REVIEW ARTICLE

A Review of Social Learning as a Function of Student-centered Outreach in African Universities

David Ekepu[1], Gabriel Karubanga[2], Jacob Godfrey Agea[3], John James Okiror[4]

10.18805/ag.R-123

Abstract

There are attempts in African universities to strengthen their engagement with communities through student-centered outreach (S-C-O). Although the concept of social learning has been introduced in S-C-O, there is still limited theoretical understanding of how the mechanism of social learning in the S-C-O model works due to inadequate availability of indicators for empirical assessment of social learning in S-C-O programs. This review paper explores possible indicators for measuring social learning in S-C-O. A desk review was conducted to obtain literature about the key concepts of the university outreach and social learning. A thematic-content analysis was employed to obtain indicators for measuring social learning. Our review has revealed that communities of practice theory (CPT) of social learning provide a conceptual framework for the analysis of social learning in S-C-O. The key tenets of CPT include practice, community, identity, and meaning. This implies that social learning occurs through collaborative learning processes as a result of social participation. Thus, efforts to investigate social learning in the S-C-O model should focus on farmers in order to assess their interactions in the prevailing social setting and/or institutional context.

Keywords: Communities of practice, Indicators, Outreach, Social learning, Student-centered

Agricultural Reviews (2019)

Introduction

Currently, African Universities have been called upon to move from their "Ivory Towers" and contribute to community development (Adipala and Egeru, 2018). This can be through strengthening the university community engagement for enhanced exchange of knowledge and ideas between communities and the universities for enhanced change in farming practices and technologies (Kalule and Ongeng, 2016; Ramesh and Rana, 2016). According to Mulu-Mutuku *et al.* (2017), community engagement in most African Universities is through outreach - one of the core mandates of the universities besides teaching and research. However, the outreach function has always received very little attention (Nampala *et al*., 2016). One way of strengthening university outreach to communities perhaps could be through enhancing student outreach whereby students are attached to communities where they interact through social learning. However, most universities in Africa still lack well developed field-based curricula (Kalule and Ongeng, 2016), that can be used as a basis of initiating the social learning processes for change.

Field attachment of students is sometimes referred to as internship if the attachment aim is to promote learning between universities and communities (Kalule *et al*., 2016); thus complements agricultural extension activities (Kalule, Sseguya, Ongeng and Karubanga, 2019a). However, how this is ensured and embedded in the theory of social learning remains unclear from the perspective of farmers hosting the students. In this study, we adopt the definition of social learning by (Reed *et al*., 2010) who defined social learning as "a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks" pp. 6 but there remains little consensus over its meaning or theoretical basis. There are still considerable differences in understanding of the concept in the literature, including a number of articles published in Ecology and Society. Social learning is often conflated with other concepts such as participation and proenvironmental behavior, and there is often little distinction made between individual and wider social learning. Many unsubstantiated claims for social learning exist, and there is frequently confusion between the concept itself and its potential outcomes. This lack of conceptual clarity has limited our capacity to assess whether social learning has occurred, and if so, what kind of learning has taken place, to what

[1-4]Department of Extension and Innovation Studies, College of Agricultural and Environmental Sciences, Makerere University, P.O. Box. 7062, Kampala, Uganda.

Corresponding Author: David Ekepu, Department of Extension and Innovation Studies, College of Agricultural and Environmental Sciences, Makerere University, P.O. Box. 7062, Kampala, Uganda, Email: dekepu@gmail.com

How to cite this article: Ekepu, D., Karubanga, G, Agea, J.G. and Okiror, J.J. (2019). A review of social learning as a function of student-centered outreach in African universities. Agricultural Reviews, 40(3): 216-221.

Source of support: The sources of support are provided in the acknowledgement section.

Conflict of interest: We, the authors have no conflict of interest to declare.

Submitted:07-05-2019 **Accepted:**03-09-2019 **Published:** 25-09-2019

extent, between whom, when, and how. This response attempts to provide greater clarity on the conceptual basis for social learning. It is reported according to Kalule *et al*. (2016) that the functions of the S-C-O model in terms of knowledge transmission and retention, knowledge generation and knowledge assimilation can be assessed through application of community of practice components such as practice, community, identity and meaning. For example, knowledge transmission and retention occurs for instance when faculty teach students how to prepare business plans, this knowledge gets retained within the students who can then use this kind of knowledge to establish their own enterprises. On the other hand, the students can decide to transmit this knowledge to the community through the interactive learning processes. Whereas knowledge can be generated directly by the faculty and students, the community can also generate its own new knowledge and/or adapt the existing technologies to suit their local conditions (Waters-Bayer *et al*., 2006; Ssebaggala *et al*., 2016). The third function of the S-C-O model is associated with knowledge assimilation which according to Fletcher and Prashanthan (2011) is the ability to analyze, process, interpret and understand information obtained from the surrounding. In the case of S-C-O model, assimilation is depicted through knowledge acquisition, interpretation and processing research outputs as well as various products obtained as a result of system interactions (Kalule *et al*., 2016). Still, how this is anchored in the social learning processes with reference to community of practice is still underscored.

In particular, at Gulu University, in S-C-O, the students are attached to smallholder farmers in a radius of 10Km from the university for a period of not less than one year. This time period is critical for enhanced knowledge flow through interactions that lead to acquisition of new skills and experiences as a result of social learning and sharing of experiences between students and communities (Kalule *et al*., 2014; Nampala *et al*., 2016). The model has been updated to encompass attachment in a range of 60Km after the introduction of postgraduate programmes in the Faculty of Agriculture in 2014 (Kalule *et al*., 2019b). This provides a better opportunity for assessing whether S-C-O enhances social learning among the widely geographically distributed farmers. The S-C-O model consists of 3 actors; faculty, students and community. These actors interact together to facilitate knowledge flow (Kalule *et al*., 2016); which is cardinal in facilitating social learning through community of practice. Thus, it is imperative to explore how the theory of social learning can be anchored in the S-C-O models to initiate and sustain actor interactions. Two cardinal questions have guided this paper including; 1) how can social learning theory be conceptualized to explain social interactions through S-C-O programmes? and 2) how can the components of community of practice theory (CPT) be employed to explain social learning through S-C-O programmes?

Theoretical framing

Learning is an important component of the S-C-O model because the actors interact with each other (Kalule *et al*., 2016), but how such interactions are initiated and sustained through social learning in the S-C-O model is not well grounded in literature related to community of practice. The concept of social learning is rooted in the field of behavioral psychology as described by Albert Bandura (Tran *et al*., 2018). Other scholars such as Bandura and Walters (1977) viewed social learning as a casual and/or directed observation of behavior performed by others in everyday situations. This earlier conceptualization of social learning shows the existence of feedback mechanism between learners and their environment. That is, learners change the environment and at the same the environment influences their learning behavior (Pahl-Wostl *et al*., 2008)

To-date, the concept of learning has also been extended to S-C-O through the analysis of farmer learning behaviors (Karubanga *et al*., 2017; Kalule *et al*., 2019b) however, with limited attention on how such behaviours are influenced by social learning processes. For instance, Kalule *et al*. (2019), in their study on contextual determinants of learning behavior differentials amongst host farmers of the University-Student Outreach in Uganda describe four main farmer learning behaviors indicators as reported by Edmondson (1999). These indicators include; seeking information, knowledge sharing, seeking feedback and giving feedback. Such literature advances knowledge on individual learning behavior within S-C-O programmes but there is a dearth of information on learning as collaborative process; of course using the leans of community of practice theory. Thus, an assessment of social interaction between students, staff, famers and other actors in S-C-O can provide greater opportunities for social learning. In a nutshell, the kind of interactions in the S-C-O model can provide a platform for advancing new forms of collaborative learning that foster grassroots innovation (Grobbelaar *et al*., 2017; Kalule *et al*., 2019b).

Conversely, it is against this background that this review paper focuses on the CPT of social learning by Wenger (1998) as the analytical framework for assessing social learning through S-C-O. According to Wenger (1998), social learning theory encompasses four main tenets including community, practice, identity and meaning. The CPT of social learning extends the understanding of social learning beyond an individual to include social participation as collaborative learning process (Farnsworth *et al*., 2016). Although the communities of practice theory has been proposed in literature as an analytical framework, there are still few studies that have reported application of this theory in empirical research within the African research context especially in assessing social learning through S-C-O programmes. Elsewhere, some empirical studies have been done involving the application of CPT of social learning especially in the rural communities of the Vietnamese Mekong Data (Tran *et al*., 2018) and in other research settings such as environmental management (Noguera-Méndez *et al*., 2016) and organizational

environment (Angelle, 2008). However, empirical literature is generally lacking on interactions between rural communities and other actors in the context of the S-C-O model. Earlier research studies form a strong basis for assessing social learning through S-C-O programmes in African Universities, particularly Gulu University in Uganda. This review study therefore contributes to exploring this knowledge and research gap. Thus, this review paper aims at exploring the theory of social learning in order to obtain indicators for measuring social interactions in S-C-O models.

Conceptualizing social learning for assessing S-C-O programmes

Social learning extends from the theory of situated learning which emphasizes that, for learning to occur, there must be interaction between people (Lave and Wenger, 1991; Karubanga *et al*., 2017). Learning through interaction is expected to lead to some kind of behavioural change and this qualifies it as social learning (Cai and Abbott, 2013; Karubanga *et al*., 2016). Learning can also be considered a multi-loop process consisting of levels namely single, double and triple loop learning (Argyris, 2003; Pahl-Wostl *et al*., 2011); which are important for assessing how social learning occurs through S-C-O programme. For example, according to Pahl-Wostl *et al*. (2011) single loop learning involves incremental enhancement of actions and routine functions without changing any underlying assumptions whereas double loop learning leads to revision of underlying value assumptions. Meanwhile, triple loop learning leads to scrutinisation of underlying ideological and value systems. The application of multiple loop processes in understanding social learning is critical towards enhancing innovative and adaptive capacity as well as change in governance systems (Tabara and Pahl-Wostl, 2007) (E; in this case governance of outreach in African Universities. Social learning that leads to innovations is situated in double loop learning (Sol, 2013). Innovations are thus ultimate outcomes of the social learning processes and can be defined as learning to do things differently as a result of exposure to S-C-O programmes that initiate and sustains the interaction processes (also see Karubanga *et al*., 2017). In this case social learning through S-C-O can be viewed as an exploratory process that seeks to overcome challenges of farmer learning for innovation (Tran *et al*., 2018) through enhancing interactive learning for behavioural change.

Explaining social learning using CPT components in assessing the S-C-O model

The concept of communities of practice has now been widely adopted by scholars to explain social learning (Figure 1). Community of practice is denoted as learning which is practice, community, identity and meaning (Wenger, 1998). The detailed explanation of these elements is provided in the sub-sequent sections and how they can be anchored in social learning while assessing S-C-O models. As reported by Graven and Lerman (2003) in their review of Wenger's 1998 book on Communities of Practice: Learning, meaning and identity, practice is regarded as a way of doing and encompasses things like shared historical and social capital, perspectives and frameworks that initiate and sustain the interactive relationship; in this social learning through case S-C-O. On the other hand, community instils a sense of belonging, social configuration in community enterprises and recognizes participation as way of demonstrating competence (Figure 1); which is associated with sharing of information and experience through social interactions embedded in social learning process.

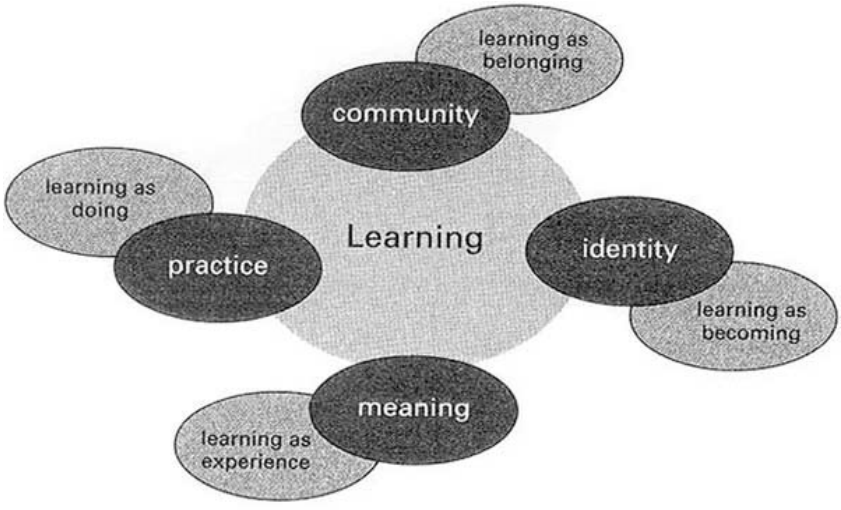

Figure 1: Components of the community of practice theory for social learning (adapted from Graven and Lerman, 2003).

With reference to Figure 1, identity means learning to demonstrate how the actors change how they are; whereas meaning refers to experience and that is the capacity to see the world as meaningful and producing desired outcomes; of course through social learning where actors are expected to common and shared meaning of the acquired knowledge and skills through S-C-O. Today, communities of practice are vibrant when there is need for mutual engagement around a joint enterprise, which requires a strong bond of communal competence that leads to knowledge creation (Wenger, 1998). In short, three key dimensions have been reported to foster social learning through S-C-O models namely; mutual engagement, shared enterprise and a shared repertoire of communal resources (Tran *et al*., 2018)

Practice

Practice is critical within the community of practice theory of social learning because it entails meaningful engagement through interactions in communities (Handley *et al*., 2006) and includes aspects like shared social capital and perspectivesthat sustain learning through well-established relationship (Graven and Lerman, 2003). It encompasses shared learning activities or practices by a community of practice (Tran *et al*., 2018). In this case, practices are developed through interactive observations, imitations, adapting and developing new practices that are in line with community norms (Handley *et al*., 2006). It is reported that all these occur through social learning for innovation (also see Karubanga *et al*., 2017)

Community

Social learning occurs within individuals belonging to particular communities where they interact and learn from each other in order to change. In the process of interaction, a community instils a sense of belonging to various actors; in this case farmers, students and other actors in the S-C-O programme. A review indicates that it is worth noting that one's participation in a community of practice, in this case S-C-O programme is an incremental process where one moves from peripheral participant to an active participant in a given community of practice by developing certain levels of competence (Farnsworth *et al*., 2016) which are acquired through social learning. Reviewed literature indicated that within the S-C-O model, farmers are expected to develop a community as a result of their interaction with students (Kalule *et al*., 2019b). Hosting the students, for example, as individuals and groups of farmers is reported to have the ability of shaping their sense of belonging in the process of fostering farmer learning (Erickson, 2010; Kalule *et al*., 2019; Preece, 2013).

Identity

Our review has indicated that the construction on an identity in social learning goes beyond just changing the mind but a complete involvement of the whole human body explained in terms of heart, brain, relationships, aspirations and human experiences involved in meaning-making (Wenger, 2010: p.181). These are critical for critical reflection, adaption and application of the acquired knowledge and skills as affirmed by Karubanga *et al*. (2017). According to Handley *et al*. (2006), learning is not merely a matter of developing a person's knowledge and practices, but includes an understanding of who we are and whether we belong and are accepted in a given community of practice. Identity is a key part in the construction of meaning because it allows participant (in this case a student or farmer) to negotiate meaning through participation to express level of competence and as well judge for oneself if as a member of the community or not (Farnsworth *et al*., 2016; Wenger, 2010). In the S-C-O, students need to develop a feeling of being accepted in rural communities and develop a new sense of belonging (Kalule *et al*., 2019); which can be achieved through interactions as a key component of social learning (Karubanga *et al*., 2017). The S-C-O model involves knowledge flow between actors (Kalule *et al*., 2016), calling for the development of an identity through creation of new forms of knowledge. As noted by Farnsworth *et al*. (2016), identification exists in three modes including engagement, imagination and alignment which are important learning processes. In relation to social learning, Wenger (2010) explains three (3) modes of identification as follows; Engagement which entails participating in activities, doing tasks, working alone or as group, talking, using and producing objects. Imagination involves the creation of mental models about the world to reflect on various perspectives and explore new possibilities of doing things (Bandura, 1997; Karubanga *et al*., 2017). Wenger (2010) asserts that imagination is possible because the world provides us with instruments like language, stories, maps, shows, role models and so on to support the learning process; in this case through S-C-O models. For instance, through the S-C-O model, students, staff and farmers can effectively participate in agricultural shows and field days thus providing them opportunities to expand knowledge and skill levels; and in the process more interactions will be harnessed through social learning. Conversely, alignment refers to the coordination of activities, ensuring that laws or regulations are respected in pursuance of university's core mandates and ensuring that communications follow a two-way process of synchronized actions, viewpoints and contexts (Wenger, 2010). Generally, the conceptualization of identity formation is well reported in literature basically for organizations but less focus on rural communities of practice as noted by (Tran *et al*., 2018).

As a result, the S-C-O introduces a new dimension whereby rural communities have an enduring association with universities through student field attachment which form a strong foundation for building and strengthening social learning among the farming communities.

Meaning:

Meaning refers to the ability to see the world as meaningful (Graven and Lerman, 2003; Wenger, 1998); and this can be acquired through social learning characterized by inherent interactions which are necessary for knowledge and information flow (Singh and Gupta, 2016). Available literature indicates that meaning is the final product of the learning process (Graven and Lerman, 2003) and it is reached by sharing knowledge and experiences among the participating individuals especially in the S-C-O models. Specifically, anchoring meaning in the S-C-O model is reflected in the ability of individuals, in this case farmers, taking up new technologies and/or innovation(s).

Conclusion

This desk review study was intended to explore how the theory of social learning can be anchored in the S-C-O models to initiate and sustain actor interactions. Our review findings indicate that a well facilitated S-C-O model can initiate and sustain social learning processes that occur as a result of inherent interactions among the key actors notably students, staff and communities. The tangible impact of social learning is expected to be realised mostly by the rural farming communities because they continuously interact within the same social setting even after the students have left the field attachment. This is possible due to a well-established and functional community of practice. In this way, farmers are able to create meaning and develop new identities or regimes of competence within their connections created through social learning. We strongly recommend that the thorough analysis of social learning in the S-C-O model should focus mainly on farmers or farming communities within their prevailing social and/or institutional context for more adaptive assessment of farmer learning behavior.

Acknowledgment

Funding for this research was obtained from the German Academic Exchange Service (DAAD) through Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) through the In-Country/In-Region Scholarship Programme (Reference No: 57429563). Further support for this research was also provided by Carnegie Corporation of New York through RUFORUM Post-Doctoral programs.

References

Adipala, E. and Egeru, A. (2018). Pushing the frontier of Africa's agricultural universities to contribute to Africa's growth and development. Retrieved from http://repository.ruforum.org

Angelle, P. S. (2008). Communities of Practice Promote Shared Learning for Organizational Success. Middle School Journal, 39: 52–58. https://doi.org/10.1080/00940771.2008.11461654

Argyris, C. (2003). A Life Full of Learning. Organization Studies, 24: 1178–1192. https://doi.org/10.1177/01708406030247009

Bandura, A. (1997). Self-efficacy : the exercise of control. New York: W.H. Freeman and Company. Retrieved from https://www.worldcat.org/title/self-efficacy-the-exercise-of-control/oclc/36074515\

Bandura, A. and Walters, R. H. (1977). Social learning theory (Vol. 1). Englewood Cliffs, NJ: Prentice-hall.

Cai, T. and Abbott, E. (2013). Using Video as a Replacement or Complement for the Traditional Lecture/Demonstration Method in Agricultural Training in Rural Uganda. Journal of Applied Communications, 97: https://doi.org/10.4148/1051-0834.1127

Edmondson, A. (1999). Psychological Safety and Learning Behavior in Work Teams. Administrative Science Quarterly, 44: https://doi.org/10.2307/2666999

Erickson, M. S. (2010). Investigating community impacts of a university outreach program through the lens of service-learning and community engagement Investigating community impacts of a university outreach program through the lens of service learning and community engagement. Retrieved from https://lib.dr.iastate.edu/etd

Farnsworth, V., Kleanthous, I. and Wenger-Trayner, E. (2016). Communities of Practice as a Social Theory of Learning: A Conversation with Etienne Wenger. British Journal of Educational Studies, 64: 139–160. https://doi.org/10.1080/00071005.2015.1133799

Fletcher, M. and Prashantham, S. (2011). Knowledge assimilation processes of rapidly internationalising firms: longitudinal case studies of Scottish SMEs. Journal of Small Business and Enterprise Development, 18:475-501.

Graven, M. and Lerman, S. (2003). Wenger, E. (1998). Communities of practice: Learning, meaning and identity. Journal of Mathematics Teacher Education, 6: 185-194. https://doi.org/10.1023/A

Grobbelaar, S., Tijssen, R. and Dijksterhuis, M. (2017). University-driven inclusive innovations in the Western Cape of South Africa: Towards a research framework of innovation regimes. African Journal of Science, Technology, Innovation and Development, 9: 7–19. https://doi.org/10.1080/20421338.2016.1225549

Handley, K., Sturdy, A. and Fincham, R. (2006). Within and Beyond Communities of Practice: Making sense of Learning through Participation, Identity and Practice. Journal of Management Studies, 43: https://doi.org/10.1159/000355499

Kalule, S.W. and Ongeng, D. (2016). Embedding community engagement in University training curricula : Experiences from Gulu University in Uganda. Fifth RUFORUM Biennial Regional Conference 17 - 21 October 2016, Cape Town, South Africa, 14: 409–413.

Kalule, S. ., Mugonola, B., Odongo, W. and Ongeng, D. (2014). University student-centered outreach for rural innovations and community transformation in northern Uganda. Fourth RUFORUM Biennial Regional Conference 21 - 25 July 2014, Maputo, Mozambique: 635–647.

Kalule, S. W., Odongo, W., Kule, E., Ndyomugyenyi, E. K., Omara, P. and Ongeng, D. (2016). Conceptualizing the Student-Centered Outreach Model for experiential learning and community transformation. African Journal of Rural Development, 1: 219–227.

Kalule, S. W., Sseguya, H., Ongeng, D. and Karubanga, G. A. (2019a). Contextual Determinants of Learning Behaviour Differentials amongst Host-farmers of University-Student Outreach in Uganda. Advances in Agricultural Science, 7: 33–47.

Kalule, S. W., Sseguya, H., Ongeng, D., Karubanga, G. (2019b). Facilitating conditions for farmer learning behaviour in the student-to-farmer university outreach. The Journal of Agricultural Education and Extension, 1–15. https://doi.org/10.1080/1389224X.2019.1604389

Karubanga, G., Kibwika, P., Okry, F. and Sseguya, H. (2016). Empowering farmers to learn and innovate through integration of video-mediated and face-to-face extension approaches: The case of rice farmers in Uganda. Cogent Food & Agriculture, 2. https://doi.org/10.1080/23311932.2016.1274944

Karubanga, G., Kibwika, P., Okry, F. and Sseguya, H. (2017). How farmer videos trigger social learning to enhance innovation among smallholder rice farmers in Uganda. Cogent Food & Agriculture, 3: 1–16. https://doi.org/10.1080/23311932.2017.1368105

Lave, J. and Wenger, E. (1991). Situated Learning: Legitimate Peripheral Participation. Cambridge: Cambridge University Press.

Mulu-Mutuku, M., Tarus, R. J., Otieno, E. O. and Mungai, N. W. (2017). Farmers' perceptions regarding Egerton university community engagement activities. African Journal of Rural Development, 2: 523–534.

Nampala, P., Kityo, R. and Adipala, E. (2016). Differentiated Community Engagement Approaches but same mission: University Outreach programs in Africa. African Journal of Rural Development, 1.

Noguera-Méndez, P., Molera, L. and Semitiel-García, M. (2016). The role of social learning in fostering farmers' pro-environmental values and intentions. Journal of Rural Studies, 46: 81–92. https://doi.org/10.1016/j.jrurstud.2016.06.003

Pahl-Wostl, C., Nilsson, C., Gupta, J. and Tockner, K. (2011). Societal Learning Needed to Face the Water Challenge. Ambio, 40: 549–553. https://doi.org/10.1007/s13280-011-0149-1

Pahl-Wostl, C., Tàbara, D., Bouwen, R., Craps, M., Dewulf, A., Mostert, E. and Taillieu, T. (2008). The importance of social learning and culture for sustainable water management. Ecological Economics, 64: 484–495. https://doi.org/10.1016/j.ecolecon.2007.08.007

Preece, J. (2013). Service Learning and Community Engagement in South African Universities: Towards an "Adaptive Engagement" Approach. Alternation Special Edition, 9: 265–291.

Ramesh, S.C.N. and Rana, S.S. (2016). Resource Conservation Technologies (RCTs)-Needs and future prospects: A review. Agricultural Reviews, 37: 257-267. DOI: 10.18805/ag.v37i4.6456.

Reed, M. S., Evely, A. C., Cundill, G., Fazey, I., Glass, J., Laing, A. and Stringer, L. C. (2010). What is social learning? Ecology and Society.

Singh, N. and Gupta, N. (2016). ICT based decision support systems for Integrated Pest Management (IPM) in India: A review. Agricultural Reviews, 37: 309-316. DOI: 10.18805/ag.v37i4.6461.

Sol, J., Beers, P. J. and Wals, A. E. J. (2013). Social learning in regional innovation networks: trust, commitment and reframing as emergent properties of interaction. Journal of Cleaner Production, 49:35–43. https://doi.org/10.1016/J.JCLEPRO.2012.07.041.

Ssebaggala, G.L., Kibwika, P., Kyazze, B.F. (2017). Contextual mismatch of interventions for reduction of postharvest losses in rice: Farmer perceptions, practices and innovations in Eastern Uganda. Agric. Sci. Digest, 37: 132-136. DOI:10.18805/asd.v37i2.7988.

Tabara, J. D. and Pahl-Wostl, C. (2007). Sustainability learning in natural resource use and management. Ecology and Society, 12. https://doi.org/10.5751/ES-02063-120203

Tran, T. A., James, H. and Pittock, J. (2018). Social learning through rural communities of practice: Empirical evidence from farming households in the Vietnamese Mekong Delta. Learning, Culture and Social Interaction, 16: 31–44. https://doi.org/10.1016/j.lcsi.2017.11.002

Waters-Bayer, A., van Veldhuizen, L., Wongtschowski, M. and Wettasinha, C. (2006). Recognising and enhancing local innovation processes: PROLINNOVA working paper, 13.

Wenger, E. (1998). Communities of practice : learning, meaning, and identity. Cambridge: Cambridge University Press.

Wenger, E. (2010). Communities of Practice and Social Learning Systems: the Career of a Concept. In Social Learning Systems and Communities of Practice: 179–198. London: Springer London. https://doi.org/10.1007/978-1-84996-133-2_11