our discussion online.” (PE T3)*

*“So, as an instructor, it is very hard for me to deliver the lesson and the topics to my students because, as I have said, it is more on performance”. (PE T4)*

The researcher finds out that 4 out of 6 participants had difficulty teaching Physical Education online. Jeong and So (2020) asserted that the sudden shift to online classes left the teachers unprepared on what teaching methods to use and so with the unfamiliar teaching methods and approaches. Haavind (2000) in his research, he concluded that monitoring discussion in an online environment was more difficult than in a classroom setting.

Teaching Physical Education during a COVID-19 pandemic is not only difficult for the students but also to the teachers as well. Physical Education teachers had a difficulty to deliver the discussion online and the subject also needs student performance as they need to do return demonstration in the subject.

The result implies that it is obvious that Physical Education teachers need preparation on how to deal with the online classes, in such a way this will help them to plan on what methods of teaching that apply to online teaching. Teachers' difficulty in teaching Physical Education could be avoided if there is enough time for preparation since online teaching is a new modality to them and this demands proper planning

### Theme 3.1.3 Learning Modalities

The present crisis requires that we continue to rethink what the best medium of instruction is in order to ensure that students' education is not compromised in any way. Learning modalities must be given priority to give the possible way for the students learning in this trying times of pandemic. A reference point for having thought about the benefits and drawbacks of various teaching and learning modalities in higher education should be addressed by learning about various teaching methods and which ones may be best for us depending on the context, situation, and needs of our students. Providing quality access to learning is the main focus of the administration and the teachers for the students. This was evident through the following responses covered during the interviews conducted:

*“From time to time, you need to create a strategy for you to be able to deliver the specific objectives and outcomes for your students, so it's really hard.” (PE T2)*

*“We have to plan more activities or alternative activities so that we can attain the goal of our subject.” (PE T4)*

The participants responses on their challenges on learning modality are evident that there is a need to redefine the approaches and the specific goals and intended learning outcomes in using learning modality due to the Covid-19 global occurrence. According to Cahapay (2020), it is a challenge whether to integrate or reduce the curriculum content. On the one hand, the most important learning outcomes must be considered in the teaching and learning of students in order to balance the use of learning modalities in the new normal education. Unal (2015), on the other hand, stated that the most appropriate learning modalities assist students in improving their learning ability. In order to achieve quality learning a good learning modality must be taken into consideration that suits and essential to the students. Physical Education teachers need to attain the goals and objectives of each lesson by using online learning modality with an appropriate plan of activities prepared for the students. Therefore, a good learning outcome comes from a good strategy in preparing the Physical Education instructions.

The data implied that the school should adopts a learning modality that suits the needs of the teacher and the student who are distant from one another in this new normal education. Adapting online modality resulted in a challenge among physical education teachers because they need to look into the scheme on how the specific objectives and learning outcomes can be attained. The challenge on online teaching remarks the Physical Education teacher's performance in their respective teaching skills in times of the COVID-19 pandemic.

### **Theme 3.1.4 Learning Assessment**

Learning assessment is a planned scheme in which its purpose is to measure the level of performance of the students, and the result would become the basis for improving the instructional program and its intended learning outcomes. Assessment is an essential part of the learning experience. This will allow students to demonstrate what they know and what they can do. It will also determine whether students meet the intended learning objectives of the lesson and motivate them to improve their performance. Assessing students' performance is one of the physical educator's challenges in this time of COVID-19 pandemic, and below are their responses regarding the learning assessment of their students:

*"We all know physical education is more about performance, but then again, because of this pandemic, it is the biggest challenge to physical education educators on how to handle this class." (PE T2)*

*"Physical education is more on the performance, so as a PE instructor, it is very hard for me to deliver the lesson and the topics to my student because, as what I have said, it is more on performance." (PE T4)*

*"Our subject is a performance task, so it's hard for the student to rate if they really did their best for the performance because they just get a video of themselves or pictures, or sometimes none just right for the performance task". (PE T5)*

In the present scenario, according to Rana et.al (2020), it is not efficient to teach psychomotor skills since there are limitations of online learning. Despite the fact that Physical Education teachers do their best to teach the students, this is related to their behavior, interpretation, appraisal, assessment, contentment, and outcomes (Gonzalez & Louis, 2018; Sun, 2014). The most difficult challenge that Physical Education teachers have faced during the COVID-19 pandemic is determining how to assess students' performance. This was

concluded on the study of Fauzi, & Khusuma (2020) that one of the problems encountered in online learning during COVID-19 pandemic is how to evaluate learning. Although students are sending their videos in performing the activity or skill yet, it is not a guarantee that it is enough to check their performances online. It is also time consuming if the students will perform during a synchronous session. Consequently, there is really a need to investigate the effectivity of the online assessment given to the students.

The result denotes that Physical Education teachers are having a hard time teaching the skills or movement, including in the assessment of the students' actual performance. Therefore, there is a need to modify the instruction and strategies in assessing students' performance in this time of COVI-19 pandemic.

### Themes 3.1.5 Health and Wellbeing

Teachers are experiencing an increase in stress and burnout during pandemic. It is difficult to maintain a healthy lifestyle in this time of a COVI-19 pandemic because of the limited mobility. Physical education teachers are one of the human resources in the educational system, and their major concern is teaching the students. The no-face-to-face classes and the work from home scheme using technologies and platforms somehow became one of the challenges that the Physical Education teachers encountered in this COVID-19 pandemic, and the following are the responses of the participants:

*“The technology can cause some mental illness, because it also has radiation when we always focus on the computer or any gadget.” (PE T1)*

*“I need to prepare myself because this battle is not easy and in terms of planning, the syllabus should be anchored to the learning objectives that the students should have achieved at the end of the lesson, so syllabus should be prepared mentally, physically, and emotionally, especially on the part of the instructor.” (PE T2)*

*“So, for physiological aspects, sometimes we are hmm. Not just sometimes but commonly, we are stressed because of those repeated queries from our students, which are something like repeated. We have already given them lengthy instructions, but we cannot really deny the fact and that it's inevitable that our students would really ask questions that have already been instructed, so it's going to create mental stress to us.” (PE T6)*

The result was supported by Dabrowski (2020) points out that teacher well-being matters, teachers who experience anxiety are less effective in supporting student well-being, and student outcomes. This is also supported by Briner & Dewberry (2007) indicated that improving school performance has a positive impact on school well-being and improving teacher well-being also improves student outcomes. According to Asmundson and Taylor (2020) aside from diseases' symptoms that the pandemic brings to humans it also affects human emotions and Bao et al (2020) also added that worry, panic, anxiety, or depression-related distress can appear more commonly among people.

Physical Education teachers needs to response to many challenges in times of COVID-19 pandemic. Teachers are great influencer to their students as far as cognitive development is concern. However, because of the recent situation, teachers have been fighting a battle to overcome the stress and anxiety that the COVID-19 pandemic has brought into the workplace and even at home. Connecting students through online is not an easy task to do, this requires patience and skills on the delivery of their teaching online. Hence, it is a top priority for the Physical Education teachers to give time to engage in relaxation, recreational activities and bonding with their family and friends. They need to give time and focus on physical, mental and emotional health in order to be more productive in teaching Physical Education subject.

This implied that teachers should prioritize their own mental and well-being in which will benefit them and the whole community. Physical Education teachers must give importance to mental and wellbeing activities like self-care such as involving themselves in physical activity and have time to catch up with family and friends. Thus, this will help improve and maintain holistic well-being of the Physical Education teachers in this time of COVID-19 pandemic.

#### **4. Proposed Intervention Plan**

The findings of the study have developed a proposed intervention plan to answer the gap created by the study based on the results. The design intervention plan will address the areas of concern regarding the challenges faced by Physical Education teachers in online Physical Education teaching during the COVID-19 pandemic. Online teaching is one of the modalities that can be used by PE teachers in times of the COVID-19 pandemic. This modality is divided into two: the synchronous and asynchronous modes of teaching. Synchronous learning is an actual meeting that happens between the teacher and students in a real-time interaction. This may happen on or offline. Meanwhile, asynchronous learning does not happen in real time. This time, a teacher could just forward a digital module, activity, or videos using the learning management system for the students to watch or comply with. Based on the findings of the study, the challenges encountered by the PE teachers in teaching online classes can be addressed by the intervention plan on poor internet connectivity, difficulty in teaching, learning modalities, learning assessment, and health and well-being. Hence, an intervention plan was developed to improve the quality of teaching and learning in physical education using an online modality.

The proposed intervention plan for teachers in online physical education teaching during the COVID-19 Pandemic seeks to attain the following: (1) to develop appropriate interventions to address the challenges that teachers face when teaching PE online during the COVID-19 pandemic. (2) to make it easier for teachers to use the interventions identified to address the challenges they face when teaching PE online during the COVID-19 pandemic. (3) To use the intervention plan to improve the way online physical education classes are taught during the COVID-19 pandemic.

To solve the challenges of poor internet connectivity, it is high time to recommend to the administration to add additional bandwidth to the internet connectivity inside the school campus. It is deemed to identify PE teachers with poor connectivity in their respective areas and a dissemination drive on the additional bandwidth internet connectivity in schools must be done for awareness. In addressing the difficulty in teaching, a mechanism must be established, like conducting an online webinar on the teaching pedagogy in line with the PE program. This initiative will relieve PE teachers of the burden of teaching the subject online. To address the PE teachers' challenges in learning modalities, it is essential to strengthen the use of online teaching using technologies. Thus, the use of a Learning Management System (LMS) should be introduced to PE teachers and students, and it is essential to orient and establish the importance of online modalities by participating in an online LMS workshop.

To support and address the challenges of learning assessment, workshops and webinars are needed to enhance PE teachers' ability to learn different learning assessments in online teaching and equip them to use them in online teaching. Lastly, the PE teachers experience problems with their personal health and well-being. These challenges can be addressed by conducting a health and wellness program at the university. Hence, this would promote PE teachers' health and well-being to be physically, mentally, emotionally, and socially fit to work and to be more productive despite the problems they have encountered in this pandemic.

## 5. Conclusion

The result of the article on the challenges of physical education teachers using online learning modality in times of COVID-19 pandemic confirmed that the narrative accounts of the participants through the discussion puts value on the themes that appeared in the conduct of the qualitative research. The challenges on poor internet connectivity, difficulty in teaching, learning modalities, learning assessment, health and wellbeing must be given attention for the physical education teachers to continually perform their duties and responsibilities in giving the best education to their students.

Furthermore, the result provided a clearer effect of the COVID-19 pandemic and brought challenges to the PE teachers using the online teaching modality. To address the challenges, there is a need to synergize with the officials and teachers in order to come up with a relevant curriculum, pedagogy, assessment, and technology to improve support to the resources needed to enhance online modality.

Moreover, the proposed intervention program should be executed to address the PE teachers needs for the improvement of the online learning modality using suitable solution to the problems encountered by the physical education teachers in times of COVID-19 pandemic.

This paper draws attention to the recent problem of physical education teachers who are having trouble with online learning. Administrators and teachers have worked together to come up with effective ways to teach so that learning doesn't stop during the pandemic. In response to significant demands in today's educational system, this paper will serve as a reference for future studies related to pandemics that might happen in the future. Moreover, a similar study can be conducted to determine the effectiveness of PE instruction and students' performance using an online learning modality in the field of physical education.

## References

- Asmundson, G. J. G., and Taylor, S. (2020). Coronaphobia: fear and the 2019-nCoV outbreak. *J. Anxiety Disord.* 70:102196. doi: 10.1016/j.janxdis.2020.102196
- Atmojo1, A.E.P, and Nugroho, A. (2020) EFL Classes Must Go Online! Teaching Activities and Challenges during COVID-19 Pandemic in Indonesia Vol. 13, No. 1, (2020), pp.49-76 p-ISSN: 1979-8903 e-ISSN :2503-040X Website: <http://journalregister.iainsalatiga.ac.id/index.php/register/>
- Bao, Y., Sun, Y., Meng, S., Shi, J., and Lu, L. (2020). 2019-nCoV epidemic: address mental health care to empower society. *Lancet* 22, e37–e38. doi: 10.1016/S0140-6736(20)30309-3
- Briner, R., & Dewberry, C. (2007). *Staff Well-Being is Key to School Success*. London: Worklife Support Ltd/Hamilton House.
- Bhandari, V. (2020) Improving Internet Connectivity During COVID-19 Digital Pathways at Oxford Paper Series; no. 4. Oxford, United Kingdom (2020), Available at SSRN: <https://ssrn.com/abstract=3688762> or <http://dx.doi.org/10.2139/ssrn.36882>
- Cahapay, M.B (2020) Rethinking Education in the New Normal Post-COVID-19 Era: A Curriculum Studies Perspective DOI: 10.29333/aquademia/8315
- Caulfield, J. (2019) How to do Thematic Analysis. <https://www.scribbr.com/methodology/thematic-analysis/>

- CHED. (2020). CHED COVID-19 ADVISORY NO. 6. Retrieved from <https://ched.gov.ph/wp-content/uploads/CHED-COVID-19-Advisory-No.-6.pdf>
- Creswell, J. (2002), *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, Merrill Prentice-Hall, Upper Saddle River, NJ.
- Dabrowski, A (2020). Teacher wellbeing during a pandemic: Surviving or thriving? *Social Education Research*, 35–40. <https://doi.org/10.37256/ser.212021588>
- Escobar, P.S. & Morrison, A. (2020). Online teaching placement during the COVID-19 pandemic in Chile: Challenges and opportunities, *European Journal of Teacher Education*, 43:4, 587-607, DOI: 10.1080/02619768.2020.1820981
- Fauzi, I., & Sastra Khusuma, I. (2020). Teachers' Elementary School in Online Learning of COVID-19 Pandemic Conditions. *Jurnal Iqra' : Kajian Ilmu Pendidikan*, 5(1), 58-70. <https://doi.org/10.25217/ji.v5i1.914>
- Gonzalez, D., & Louis, R. St. (2018). Online Learning. In J. I. Liantas (Ed.), *The TESOL Encyclopaedia of English Language Teaching* (1st ed.). <https://doi.org/10.1002/9781118784235.eelt0423>
- Jeong, H.C. and So, W.Y. (2020) Difficulties of Online Physical Education Classes in Middle and High School and an Efficient Operation Plan to Address Them
- Haavind, S. (2000, Fall). Why Don't Face-to-Face Teaching Strategies Work In the Virtual Classroom? [Electronic version]. *The Concord Consortium*. Vol. 4 No. 3. 9.
- Pokhrel, S and Chhetri, R (2021). A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning. [in.sagepub.com/journals-permissions-india](https://www.sagepub.com/journals-permissions-india) DOI: 10.1177/2347631120983481
- Rana, W., Mukhtar, S., & Mukhtar, S. (2020). Mental health of medical workers in Pakistan during the pandemic COVID-19 outbreak. *Asian journal of psychiatry*, 51, 102080. <https://doi.org/10.1016/j.ajp.2020.102080>
- Ribeiro, R. (2020, April 14). How university faculty embraced the remote learning shift. *EdTechMagazine*, <https://edtechmagazine.com/higher/article/2020/04/how-university-faculty-embraced-remote-learning-shift>
- Unal, M (2015). An Investigation on Revealing the Learning Modalities of Undergraduate Students. <https://doi.org/10.5897/ERR2015.2342>