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E-Learning Perception and Attitude among Agriculture Researchers, Scientists and Engineers in the Philippines

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Abstract

This quantitative study assessed the acceptability of e-learning platforms for researchers, scientists, and engineers of agriculture research and development (R&D) institutions in the Philippines in using e-learning platform for non-formal education based on their attitudes and perceptions. Data was obtained from a sample of 71 respondents from the partner agencies of the Department of Science and Technology's Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development, using an online survey instrument and scheduled key informant interview. Amidst the mixed understanding and perceptions, the general conclusion was that e-learning was accepted as an innovative way of improving and upscaling the capabilities of the human resources, and eventually operations of the organisation. However, since the respondents still preferred traditional classroom type of trainings, there is the need to further sensitise and educate the people on the advantages and features of online training courses and e-learning platforms for lifelong learning.

Keywords: e-learning perception, e-learning attitude, logistic regression model, selective perception theory

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INTRODUCTION

As we usher the fourth industrial revolution, we have seen how technological breakthroughs are already creating disruptions in our economic, social and educational sectors (Schwab, 2018). Along with this, globalization, changing demographics and climate change, are affecting the job market by creating more highly skilled jobs, but losing other jobs along the way (ILO, 2021). These developments have pushed educational institutions to develop innovative ways to reskill and upskill their workforce. Consequently, educational planners and policy makers have been redesigning new curricula in an attempt to prepare the workforce to meet the demands of the environment (Mouzakitis & Tuncay, 2011).

To cope with the demands of the globalization and enhance the employability of the workforce, formal and non-educational reforms need to take place. Because of the ubiquitous characteristic of the Internet, the academe and other organizations and enterprises have developed their Learning Management Systems (LMS) to support education and lifelong learning opportunities (Thakkar & Joshi, 2017). According to a review of national e-learning strategies, the two key drivers underlying the adoption of e-learning are (1) need to upskill the population to meet the challenge of the information and knowledge society and; (2) the need for accessible and flexible access to tertiary education to meet the changing nature of society and the lifelong learning agenda (Anderson, 2006).

Online learning activities have gaining ground, especially in the formal education sector during the pandemic (Tam & El-Azar, 2020). While e-learning platforms are getting more attention, more studies on learners' preferences within the online environments are still needed in various circumstances (Gülbahar & Alper, 2011). Correspondingly, the incorporation of online tools in the operations of institutions cannot be effective without the acceptance and/or compliance of the subjects who are directly involved.

This is because adult learners make decisions based largely on their perceptions. Perception is defined as the process of interpreting the messages of our senses to provide meaning and order to the environment (Sacks & Johns, 1960). Knowing that there is a strong link between an individual's perception and decision making, it is important to know what factors affect their perception. According to Saks and Johns (1960), there are three components to perception, namely the perceiver, the target or the object of perception, and the environmental factors affecting the process of perception.

Thus, this study aims to analyse how the perceivers, specifically researchers, scientists and engineers in the agriculture sector perceive e-learning platforms and what their views and dispositions are toward these modes of learning in an attempt to sustain personal development and lifelong learning. In particular, the study aims to:

1. Determine the attitudes and experiences of the participants towards e-learning as means for personal development and lifelong learning;
2. Determine the expectation of the participants towards e-learning as means for personal development and lifelong learning; and
3. Examine the motivations, perceived benefits and interests towards e-learning as means for personal development and lifelong learning.

The results of the study will help determine the prospects of e-learning in building effective programs for the agriculture sector to develop more T-shaped scientists, researchers and engineers.

METHODOLOGY

This study aimed to analyse the perception of researchers, scientists and engineers in the agriculture sector towards e-learning platforms and establish their views and dispositions are toward e-learning.

What are considered by Saks and Johns (1960) to be major factors of perception are the motivational state, emotional state, and experience. Comparably, the Selective Perception Theory expounds that individuals tend to interpret what they see on the basis of their interest, background, experience, and attitudes (Robbins, Judge, & Millett, 2015).

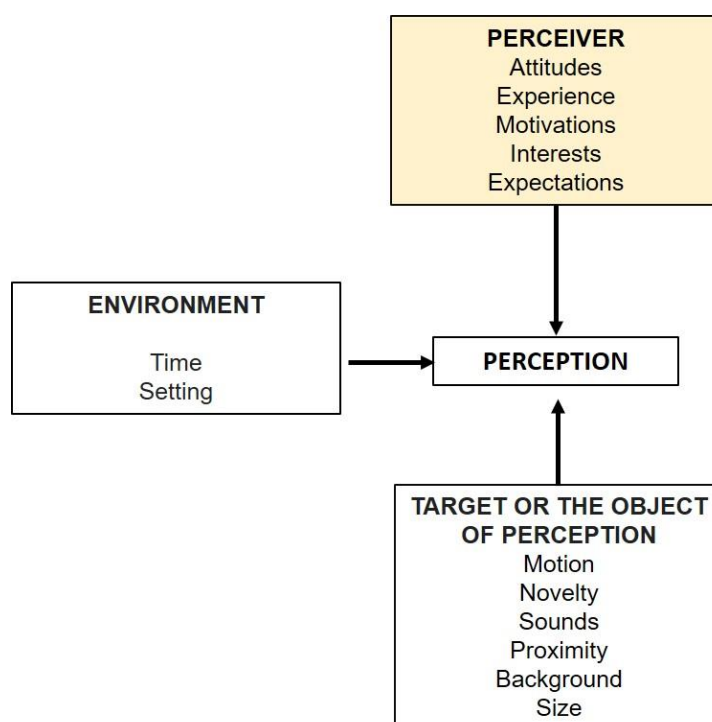


Figure 1. Factors Affecting Perception (Saks and Johns, 1960; Robbins, Judge & Millet, 2015)

Thus, these served as the framework for the study and in developing the survey instrument, accordingly.

To achieve the project objectives, a survey instrument was developed and distributed online. This instrument was a five-point Likert scale focusing on the perceived attitudes and experiences; expectations; benefits, motivations, and interests; as well as the dynamics of e-learning.

Respondents of the study were project managers and researchers from the Agriculture R&D organizations in the Philippines who were identified through stratified random sampling. These are faculty members, scientists, and researchers from various State Universities and Colleges in the Philippines, as well as other institutions, have been conducting Science and Technology (S&T) based R&D programs and projects on Agriculture, Aquatic and Natural Resources with funding from the agriculture council.

Preliminary results were subjected to Cronbach alpha testing to determine each question's consistency. According to the suggestions of (Coakes & Ong, 2011) a reliability analysis was

done to determine the internal consistency of the scales using the Cronbach's Alpha. The mathematical relation of the Cronbach's Alpha (Fraenkel and Wallen, 1996) is given as:

$$r_{kk} = \left(\frac{k}{k-1} \right) \left(1 - \frac{s_i^2}{s_x^2} \right)$$

where,

r_{kk} = estimated Cronbach's Alpha coefficient value

k = number of items in the questionnaire

s_i^2 = sum of item variance

s_x^2 = factor variances

The Logistic regression model as employed in the current study considers four different dependent variables (attitudes, expectations, benefits and dynamics) and the demographic characteristics as the independent variables. Thus;

$$\ln \left(\frac{p(x)}{1-p(X)} \right) = \beta_0 + \sum_{i=1}^k \beta_i x_i$$

The final survey instrument was distributed to the list of project leaders and researcher in the AANR who have R&D activities funded by DOST-PCAARRD. The methodologies considered were descriptive statistics, reliability analysis, and logistic regression analysis.

At the same time, a key informant interview (KII) was conducted to add qualitative depth to the information collected in the survey. For this study, a Deputy Director for R&D of an organization was interviewed, who is considered knowledgeable on the capacity building programs and activities of the organization.

RESULTS AND DISCUSSION

Overall, a sample size of 77 participants were contacted and a 92.21% response rate was achieved. The descriptive statistics of employee profiles are presented in Table 1 for only participants who completed and returned questionnaire. Out of the 71 respondents 53.52% were female, 57.75% were Master's degree graduates at the time of the research. More than 50% had worked with their organisation for more than 5 years. Majority of the respondents were researchers, while there were also administrative staff and affiliates who joined the survey.

Table 1. Demographic characteristics

	Number of responses (n)	Percentage (%)
Age group		
< 30	35	49.30
30 – 50	29	40.85
> 50	7	9.86
Gender		
Female	38	53.52
Male	33	46.48

Education			
	<i>Masters</i>	41	57.75
	<i>Bachelors</i>	18	25.35
	<i>PhD</i>	12	16.90
Related Position			
	<i>Academic</i>	3	4.23
	<i>Research</i>	39	54.93
	<i>Administration and affiliates</i>	29	40.85
Number of years			
	< 5	28	39.44
	5 – 10	23	32.39
	> 10	20	28.17

Attitudes and experiences towards e-learning

While learner's attitude has been considered one of the barriers to the use of technology in e-learning (Daniels & et.al., 2019), a systematic literature review by Rodrigues, et. al (2019), has established that students' satisfaction and experience are important indicators of the quality of e-learning experiences.

For this study, there was general agreement to the outlook that e-learning can be an effective tool for the training and staff development; that organisation and management should actively support e-learning activities to upgrade employee skills; and that e-learning is important under the new normal (Table 2).

Training and staff development as agreed by the respondents, is considered an important investment for both the organization and its employees, and as such should consider both the priorities and directions of the organization, as well as the strengths and potential of the employees, whether it be conducted in a traditional classroom type of training or automated (e-learning).

The support that the organisation gives to employees to empower themselves through online training courses had a wider dispersion. Though there was a general agreement to that statement, the wide dispersion of the responses indicates that there were much disagreement to some extent. Management support, therefore, is implied from the support of the organisation towards online trainings and the fact that training and staff development is decided by both managers and the employees.

These results are consistent with previous studies showing that organizations have positive outlook towards e-learning, and that it is an effective instructional strategy that can be used for imparting needed knowledge, skills, and attitudes in organizations (Derouin, Fritzsche, & Salas, 2005).

These findings were also coherent with the results of the KII. Foremost, the KII validated the fact that staff development plans are finalized through a series of consultative process that includes dialogues with the employee, immediate supervisors and up to the upper management level. The same development plans are likewise subject to periodical reviews to ensure that they remain relevant and timely as part of the overall human resource development plan of the organization.

All employees need to prepare their Professional Development Plan (PDP) which should be discussed first with the Director before its proper endorsement to the Management through the Personnel Section. These PDPs are part of and should be consistent with the organization's HRDP. Cross checking and validation with the concerned division is done especially when the plan is being implemented. In addition, the updating of the Human Resources Development Plan to include the PDP is a continuing activity among the units/divisions as it changes every now and then, depending on the status of the divisional manpower, needs and opportunities, i.e. funding support, priority areas, knowledge and skills to be acquired, etc.

Likewise, the KII also reveals that organizations already recognize the advantage of e-learning and support the participation of its employees in such activities. The interviewee also emphasized that importance of e-learning, particularly as we move towards the "new normal."

E-learning has been the most appropriate platform, for organizations locally and globally. For our officers and employees, every time there are invitations for webinar, online seminars, online trainings, etc., these are being widely disseminated, especially to the appropriate unit/s who should attend such online activity/ies and assign and encourage the appropriate staff to participate or even represent the organization to such activity.

E-learning has not been the usual platform for the employees to attend these activities, but I believe even if the global and local situations normalize, the e-learning platform may still be preferred in the conduct of some activities, because of its foreseen advantages, especially in terms of cost and logistics.

It was clear from the survey results that work and family pressure do not distract and cannot be an impediment to employee's participation in online trainings and learning activities. However, there was much disagreement based on the distribution of the individual responses around the mean. Despite the lack of enthusiasm from some employees, the collective response is an evidence that e-learning is becoming part and parcel of our daily activities as majority of the respondents disagreed to the statement that they do not find e-learning enjoyable. These findings resonate previous research which reported employees generally find e-learning to be enjoyable and would likely recommend e-learning to coworkers (Derouin, Fritzsche, & Salas, 2005).

Also, age was not considered a factor to e-learning as it could be an advantage to the aged, given them the opportunity to work and learn from home. This is consistent with the findings of the study in an Indian university which disclosed that age is not a significant criterion that affects computer attitude and e-learning attitude (Suri & Sharma, 2013). Rather it is the impact of self-theories on attitudes, goals, and behaviors that are considered as factors to e-learning. Thus, organizations need to support and promote training and lifelong learning to maximize the employees' flexibility, regardless of age (van Vianen, 2011). Overall, it was evident that e-learning is an essential component to upgrading the skills of employees and for promoting one's career.

Table 2. Attitudes and Experiences towards e-learning

	Mean \pm std ¹	N	Decision
Attitudes and Experiences			
Training and staff development plan is made together by the manager and the employee	4.49 \pm 0.77	71	Agree
Our organization has allowed my participation in past e-learning or online training courses	4.07 \pm 1.03	71	Agree
My manager has supported my attendance to trainings and e-learning activities	4.24 \pm 0.95	71	Agree
My work keeps me from participating in any e-learning or online training activity	2.89 \pm 1.18	71	Disagree
My family and personal life keeps me from participating in any e-learning or online training activity	2.39 \pm 1.2	71	Disagree
I do not find e-learning or online training activities enjoyable	2.11 \pm 1.24	71	Disagree
I feel I may be too old to participate in any e-learning or online training activity	1.54 \pm 0.86	71	Disagree
E-Learning is essential for updating my skills for career development	4.45 \pm 0.69	71	Agree
E-Learning or online trainings are useful under the "new normal"	4.72 \pm 0.59	71	Agree
I do not know how to access learning or online training activities	1.75 \pm 1.05	71	Disagree

Participants Expectations towards e-Learning

The successful adoption of e-learning entails not just the ability to accept change, but also appropriate organizational program design that will meet the learning needs of the adult learners as they shift from the traditional learning model to a more innovative and flexible one that allows adult learners to reskill and upskill in a less stressful work environment (Rodrigues & et.al, 2019).

¹ The standard deviation (SD) as stated in the results shows the extent to which the responses to the questions from the managers and researchers varied relative to the average response (mean). It can be observed that, most of them had varied concerns with respect to the attitudes and perceptions towards the e-learning/training but the consensus (mean) appears to be agreed by all unanimously.

Thus, in terms of expectations, respondents were of the view that the organisation should provide incentives for those employees who would like to complete e-learning or online training courses. Again, there was a varied opinion on this matter as responses were widely distributed around the average response.

On this aspect, the KII expounded that allowing the staff to attend the e-learning activity on official time, is already the incentive itself.

“Allowing the staff to attend and participate in this activity whether it is through an online platform or not, is already an incentive in itself as this would provide additional item to the staff’s credentials and may probably lead to his/her own professional growth.”

Regarding the mode of learning, the general sentiment was towards self-paced learning. The preference over self-paced over instructor-led synchronous training may be attributed to the fact that not all learners start on equal footing; and starting and finishing at the same time may be quite difficult for some. Thus, the flexibility of self-paced or asynchronous trainings is considered one of its advantages (Greener, 2007).

Table 3. Expectations towards e-Learning

	Mean ± std	N	Decision
Expectations			
Organizations should provide incentives for those who complete e-Learning or online training courses	3.76 ± 1.16	71	Agree
I prefer self-paced training course or e-learning modules than instructor-led online trainings	3.51 ± 1.08	71	Agree

Perceived Benefits, Motivations, and Interests towards E-Learning

The Technology Acceptance Model (TAM) presented by Davis has recognized perceived usefulness and benefits can help learners overcome the challenges of using new technologies (Chitanana & Museva, 2012).

With respect to the benefits of online training or e-learning, the employees/respondents of this study affirmed that e-learning has the potential to break through the learning barriers due to its ease of access, the mode of instruction (self-paced) and are more interactive as every subscribed member of the course would have to post their opinion, questions and requirements regularly. These are all consistent with the previous studies asserting that e-learning can deliver exactly what a student needs, at the time when he or she needs it, and in the form that he or she prefers (Mouzakis & Tuncay, 2011). Other favourable e-learning advantages reported were its accessibility, cost-effectiveness, and convenience (Derouin, Fritzsche, & Salas, 2005). Convenience likewise equates to the flexibility of learning, particularly with asynchronous e-learning.

Inasmuch as it was agreed that many topics could covered in an online or e-learning training courses and relevant to their work, it was disclosed that the learning through online trainings

may be more difficult compared with the traditional face-to-face training activities. While in general e-learning may be used as an option for non-formal education, it should be noted that the use of technology may not always be a viable option particularly for soft-skills and practical learning activities (Derouin, Fritzsche, & Salas, 2005). Nonetheless, in such cases e-learning platforms can be used for pre-course preparation, additional resources, and follow-up; and in particular, blended with classroom based learning and other types of learning maximize user experience (Greener, 2007). Same findings were echoed in the systematic literature review which revealed that exclusive online courses were considered less satisfactory than partially online courses (Rodrigues & et.al, 2019).

Likewise, effectiveness of e-learning also depends on intrinsic characteristics of learners. Studies have found it unsuitable for learners who need high levels of self-discipline, independence and motivation, and those who are not too comfortable manipulating technology (Greener, 2007).

The same perception on the limitations of e-learning were also revealed during the KII.

"I think e-learning can still help build the capacities of our employees, especially for the activities that would not require or do not include hands on/practical activities. I believe the capacity of the participants and the degree to learn and absorb the lectures, knowledge and new learnings through online platform in a training, conference or seminar is almost similar with when the participants actually attend the activity in a training venue/room, as long as the activity is done through pure lectures and/or presentations by the resource person(s) or speaker(s)."

Though many employees reported having more opportunity to learn through online courses, it was also disclosed that e-learning is prone to academic dishonesty as compared to its traditional counterpart. Table 4 presents a summary of the survey results on the benefits, motivations and interests towards e-Learning.

Table 4. Benefits, Motivations and Interests towards E-learning

	Mean \pm std	N	Decision
Benefits, Motivations and Interests			
E-learning can help break through learning barriers because it is easier to access	4.08 \pm 0.97	71	Agree
E-learning can help break through learning barriers because it is self-paced	4.25 \pm 0.81	71	Agree
E-learning/ online training courses are more interactive than traditional learning modes	3.21 \pm 1.04	71	Agree
Many topics covered in e-learning/online training courses are relevant to my work	3.85 \pm 0.87	71	Agree
Dynamics			

I have more opportunities to learn in e-learning or online training courses compared with traditional face-to-face training activities	3.28 ± 1.08	71	Agree
Learning is more difficult with e-learning or online training courses compared with the traditional face-to-face training activities	3.34 ± 0.98	71	Agree
E-learning or online training are more prone to academic dishonesty (cheating, plagiarism) than its traditional counterpart	3.11 ± 0.95	71	Agree

CONCLUSION AND RECOMMENDATIONS

This research analysed how Researchers, Scientists and Engineers in the agriculture sector R&D perceive e-learning platforms and what their views and dispositions are toward this mode of learning towards personal development and lifelong learning. For this perception study, the attitudes, experience, expectations, as well as motivations, perceived benefits and interests of the Project Managers, Researchers, and affiliate staff from agriculture R&D institutions were determined through a quantitative online survey, and a qualitative key informant interview.

The study reveals the readiness of researchers and project managements to any policy and program relating to e-learning or online training courses. The general outlook was that e-learning can be an effective tool to consider when planning for non-formal education or training and staff development programs.

The perceived advantages of e-learning include its flexibility, attributed to asynchronous, self-paced learning, its accessibility and convenience. The learners age, workload as well as family are not considered by the respondents are barriers to their learning through e-learning platforms.

However, while e-learning can be considered as a viable option for capacity development and lifelong learning, the respondents also stated that traditional classroom type trainings are perceived as a better option for training. Thus, a blended approach to delivery of training may also be considered during education planning. Likewise, online learning resources can also be complemented by other offline learning materials such as printed modules and handouts to help maximize learning experience.

To fully understand the operations of the online training courses, there is the need to further sensitise and educate people of all age and levels of education, hence the proposed learning intervention focus on improving the readiness of the project managers and researchers on e-learning.

The key is for the educational planners to recognize these education technologies as readily available to help in capacity building programs. However, this is just one aspect of educational planning and understanding the needs of the learners and overall goal of the capacity building activity are foremost consideration when developing instructional designs.

Inasmuch as we would have wanted to conduct the survey face to face to eliminate biases of online surveys, the researchers had to settle with an online survey because of the current

pandemic which has restricted our movements. Thus, we recommend that another study may be done using self-administered questionnaire or face to face interview.

REFERENCES

- Anderson, e. a. (2006). *Global picture, local lessons: E-learning policy and accessibility: Final Report*. Wellington, New Zealand.: Ministry of Education.
- Chitanana, L., & Museva, L. (2012). *Adult Education Students' Perceptions of E-learning: A Case Study of Midlands State University*. *The Dyke*, 6(2).
- Coakes, J., & Ong, C. (2011). *SPSS Version 18.0 for Windows Analysis Without Anguish (1st Edition)*. Dougall Street, Milton: John Wiley & Sons Australia, Ltd.
- Cornell University, INSEAD, and WIPO . (2019). *The Global Innovatoin Index 2019: Creating Healthy Lives - The Future of Medical Innovation*. Ithaca, Fontainebleau, and Geneva: WIPO, CII.
- Daniels, M. M., & et.al. (2019). *Students' perception on e-learning: a basis for the development of e-learning framework in higher education institutions*. IOP Conference Series: Materials Science and Engineering, 482.
- Derouin, R. E., Fritzsche, B. A., & Salas, E. (2005). *E-Learning in Organizations*. *Journal of Management*, 920-940.
- Erduran, S. (2020). *Science Education in the Era of a Pandemic*. *Science and Education*, 233-235.
- Foltnowicz, Z. (2013). *T-shaped Professionals*. doi:10.13140/2.1.3833.6644.
- Fraenkel, J., & Wallen, N. E. (1996). *How to Design and Evaluate Research in Education (3rd Edition)*. New York: McGraw Hill, Inc.
- Greener, S. (2007). *Learning and teaching in a virtual environment: A Review of Current Thinking*. Brighton: University of Brighton.
- Gülbahar, Y., & Alper, A. (2011). *Learning Preferences and Learning Styles of Online Adult Learners*. *Education in a technological world: communicating current and emerging research and technological efforts*, 271-278.
- Guo, C., & Wan, B. (2022). *The digital divide in online learning in China during the COVID-19 pandemic*. *Technol Soc*. doi: doi: 10.1016/j.techsoc.2022.102122
- ILO. (2021). *Skilling, upskilling and reskilling of employees, apprentices and interns during the COVID-19* . Geneva: International Labour Office.
- Kurt, S. (2018, December 18). *ADDIE Model: Instructional Design*. Retrieved from Educational Technnology: <https://educationaltechnology.net/the-addie-model-instructional-design/>
- Mouzakitits, G., & Tuncay, N. (2011). *E-learning and Lifelong learning*. *Turkish Online Journal of Distance Education* 12 (1), 166-173.

- PIDS. (n.d.). PH gov't support to R&D, inadequate – experts. Retrieved from PIDS: <https://www.pids.gov.ph/press-releases/419>
- Robbins, S., Judge, T., & Millett, B. (2015). *OB: The Essentials*. Pearson Australia.
- Rodrigues, H., & et.al. (2019). Tracking e-learning through published papers: A systematic review. *Computers & Education*, 136, 87-98.
- Sacks, A., & Johns, G. (1960). *Organizational Behaviour*, 9th Ed. Toronto: Pearson.
- Schwab, K. (2018). *The Global Competitiveness Report 2018*. Geneva: World Economic Forum.
- Smith, S. B., Smith, S. J., & Boone, R. (2000). Increasing access to teacher preparation: The effectiveness of traditional instructional methods in an online learning environment. *Journal of Special Education Technology*, 37-46.
- Suri, G., & Sharma, S. (2013). Impact of Age on student's attitude towards e-learning: A study on Panjab University, India . *GIAN JYOTI E-JOURNAL* 3 (2), 73-80.
- Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6), 1273-1296.
- Tam, G., & El-Azar, D. (2020, March 13). 3 ways the coronavirus pandemic could reshape education. Retrieved from World Economic Forum: <https://www.weforum.org/agenda/2020/03/3-ways-coronavirus-is-reshaping-education-and-what-changes-might-be-here-to-stay/>
- Thakkar, S., & Joshi, h. (2017). Students' Attitude towards E-learning. *International Journal of Advance Engineering and ResearchDevelopment*, 4(11).
- UNESCO. (2020, April 4). Startling digital divides in distance learning emerge. Retrieved from UNESCO: <https://en.unesco.org/news/startling-digital-divides-distance-learning-emerge>
- van Vianen, A. (2011). Aging and training and development willingness: Employee and supervisor mindsets. *Development and Learning in Organizations: An International Journal*. doi:25. 10.1108/dlo.2011.08125daa.009.