


Perceived Effectiveness of Academic Leadership Development Training: The Contribution of Motivational Factors and Peer Interaction

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Abstract

Due to the radical changes and complexities within academic institutions, leadership development addressed to academic leaders in the digital age has become more critical. In the available literature, the outcome assessment of leadership development and its related factors have not been evaluated rigorously. The current study investigated the contribution of peer interaction and two subscales of motivation to the effectiveness of the leadership development programs perceived by training participants in a diverse context. Of 101 participants, the majority of training workshop attendees were junior and middle-level leaders from both European universities and Chinese universities who participated in the leadership development programs organized under an EU project. PLS-SEM was exploited to validate the measurement model and test the hypotheses. The results showed that self-growth and peer interaction significantly contribute to perceived effectiveness, whereas networking motivator shows nonsignificant impact. The findings also illustrated that the two

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motivation patterns have significant effects on interaction quality. The mediating role of peer interaction on the relationships between the two motivational factors and perceived effectiveness, respectively, were not found in the current study. The findings contributed to identifying the role of different contributors to the effectiveness of the leadership development program in HE contexts and the potential of such a program to enhance knowledge and capacities of academic leaders regarding university governance and leadership.

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Introduction

Throughout the past decades, higher education institutions have coped with substantial changes and increasing challenges when it comes to their transformation in size and complexity (Sewerin & Holmberg, 2017). More importantly, academic institutions tend to alter themselves towards entrepreneurship, innovation, and accountability (Antoine & Van Langenhove, 2019). In this respect, the successful functioning of the higher education institutions and maintaining their competitive advantages rely on university governance and the new generation of academic leaders who can cope with on-going challenges and facilitate the institutions' mission (Dinh et al., 2021; Evans, 2014). This issue is more important for those in junior or middle-leadership positions including the department head or dean of the faculties (Dinh et al., 2021; Hundessa, 2019). Not surprisingly, academic leadership



development, which strongly supports leaders and staff in enhancing their leadership capacities in the new context, is increasingly in the interest of researchers (Dinh et al., 2021; Dopson et al., 2018; Evans, 2014; Kovacevic, 2019; Liu, 2019).

Concerning leadership and leadership development in the 21st century, recent studies indicate that leadership development goes beyond traditional features of professional training (Day et al., 2021; McCauley & Palus, 2021). To be specific, previous leadership development frameworks mainly focus on an individualistic perspective rather than a collective emergent perspective that considers leadership a group activity (Day et al., 2021; McCauley & Palus, 2021). Recent studies in leadership underline relational theory, which considers leadership means of collaboration within a group of people (McCauley & Palus, 2021). Thus, inclusive leadership development that simultaneously enhances knowledge and competencies for leaders and strengthens professional networks, collaboration in order to create institutional values for their organizations is emphasized (Day et al., 2021; Liu, 2019). To date, empirical research that evaluates training effectiveness and its' vital contributors to this type of leadership program has not been implemented in the literature. Nevertheless, participants' perception towards the effectiveness of the program and related factors represents a fundamental construct as it is related to both crucial training outcomes and behavioral changes (Dopson et al., 2018). In higher education settings, in particular, study on the effectiveness of leadership development and its related factors have not been evaluated rigorously (Dopson, Ferlie, McGivern, et al., 2016). According to Dopson (2016), there were just a few studies focusing on the effectiveness and impact assessment of higher education leadership development programs. Nevertheless, in the new context of

digital age, theoretical and empirical research on leadership development needs more attention in order to have an optimal and effective leadership program for leaders in new academic settings.

With such a background, this research endeavored to identify the contribution of motivational factors and peer interaction with levels of perceived effectiveness of leadership development workshops addressed to leaders at different levels in academic settings.

Theoretical Framework

A new approach to leadership and development

Over the last decades, leadership has been conceptualized in multiple ways, from the traditional approach to the modern perspective (Tedla et al., 2021). Traditionally, a large number of studies consider leadership as a property of individuals and their interactions with followers (McCauley & Palus, 2021; Reyes et al., 2019). Rooted on relational theory, a modern perspective of leadership promotes democratization of leadership and defines leadership as a “collective phenomenon that is distributed or shared among different people potentially fluid and constructed interaction” (Denis, Langley, & Sergi, 2012, p.212). Accordingly, leadership is contextual and located in the relational processes through which the communal achievements of organizing, collaborating, and adapting were constructed and produced. When it comes to higher education contexts, Dinh et al. (2021) conceptualize leadership as “an influence of one or more people with an academic profile on academic behavior, attitudes, or intellectual capacity of others based on commitment and power in order to achieve managerial, structural, and institutional vision values (p.14).



Conceptual perspectives on leadership consistently relate to how leadership development is designed and implemented. Day et al. (2021) highlight that it is crucial to distinguish between leader development and leadership development. Leader development, which is based on the traditional approach, focuses on enhancing competencies and skills for individuals. Leadership development, which is rooted in relational theory, goes beyond the purpose of individual skill enhancement to nourish networked relationships within a group of people and collegially accomplish institutional values or visions (Day et al., 2021; McCauley & Palus, 2021).

In the 21st century, academic institutions are demanding leadership development training that is not only well adaptive to the organizational context but also supportive for transformation (McCauley & Palus, 2021; Zhu & Zayim-Kurtay, 2018). In the recent study on academic leadership in the time of COVID 19, Dumulescu & Mutiu (2021) also raised a call for academic leadership training in which networked relationships and collaboration among learners are fostered. Unfortunately, leadership training that comprises individual competence and relational competence is scarce in literature as current leadership programs predominantly follow the traditional approach to leadership to design a competency-based or behavior based training curriculum (Day et al., 2021; Liu, 2019). Following studies conducted by Day et al. (2021), Liu (2019), and McCauley & Palus (2021), we perceive academic leadership development training as a type of professional development addressed for leaders in academic settings which aims at enhancing capacities for learners and simultaneously promoting networked community and collaboration regarding academic leadership.

Perceived effectiveness of leadership development program

Perceived effectiveness of the training course is generally defined as a perception of learners towards the quality of the training program. The approach for evaluating perceived effectiveness, however, varies in the literature. Some studies examine perceived effectiveness via the level of satisfaction or the extent to which skills and competencies developed (Levin et al., 2018; Zhu, 2017). Some evaluate perceived effectiveness via course outcomes or course design parameters (Cooper et al., 2017; Malik et al., 2015). Several studies prefer to use a global scale to examine the role of perceived effectiveness (Hone & El Said, 2016; Jung et al., 2019; J. Peltier et al., 2007).

As any other disciplines, measuring the success of leadership development training is crucial to better understand the usefulness and impacts of such program (Newcomer et al., 2015). In addition, it is promising to offer opportunities for revision and progress (Dopson, Ferlie, McGivern, et al., 2016). The current research adopted an evaluation model of training outcomes proposed by Kirkpatrick (1996) as mean of the theoretical basis. The model consists of 4 levels: reaction, learning, behavioral change, and organizational performance. Although exploring all levels of the evaluation model is equally essential (Kirkpatrick & Kirkpatrick, 2006), this study intentionally focuses on the first level (reaction), which is considered an essential level to evaluate perceived trainees' engagement in the training program. Concerning measurement instruments, a three-item scale for measuring perceived effectiveness globally, which was successfully validated in previous studies, was adopted (Hone & El Said, 2016; J. Peltier et al., 2007).



Peer interaction and perceived effectiveness of leadership development program

Interactivity is conceptualized as a way in which education involves communication, participation and feedback (Muirhead, 1999) or as an interplay and exchanges in which various people or groups influence each other (Roblyer & Ekham, 2000). Peer interaction, accordingly, is perceived as the degree to which the learners perceive the process of actively engaging with their peers in constructive and reflective ways in order to enhance motivation, knowledge and skill instruction (Diep et al., 2017; Ke & Kwak, 2013).

In educational settings, many studies indicate the related factors that affect the effectiveness of the training programs, including course contents, course structure, learner interaction, instructor support, and mentoring (Gray & Diloreto, 2016; Lagat & Concepcion, 2022; Xie & Ke, 2011). Of this, peer interaction is considered a vital indicator that positively associates with learning effectiveness (Diep et al., 2016; Green & Cifuentes, 2011; Lagat & Concepcion, 2022). When it comes to leadership development addressed to academic leaders, particularly in the present study's context, the training design is uniquely different. As a training addressed for adult learners, it intentionally goes beyond knowledge and competency construction to promote a community of practice where participants have more opportunities to interact, share personal experiences and broaden their professional network (Loizzo et al., 2017). Thus, collaborative learning is emphasized in several leadership studies on leadership (Cullen et al., 2014; Lester et al., 2017). Along the same line, Dopson et al. (2018) highlight that leadership program design should be based on problem-based learning and organized under workshops, seminars that interactively address on-going obstacles and challenges faced by leaders. In this regard, understanding peer interaction is a

fundamental step that may provide insights into enhancing academic learners' perception of learning. Therefore, it is crucial to examine whether this factor leads to a productive and successful leadership program tailored to academic staff and higher education leaders.

While there are implications that peer interaction plays a preeminent role in perceived learning effectiveness in academic leadership training, empirical studies that investigate the relationship between the two features are scarce. Based on the literature, the following hypothesis was put forward:

H1: Peer interaction is positively related to perceived effectiveness

Motivation, peer interaction and perceived effectiveness of leadership development program

1. Self-growth and networking: two essential forms of motivation in leadership development program

Motivation: conceptualization

The notion of motivation, which was initially conceptualized by Gardner et al. (1976), describes the reasoning that directs individual behaviour and consists of beliefs, perceptions, interests, and actions. In this light, a broader concept of individual motivation, proposed by Ryan and Deci (2000), refers to reason or the intention to do something, which takes place either intrinsically or extrinsically. Intrinsic motivation is usually developed by personal interests, curiosity (Wasko & Faraj, 2000), or enjoyment and delight (Ryan and Deci, 2000). Extrinsic motivation is usually identified by related indicators such as perceived usefulness or reputation (Nov et al., 2010).



Self-growth

Self-growth is psychologically defined as the intentional growth process (rather than nonconscious growth) of individuals in the ways that are important to them towards self-actualization (Luyckx & Robitschek, 2014; Robitschek et al., 2012). Woerkom & Meyers (2019) highlight that self-growth is not only a central individual need but also an essential requirement for organizational success.

Previous studies on motivational orientation towards professional development revealed that personal interest and practical enhancement are among the most important reasons that encourage learners to join the programs (Kao et al., 2011; Loizzo et al., 2017). Personal interest is perceived as intrinsic motivation for inherent joy of the program that compels learner participation (Kao et al., 2011; Ryan & Deci, 2020). Practical enhancement, which could also be categorized as a subtype of autonomous extrinsic motivation, refers to the desire to enhance their knowledge, skills and competencies within the field (Kao et al., 2011; Ryan & Deci, 2020). In the recent study on intrinsic and extrinsic motivation from a self-determination theory perspective, Ryan & Deci (2020) posit that while intrinsic motivation and autonomous extrinsic motivation are distinguished by enjoyment and sense of value, they mutually share the quality of being highly volitional or willing to act. In the empirical study on the formation of teachers' intrinsic motivation in professional development, Liu et al. (2019) found that sense of professional development value contributes to self-development for a long time as it helps teachers to build their own meanings of development, so as to nourish their motivation. The findings are consistent with Ryan & Deci (2020)'s study.

Following theoretical and empirical studies implemented by Liu (2019; Luyckx & Robitschek (2014); Ryan & Deci (2020), in the current study, we perceive motivation for self-growth as an individual's intentional desire to enhance their skills and competencies within the field for personal change and the inherent joy of the program that may impels learners to engage in the training course.

Networking

Networking is generally understood as the configurations of connectivity that occur when people interact with each other via communication, resource sharing, etc., supported either through face-to-face interaction or virtual connectivity using digital technology tools (Haythornthwaite & De Laat, 2012). In the context of professional development, networking is perceived as interaction between participants for knowledge co-construction, skill enhancement and professional development (Haythornthwaite & De Laat, 2012; Vaessen et al., 2014). Previous studies point out the importance of building a professional networked learning community that not only contributes to individual capacity enhancement but also organizational development (Chen et al., 2020; Lester et al., 2017; Vaessen et al., 2014). In professional development with networked learning approach, the individual plays an essential role as the primary source and destination of learning (Haythornthwaite & De Laat, 2012; Meijs et al., 2016; Vaessen et al., 2014). As the leadership development training exploited in the current study aimed at enhancing leadership capacities for learners and simultaneously strengthening a professional network community, we intentionally placed emphasis on exploring the contributing role of participants' motivation for networking to learning engagement and training effectiveness.



2. Motivational factors and perceived effectiveness

As motivation is considered a key factor in learner success (Fischer, Malycha, & Schafmann, 2019), the association between learner motivation and the effectiveness of the training program are among the faster-growing areas of investigation in an adult education setting (Chia et al., 2011; Kao et al., 2011; Osman & Warner, 2020; Truong & Murray, 2019). Cave & Mulloy (2010) conducted research that aimed to understand the motivational orientations that either assisted or direct teachers' behavior in an intervention program. The findings demonstrated that learning motivation, along with time, resources, and interactions are essential to promoting effective and sustained program implementation. Similarly, Osman & Warner (2020) endorse the view that teachers' motivation plays an essential role in determining learners' behavior after participating in professional development. In other words, motivation to join the training is crucial to the success and failure of a professional development program. Those studies support the importance of evaluating the relationship between motivation and the perceived effectiveness of professional development training. The findings are practically helpful for policymakers or designers in order to design an effective training program that meets the needs of learners based on different levels of motivation.

H2a: Motivation for self-growth is positively related to perceived effectiveness

H2b: Motivation for networking is positively related to perceived effectiveness

3. Motivational factors and peer interaction

Several studies in educational settings endorse the view that motivation has a significant correlation to learning interaction quality (Barak et al., 2016; Xiong et al., 2015; Zainuddin, 2018). For example, Xiong et al. (2015)'s study revealed that the higher unit of intrinsic and extrinsic motivations may increase the unit of student engagement in the course. Barak et al. (2016)'s study indicated a positive correlation between motivation gain and the learners' social engagement quality including the participation in group discussion. In the context of professional development particularly, Durksen et al. (2017) also found a positive relationship between motivation constructs and learners' engagement in the professional training course. We propose the hypotheses upon the relationship between motivation and learners' interaction

H3a: Motivation for self-growth is positively related to peer interaction

H3b: Motivation for networking is positively related to peer interaction

The mediating role of peer interaction

As discussed, there is a potential bivariate relationship between perceived effectiveness, peer interaction, and motivation in a leadership development program. Nevertheless, studies have not addressed the triangular relationship between these three dimensions. Moreover, it has been found that there is a significant association between the individuals' motivation and interaction quality among learners (Xie & Ke, 2011). Hence, it is possible to hypothesize that peer interaction can play a role as the mediator of the relationship between perceived effectiveness and motivation. Based on the literature,

research questions are formed in the current study, which will be discussed in the following part.

H4a: Peer interaction mediates the relationship between self-growth and perceived effectiveness

H4b: Peer interaction mediates the relationship between networking and perceived effectiveness

The research model

The primary objective of the present research was to examine the statistical significance of motivation and peer interaction effects on the perceived learning effectiveness of academic leadership development (ALD) programs in academic settings. Based on the literature review and the hypotheses proposed, the research model is depicted in *Figure 1*.

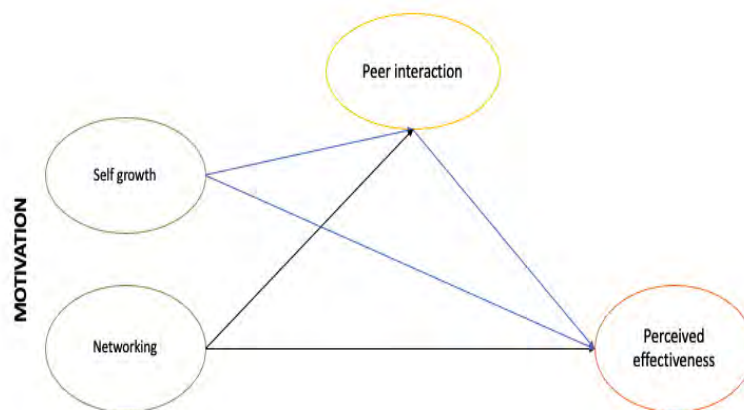


Figure 1. The research model

Methodology

Research context

This study was conducted during the three series of face-to-face (F2F) training workshops for academic members and leaders. The three workshops were consistent in terms of format, contents, and activities. The ultimate goals of the training workshop series were to foster knowledge and capacities of academic leaders at different levels of university governance and academic leadership and simultaneously develop an international network of collaboration and partnership on professional development, research, and teaching among participants from different institutions. Each workshop series was organized for 3 to 5 days hosted by the project partner university. The training program include keynote speeches on knowledge sharing and structured discussions addressing situated knowledge and on-going challenges faced by academic members and leaders. These learning formats are highlighted as optimal program designs for leadership training in the digital age (Scott et al., 2008; Turnbull & Edwards, 2005; Wolverton et al., 2005). Training contents were consistently selected under three main themes, including university governance, academic leadership, networking and collaboration. For example, for the first workshop series, the main contents included university governance from senior leaders and administrators' perspective, the roles of middle-level academic leaders, governance of research-based universities, etc. During the second workshop series, main contents were about academic rankings and university governance, governance of doctoral education, case studies on academic leadership, etc. Concerning the third workshop series, main contents were surrounded by key topics including policy recommendations for university governance and academic leadership, internationalization, diversified



education and academic leadership. In addition to the main training workshops, social learning and informal activities including interpersonal exchanges, peer-to-peer learning and cultural exchanges were organized to provide more opportunities for networking and social interactions. Concerning participants, attendees of the three workshops included leaders and academic staff from partner universities and non-partner universities. There were 75 participants who took part in the first series of training and 45 participants who participated in the second series. There were 23 participants who joined the third series of workshops.

As the three series of training workshops offer the same training format, training themes and similar duration, survey data were collected at the end of each workshop series. After cleaning up of the data and eliminating of missing data, the final dataset consists of 101 valid responses categorized by each series of training workshops (Table 1).

Research design

The current research presents the results from a quantitative study of F2F training on academic leadership in higher education settings. We used a quantitative study design as it enables researchers to examine the potential relationships between the two motivational factors, namely self-growth and networking, and peer interaction to the perceived effectiveness of the training (Creswell, 2009). The findings provided essential guidelines for designing leadership development programs in academic settings. The study could serve as a starting point for more large-scale research examining related factors affecting the outcome of such leadership development program

addressed to academic leaders and staff from an international perspective.

Sample

Within limited time resources available, heads are mainly preoccupied with administrative duties, leaving the guidance of teachers as an additional burden (Brauckmann & Schwarz, 2015; Windlinger & Hostettler, 2014).

Respondents originating from European and Chinese higher education institutions voluntarily completed the surveys. As several participants joined more than one workshop, we used demographic information to eliminate duplicate responses. In total, 101 valid responses were used with no cases of missing data. Female participants accounted for 45.5%, and male respondents accounted for 50.5%. The two most dominant age groups were those between 30-39 and 40-49, which accounted for 67.3%. On the contrary, a minority of the respondents who were less than 30 years old (6.9%). **Table 1** summarizes the socio-demographic information of the survey respondents.

The sample size was sufficient enough to empirically examine the research model by exploiting the Partial Least Squares (PLS) statistical regression method based on the minimum R-squared method. Specifically, the maximum number of arrows pointing at a latent variable is 3, the minimum R^2 in the model is 0.35. By using G*power analysis, a minimum of 53 cases were efficient to evaluate the research model in the current study (Hair et al., 2017).



Table 1. Demographic information of the survey respondents (N=101)

Variables	Category	Statistics	Percentage (%)	
<i>Gender</i>	Male	51	50.5	
	Female	46	45.5	
	Missing	4	4	
<i>Age</i> (M= 43.7; SD=9.80)	22-29	7	6.9	
	30-39	30	29.7	
	40-49	38	37.6	
	50-more	26	25.8	
<i>Academic leadership experience</i> (M= 6.613; SD=6.268)	Junior level (0-5 years)	58	57.4	
	Middle level (6-10 years)	20	19.8	
	Senior level (>10 years)	21	20.8	
	Missing	2	2.0	
<i>Series of Workshops</i>	The first series, June 2019	50	49.5	
	The second series, Oct 2019	32	31.7	
	The third series, Oct 2021	19	18.8	
<i>Contexts</i>	From Chinese universities	Chinese participants	61	60.4
	From European universities	European participants	40	39.6

Instrumentation and procedures

In this study, a questionnaire was developed predominantly from the literature with the wording modified to fit the context of leadership development program. Concerning the measurement scales, two forms of motivation, namely self-growth and networking, were developed from Kao et al. (2010). Peer interaction scale was taken from Diep, Cocquyt, Zhu and Vanwing (2016), while perceived effectiveness was developed from Peltier et al. (2003). The questionnaire items were initially written in English using 5-point

Likert scales anchored on “1=strongly disagree” and “5=strongly agree”. Socio-demographic information was collected on gender, age, and academic leadership experience. To collect evidence of validity for the adapted instrument, a two-step procedure was implemented. First, we consulted two experts with expertise in Education for content validity and face validity of the items. Second, we conducted a pilot study with a small subset of survey participants. Based on the results of principal components analysis, several items were retained or eliminated. The final instrument for the main study consisted of four constructs with five items for self-growth, three items for networking, six items of peer interaction, and three items of perceived effectiveness. The measured constructs with Cronbach’s alpha and item loadings can be found in **Appendix A**.

As part of the target group include participants from Chinese universities, the survey questionnaire was translated into Chinese. To ensure equivalent meaning of the instrument, the translated survey was backtranslated by a native English speaker. In addition, before respondents received the questionnaire, researchers briefly introduced the primary objectives of conducting the survey as well as the importance of precise answers provided by attendees. Besides, voluntary contribution, anonymity and confidentiality of respondents were informed.

Data Collection

Regarding data collection, a cross-sectional study was exploited using a self-administered questionnaire. On the last day of each conference, the participants were invited to complete the 5-minute survey. In order to minimize the systematic bias and enhance respondents’ ability and motivation to answer surveyed questions,



procedural controls suggested by MacKenzie and Podsakoff's (2012) were followed.

Data Analysis

Data screening and descriptive analysis were carried out in SPSS. Afterwards, measurement validation and path model analysis were respectively implemented by exploiting Partial Least Squares (PLS) (Hair et al., 2017). The two main motivations to exploit of this technique include the possibility of working with small samples and the capability of solving the possible problems of data non-normality (Hair et al., 2017). As mentioned by Hair et al.(2017), the model fit evaluation in PLS-SEM includes two main steps: Confirmatory Factor Analysis (CFA) and structural model. To that end, a two-step procedure was implemented. First, composite reliability, convergent validity, discriminant validity, and measurement invariance assessment were evaluated by CFA using Smart PLS software ver.3.3.3. Subsequently, the structural model was performed using PLS algorithms and bootstrapping analysis in Smart PLS software ver. 3.3.3. As the dataset consists of two distinct groups (Chinese vs European participants), measurement invariance assessment was conducted following MICOM procedure to check whether the pooled data analysis is supported (Hair et al., 2017). To that end, three steps were implemented: (1) configural invariance, (2) compositional invariance, and (3) the equality of composite mean values and variances. If most of the structural effects are invariant across groups, pooling data is allowed (Henseler & Fassott, 2015).

Results

Measurement validation

Composite reliability and convergent validity are depicted in **Table 2**. The findings reveal that the four scales performed acceptable internal consistency as Cronbach's alpha exceeded the minimum threshold of 0.60 (Gde Agung Yana et al., 2015; Mueller & Hancock, 2018). As for composite reliability, which evaluates whether the scale items indicate the latent construct, met the cut-off value of 0.7 (Hair et al., 2017). Concerning convergent validity, the statistical results indicate that the Average Variance Extracted (AVE) exceeded the cut-off value of 0.5 (Hair et al., 2017).

Table 2. Descriptive Statistics, Composite Reliability and Validity

Construct	Number of items	M(SD)	Cronbach's α	CR	AVE
Self-growth (SG)	5	4.413 (0.561)	0.746	0.829	0.501
Networking (NW)	3	4.458 (0.587)	0.641	0.804	0.580
Peer interaction (PI)	6	4.174 (0.547)	0.806	0.861	0.511
Perceived effectiveness (PE)	3	4.412 (0.540)	0.789	0.874	0.703

Concerning discriminant validity, Fornell and Larcker's (1981) proposed that the square root of average variance extracted (AVE) for each construct should be greater than the correlations with the other constructs. **Table 3** illustrates the square root of AVE (in bold) and the correlations between constructs. Significantly, the data in the table satisfy the conditions for discriminant validity. Henseler & Fassott (2015) argue that the Fornell & Larcker (1981) criteria are not adequate



to capture a lack of discriminant validity happened in common research situations. Alternatively, the heterotrait-monotrait (HTMT) criterion was proposed (Henseler & Fassott, 2015). According to (Kline, 2011), the HTMT value should be smaller than the HTMT_{.85} value of 0.85 to avoid multicollinearity problems. The results of the discriminant validity test using the new method (Table 4) illustrate that all of the values surpassed HTMT_{.85}, meaning that the discriminant validity is adequately supported.

Table 3. Discriminant validity results

Constructs	1	2	3	4
Self-growth (SG)	0.708			
Networking (NW)	0.613	0.761		
Peer interaction (PI)	0.446	0.439	0.715	
Perceived effectiveness (PE)	0.556	0.466	0.452	0.838

Table 4. Heterotrait-monotrait (HTMT) results

Constructs	1	2	3	4
Self-growth (SG)				
Networking (NW)	0.846			
Peer interaction (PI)	0.570	0.573		
Perceived effectiveness (PE)	0.702	0.652	0.557	

Measurement invariance assesment

In order to evaluate measurement invariance, the 3-step MICOM procedure suggested by Hair et al. (2017) and Henseler & Fassott (2015) were implemented. In step 1, the configural invariance, we ensure that the three aspects are identical for both groups: setup of measurement model and the structural model, data treatment for the model estimation using the full set of data and each group of data, algorithm settings for all model estimations (Table 5). In step 2,

compositional invariance assessment, we ran the permutation procedure with 5000 permutations (Henseler & Fassott, 2015). To evaluate compositional invariance, we compared the original composite score correlation c with the empirical distribution of the composite score correlations resulting from the permutation procedure c_u . If c exceeds the 5% quantile of c_u , compositional invariance is established. The results depicted in table 5 revealed that compositional invariance was established in the structural model.

Table 5. Configural invariance and compositional invariance results

Construct	Configural invariance	Compositional Invariance assessment			
		Original Correlation (c)	5% quantile of c_u	Permutation p-Values	Compositional Invariance
Self-growth (SG)	Established	0.989	0.956	0.703	Established
Networking (NW)	Established	0.950	0.902	0.189	Established
Peer interaction (PI)	Established	0.990	0.961	0.593	Established
Perceived effectiveness (PE)	Established	0.996	0.983	0.502	Established

As for step 3, we examined the composites' equality of mean values and variances across groups. As depicted in table 6, the results reveal that most of the composite means, and variances are equal across the samples from the two groups (except for the equality of means of self-growth). As most of the structural effects are invariant across groups, pooling data is recommended (Henseler & Fassott, 2015)



Table 6. Equality of composite mean values and variances results

Construct	Full measurement model invariance assessment								
	Mean-original difference	Confidence interval	Permutation p-Values	Equality of means	Variance -Original Difference	Confidence interval	Permutation p-Values	Equality of variances	Measurement invariance
Self-growth (SG)	0.438	[-0.410, 0.406]	0.030	Not equal	-0.503	[-0.537, 0.615]	0.051	Equal	Partial
Networking (NW)	-0.139	[-0.410, 0.406]	0.504	Equal	0.636	[-0.618, 0.701]	0.061	Equal	Full
Peer interaction (PI)	-0.163	[-0.414, 0.399]	0.435	Equal	-0.258	[-0.426, 0.468]	0.247	Equal	Full
Perceived effectiveness (PE)	-0.260	[-0.400, 0.405]	0.206	Equal	-0.110	[-0.476, 0.522]	0.690	Equal	Full

Controlling variables

In order to evaluate the extent to which socio-demographic characteristics have effects on the two dependent variables, *t*-tests and ANOVA were performed. The *t*-tests findings revealed that there is a nonsignificant difference in peer interaction between male and female respondents with $t(95) = 0.859, p > .05$. Similarly, there is no difference in perception of perceived effectiveness between groups in gender with $t(95) = 1.990, p > .05$. Besides, the findings illustrated that there is no difference in perception of perceived effectiveness and peer interaction between Chinese and European attendees, with $t(99) = -0.805, p > .05$ and $t(99) = -1.040, p > .05$, respectively.

ANOVA results showed that age group has a non-significant effect on peer interaction ($F(3) = 1.714, p > .05$) and perceived effectiveness ($F(3) = 1.540, p > .05$). Similarly, the finding revealed that leadership experience has non-significant effect on peer interaction

($F(2) = 1.984, p > .05$) and perceived effectiveness ($F(2) = 2.062, p > .05$).

Table 7 illustrates the ANOVA results.

Table 7. Effects of gender, age and leadership experience, and contexts on peer interaction and perceived effectiveness

Grouping variables	Dependent variables	Df	t	p-value
Gender	Peer interaction (PI)	95	0.859	0.064
	Perceived effectiveness (PE)	95	1.990	0.056
Contexts (Chinese vs European universities)	Peer interaction (PI)	99	-0.805	0.423
	Perceived effectiveness (PE)	99	-1.040	0.301
		Df	F	p-value
Age group	Peer interaction (PI)	3	1.714	0.169
	Perceived effectiveness (PE)	3	1.540	0.209
Leadership experience	Peer interaction (PI)	2	1.984	0.143
	Perceived effectiveness (PE)	2	2.062	0.133

Given the nonsignificant effects of demographic variables on dependent variables, none of the four socio-demographic variables was included as covariates in subsequent analysis. In other words, the four socio-demographic variables did not perform as explanatory factors which affect peer interaction and perceived effectiveness in the main analysis.

Structural model evaluation

To test the research hypotheses, the structural model was measured using the bootstrapping of SmartPLS® 3 (Ringle et al., 2015).



Table 8 illustrates the results of the PLS-SEM, indicating the direct and indirect effects of the independent variables.

Concerning the hypothesis H1, the findings reveal that peer interaction was significantly associated with perceived effectiveness ($\beta=0.226, p < 0.05$). Thus, it is reasonable to postulate the more effective the interaction quality the participants perceived, the better the perceived effectiveness of the leadership training program. Therefore, H1 is supported.

With regard to the hypothesis H2a, the results empirically demonstrate that self-growth has a positive correlation with perceived effectiveness ($\beta=0.369, p < 0.001$). Thus, H2a is confirmed. Concerning the hypothesis H2b, the results indicate that networking shows a nonsignificant effect on perceived effectiveness ($\beta=.141, p > 0.05$). Therefore, H2b is not supported.

In relation to the H3a and H3b, the empirical evidence shows that both self-growth and networking have a positive correlation with peer interaction ($\beta=0.283, p < 0.05$ and $\beta=0.265, p < 0.05$, respectively). Thus, H3a and H3b are supported.

Regarding H4a and H4b, the mediating effects of peer interaction on the relationship between self-growth and perceived effectiveness (H4a) and the relationship between networking and perceived effectiveness (H4b) respectively were examined in accordance with Preacher & Hayes (2008)'s methods of bootstrapping indirect effect. The findings illustrate that the mediating role of peer interaction which intervenes the relationship between self-growth and perceived effectiveness was not found in the current study ($\beta= 0.064, p > 0.05$). Similarly, the triangular relationship among motivation of networking, peer interaction and perceived effectiveness was

nonsignificant ($\beta=0.060$, $p>0.05$). Therefore, H4a and H4b are not supported.

Table 8. PLS-SEM results of the structural model (N=101)

Hypotheses	Path	Standardized coefficient (β)	t-statistics	p-value	Confidence Interval	Decision	R ²	Q ²	f ²	VIF
H1	PI => PE	0.226**	2.383	0.018	[0.047;0.387]	Supported	0.373	0.240	0.062	1.320
H2a	SG=> PE	0.369***	3.903	0.000	[0.194;0.558]	Supported			0.127	1.707
H2b	NW=> PE	0.141	1.397	0.163	[-0.063;0.330]	Not supported			0.019	1.694
H3a	SG=> PI	0.283**	2.669	0.008	[0.095;0.512]	Supported	0.243	0.111	0.066	1.601
H3b	NW=>PI	0.265**	2.599	0.010	[0.055;0.457]	Supported			0.058	1.601
H4a	SG=>PI=> PE	0.064	1.718	0.086	[0.003;0.135]	Not supported				
H4b	NW=>PI=> PE	0.060	1.704	0.089	[0.009;0.145]	Not supported				

Significance: *** = $p<0.001$; ** = $p<0.05$

R² values: >0.20 = weak; >0.33 = moderate; >0.67 = substantial (Chin, 1998).

Q²: > 0 = The model has predictive relevance for a specific endogenous construct (Stone, 1974)

f² effect sizes: >0.02 = small effect; >0.15 = medium effect; >0.35 = large effect (Cohen, 1988)

VIF values: largest VIF value <5 = a multicollinearity problem is absent (Hair et al., 2017)

Source: Own contribution from results obtained with SmartPLS® 3 (Ringle et al., 2015)

The model overall explains 37% of the variance in perceived effectiveness and 24% of the variation in peer interaction. This means that the three independent latent variables, which are self-growth, networking and peer interaction, moderately explain 37% of the variance in attendees' opinions about the effectiveness of the leadership program (Chin, 1998). The two forms of motivation, self-growth and networking, in their role as endogenous constructs have



explanatory capacity to explain the variance in peer interaction as the values of R^2 are higher than 0.20 (Chin, 1998). Thus, the model has good quality.

When examining the predictive relevance of the endogenous constructs of the model using the blindfolding techniques of the Stone-Geisser Q2 test (Geisser, 1974; Stone, 1974). Accordingly, Q2 value exceeding zero for a specific endogenous reflective type constructs denotes the predictive relevance of the path model (Hair et al., 2017). In this study, the results indicate that the model has predictive relevance for self-growth, networking, peer interaction in their role of endogenous constructs.

Effects sizes (f^2), which measure the impact of exogenous latent constructs on endogenous latent constructs, were evaluated in the current study. According to Cohen (1988), the obtained f^2 value of 0.02 denotes small effect, 0.15 denotes medium effect, and 0.35 denotes large effect. As shown in **Table 8**, most of the relationships in the current study denote small or medium effects except the networking-perceived effectiveness relationship, which shows non-effect.

The variance inflation factor (VIF), which determines the degree of multicollinearity present, was measured in this study. In this vein, a largest VIF value exceeding 5 shows a multicollinearity problem (Hair et al., 2017). As can be seen in Table 8, the VIF values in the current study are between 1.320 and 1.707 (i.e., less than 5). Therefore, multicollinearity issue is absent.

Discussion

In the present study, the effectiveness of the leadership program in a higher education context perceived by workshop participants has been examined from peer interaction and two major sources of motivation. The empirical findings from a survey of 101 participants, predominantly leaders at the junior and middle levels, uniquely provide deep insights into the contributing role of motivation and peer interaction to the effectiveness of the leadership program perceived by participants.

In line with the previous studies on professional development (PD), the current findings indicate the significant role of peer interaction in predicting the variance of perceived effectiveness in the academic leadership development program. The present work, therefore, supports previous research and studies, thus reinforcing the role of peer interaction in leadership training (Dopson et al., 2018; Loizzo et al., 2017). It also explains Ladyshevsky and Flavell's (2011) argument indicating that learning through experience and knowledge sharing is crucial for learning about leadership. Thus, interactive collaboration among attendees during the training is even more essential.

The present study endorses the view that self-growth plays an essential role as a strong predictor of perceived effectiveness in terms of leadership development training. This finding is highly consistent with a number of studies regarding professional development (PD) programs (Nasser & Shabti, 2010). In addition, a new contribution of this study was identifying the mediating role of peer interaction regarding the effectiveness of the leadership program. More specifically, it showed that peer interaction did not play a mediating



role which mediates the relationship between motivation for self-growth, networking and perceived effectiveness, respectively. Further research is recommended in order to verify the hypothesis.

On the contrary, networking, which is highlighted as a key motivator to join the leadership development training in the digital age (Day et al., 2021), shown to have a nonsignificant association with the perceived effectiveness of the program. The reason could be due to the mixture of networking types in the measurement scale including professional networking, personal or social networking. Even though the significant importance of networking was not identified in our model, further research with larger sample size and a reliable measurement scale to testify this hypothesis is recommended.

It is interesting to note that overall, these constructs explained 37% of the variance of perceived effectiveness of the leadership program. These results can be explained by the argument that there are different indicators which also influence the outcome of the training program such as course structures, course content, and so on (Reeves & Pedulla, 2011). The findings provide an excellent starting point for future research on outcome measurement of a leadership development program. Further research is necessary to determine the comprehensiveness of related factors which contribute to effectiveness of the leadership program.

Implications

Practical implication

By attempting to identify the effects of motivation and peer interaction on the perceived effectiveness of the leadership development programs addressed for academic leaders at different levels, our study provides practical implications in terms of the design,

implementation, and enhancement of leadership development program in a new HE context.

First, as the current research aimed at examining the contribution of predicting variables to effectiveness of the leadership development training, it is expected that the application of this finding will bring in professional development (PD) workshops on academic leadership that participants will find effective. In this light, we hope that these research results could be used to design a leadership development program addressed to academic leaders at higher education institutions with high quality and impacts. As a result, academic leaders and staff would feel satisfied and eager for performing higher levels of improvement in academic leadership quality.

Second, given the primary purpose of the current study was to examine relationship between selected indicators and learners' opinions about the leadership program, it is recommended that workshops on university governance and academic leadership in the digital age should be designed to enhance interactive collaboration among workshop participants. Besides, the training program tailored to learners' needs and expectations is vital. In addition, the design of the training programs must focus on different patterns of motivation in order to engage them in interactive activities. In this way, quality and effective outcomes of the leadership development program will be enhanced.

Third, given that the academic leadership workshops in this study are part of an EU project, and one of the very first projects on leadership addressed to academics and staff in a higher education setting, our research provides empirical lessons learned which could



practically be applied to design and implement professional development (PD) programs for junior and middle-level leaders in diverse contexts. While PD of leadership as a form of capacity building for academic leaders is not a cure-all for university renovation efforts, taking into consideration of its impact does offer potential.

Theoretical implications

As a first theoretical implication, this study suggests that motivation for self-growth, motivation for networking, and peer interaction are crucial factors to perceived effectiveness of academic leadership development training. These results are well consistent with existing studies regarding face-to-face and online PD programs in educational settings (Dopson et al., 2018; Loizzo et al., 2017; Nasser & Shabti, 2010). In other words, the significant correlations between contributing variables and perceived training effectiveness can also be supported in terms of leadership development in a higher education setting. In regard to encouraging PD on academic leadership addressed to leaders and staff in higher education institutions, this study proposes a new viewpoint.

Furthermore, the second theoretical implication is a confirmation of the direct links between motivation for self-growth, networking and peer interaction in the program. The study provided additional evidence that it is essential to clarify learners' motivational orientations in order to facilitate interaction activities.

Limitations and future work

Regardless of significant contribution and implications yield from the current study, there are certain aspects that should be approached with caution. Firstly, due to the limitation of the sample

size, we resolved to focus on three indicators that have a likelihood of affecting perceived effectiveness in the chosen setting using PLS-SEM. Consequently, it might have impacted the power of statistical analysis. Further research with a larger sample size is recommended to see if the findings can be replicated as well as to identify other factors that covary with perceived effectiveness such as PD program, design, content, etc. Second, as the instrument was used in two languages, there might be potential issues regarding the cultural understanding of each item although the translation of the instrument was ensured to have the same meaning of each item. The cultural understanding of the instrument may be investigated through qualitative approaches in future studies. Third, as random sampling or quota sampling was not feasible, it was not possible to ensure the equality of group sizes across countries, educational levels and academic experiences. Hence, more purposive sampling could be applied in further studies to increase the generalizability of the findings. Forth, as the current study followed quantitative design, it could be interesting to investigate the effects of motivation and peer interaction on effectiveness of academic leadership development in a qualitative way to further substantiate the results.

Conclusion

This study aimed at evaluating the relationship between the two motivational factors, peer interaction, and the perceived effectiveness of leadership development program. The findings have contributed to the literature on academic leadership development in higher education contexts based on four features. First, a research model evaluating the effect(s) of motivation and peer interaction on the perceived effectiveness of leadership development program in higher education settings was designed. The findings significantly



supported to explain the substantial variance for perceived effectiveness in the training workshops for academic leaders and staff in an academic setting. Second, a critical finding of this study was that the two patterns of motivation and peer interaction are strong predictors for explaining the variance of perceived effectiveness regarding the workshops on academic leadership development. The results of the research affirm for program personnel the importance of these factors for future workshop offerings. Further research which explores different patterns of motivation and the interaction of individuals, who participate in the leadership development workshops, will have potential value for both researcher and leadership program designers. Fourth, the research was implemented in diverse contexts, which is different from previous studies exploring the effect of motivation and peer interaction on the effectiveness of leadership training in a specific country context. The findings could serve as a starting point for more large-scale research examining related factors affecting outcome of such leadership development program addressed to academic leaders and staff from an international perspective.

Appendix 1. The questionnaire

Motivational factors	
<i>Self-growth (M = 4.413, SD = 0.561, Cronbach's alpha = 0.746)</i>	
I registered the workshops for enhancing self-growth in university governance and academic leadership	0.634
I registered the workshops for satisfying my enquiring mind	0.664
I registered the workshops to adapt to new academic leadership styles in the future	0.724
I registered the workshops because I want to develop my competence by learning from other experts within the field	0.804
I registered the workshops to enhance competence in university governance and academic leadership	0.678
<i>Networking (M = 4.587, SD = 0.587, Cronbach's alpha = 0.641)</i>	
I registered the workshops to exchange ideas about academic leadership	0.808
I registered the workshops to make more friends with the same interest	0.634
I registered the workshops to learn with other leaders and academic staffs.	0.828
<i>Peer interaction (M = 4.174, SD = 0.547, Cronbach's alpha = 0.806)</i>	
During the workshops, I shared information (references, interesting websites and projects), which I find useful to my colleagues	0.652
During the workshops I provide information related to the topic under discussion	0.782
During the workshops, I provide examples to illustrate my points	0.760
During the workshops, I contribute to the discussion by evaluating the information and arguments provided	0.763
During the workshops I express my agreement or disagreement on my peers' arguments provided	0.703
During the workshops, I comment on other peers' thoughts and ideas to keep the discussion going	0.612
<i>Perceived effectiveness (M = 4.412, SD = 0.540, Cronbach's alpha = 0.789)</i>	
I have enjoyed following the workshops	0.862
I have learned a lot in the workshops	0.831
I would recommend the workshops to friends/ colleagues	0.821



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