



## Perceived Performance of Cooperating Schools: Gearing Towards Future Policies

Rosanna D. Gonzales, Marjorie M. Collado, Cherrie Dianne M. Mila

### Abstract

Part of providing quality education is the quest to continually improve one's service delivery since competition is now the essence of time. In the academic field, inputs in the life of pre-service teachers are considered to be of utmost significance. These include the cooperating teachers as well as the cooperating officials who may directly or indirectly influence the future would-be-teachers, the learners who may inspire them more and the learning environment that may significantly affect their desire to enter the world of teaching upon completion of the internship. This study determined the performance of the cooperating schools as perceived by the selected elementary and secondary education students enrolled during the second semester of the calendar year 2019 in one of the higher education institutions in the Philippines offering a teacher-education program. Employing the quantitative (descriptive) research design, the results revealed that the cooperating schools' over-all performance was excellent. However, the performance rank of the indicated factors along the cooperating schools' selected variables (i.e. cooperating teachers, cooperating officials, learners, and learning environment) vary. In general, among all the factors included in the four main elements in the cooperating school; the learning environment particularly on functional, medical and dental facilities gained a very good rating.

**Keyword:** cooperating school, performance, pre-service teachers, quantitative research,

**Published Date:** 8/1/2020

**Page.141-151**

**Vol 8 No 08 2020**

**DOI:** <https://doi.org/10.31686/ijer.vol8.iss8.2500>

# Perceived Performance of Cooperating Schools: Gearing Towards Future Policies

**Rosanna D. Gonzales, Marjorie M. Collado, Cherrie Dianne M. Mila**

Pangasinan State University  
[rosanna\\_gonzales0906@yahoo.com](mailto:rosanna_gonzales0906@yahoo.com)

## Abstract

*Part of providing quality education is the quest to continually improve one's service delivery since competition is now the essence of time. In the academic field, inputs in the life of pre-service teachers are considered to be of utmost significance. These include the cooperating teachers as well as the cooperating officials who may directly or indirectly influence the future would-be-teachers, the learners who may inspire them more and the learning environment that may significantly affect their desire to enter the world of teaching upon completion of the internship. This study determined the performance of the cooperating schools as perceived by the selected elementary and secondary education students enrolled during the second semester of the calendar year 2019 in one of the higher education institutions in the Philippines offering a teacher-education program. Employing the quantitative (descriptive) research design, the results revealed that the cooperating schools' over-all performance was excellent. However, the performance rank of the indicated factors along the cooperating schools' selected variables (i.e. cooperating teachers, cooperating officials, learners, and learning environment) vary. In general, among all the factors included in the four main elements in the cooperating school; the learning environment particularly on functional, medical and dental facilities gained a very good rating.*

**Keywords:** *cooperating school, performance, pre-service teachers, quantitative research, Philippines*

## INTRODUCTION

Part of becoming a successful Teacher Education Institution is being able to strengthen one's coordination, collaboration and cooperation with partners particularly the business industries, agencies, individuals and stakeholders (Evjen, 1967). It is a fact that as a higher education institution offering teacher education programs, part of the system already is to take into consideration the crucial and great role of cooperating schools that provide a link between theory and practice (Ash, et al. 2012). It is in these cooperating schools where the pre-service teachers are expected to put into practice the bulk of knowledge, attitudes, skills and values that they have learned from their subjects that include general education, professional education, concentration areas and specialization areas. The successful attainment of the student teaching program lies in the full support of every entities involve in the activity (Libao, 2010). In other words, the cooperating teachers, the cooperating officials, the learners, and the learning environment are of high significance in making or breaking the future of a soon to be the professional teacher. It makes sense if we use as a working

framework the 17 sustainable development goals wherein the 4<sup>th</sup> to be considered is the provision for a quality education (UN, 2017). Providing quality education will prepare the practice teachers of today a better, competent and competitive individuals in educating the next set of learners. Thus, it implies that the kind of education that they receive now will have an impact to them upon the completion of their respective degree programs.

Pangasinan State University (PSU)-Infanta is one among the thousands of campuses/institutions catering the needs of students dreaming to be a part of the teaching profession. As a committed service provider who has the end-goal in mind to produce graduates capable of educating the future generations of their time, it is just proper to conduct such study in order to meet the fast-changing needs of the time in the teaching field. Hence, such study.

### **Objectives of the Study**

The study sought to determine the:

1. over-all performance rank of the cooperating schools' selected variables as perceived by the pre-service teachers?
2. perceived level of performance and rank by the pre-service teachers along the indicated factors in cooperating schools':
  - a. cooperating teachers,
  - b. cooperating officials,
  - c. learners, and;
  - d. learning environment?

## **METHODOLOGY**

### **Research Design**

The quantitative descriptive-evaluative research design was applied in the study wherein the focus was on the performance of the cooperating schools as a training ground in order to determine whether or not the said Teacher-Education-Institution counter possess the minimum qualification standards so that the best experience can be gained by the pre-service teachers and to develop within them the desirable characteristics that they may live in as an individual and as a future professional (Alharbi, 2015).

### **Respondents**

The respondents of the study were the fifty-three (53) practice teachers enrolled in the Student Teaching Program of the Second (2<sup>nd</sup>) Semester, Calendar Year 2019 wherein thirty (30) of them were from the Bachelor of Elementary Education program while the remaining twenty-three (23) were from the Bachelor of Secondary Education -major in Social Studies.

### **Locale of the Study**

The study was conducted in the District of Infanta, Pangasinan, Philippines where the practice teachers were deployed. Said cooperating schools (Infanta Integrated School, Cato National High School, Cato

Elementary School and Bamban Elementary School) are recognized and have executed a corresponding Memorandum of Agreement between the teacher education institution-PSU and the Department of Education (DepEd).

### **Instrument**

The main instrument used in data gathering was the Evaluation Checklist for Cooperating Schools (FM-AA-PPT-09) provided in the Quality Management System (QMS) in conformity with the requirements of ISO 9001:2015). Included in the questionnaire were the cooperating schools' selected variables specifically these were the cooperating teachers, the cooperating officials, the learners and the learning environment. Each identified variable is composed of specific indicators applicable to such and are rated as 5-always observed, 4-often observed, 3 sometimes observed, 2-rarely observed, and 1- not observed (QMS Manual).

### **Procedure**

The instrument was personally administered by the Practice Teaching Supervisor to the Practice Teachers after conducting their student teaching course at their respective cooperating schools.

### **Data Analysis**

The data gathered was analyzed by the use of mean, average weighted mean (AWM) and ranking. The performance level of cooperating schools was verbally described as Very Poor (1.0-1.80); Poor (1.81-2.60); Good (2.61-3.40); Very Good (3.41-4.20) and Excellent (4.21-5.0).

## **RESULTS AND DISCUSSION**

The succeeding discussions and table presentations contain the detailed results in order to answer the specific questions posed in the study.

### **On Over-all performance rank of cooperating schools**

The cooperating schools are those public elementary and secondary schools duly acknowledged and accredited by the DepEd to serve as the partner agency of higher education institutions (HEIs) in producing professionals of tomorrow. Undeniably, the graduates of the HEIs will soon be the applicants of the said agency, that is why a close monitoring and 100% support from said institutions are guaranteed and secured to fully comply with the rigorous requirements of the teacher education program. These cooperating schools are therefore marked as "the cooperative schools" all for the sake of achieving the desired characteristics to be developed within the practice teachers and further to showcase the positive attributes of a cooperating school worthy of emulation and thus will encourage the practice teachers to continually study and work hard by playing multi-faceted roles.

Table 1 revealed that along the selected cooperating schools' selected variables such as the cooperating teachers, cooperating officials, the learners and the learning environment were perceived to be "excellent" with an average weighted mean (AWM) of 4.52. This implies that the components of the cooperating

schools where the practice teachers conducted their student teaching activities had at par meet the expected standards set by the DepEd and HEIs to deliver the service needs of the practice teachers.

It was also shown in the table that among the components of the cooperating schools, the cooperating officials' performance ranked 1<sup>st</sup>, followed by the learners, and both the cooperating teacher and the learning environment received the same rank.

Table 1. Over-all performance rank of cooperating schools' along selected variables

Variables	BSE			BEE			AWM
	Mean	VD	Rank	Mean	VD	Rank	
a. Cooperating Teachers	4.61	Excellent	2	4.39	Excellent	3.5	4.5
b. Cooperating Officials	4.72	Excellent	1	4.53	Excellent	1	4.62
c. Learners	4.47	Excellent	4	4.50	Excellent	2	4.48
d. Learning Environment	4.56	Excellent	3	4.44	Excellent	3.5	4.5
<b>AWM</b>	<b>4.59</b>	<b>Excellent</b>		<b>4.46</b>	<b>Excellent</b>		<b>4.52</b>

### On Perceived performance of the Cooperating Teachers

During the practicum phase in the life of a practice teacher his/her ideals, beliefs, attitude, skills and values are subjected to change. This can be attributed to the significant person who may bring positive influence in the many ways of facing the challenges and prospects of becoming a future teacher – this is no other than the “cooperating teacher” who is expected to discover, mold and enhance the potentials of the assigned intern in to him/her (Anderson, 2009). A great number of professional teachers measure success through their academic achievements and more on large number of lives they had touched and transformed through teaching the pupils/students and practice teachers assigned to them. Much of their matured role as a mentor are being shared to the practice teachers whom they are honing the necessary experiences to overcome the challenges that might come across their way once they are already called as a full-fledged teacher who may also serve the same role once they meet the set requirement (Clarke, et al., 2014).

The table below showed that the cooperating teachers' performance across all the indicators were “excellent” wherein top three (3) on the list were on checking and re-checking the lesson plans, providing the practice teacher with necessary background about individual pupil in the class, and maintaining consistent standards of classroom behavior and environment of mutual respect. It implies that for the cooperating teachers extra care and effort was given attention in lesson planning since this will serve as the main guide of the practice teacher in making the class stay attentive and for him/her not to be lost once she is teaching (Nesari and Heidari, 2014). This confirms the result of the study conducted by the Department of Education and Science (2006) wherein they found out in their evaluation on Learning to Teach that a little over half (58%) of the student teachers received excellent, very good or good on planning for integration and 75% of them planned satisfactorily in the use of resources. Second and third in rank will help the practice teacher promote a relaxed, safe and secured classroom atmosphere that may make the

pupils/students feel the sense of belongingness and become an active and more responsive to the class activities (Singh, 2014; Salayog, et.al. 2019). On the other hand, the least in rank were holding regular conferences with the practice teacher's strong and weak points, initiating practice teacher's activities within the bounds of officially-approved program, and observing the actual performance of the practice teacher.

Table 2. Performance of the Cooperating Teachers

Variables	BSE		BEE		AWP	VD	Rank
	Mean	VD	Mean	VD			
a. The Cooperating Teachers							
1. Maintain consistent standards of classroom behavior and environment of mutual respect.	4.75	Excellent	4.45	Excellent	4.6	Excellent	3
2. Check and re-check the lesson plans of the practice teacher.	4.68	Excellent	4.7	Excellent	4.69	Excellent	1
3. Observe the actual performance of the practice teacher.	4.59	Excellent	4.2	Very Good	4.39	Excellent	8
4. Hold regular conferences with the practice teacher on his/her strong and weak points.	4.56	Excellent	3.95	Very Good	4.25	Excellent	10
5. Initiate practice teacher's activities within the bounds of officially-approved program.	4.59	Excellent	4.15	Very Good	4.37	Excellent	9
6. Provide a relaxed atmosphere and encourages a friendly working relationship with the practice teacher.	4.65	Excellent	4.45	Excellent	4.5	Excellent	6
7. Provide the practice teacher with necessary background about individual pupil in the class that he/she gains more insights in teaching all members of the class.	4.62	Excellent	4.65	Excellent	4.66	Excellent	2

8. Guide the practice teacher in the preparation of various school forms.	4.53	Excellent	4.5	Excellent	4.51	Excellent	4.5
9. Guide the practice teacher in administering examinations, scoring, recording, and computing grades of the pupils/students.	4.53	Excellent	4.5	Excellent	4.51	Excellent	4.5
10. Evaluate objectively the performance of the practice teacher at the end of the program.	4.62	Excellent	4.35	Excellent	4.48	Excellent	7

**On Perceived performance of the Cooperating Officials**

The cooperating officials play a significant role not only for their teachers but to the practice teachers as well. The strong support given to both will boost the power of team effort which will produce a more positive atmosphere and will encourage the cooperating teachers to assist more the practice teachers. Likewise, the practice teacher’s spirit will be more delighted in performing their tasks at their cooperating school.

It can be gleaned in table 3 that cooperating officials’ orient the practice teachers on the operational program of the school, the structure of leadership and management pertinent data related to the program, however; monitoring and observing practice teacher’s performance was ranked fifth (5<sup>th</sup>) which coincides with the result gathered in table 2. This means that top in consideration the cooperating officials is to make the practice teachers aware on the “background” of the cooperating school in order for them to be properly guided on the school’s set-up and abide with its guiding principles, philosophy, rules and regulations.

Table 3. Performance of the Cooperating Officials

Variables	BSE		BEE		AWP	VD	Rank
	Mean	VD	Mean	VD			
<b>b. The Cooperating Officials</b>							
1. Orient the practice teachers on the operational program of the school, the structure of leadership and management pertinent data related to the program.	4.84	Excellent	4.7	Excellent	4.77	Excellent	1
2. Implement existing rules and regulations of the Dep-Ed with	4.68	Excellent	4.7	Excellent	4.67	Excellent	2

regards to curricular program on practice teaching.							
3. Observe a class conducted by the practice teachers during demonstration and as the need arises.	4.75	Excellent	4.45	Excellent	4.6	Excellent	3
4. Monitor and observe practice teacher's performance.	4.65	Excellent	4.35	Excellent	4.5	Excellent	5
5. Discuss with the cooperating teachers' problems related to the performance of the practice teachers.	4.68	Excellent	4.45	Excellent	4.56	Excellent	4

### On Perceived performance of the Learners

The learners are known to be the focus of the prime movers (teachers) in a teacher-centered learning environment. The learners' top-rated performance as reflected in Table 4 was on responding to the strategies and approaches used by the practice teachers. As pointed by the study conducted by Ganyaupfu (2013) student-centered strategy/method motivates pupils/student's goal-oriented behavior while they rated last the values and attitudes anchored on the vision, mission and core values of Dep-Ed possessed by the learners.

Table 4. Performance of the Learners

Variables	BSE		BEE		AWM	VD	Rank
	Mean	VD	Mean	VD			
<b>c. The Learners</b>							
1. Possess the values and attitudes anchored on the vision, mission and core values of Dep-Ed.	4.53	Excellent	4.15	Excellent	4.34	Excellent	5
2. Are physically, socially and academically active.	4.46	Excellent	4.55	Excellent	4.50	Excellent	2
3. Have the facility to use verbal and non-verbal communication skills.	4.37	Excellent	4.5	Excellent	4.43	Excellent	3
4. Respond to the strategies and approaches used by the practice teachers.	4.53	Excellent	4.75	Excellent	4.64	Excellent	1
5. Observe rules and regulations of the school.	4.34	Excellent	4.4	Excellent	4.37	Excellent	4



### On Perceived performance of the Learners

As stated in the paper of Anderson (2017) the new learning environment is holistic and integrated which promotes opportunities for lifelong learning which according to Laal (2011) aids in the acquisition of skills for survival. The cooperating schools' learning environment reflected that there the principal's office is accommodating, the canteen is managed by TLE teacher and the classrooms are conducive for learning, however; least in the rank were the functional medical and dental facilities, guidance/counseling facilities and services, and library with books and other learning resources for pupils/students' use.

Table 5. Performance of the Learning Environment

Variables	BSE		BEE		AWP	VD	Rank
	Mean	VD	Mean	VD			
d. The Learning Environment							
1. Has enough classrooms conducive for learning.	4.78	Excellent	4.55	Excellent	4.66	Excellent	3
2. Has library with books, and other learning resources to be used by the pupils/students.	4.5	Excellent	4.05	Very Good	4.27	Excellent	8
3. Has technology like computer, DLP, camera, laptop, television set.	4.75	Excellent	4.3	Excellent	4.52	Excellent	5
4. Has guidance and counseling facilities and services.	4.37	Excellent	4.05	Very Good	4.21	Excellent	9
5. Has sports and recreational activities.	4.34	Excellent	4.4	Excellent	4.37	Excellent	7
6. Has functional medical and dental facilities.	3.81	Very Good	3.9	Very Good	3.85	Very Good	10
7. Has canteen managed by TLE teachers, dietician or nutritionist.	4.59	Excellent	4.75	Excellent	4.67	Excellent	2
8. Has clean comfort rooms.	4.25	Excellent	4.65	Excellent	4.45	Excellent	6
9. Has room/office for holding conferences.	4.46	Excellent	4.55	Excellent	4.50	Excellent	4
10. Has Principal's office with accommodating ambiance.	4.87	Excellent	4.85	Excellent	4.86	Excellent	1

## CONCLUSION

The cooperating schools' exceeded the performance required to holistically develop and bring out the best characteristics and potentials of the practice teachers through the presence of the cooperating teachers who attend to the priority need areas of the practice teachers in order for them to execute properly the subject matter for the pupils/students through a well-prepared lesson plan with consideration of the nature of the learners in a sound and friendly environment. On the same manner, the cooperating officials do consider the vital role of making the practice teachers knowledgeable about the cooperating school's information. The cooperating schools' learners are classified as active, are diversified in learning styles and are responsive to various teaching approaches. Likewise, the learning environment is characterized by value-driven in dealing with their customers as reflected in the office of the principal. Such performance should be sustained.

## RECOMMENDATION

The cooperating teachers and cooperating officials may enhance their monitoring scheme in close supervision and observation to the practice teachers. The cooperating schools' learners must understand the DepEd values and attitudes by integrating it within their subjects and for them to instill at their early age the core values of the agency. A more functional and evident medical-dental facilities can be considered in all cooperating schools to promote higher health access for the pupils/students.

A follow-up study using a wider scope can be conducted by taking into consideration the profile of the cooperating school, the cooperating teachers, the cooperating officials and the learners. The extent of the service/s received from the various facilities, equipment and physical structures provided by cooperating schools can be a priority research area of interest.

The problems encountered by the practice teachers towards their student teaching activity can be included as an objective.

The evaluation of the significant others on the performance of practice teaching program, and practice teachers can help the teacher education institutions address the present needs and demands of the cooperating schools can be another research aspect so as cope with the set criteria by the DepEd.

## REFERENCES

- [1] Alharbi, Ahlam. (2015). A descriptive-evaluative study of a Saudi EFL textbook series. *Cogent Education*. 2. 10.1080/2331186X.2015.1079946.  
[https://www.researchgate.net/publication/281643010\\_A\\_descriptive-evaluative\\_study\\_of\\_a\\_Saudi\\_EFL\\_textbook\\_series/citation/download](https://www.researchgate.net/publication/281643010_A_descriptive-evaluative_study_of_a_Saudi_EFL_textbook_series/citation/download)  
Accessed: November 20, 2019
- [2] Pangasinan State University (2017). *Quality Management System (QMS) Manual*.  
Evjen, Martle (1967). The Role of Cooperating School. *Journal of Teacher Education*. Vol. 18, Issue 4, 1967.  
<https://doi.org/10.1177/002248716701800407>

<https://journals.sagepub.com/doi/abs/10.1177/002248716701800407?journalCode=jtea>

Accessed on November 20, 2019

- [4] Libao, Manuel E. (2010). Institutional Capability of Cooperating Schools of the DMMMSU Teacher Education Program: An Analysis. E-International Scientific Research Journal ISSN: 2094-1749 Volume: 2 Issue: 1, 2010 76  
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.153.7690&rep=rep1&type=pdf>  
Accessed November 20, 2019
- [5] Ash, Doris, Rahm, Jrene and Melber, Lea (2012). Putting theory into practice. New Directions in Mathematics and Science Education: Tools for Research in Informal Settings. Sense Publishers: Rotterdam.  
<https://www.sensepublishers.com/media/1351-putting-theory-into-practice.pdf>  
Accessed November 20, 2019
- [6] United Nations (UN). (2017) The Sustainable Goals Development Report.  
<https://sdgactioncampaign.org/wp-content/uploads/2017/07/TheSustainableDevelopmentGoalsReport2017.pdf>  
Accessed November 20, 2019
- [7] Anderson, Derek. (2009). The Impact of Cooperating Teachers on the Teaching Perspectives of Student Teachers. International Journal of Learning. 16. 119-133. 10.18848/1447-9494/CGP/v16i01/45883.  
[https://www.researchgate.net/publication/289861056\\_The\\_Impact\\_of\\_Cooperating\\_Teachers\\_on\\_the\\_Teaching\\_Perspectives\\_of\\_Student\\_Teachers/citation/download](https://www.researchgate.net/publication/289861056_The_Impact_of_Cooperating_Teachers_on_the_Teaching_Perspectives_of_Student_Teachers/citation/download)  
Accessed November 20, 2019
- [8] Clarke, Anthony, Triggs, Valerie and Nielsen, Wendy. (2014). Cooperating teacher participation in teacher education: a review of the literature. Review of Educational Research, 84 (2), 163-202  
<http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1902&context=sspapers>  
Accessed November 20, 2019
- [9] Nesari, Ali Jamali and Heidari, Mina. (2014) The Important role of Lesson Plan on Educational Achievement of Iranian EFL Teachers' Attitudes. International Journal of Foreign Language Teaching and Research. Vol 3, Issue 5, Spring 2014.  
[https://www.academia.edu/30773104/The\\_Important\\_Role\\_of\\_Lesson\\_Plan\\_on\\_Educational\\_Achievement\\_of\\_Iranian\\_EFL\\_Teachers\\_Attitudes\\_by\\_Ali\\_Jamali\\_Nesari](https://www.academia.edu/30773104/The_Important_Role_of_Lesson_Plan_on_Educational_Achievement_of_Iranian_EFL_Teachers_Attitudes_by_Ali_Jamali_Nesari)  
Accessed November 20, 2019
- [10] Singh, Anjali. (2014). Conducive Classroom Environment in Schools. International Journal of Science and Research (IJSR). Vol 3, Issue 1, January 2014. 387-391.  
<https://www.ijer.net/archive/v3i1/MDIwMTM4MzE=.pdf>  
Accessed November 20, 2019
- [11] Salayog, Crisanto C., Estacio, Eugene A., Marcelo, Carlos A. and Gonzales, Rosanna D. (2019). Student Satisfaction on Selected Institutional-Based Services. Asia Pacific Journal of Education, Arts and Sciences. Vol 6, No. 2, April 2019  
<http://apjeas.apjmr.com/vol-6-no-2/>

Accessed November 20, 2019

- [12] Department of Education and Science. (2006). Stack, Eamon, Chief Inspector. Learning to teach: Students On Teaching Practice In Irish Primary Schools.  
[https://www.education.ie/en/Publications/Inspection-Reports-Publications/Evaluation-Reports-Guidelines/insp\\_learning\\_to\\_teach\\_pdf.pdf](https://www.education.ie/en/Publications/Inspection-Reports-Publications/Evaluation-Reports-Guidelines/insp_learning_to_teach_pdf.pdf)

- [14] Ganyaupfu, Elvis Munyaradzi. (2013). Teaching Methods and Students' Academic Performance. International Journal of Humanities and Social Science Invention ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714 [www.ijhssi.org](http://www.ijhssi.org) Volume 2 Issue 9| September. 2013| PP.29-35 [www.ijhssi.org](http://www.ijhssi.org) 29  
[http://www.ijhssi.org/papers/v2\(9\)/Version-2/E0292029035.pdf](http://www.ijhssi.org/papers/v2(9)/Version-2/E0292029035.pdf)

Accessed November 20, 2019

- [15] Laal, Marjan. (2011). Lifelong Learning: What does it Mean?. Procedia - Social and Behavioral Sciences 28 (2011) 470 – 474. 10.1016/j.sbspro.2011.11.090.  
[https://www.researchgate.net/publication/224767020\\_Lifelong\\_Learning\\_What\\_does\\_it\\_Mean/citation/download](https://www.researchgate.net/publication/224767020_Lifelong_Learning_What_does_it_Mean/citation/download)

Accessed November 20, 2019

- [16] Andersone, Rudite (2017). The Learning Environmentt in Today's School in the Context of Content Reform of Curriculum. RURAL ENVIRONMENT. EDUCATION. PERSONALITY. ISSN 2255-808X Jelgava, 12-13 May, 2017.  
[https://llufb.llu.lv/conference/REEP/2017/Latvia-Univ-Agricult-REEP-2017\\_proceedings-17-22.pdf](https://llufb.llu.lv/conference/REEP/2017/Latvia-Univ-Agricult-REEP-2017_proceedings-17-22.pdf)

Accessed November 20, 2019