

Mediation of perceived content validity on motivation and training transfer among smallholder farmers in Central Uganda

Ismail Twase¹  | Richard F. Miiro¹ | Frank Matsiko¹ |
Sulaiman Ndaula^{1,2} | Mathias Ssamula³

¹Department of Extension and Innovation Studies, School of Agricultural Sciences, College of Agricultural and Environmental Studies, Makerere University, Kampala, Uganda

²Commercialization and Social Change Group, MoMEALS Africa, Kampala, Uganda

³Department of Sociology and Social Anthropology, School of Social Sciences, College of Humanities and Social Sciences, Makerere University, Kampala, Uganda

Correspondence

Ismail Twase, Department of Extension and Innovation Studies, School of Agricultural Sciences, College of Agricultural and Environmental Studies, Makerere University, Kampala, Uganda.
Email: twaseismail@gmail.com

Funding information

Carnegie Corporation of New York

Abstract

Farmer training is a key strategy for building skills that lead to enhanced productivity of small-scale farmers' fields. This result hinges on farmers transferring the training to their fields. However, the factors that determine the subsequent transfer of training including those with mediating effects are not fully known. A study was conducted to assess the mediating role of perceived content validity on the association of farmers' motivation to implement acquired knowledge with actual training transfer outcomes from a random sample of 603 Ugandan farmers who had received four agricultural related trainings. Using Structural Equation Modelling, results indicated intrinsic motivation ($\beta = 0.246$; $t = 2.991$; $p < 0.05$) and perceived content validity ($\beta = 0.325$; $t = 2.693$; $p < 0.05$) to strongly influence training transfer. Intrinsic motivation predicted up to 45% of variance in farmers' perceptions about training design suitability. Perceived content validity mediated the relationship between intrinsic motivations to implement acquired knowledge and training transfer. In order to improve the transfer of learnt knowledge among smallholder farmers, trainers need to pay attention to pre-training efforts, such as adopting a criterion of assessment checklist for identifying highly motivated trainees, as mechanisms for obtaining internally motivated training participants.

INTRODUCTION

Training is a central strategy used by agricultural extension workers to build agricultural skills of smallholder farmers, and it contributes to farmers' livelihoods of developing countries (Global Forum for Rural Advisory Services, 2014). In Uganda, close to 80% of the working population is involved in agriculture (Government of Uganda, 2015). Agriculture contributes more than 50% of all export earnings, and 25% of the national GDP (Uganda Bureau of Statistics [UBOS], 2018). Close to 90% of all agriculture is done in rural areas by 7.4 million smallholder farmers' households (UBOS, 2020). Investing in building smallholder farmers' capacities through training is crucial for an agro-based economy like Uganda (Amadu & McNamara, 2014).

Farmers' in the developing world majority of whom are small scale face a lot of constraints. Training has been the most dependable solution in addressing these constraints. Training smallholder farmers is often conducted by extension workers who can be government workers or from NGOs, the private sector and/or from farmers' organizations. The Uganda annual agricultural survey of 2018 reported that 51% of smallholder farmers' households received training from local government and 27% from NGOs (UBOS, 2020). Trainings offered can be as specific as the constraint being solved, and can also cover various aspects of agriculture and any stage of the value chain. The UBOS study revealed that 82% of the farmers having received training related to agricultural production. Crop and livestock diseases were 41%, while 31% focused on agricultural input use (UBOS, 2020). Such trainings represent millions of shillings that are invested. Trainings of this kind are premised on the assumption that training the farmers would improve their capacities and effectiveness in carrying out their farm activities leading to increased and improved production, productivity, income and well-being.

However, despite the continuing investment in building smallholder farmers' capacities, training is not a super bullet to farmer prosperity (Bell et al., 2017). Training becomes a worthwhile investment to the trainees and the sponsoring institutions when it leads to learning, retention of learned knowledge and skills and subsequently the application or transfer by the trainees of the training to their work contexts. By extension, if a training is not transferred the resources (time, effort and money), spent on training would have been wasted. Therefore, understanding the return to such investments, as well as knowledge on how to enhance the application/transfer of what is trained, is critical (Baldwin et al., 2017). This is the notion of training transfer and training effectiveness.

Training transfer is influenced by a system of factors, including trainee characteristics, training/transfer design and work environment. The training transfer system perspective was developed by Holton and his colleagues (2000) when they came up with the learning transfer systems inventory (LTSI) (Chatterjee et al., 2018). LTSI assumes that training transfer is a direct outcome of system factors. Several studies have been conducted since and these factors have been found to influence training transfer back to the work place in varying ways, often changing because of the context and the type of training. Studies focused on understanding the factors that lead to transfer of agricultural training were initiated by Miiro et al. (2012) and several others have followed since (Kiwanyuka et al., 2020; Muthoni & Miiro, 2017; Zamani et al., 2016). Various factors have been identified for different work contexts. For example, Miiro et al. (2012) examined transfer of governance facilitation by leaders of farmers' marketing organizations in which they found transfer to be significantly influenced by personal capacity to transfer, transfer design, supervisor support and feedback on performance. Zamani et al. (2016) also found motivation to transfer, performance self-efficacy, supervisor support, performance–outcome expectations, opportunity to use and supervisor sanctions to significantly predict farmers' sustainability learning transfer. However, these studies have sought to understand the direct influence of LTSI factors,

that is, trainee characteristics, training design and work environment on transfer of agricultural training. The studies have not explored the mediating influence of some of the LTSI factors, such as perceived content validity, just like other studies have done (e.g. Kalule et al., 2019; Park et al., 2017). The mediating effect studies have not yet been considered as far as agricultural training transfer is concerned, calling for need for focused research in this aspect.

Noteworthy, evaluating the influence of individual trainee factors on training transfer outcomes from the context of LTSI tends to be an inadequate proxy as this leaves out social-psychological issues that are at play. Predicting human behaviour using social-psychological lens gives opportunity to understand how to improve training transfer (Weisweiler et al., 2013). Social psychology, in particular, considers human behaviour within the individual's social context and how situational cues influence human behaviour, such as training transfer. There is a need to combine the LTSI with selected socio-psychological factors to see if knowledge of what enhances training transfer particularly in agriculture improves, and leads to better training planning and design. Thus, the conjunction between training transfer and social-psychological research has been mildly studied (Weisweiler et al., 2013). Charatsari et al. (2017) have called for the integration of socio-psychology in agricultural extension, a field mainly integrated with training. Efforts to incorporate social-psychological factors in understanding intentions to use agricultural training have already been initiated.

Psychological factors are known to be mediated by behaviour intentions in predicting training and behavioural outcomes (Ajzen, 2002; Ajzen et al., 2009). In their study on farmers intentions to participate in competence-based training done in Greece, Charatsari et al. (2017) demonstrate how the trainee's motivation influence farmers willingness to participate in capacity development programs. Charatsari et al. (2017), particularly, observe that the intention to participate in capacity building programs among Greek farmers was guided by the most internal forms of human motivation, including identified, integrated and intrinsic motivation. Inegbedion and Islam (2020) also studied motivation among a sample of youth joining tertiary institutions, and contrary to Charatsari and his colleagues found that the externally oriented motivational factors were the main predictors for youth intention to enrol for agricultural related courses. In Uganda, farmers' intention to integrate trees in coffee plantations in mountain Elgon areas have been found to be driven by farmers' attitudes about the benefit of trees and capability perceptions of the farmers to overcome tree planting barriers (Buyinza et al., 2020). Also farmers' responses to cultivate new sweet potato cultivars that are rich in vitamin A have been found to be an outcome of their perceptions regarding action of peers towards the new varieties (Ndaula et al., 2020) and the beliefs farmers hold about cultivating the new cultivars (Ndaula et al., 2019). This suggests that a farmer may fail to put to action a relatively well-perceived intervention, because its implementation contradicts his/her social-psychological environment.

The above discourse could be interpreted to mean that the social-psychological factors that influence the way individuals respond to a training or learning opportunity vary due to the training context, the individuals and the context of training implementation.

As social-psychological factors influence individuals' intentions to engage with trainings and in the implementation of intervention, they are bound to influence how individuals transfer what they have learned through training. Combining social-psychological studies and transfer has only been conducted in Europe and West African farmer settings and focus on predicting training participation intentions (Inegbedion & Islam, 2020; Weisweiler et al., 2013). Such studies will be useful in the East African region and particularly in Uganda, where lots of trainings for farmers are conducted year after year.

Motivation and training design are probably not always having a direct relationship with transfer as LTSI-based studies tend to suggest. For instance, perceived value of content mediated faculty

supervision support in predicting farmers' intention to apply what they had learned during agricultural students' internship of Gulu University in Uganda (Kalule et al., 2019). This demonstrated that an individual's evaluation about the training could be mediated by factors espoused in training design. Park et al. (2017) explored a similar relationship and found that perceived content relevance mediated self-efficacy and motivational factors to predict training transfer among staff trainees in private organization in Korea. This posited that a well-designed training pre-supposes that training design matches the characteristics of the trainees. Motivation as a major element of the trainee characteristic (Holton et al., 2000) in training transfer studies has been utilized interchangeably, sometimes as an independent variable (Arefin & Islam, 2019), others as a mediating (Reinhold et al., 2018; Wasilu et al., 2018) and in other situations as a dependent variable (Sahoo & Mishra, 2018). Given that motivation can be enhanced through training design, this study proposes that the relationship between motivation and training transfer will be mediated by training design (Park et al., 2017). However, no study has explored this mediation within the developing country context, more so among smallholder farmers. In addition, training transfer can be enhanced if social-psychological factors are integrated with transfer system factors. Therefore, this study sought to determine the mediation effect of training design between trainee's motivation and training transfer among smallholder farmers in Central Uganda who were trained in selected areas of agriculture.

CONCEPTUAL FRAMEWORK

The motives of a trainee play an important role in applying training. Self-psychological motivational theories – such as, the Self-Determination Theory, self-categorization, self-verification, self-perception and symbolic interaction, are commonly used to understand the role of an individual (trainee) in self-directed behavioural outcomes, such as training transfer (Weisweiler et al., 2013). The self-determination theory (SDT) by Ryan and Deci (2019) is a key to understand other trainee factors that enhance training transfer particularly in farmer training. SDT posits that a person's response to behavioural interventions, such as training opportunities, is a conscious outcome of the intrinsic and extrinsic motives one holds regarding the behaviour. Intrinsic motivation is defined as performing an activity for one's own sake because of the inherent satisfaction and the sense of pleasure she/he earns by doing that while extrinsic refers to acts done for instrumental reasons (Ryan & Deci, 2019). In general, SDT distinguishes motivation factors as being represented on a 3-component continuum that starts in 'amotivation', in which individuals have no reasons for – and thus no interest in – performing a behaviour, followed by extrinsic motivations and through to intrinsic motivation (Deci & Ryan, 2012).

Extrinsic motivation is further divided into four motivational types: (1) external, (2) introjected, (3) identified and (4) integrated motivation. External motivation is about the enactment of a behaviour due to external coercions, including rewards or punishments and it is the least autonomous type of human motivation. 'Introjection', refers to a form of intrinsic motivation that prompts the individual to engage in certain behaviour, without, however, accepting this regulatory process as his/her own. In this sense, introjected motives are controlled rather than being autonomously oriented as compared with 'identified motivations' and 'integrated motivations', which are more of autonomous. In identified motivation, a person identifies with the value of an activity and acknowledges the importance of a behaviour, leading to acceptance of the behaviour as his or hers, whereas 'integrated motivation' occurs when identified motives are assimilated to one's sense of his or herself. Evidence suggests that low intrinsic and/or extrinsic motivation could be associated with transfer failure and vice versa (Baldwin et al., 2017; Charatsari et al., 2017; Inegbedion et al., 2020).

The study also draws from the LTSI. The LTSI posits that application of training to one's work place is influenced by a system of factors inherent in the trainee, the training design and the trainee's work environment. However, trainee factors/characteristics are critical in the transfer process. The LTSI suggests that trainee factors that affect transfer of training include learner's readiness, motivation to learn, self-efficacy, motivation to transfer. Motivation to transfer depends on the desire of the trainees (Gegenfurtner et al., 2009). Learner readiness demonstrates the extent to which trainees are prepared to enter and participate in training. Transfer design refers to the degree by which training has been designed and delivered in such a way that provides trainees the ability to transfer learning in their work contexts (Holton et al., 2000). Training design is itself assessed using two constructs which are perceived content validity and perceptions regarding the transfer design.

This study used LTSI within the boundaries of SDT, premised on the assumption that trainee characteristics as seen in LTSI, aim to support the trainee to assess his/her internal and external motivation to implement learnt knowledge and skills. It utilized the constructs of motivation to transfer and learner's readiness to transfer in LTSI to enhance the intrinsic and extrinsic motivational factors within SDT respectively. Likewise, the construct of perceived content validity was used as a proxy for training design in this study, to conform to the earlier discussed assumption in the introductory section, that relationship between training transfer and trainee characteristics is mediated by training design (Figure 1). Holton et al. (2000) argue that part of transfer design is the degree to which training instructions match job requirements, which could be interpreted to mean that trainees' characteristics determine the appropriateness of training design, before the two attributes subsequently determine training transfer. Thus, this study aimed to test the hypotheses: H1a,b,c, H2 and H3 (as illustrated on the conceptual framework below) which state that:

H1a. Intrinsic motivation positively associates with training design.

H1b. Extrinsic motivation positively associates with training design.

H1c. Training design is positively related with training transfer.

H2. Intrinsic motivation is positively associated with training transfer.

H3. Extrinsic motivation is positively related with training transfer.

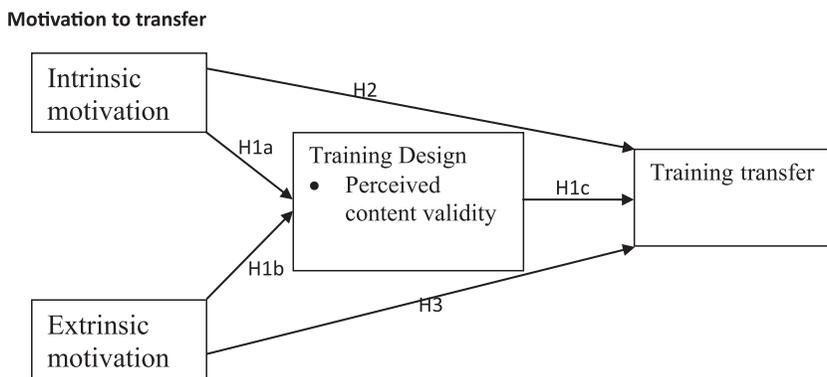


FIGURE 1 Conceptual framework for training design mediation on motivation to transfer and Training Transfer

METHODOLOGY

The study followed a cross-sectional survey design, conducted in the three rural districts in Central Uganda, that is, Rakai, Lyantonde and Luweero. The focus was on determining the transfer success antecedents among smallholder farmer trainees who had received four agricultural trainings conducted in 2016. Two of the trainings, the bean agronomy and gender in agriculture, were conducted by an NGO called Community Enterprise Development Organization (CEDO) involving 1458 and 934 farmers respectively. The other two trainings on pasture agronomy and maize marketing were conducted by another NGO called CARITAS for 886 and 927 farmers respectively. This gave a total of 4205 trainees, on which proportionate random sampling was applied to obtain the sample of 700 eligible respondents. Out of the selected smallholder farmers, 603 participated in the survey, representing 86% response rate.

Data were collected between October and December 2016, one month after the trainings took place, using a three-sectioned self-administered questionnaire translated into Luganda one of the main local dialects in the country. The translation aimed to eliminate inter-rater error, which accrues when different interviewers are used. The first section of the questionnaire focused on respondents' social-demographics information, which included sex, education level and age. These were collected in order to describe the general characteristics of the smallholder farmer from whom data were obtained.

The second section focused on respondents' assessment of their 'intrinsic motivation', which had three items and 'extrinsic motivation' which had five items and all measured using a 5-likert scale. Sample item for intrinsic and extrinsic motivations included: *I had personal satisfaction at farm when applying knowledge and skills gained from training and; I felt worried or letting down my fellow trainees/farmers if I hadn't engaged in applying the training on my farm*, respectively, adapted from Ryan and Deci (2000). Intrinsic motivation items were enhanced with four items that measure motivation to transfer within LSTI (Holton et al., 2000), while the three items that measured learner readiness to transfer were found to incline more to extrinsic motivation. Motivation to transfer sample item included: *"When I left training I couldn't wait to get back to work to tryout what I learnt"*. Learner readiness sample item included *before the training, I had a good understanding of how training would fit my farm related development*. The section also measured farmers' perceptions of the training design that captured 'perceived content validity', which had five-scale (Holton et al., 2000). Perceived content validity is coined to read, for example, as, *the instructional aids (materials) used in the training were very similar to real things I use on the farm*.

The third section focused on training transfer measure using nine-scale items, which reflected the four agricultural related trainings received by the respondents. The items that measured training transfer were developed following the key principles by Facteau et al. (1995) and Xiao (1996) that capture knowledge, skills and attitude change related to the specific training. The items were phrased, for example, as: *I am confident at applying learnt knowledge and skills on courses trained in*.

Cronbach alpha was used to estimate the scales' reliability and validity. Items used to measure intrinsic motivation, extrinsic motivation, perceived content validity and training transfer had coefficient of, 0.558, 0.647, 0.682, 0.777 and 0.810 respectively. This indicated that the scale used in the study had acceptable reliability and validity, given that Nunnally (1978) recommends a cronbach alpha between 0.50 and 0.90 in social science studies.

Structural equation modelling (SEM) was conducted to assess the mediation effect of perceived content validity on motivation and training transfer using SPSS enhanced with AMOS

version 21. SEM is particularly handy because it performs all the preliminary results and the final model simultaneously rather than conducting several independent analyses. SEM has three steps which were followed including: (1) the confirmatory factor analysis which evaluated the fit of the model and examined the validity of the reliability of the study constructs; (2) testing of the structural model to determine the strength of the hypothesized relationship between the exogenous and endogenous variables and (3) conducting the bootstrap procedures to evaluate the mediation association. Bootstrapping procedures allow the derived sample to be conceptualized as a pseudo-population and it imposes no distributional assumptions (Preacher et al., 2010). The 2000 bootstrap sampling results demonstrated 95% CI for the distribution of the coefficient.

RESULTS AND DISCUSSION

Description of respondents and study variables

Fifty-two per cent of the respondents were female, while 48% were male. Further, 68% of respondents had completed primary education and 23% had secondary school level education and 9% had studied beyond post-secondary school. Most respondents were below 50 years of age, that is, 20% between 20 and 30 years, 27% in the age bracket of 31–40 and 30% between 41 and 50. Those above 50 years constituted 23% of the study participants.

Table 1 shows correlation matrix of intrinsic and extrinsic motivations, perceived content validity and training transfer. The positive correlation of intrinsic and extrinsic motivations with training design, which is itself shown to significantly correlate with training transfer, points to a probable mediation effect. Similarly, all variables correlated with training transfers, which indicate that the probable association between training transfer with training design, and motivational constructs qualified to be further examined in regression analysis.

Confirmatory factor analysis

Results of the confirmatory factor analysis (Table 2) show that the vital parameters for consideration of the resultant empirical model were good (Hu & Bentler, 2009). The Goodness-of-Fit Index (GFI) was 0.961 (spec. ≥ 0.90), adjusted GFI (AGFI) = 0.90 (spec. ≥ 0.90), Tucker–Lewis Index (TLI) = 0.905 (spec. ≥ 0.90) and the comparative Fit Index (CFI) = 0.922 (spec. ≥ 0.90), meaning that the parameters fulfilled the acceptable baseline. Also, the root-mean square error of approximation (RMSEA) was 0.049, which is far less than the set maximum value of 0.08. A

TABLE 1 Correlation matrix of intrinsic motivation, extrinsic motivation, perceived content validity and training transfer

	Intrinsic motivation	Extrinsic motivation	Training design	Training transfer
Intrinsic motivation				
Extrinsic motivation	0.735 ^{***}			
Perceived content validity	0.336 ^{***}	0.408 ^{***}		
Training transfer	0.427 ^{***}	0.527 ^{***}	0.392 ^{***}	

^{***} $p \leq 0.01$.

RMSEA from 0.06 to 0.08 is taken as an acceptable fit (Brown, 2015), while the ratio of chi-square to degrees of freedom was 2.18 less than 3 the acceptable cut-off. Thus, the empirical data fitted the specified model, where the intrinsic and extrinsic motivations of smallholder farmers related to the training received were expected to influence training transfer behaviour via the perceptions they held about the design of the training.

Motivation, perceived content validity and training transfer path analysis

The second step of the SEM was to test the general hypothesis that the relationship between motivation and training transfer is mediated by training design. Specifically, to (i) H1a: Intrinsic motivation positively associated with training design; (ii) H1b: Extrinsic motivation positively associated with training design; (iii) H1c: Training design is positively related with training transfer, (iv) H2: determine whether ‘intrinsic motivation’ was positively associated with ‘training transfer’ and (v) H3: Extrinsic motivation is positively related with training transfer.

Results in Table 2 show that Hypothesis, H1a that stated that intrinsic motivation positively associated with training design was significant ($\beta = 0.325$; $t = 2.693$; $p < 0.05$), meaning that the hypothesis was supported. H1b that stated that extrinsic motivation positively associated with training design was not supported ($\beta = 0.202$; $t = 0.653$, *n.s.*). Hypothesis, H1c that stated that training design is positively related with training transfer was supported ($\beta = 0.47$ $t = 3.353$ $p < 0.01$). Hypothesis, H2 was supported with $\beta = 0.737$ ($t = 2.2991$; $p < 0.01$). Implying that ‘intrinsic motivation’ of smallholder farmers’ positively and significantly influenced their transferring of the agricultural training. H3 that stated that extrinsic motivation is positively related with training transfer ($\beta = 0.150$; $t = 0.583$, *n.s.*) was not supported. This means that extrinsic motivation did not matter in training transfer in both mediated and direct relationship.

Taken together, the findings about H1a-c through H3 lead to the conclusion that training design (perceived content validity) mediates the association between intrinsic motivation and training transfer but not that of extrinsic motivation. This is because according to Baron and Kenny (1986) for the mediation association to be presupposed, the path between the independent

TABLE 2 Testing of the association of motivation and training design on training transfer

Hypothesis		Standardized estimates	SE	t value	Hypotheses testing decision
H2	Intrinsic motivation → Training transfer	0.737	0.246	2.991**	Supported
H1a	Intrinsic motivation → Training design	0.875	0.325	2.693**	Supported
H1b	Extrinsic motivation → Training design	0.132	0.202	0.653	Not supported
H1c	Training design → Training transfer	0.158	0.047	3.353***	Supported
H3	Extrinsic motivation → Training transfer	0.88	0.150	0.583	Not supported

*** $p \leq 0.01$; ** $p \leq 0.05$.

variable and the mediating variable as well as that of the mediating variable with dependent variable should be significant, which was the case for intrinsic motivation and not for extrinsic. This could further lead to the conclusion that in this study, only intrinsic motivation associated with training transfer. This can be interpreted to mean that the likelihood of the smallholder farmers to transfer is guided by the most internal forms of their motivation, and their perceptions about the suitability of trained content to their work lifestyles. This finding is consistent with Charatsari et al. (2017) who, in their study carried out in Greece, found that farmers' intentions to participate in competence development trainings was inclined to the intrinsic motives but not their extrinsic ones.

Mielniczuk and Laguna (2017) found that although both intrinsic and extrinsic motivations positively related to intention to start new training among employees of small- and medium-sized enterprises in Poland, intrinsic motivation was a more powerful predictor. Inegbedion et al. (2020), however, reported youth motivation to participate in agricultural related practical course at universities in Nigeria, another developing country to be more inclined to motives espoused in the extrinsic motivation domain. But all the above studies examined intentions to participate in transferable trainings as directly predicted from the trainees' motives.

This study examined both the direct and mediated relationship by training design of trainees' internal and external motivation to transfer of acquired knowledge and skills. The R-square value of 0.24 at the mediation point (training design) of motivational factors implies that intrinsic and extrinsic motivational factors account for 24% of trainees' satisfaction about suitability of the training design with their context. This points to the existence of other factors predicting training design. Similarly, the overall, the R-square value of 0.30 implies that trainee motivation and their perception about the training design, together explain 30% of the likelihood of smallholder farmers to transfer learnt knowledge and skills. However, this also suggests that other than motivation and training design, there could also be other probable factors that explain training transfer among smallholder farmers, either directly or as mediated by training design.

Evaluation of mediation of training design with motivation on training transfer

Table 3 shows the bootstrap output, which indicates that the mediation effect of training design on motivation and training transfer was significantly different from zero. Farmers' perceptions about the training design between intrinsic motivation and training transfer significantly differed from zero ($\beta = 0.082$; 95% CI = $-0.023\sim 0.176$). Farmers' perceptions about the training design between extrinsic motivation and training transfer also significantly differed from zero ($\beta = 0.010$; 95% CI = $-0.023\sim 0.062$). This suggests, bootstrap results support the hypothesis that training design mediates the association of both the intrinsic and extrinsic motivations with training transfer. However, the relevance of obtained results of the mediation for practical usage necessitates evaluating the effect sizes alongside coefficients of each path; where only coefficients with $\beta \geq 0.2$ are considered to carry practical relevance (Medina, 2017).

In this study, the biggest standardized total effects were found in the prediction relationship between intrinsic motivation ($\beta = 0.450$; 95% CI = $-0.146\sim 0.629$; hypothesis H1a) and training design, which merits the criterion for practical relevance. The estimate 0.450 implies that intrinsic motivation predicts up to 45% of variance in farmers' perceptions regarding the suitability of the training design. This implies that if trainers and training organizers need to achieve having a well-perceived training design, they need to focus more attention on selection of internally

TABLE 3 Bootstrap evaluation for training design mediation test

Paths	Standardized effects			Bias-corrected (95% CI)			Practical relevance ($\beta \geq 0.2$)
	Direct effects	Indirect effects	Total effects	Lower limit	Upper Limit		
Intrinsic motivation	0.313	0.082	0.395	-0.034	0.636		Supported
Intrinsic motivation	0.450	—	0.450	-0.146	0.629		Supported
Extrinsic motivation	0.169	0.010	0.179	0.169	0.378		Not Supported
Extrinsic motivation	0.056	—	0.056	0.242	0.247		Not Supported
Perceived content validity	0.201	—	0.201	0.31	0.317		Supported
Intrinsic motivation	—	0.082	0.082	-0.023	0.176		Supported
Extrinsic motivation	—	0.010	0.010	-0.023	0.062		Not Supported

motivated trainees. For example, high impact strategies for identifying highly motivated trainees utilized a list of criteria that assess an individual's desire to fulfil human basic needs, such as hunger, thirst, sleep and avoiding pain, anxiety/discomfort as well as the desire to build or maintain social relations among peers through a suggested training. Alternatively, trainers could focus on having pre-training briefing strategies that aim to consolidate the internal motives of the trainees regarding the training as well as select the well-matched candidates.

In the same context, the relationship between intrinsic motivation and training transfer ($\beta = 0.395$; 95% CI = $-0.034\sim 0.636$; hypothesis H2) satisfied the practical relevance criterion; suggesting that a well-motivated trainee internally could contribute to transfer success even in cases where the design is not well suited to the contexts of the trainees.

Lastly, the hypothesis 1c that points the path between training design and training transfer ($\beta = 0.201$, 95% CI = $0.031\sim 0.317$) also merited for practical consideration. Overall, total effect sizes were, however, small pointing to the possibility other factors, such as factors related to work environment, not covered in this study that could be affecting training transfer among small-holder farmers in Central Uganda.

CONCLUSION

The findings of this study suggest that intrinsic motivation is crucial if smallholder farmers are to appreciate the training approaches used during training which subsequently is established in this study as an important factor for them to transfer acquired knowledge and skills through trainings. This leads to the suggestion that trainers need to pay specific attention on who participates in any given training and aim to influence their internal motivation before, during and after the training.

Theoretically, this study contributes to training transfer studies by combining social-psychological theories with the learning transfer system inventory. Particularly, it suggests that motivations may not be always influence training transfer directly as seen from LTSI studies. This study reveals that by splitting up of motivation based on motivational theories, it is probable to find more accurate parts of motivation, such as is the case for intrinsic motivation that contribute to transfer success than the other human motives. This is likely to improve the practical recommendations drawn to practitioner based on theoretical orientation. In addition, this study opens the case for exploration of mediation variable within training transfer studies.

LIMITATION OF THE STUDY

Surprisingly, this study did not find extrinsic motivation to play a vital role in influencing training transfer. This could have been the case because extrinsic motivation is further broken down into four sub-constructs (external regulations, introjection, identified and integrated), yet this study treated it as a single construct. Thus, sub-construct interactions may have resultant muted the relationship between extrinsic motivational factors, training design and training transfer. Other studies could consider exploring the individual contribution of each of the extrinsic motivation constituents on training transfer. Future studies could also reveal more insights through using multi-group structural equation modelling for analysis; this could bring out context-specific variations regarding the association of motivational factors and training transfer.

ACKNOWLEDGEMENTS

Support for this study was made possible through a Capacity building Competitive grant *Training the next generation of Scientists* provided by the Carnegie Corporation of New York through the Regional Universities Forum for Capacity building in Agriculture (RUFORUM) for which we are grateful. Special thanks to CARITAS Luweero office and CEDO Organization in Rakai and Lyantonde districts and the smallholder farmer who participated in the study.

ORCID

Ismail Twase  <https://orcid.org/0000-0001-5802-1136>

REFERENCES

- Ajzen, I. (2002). Residual effects of past on later behaviour: habituation and reasoned action perspectives. *Personality and Social Psychology Review*, 6, 107–122.
- Ajzen, I., Czasch, C., & Flood, M. G. (2009). From Intentions to Behaviour: Implementation Intention, Commitment, and Conscientiousness. *Journal of Applied Social Psychology*, 39(6), 1356–1372.
- Amadu, F. O., & McNamara, P. E. (2014). *How do Social Networks Influence the Performance of Extension Workers? Modernizing extension and advisory services*. USAID.
- Arefin, S., & Islam, N. (2019). A study on the motivation to transfer training in the banking industry of Bangladesh. *South Asian Journal of Human Resources*, 6, 45–72.
- Baldwin, T. T., Ford, J. K., & Blume, B. D. (2017). The state of transfer of training research: Moving toward more. *Human Resource Development Quarterly*, 28, 17–28.
- Baron, R., & Kenny, D. (1986). The moderator-mediator distinction in social psychological research: conceptual, strategic, and statistical consideration. *Journal of Personality and Social Psychology*, 51(1), 1171–1182.
- Bell, B. S., Tannenbaum, S. I., Ford, J. K., Noe, R. A., & Kraiger, K. (2017). 100 years of training and development research: What we know and where we should go. *Journal of Applied Psychology*, 102(3), 305–323.
- Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). Guilford Press.
- Buyinza, J., Nuberg, I. K., Muthuri, C. W., & Denton, M. D. (2020). Psychological factors influencing farmers' intention to adopt agroforestry: A structural equation modeling approach. *Journal of Sustainable Forestry*, 39(8), 854–865.
- Charatsari, C., Lioutas, E. D., & Koutsouris, A. (2017). Farmers' motivational orientation toward participation in competence development projects: a self-determination theory perspective. *Journal of Agricultural Education and Extension*, 23(2), 105–120. <https://doi.org/10.1080/1389224X.2016.1261717>.
- Chatterjee, A., Arun, P., & Sarkar, B. (2018). Learning transfer system inventory (LTSI) and knowledge creation in organizations. *The Learning Organization*, 25(5), 305–319. <https://doi.org/10.1108/TLO-06-2016-0039>
- Deci, E. L., & Ryan, R. M. (2012). Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (pp. 85–110). Oxford University Press.
- Facteau, J. D., Dobbins, G. H., Russell, J. E. A., Ladd, R. T., & Kudisch, J. D. (1995). The influence of general perceptions of the training environment on pretraining motivation and perceived training transfer. *Journal of Management*, 21(1), 1–25.
- Gegenfurtner, A., Veermans, K., Festner, D., & Gruber, H. (2009). Motivation to transfer training: an integrative literature review. *Human Resource Development Review*, 8(3), 403–423.
- Global Forum for Rural Advisory Services. (2014). *Gender equality in rural advisory services*. AGFRAS Working Group.
- Government of Uganda. (2015). *Second national development plan (NDP II) 2015/16–2019/2020*. Author.
- Holton, E. F., Bates, R. A., & Ruona, W. E. A. (2000). Development of a generalized learning transfer system inventory. *Human Resource Development Quarterly*, 11(4). [https://doi.org/10.1002/1532-1096\(200024\)11:4<333:AID-HRDQ2>3.0.CO;2-P](https://doi.org/10.1002/1532-1096(200024)11:4<333:AID-HRDQ2>3.0.CO;2-P).
- Hu, L., & Bentler, P. M. (2009). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55.

- Inegbedion, G., & Islam, M. (2020). Youth motivations to study agriculture in tertiary institutions Youth motivations to study agriculture in tertiary institutions. *The Journal of Agricultural Education and Extension*, 26(5), 497–512.
- Kalule, S. W., Sseguya, H., Ongeng, D., & Karubanga, G. (2019). Facilitating conditions for farmer learning behaviour in the student-to-farmer university outreach student-to-farmer university outreach. *The Journal of Agricultural Education and Extension*, 25(3), 211–225. <https://doi.org/10.1080/1389224X.2019.1604389>.
- Kiwanuka, J., Miiro, R. F., Matsiko, F. B., & Nkalubo, S. (2020). Using the Learning Transfer System Inventory to test the effects of trainee and training design characteristics on the transfer of agricultural training in Uganda. *International Journal of Training and Development*, 24(4), 374–383.
- Medina, M. N. (2017). Training motivation and satisfaction: The role of goal orientation and off shoring perception. *Personality and Individual Differences*, 105, 287–293.
- Mielniczuk, E., & Laguna, M. (2017). Motivation and training initiation: Evidence from Poland. *Journal of Workplace Learning*, 29(1), 22–37. <https://doi.org/10.1108/JWL-01-2016-0002>.
- Miiro, R. F., Mazur, R. E., & Matsiko, F. B. (2012). Factors in the transfer of governance- facilitation skills within farmers' marketing organizations in Uganda. *Journal of Agricultural Education and Extension*, 18(3), 231–245. <https://doi.org/10.1080/1389224X.2012.670051>.
- Muthoni, R. A., & Miiro, R. F. (2017). What influences transfer of training in an African agricultural research network? *Journal of Agricultural Education and Extension*, 23(1), 23–37.
- Ndaula, S., Matsiko, F., & Sseguya, H. (2019). Farmers' multidimensional beliefs in orange-fleshed sweetpotato acceptance among rural households in Uganda. *Advances in Agricultural Science*, 7(2), 100–112.
- Ndaula, S., Sseguya, H., & Matsiko, F. (2020). Social-cognitive factors influencing household decisions to grow orange-fleshed sweet potato in Uganda. *Journal of Agricultural Extension*, 24(1), 1–12.
- Nunnally, J. (1978). *Psychometric theory*. McGraw-Hill.
- Park, Y., Lim, D. H., & Chang, J. (2017). Trainee versus supervisor assessment of training transfer: Mediational analysis of transfer variables. *Asia Pacific Journal of Human Resources*, 55, 192–212.
- Preacher, K. J., Zyphur, M. J., & Zhang, Z. (2010). A general multilevel SEM framework for assessing multilevel mediation. *Psychological Methods*, 15, 209–233.
- Reinhold, S., Gegenfurtner, A., & Lewalter, D. (2018). Social support and motivation to transfer as predictors of training transfer: Testing full and partial mediation using meta-analytic structural equation modelling. *International Journal of Training and Development*, 22(1), 1–14.
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54–67.
- Ryan, R. M., & Deci, E. L. (2019). Brick by brick: The origins, development, and future of self-determination theory. In *Advances in motivation science* (1st ed., Vol. 6, pp. 111–156). Elsevier.
- Sahoo, M., & Mishra, S. (2018). Effects of trainee characteristics, training attitudes and training need analysis on motivation to transfer training. *Management Research Review*, 42(2), 215–238. <https://doi.org/10.1108/MRR-02-2018-0089>.
- Uganda Bureau of Statistic. (2018). *The national population and housing census 2014—Main report*. Author.
- Uganda Bureau of Statistic. (2020). *Annual Agricultural Survey 2018*. Author.
- Wasilu, S., Mudiyansele, D. S., & Abang, E. O. (2018). Mediation of transfer motivation on the relationship between trainee characteristics and transfer of training: Evidence from educational sector in Nigeria. *Human Resource Development International*, 21(5), 552–570.
- Weisweiler, S., Nikitopoulos, A., Netzel, J., & Frey, D. (2013). Gaining insight to transfer of training through the lens of social psychology. *Educational Research Review*, 8, 14–27. <https://doi.org/10.1016/j.edurev.2012.05.006>.
- Xiao, J. (1996). The relationship between organizational factors and the transfer of training in the electronics industry in Shenzhen, China. *Human Resource Development Quarterly*, 7, 55–73. <https://doi.org/10.1002/hrdq.3920070107>.
- Zamani, N., Ataei, P., & Bates, R. (2016). The use of the Persian translation of the Learning Transfer System Inventory in the context of agricultural sustainability learning in Iran. *International Journal of Training and Development*, 20(1), 92–104. <https://doi.org/10.1111/ijtd.12071>.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

How to cite this article: Twase, I., Miiro, R. F., Matsiko, F., Ndaula, S., & Ssamula, M. (2021). Mediation of perceived content validity on motivation and training transfer among smallholder farmers in Central Uganda. *International Journal of Training and Development*, 00, 1–14. <https://doi.org/10.1111/ijtd.12236>