The Dynamics of Distributed Leadership in Arsi Zone Public Primary Schools: Investigating the Interplay of Challenges and Benefits, and the Mediating Role of Practice

Misbahu Dawud Ali (Corresponding Author) [1], Kasim Kimo Kebelo[2] and Ziyn Engdasew Woldab[3]

[1-]PhD Candidate, Department of Educational Leadership & Management, College of Education & Behavioural Science, Arsi University, Asella, Ethiopia. Email: misbahdawud@ymail.com,
[2-]Professor, Department of Psychology, College of Education & Behavioural Science, Arsi University, Asella, Ethiopia. Email: karayu2008@gmail.com [3-]Associate Professor, School of Humanities and Social Sciences, Adama Science and Technology University. Email: engdasewziyn1970@gmail.com

ABSTRACT

Background: *This study examines the practices, challenges, and benefits of distributed leadership in public primary schools of Arsi Zone of Ethiopia.*
Methods: *A survey research design employing a mixed-methods approach was used. Data were collected from teachers, principals, students, and supervisors through questionnaires, interviews, and Focus Group Discussions (FGDs). Quantitative data were analyzed using SPSS version 21, complemented by qualitative thematic analysis.*
Findings: *The findings indicated that distributed leadership is widely practiced in the schools, with participants rating all aspects of its practice as 'high' or 'very high.' Despite these positive perceptions, significant challenges—such as insufficient time, resources, and supportive school culture—were identified, hindering the full potential of distributed leadership. Mediation analysis revealed that the practice of distributed leadership mediated the relationship between challenges and benefits, where increased challenges negatively influenced practice, subsequently reducing perceived benefits. Moderated mediation analysis further showed that effective leadership practices enhanced the perceived benefits of distributed leadership.*
Conclusions: *Distributed leadership is broadly implemented and recognized for its positive impact on school leadership dynamics. However, addressing the challenges is critical to maximizing its benefits and sustaining its effectiveness.*
Recommendations: *To address challenges and amplify the benefits of distributed leadership, the following strategic actions are recommended. Prioritize capacity building through targeted training for school leaders and staff to enhance their understanding and implementation of distributed leadership. Ensure adequate resource allocation, including time, facilities, and materials, to support collaborative practices. Develop and implement supportive policies to foster a conducive culture. Strengthen stakeholder engagement by promoting collaboration among teachers, students, and supervisors for shared ownership and responsibility. Finally, establish regular monitoring and evaluation mechanisms to identify gaps and improve practices. These strategies collectively form a robust framework for advancing distributed leadership in educational institutions.*
Keywords: challenge, distributed leadership, principals, public primary schools, teachers

INTRODUCTION

Background of the Study

A successful leadership strategy involves distributing tasks among various stakeholders (Eryilmaz & Hernandez, 2023). This concept has evolved into understanding leadership as a collective trait, challenging traditional distinctions between leaders and followers and forming the foundation of distributed leadership (Hristov & Zehrer, 2017). Hartley (2007) links the rise of distributed leadership to the decline of the *charismatic hero* model in transformational leadership and the increasing complexity of tasks for school principals. Ajay and Hans (2014) note that distributed leadership has gained attention as a new perspective in management and education.

Theoretical shifts from individual-focused leadership to recognizing multiple leadership sources have paved the way for distributed leadership (Harris, 2004). Scholars such as Fitzsimons, James, and Denyer (2011) and Williams (2011) argue for this change, highlighting the need for rapid responses to evolving conditions and dissatisfaction with the *superhero* leadership image. The concept traces back to Gibb (1954), who proposed that leadership is fundamentally a group function (Hristov & Zehrer, 2017).

Gronn (2000) popularized the concept, later expanded by Spillane, Halverson, and Diamond (2004) through theories of distributed cognition and activity theory. These theories illustrate how human activities are shaped by community, tools, rules, and division of labor (Irvine, 2018), emphasizing the collaborative nature of leadership and its effectiveness in tackling complex challenges (Harris & Muijs, 2005).

Globally, empirical studies confirm the widespread adoption of distributed leadership and its diverse impacts (Liu, 2020; Sentoènik & Rupar, 2009; Tian & Risku, 2018). In Singapore, it enhances teacher satisfaction; in Belgium, it promotes teacher involvement in decision-making. Korea sees indirect effects on teacher professionalism, while New Zealand reports effective facilitation of teacher leadership. In Turkey, it correlates with organizational trust and job satisfaction, and in the USA, it positively affects teachers' job satisfaction. In Africa, distributed leadership is gaining momentum, with notable adoption in Ghana, implementation challenges in South Africa, teacher commitment in Nigeria, and a collective leadership perspective in

Botswana, indicating a sign of continental shift toward shared leadership models (Education for Development, 2022).

Research has outlined numerous benefits of distributed leadership for schools, educators, and students. Özdemir et al. (2023) emphasize its role in enhancing instructional practices. Gronn (2000) and Spillane (2005) highlight that it harnesses diverse perspectives, fostering collaboration among leaders and peers to achieve collective goals. Hulpia et al. (2012) note that distributed leadership enables the utilization of multiple staff strengths, nurturing creativity, innovation, and alignment with the school's vision.

However, implementing distributed leadership poses challenges (Harris, 2004), often categorized as institutional and individual. Dampson, Havor, and Laryea (2018) found that distributing leadership can risk incompetence, while structural and cultural barriers may prevent some teachers from exhibiting leadership behaviors. Power struggles can suppress younger teachers' voices, especially when their views differ from prevailing opinions. Moreover, power-sharing may conflict with the principal's leadership style (Gronn, 2009; Liang & Sandmann, 2015; Lumby, 2016; Miskolci et al., 2016; Irvine, 2018).

In Ethiopia, research on distributed leadership, particularly in primary schools, is scarce, resulting in limited understanding of its practices, benefits, and challenges. This study aims to address these gaps by analyzing the interactions among three variables: challenges hindering distributed leadership (independent variable), its practice as a mediator (mediating variable), and the resulting benefits (dependent variable) in public primary schools of Arsi Zone. Figure 1 illustrates the relationships among these elements in a hypothetical school setting.

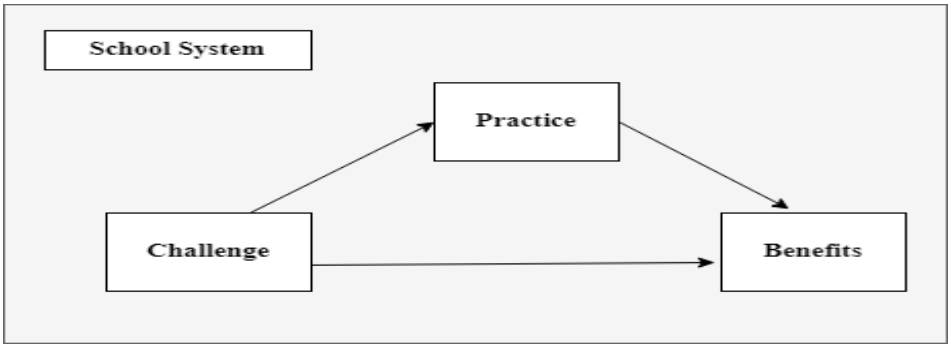

Fig. 1 *Challenge Influencing Distributed Leadership Benefit Mediated by Practice*

(Source: Researcher's Own Construction)

Statement of the Problem

Distributed perspective on school leadership and management has attracted the attention of politicians, practitioners, and researchers across the world in recent years (Akdemir & Ayik, 2012). It has gained this scholastic popularity, as Kilicoglu (2018) notes, as a result of the benefits attached to it. These advantages can be grouped into three main categories: those related to the school environment (Gronn, 2000), benefits for teachers (Botha & Triegaardt, 2015), and positive impacts on students (Harris, 2009; Bush & Glover, 2014).

Although numerous advantages have been outlined, conversely, certain challenges could impede the implementation of distributed leadership to serve as an instrument for school enhancement efforts. Mckenzie and Locke (2014) underscore that the practice of distributed leadership is not free of challenge. It was found that teachers and school principals who are involved in the distributed leadership process face various challenges. These challenges are categorized as institutional and individual. Institutional challenges are those challenges pertinent to the institution. Harris (2004) states that, clearly schools as traditional hierarchies, with the demarcations of position and pay scale, are not going to be instantly responsive to a more fluid and distributed approach to leadership.

Moreover, (Williams, 2011) concerns about scarce resources, particularly time, are also significant. Another significant issue faced by head teachers when distributing leadership is the ability, expertise, experience, and willingness of teachers to hold leadership roles and responsibilities distributed to them. On the other hand, individual challenges are related to principals (Supovitz, Jonathan, D'Auria, John; and Spillane (2019) and Teachers (Harris, 2004). Furthermore, according to Arrowsmith and Parker (2013), principals may feel an acute sense of personal accountability and responsibility for the school's performance when delegating tasks to others. Teachers also may lack self-efficacy beliefs, and fear of workloads beyond the scope of their professional responsibilities (Tahir, Lee, Musah, Jaffri, Said, & Yasin, 2016).

Nowadays, studies on distributed leadership are gaining momentum at the global level. However, in Ethiopia, as far as the researcher's search effort is concerned, a few research indicate some schools are adopting distributed leadership practices (Ashenafi, 2019; Asrat, 2017; Belayneh, 2020; Esaw & Ayalew, 2021; Shimelis, 2018). However, these studies alone are not conclusive

evidence of widespread implementation in all regions. Hence, given the timeliness, relevance, and benefits of the distributed leadership approach, along with the noticeable research gap in the area, especially evident in primary schools, further investigation is reasonable. To achieve this purpose, the study designed the following basic questions:

To what extent distributed leadership is practiced in public primary schools of Arsi Zone?

1) To what extent distributed leadership benefit public primary schools of Arsi Zone?
2) What are the major challenges that impede the practice of distributed leadership in public primary schools of Arsi zone?
3) Does practice significantly mediate the relationship between challenge and benefit?

MATERIALS AND METHODS

Research Approach

This research utilized a concurrent embedded research design ("QUAN+qual") employing a mixed research method approach. This choice was made because mixed method research, as described by Creswell (2016), integrates the advantages of both quantitative and qualitative research methodologies.

Sources of Data

The primary data sources for this study included teachers, principals, students, and supervisors, selected for their vital role in distributed leadership initiatives in schools. Then, 34

Samples and Sampling Techniques

The study used multi-stage, simple random, stratified sampling techniques, and a census. First, 8 Woredas (30%) were randomly selected from 26 Woredas and one town administration in Arsi Zone, ensuring representativeness at the Woreda level (Gay, Mills, & Airasian, 2012).

Table 1. Primary school statistics: total count, sampled schools, and study participants

SN	Woredas	Schools			Participants												Total
					Principals			Teachers			Supervisors			Students			
		Total	Samples		[1]P	[2]S	%	P	S	%	P	S	%	P	S	%	
1	Amigna	36	4		8	8	100	108	32	30	8	2	25	16	12	75	55
2	D/Tijo	53	5		11	11	100	135	40	30	8	2	25	20	15	75	68
3	Diksis	26	3		6	6	100	81	24	30	9	2	22	12	9	75	42
4	Hetosa	36	4		9	9	100	108	32	30	8	2	25	16	12	75	55
5	Jeju	41	4		9	9	100	108	32	30	9	2	22	16	12	75	55
6	Sude	41	4		9	9	100	108	32	30	9	2	22	16	12	75	56
7	Tiyo	48	5		11	11	100	135	40	30	8	2	25	20	15	75	68
8	Dodota	54	5		10	10	100	135	40	30	9	2	22	20	15	75	68
	Total	335	34		73	73	100	918	272	30	68	16	24	136	102	75	463

Source: Arsi Zone Education Office (AZEO), (2022) [1]Population, [2]Sample

schools (10%) were randomly chosen from 335 schools in the sampled Woredas to represent the school-level population. To determine the sample size, Yamane's formula (Himoonga and Phiri (2020), $n = N/(1 + N(e^2))$, was applied, with a population of 10,859 and a 5% margin of error, yielding 386 respondents. Following Lodico,

Spaulding, and Voegtle (2010), 20% (77) was added for non-response, resulting in a final sample of 463. In selected schools, participants were chosen using specific methods: all 73 principals (100%) were purposively selected; 272 teachers (30%) randomly chosen from 918; 16 supervisors (24%) randomly selected from 68; and 102 student representatives (75%) randomly chosen from 136 to ensured a well-distributed, representative sample.

Data Collection Instruments

The primary data collection tools utilized in this research encompassed questionnaires aimed at gathering information from teachers and principals, FGDs conducted with students, and interview guides employed specifically for supervisors.

Establishing Validity and Reliability of Instruments

The integrity of research data was ensured through the assessment of validity and reliability of data collection instruments. Content validity was evaluated using statistical analysis (CVR, I-CVI, and S-CVI) and expert judgment. Feedback from pilot testing at two primary schools in Sire Woreda was used to improve the quality of the instrument. Cronbach's alpha confirmed strong internal consistency, with values in Table 2 exceeding the typical threshold of 0.7.

Table 2. Cronbach's alpha estimates

	Cronbach's Alpha	
Study Variables	Teachers	Principals
Challenges	.91	.86
Practices	.94	.96
Benefits	.92	.93
Grand Mean	.92	.92

Data Analysis Technique

The study employed both descriptive and inferential statistical techniques to analyze the data collected. Percentages mean scores, and Structural Equasion Model (SEM)-based mediation analysis and moderation analysis were used through the application of SPSS version 21 software. Additionally, qualitative data analysis was carried out using thematic analysis method.

Ethical Statement

In accordance with the ethical guidelines established, this study rigorously adhered to principles of informed consent, confidentiality, and honesty throughout all stages of research. Before data collection, appropriate permissions were obtained from the authors' institution, and all necessary documents, including participant consent, were secured. Data collection, analysis, and reporting were conducted with integrity, ensuring the protection of participants' rights and maintaining the highest ethical standards.

RESULTS

This section examines the demographic details of the study participants and key findings from both quantitative and qualitative data. A total of 345 surveys were distributed to 272 teachers and 73 principals, with 301 responses received (239 teachers, 79.4%, and 62 principals, 84.9%), yielding an 87.2% response rate. For qualitative data, 14 out of 16 supervisors (87.5%) were accessed, and 13 FGD sessions were conducted with 94 out of 102 participants (92.2%). The quantitative data was analyzed using SPSS version 21, and the qualitative data was thematically analyzed, with results detailed in the following sections.

Analysis of Quantitative Data

Demographic Characteristics

As can be understood from Table 3, a near-equal representation of male (52.2%) and female (47.8%) respondents in the study is depicted. This gender distribution in the study sample closely aligns with the gender proportions in the broader population of the zone—54.9% male and 45.1% female (AZEO, 2022).

Table 3. Demographic characteristics: gender, qualification, and specialization

Characteristics		Frequency	Percent	Valid Percent	Cumulative Percent
Sex	Male	157	52.2	52.2	52.2
	Female	144	47.8	47.8	100.0
	Total	301	100.0	100.0	100
Qualification	BA/BSc Degree	51	16.9	16.9	16.9
	Diploma	209	69.4	69.4	86.4
	Others (TTI, etc.)	41	13.6	13.6	88.7
	Total	301	100.0	100.0	100
Specialization	Natural Science	39	13.0	13.0	13.0
	Social Science	99	32.9	32.9	45.8
	Mathematics	50	16.6	16.6	62.5
	Language	95	31.6	31.6	94.0
	Other	18	6.0	6.0	100
	Total	301	100.0	100.0	

Table 3 shows that 69.1% of respondents held diplomas, aligning with Ethiopia's standard for primary school teachers, while 17.3% had BA/BSc degrees, and 13.6% held TTI certificates or lower qualifications. This mirrors the regional distribution of 73.2%, 17.1%, and 9.7% respectively (AZEO, 2022). Respondents' specializations were mainly in Social Science (32.9%), Language (32.6%), and Natural Science (29.6%), reflecting diverse subject areas. Table 4 reveals that 57.5% of respondents were aged 25-34, with 19.9% aged 20-24 and 22.6% aged 35-58, indicating that 77.4% were in their prime working years. Additionally, 64.8% had 1 to 10 years of service, typical of rural areas where new teachers begin their careers.

Table 4. Demographic characteristics: age and teaching experience

Characteristics	Rage	Frequency	Percent	Valid Percent	Cumulative Percent
Age	20-24	60	19.9	19.9	19.9
	25-29	95	31.6	31.6	51.5
	30-34	78	25.9	25.9	77.4
	35-39	52	17.3	17.3	94.7
	≥40	16	5.3	5.3	100.0
	Total	301	100.0	100.0	
Total Teaching experience	1-5	92	30.6	30.6	30.6
	6-10	103	34.2	34.2	64.8
	11-15	62	20.6	20.6	85.4
	16-20	34	11.3	11.3	96.7
	above 20	10	3.3	3.3	100.0
	Total	301	100.0	100.0	

The Practice of Distributed Leadership

This section presents the data pertinent to the practice of distributed leadership in public primary schools of the Arsi zone. In the analysis, four specific dimensions of distributed leadership

Table 5. Percentage ratings for the practice of distributed leadership

Variables	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	C't[3]	RN[4] %	C't	RN %	C't	RN %	C't	RN %	C't	RN %
vision21	12	4.00%	54	17.90%	56	18.60%	136	45.20%	43	14.30%
Vision22	19	6.30%	82	27.20%	42	14.00%	117	38.90%	41	13.60%
Vision23	25	8.30%	40	13.30%	40	13.30%	143	47.50%	53	17.60%
Vision24	26	8.60%	64	21.30%	23	7.60%	147	48.80%	41	13.60%
Vision25	27	9.00%	36	12.00%	41	13.60%	106	35.20%	91	30.20%
Vision %		7.24%		18.34%				48.12%		17.86%
Culture21	11	3.70%	29	9.60%	38	12.60%	101	33.60%	122	40.50%
Culture22	7	2.30%	27	9.00%	37	12.30%	109	36.20%	121	40.20%
Culture23	6	2.00%	30	10.00%	31	10.30%	131	43.50%	103	34.20%
Culture24	0	0.00%	9	3.00%	29	9.60%	128	42.50%	135	44.90%
Culture %		2%		7.9%				38.95%		39.95%
Instruction24	1	0.30%	7	2.30%	21	7.00%	108	35.90%	164	54.50%
Principal22	9	3.00%	9	3.00%	40	13.30%	126	41.90%	117	38.90%
Principal23	2	0.70%	3	1.00%	22	7.30%	143	47.50%	131	43.50%
Principal %		1.85%		2%				44.7%		41.2%

[3]Count, [4]Row Number

(school vision, school culture, instruction, and principal leadership) were examined. Each of these aspects garnered response rates of 65.98%, 78.9%, 90.4%, and 85.9%, respectively, indicating agreement to strong agreement levels (Table 5). Remarkably, the findings indicated that school vision and school culture were rated as 'high,' while instruction and principal leadership were rated as 'very high.' This result suggests that the majority of responses fell within the *agree* to *strongly agree* range, leading to the overall understanding that distributed leadership has been implemented at a 'high' to 'very high' level within the public primary schools in the study area.

Benefits of Distributed Leadership

This study explores how the perceived benefits of distributed leadership align with the reality in public primary schools. Table 6 summarizes nine key benefits at both institutional and individual levels.

The data highlights several advantages: distributed leadership fosters a strong sense of ownership (33.9% very high), enhances team spirit (39.9% very high), and reduces principals' workload (32.6%). It also motivates staff to deliver quality work (42.9% very high) and enables principals to gain new ideas from staff (44.2%). Furthermore, it boosts staff involvement in school affairs (42.9% very high), creates a favorable learning environment (43.5% very high), improves teachers' compliance with principals (28.9%), and strengthens staff collaboration in problem-solving (46.5%). Overall, distributed leadership significantly enhances school effectiveness.

Table 6. Percentage Ratings of Benefits of Distributed Leadership

Variables	Very low		Low		Moderate		High		Very high	
benefit1	0	0.00%	11	3.70%	90	29.90%	98	32.60%	102	33.90%
benefit2	3	1.00%	5	1.70%	67	22.30%	106	35.20%	120	39.90%
benefit3	0	0.00%	11	3.70%	69	22.90%	123	40.90%	98	32.60%
benefit4	0	0.00%	5	1.70%	35	11.60%	132	43.90%	129	42.90%
benefit5	0	0.00%	11	3.70%	64	21.30%	93	30.90%	133	44.20%
benefit6	2	0.70%	9	3.00%	49	16.30%	112	37.20%	129	42.90%
benefit7	2	0.70%	21	7.00%	38	12.60%	109	36.20%	131	43.50%
benefit8	4	1.30%	24	8.00%	52	17.30%	134	44.50%	87	28.90%
benefit9	3	1.00%	17	5.60%	47	15.60%	94	31.20%	140	46.50%

Challenges to Distributed Leadership

Table 7 outlines key challenges to implementing distributed leadership. The primary barrier is principals' reluctance to share leadership roles, with 41.9% agreeing and 38.9% disagreeing. Principals' lack of awareness about power-sharing was another issue, with 33.5% agreeing and 36.6% disagreeing. Teachers' lack of confidence (22.9% agreement) and lack of interest in leadership tasks (55.2% agreement) also emerged as challenges. Additionally, lack of leadership experience (49.5% agreement), time constraints (60.5%), and absence of supportive policies (49.5%) further complicate leadership distribution. Inadequate resources (60.7%), fear of accountability (42.2%), and unsupportive school culture (57.5%) were also major obstacles. These findings highlight personal, structural, and environmental challenges in successfully implementing distributed leadership.

Table 7 Percentage ratings of challenges of distributed leadership

	Very low		Low		Moderate		High		Very high	
Variable	C't*	RN* %	C't	RN %	C't	RN %	C't t	RN %	C't	RN %
challenge1	53	17.60%	64	21.30%	58	19.30%	98	32.60%	28	9.30%
challenge2	65	21.60%	45	15.00%	90	29.90%	63	20.90%	38	12.60%
challenge3	51	16.90%	54	17.90%	80	26.60%	75	24.90%	41	13.60%
challenge4	35	11.60%	34	11.30%	66	21.90%	126	41.90%	40	13.30%
challenge5	22	7.30%	49	16.30%	81	26.90%	120	39.90%	29	9.60%
challenge6	10	3.30%	63	20.90%	46	15.30%	123	40.90%	59	19.60%
challenge7	28	9.30%	38	12.60%	86	28.60%	118	39.20%	31	10.30%
challenge8	11	3.70%	39	13.00%	65	21.60%	107	35.50%	76	25.20%
challenge9	23	7.60%	75	24.90%	76	25.20%	90	29.90%	37	12.30%
challenge10	26	8.60%	49	16.30%	53	17.60%	136	45.20%	37	12.30%

Mediation Analysis

Mediation analysis is widely conducted to deepen understanding of the mechanisms behind established cause-effect relationships. It does so by separating the indirect effect that operates through a given intermediate (or mediator) from the remaining direct effect and by quantifying their respective contributions to the overall exposure effect (Steen, Loeys, Moerkerke, & Vansteelandt, 2017).

Mediation Analysis: Challenge as an Independent Variable

In this study, the independent variable (challenge), its interaction with the dependent variable (benefit), and the mediator variable (practice) are described in the following paragraphs. These variables are denoted as X, Y, and M, respectively. Detailed results from the SPSS PROCESS procedure are presented in Appendix 1.

The SEM-based mediation analysis examines whether the effect of *challenge* on *benefit* is mediated by *practice*, using the PROCESS macro for SPSS (Hayes, 2022). In this model, the independent variable (X) is *challenge*, which measures the level of difficulty in a task, while the dependent variable (Y) is *benefit*, representing the perceived advantages of the task. The mediator variable (M) is *practice*, which quantifies the amount of practice involved in the task.

In the process, the total effect of *challenge* on *benefit* is 0.0243 (p = 0.6468), showing no significant relationship. However, the direct effect, accounting for *practice*, is 0.0834 (p = 0.0506), indicating a weak positive relationship between challenge and *benefit* after controlling for *practice*. The indirect effect, which captures the influence of *challenge* on *benefit* through *practice*, is -0.0591 (p < 0.05), suggesting a negative relationship. This means higher *challenge* reduces *practice*, leading to lower *benefi*t. Although the mediation effect size is large (-2.4319), it loses relevance as the total effect is not significant. In conclusion, while *challenge* has a weak direct positive effect on *benefit*, the indirect effect through *practice* is negative and significant, indicating that *practice* partially mediates the relationship

The total effect of X on Y is the sum of the direct and indirect effects, estimated by regressing Y on X without including M in the model. In this case, the total effect is 0.0243, which is not significant (p = 0.6468), indicating no overall relationship between *challenge* and *benefit*. Conversely, the direct effect of X on Y, which accounts for M, is determined by regressing Y on both X and M. Here, the direct effect is 0.0834, marginally significant (p = 0.0506), suggesting a weak positive relationship between *challenge* and *benefit* after controlling for *practice*. The indirect effect of X on Y, representing the influence of X on Y through M, is calculated by multiplying the coefficients of X on M and M on Y.

In this analysis, the indirect effect is -0.0591, which is significant (p < 0.05), indicating a negative relationship between *challenge* and *benefit'*mediated by *practice*. Specifically, higher *challenge* leads to lower *practice*, which subsequently results in lower *benefit*. The mediation effect size is the ratio of the indirect effect to the total effect, measuring the proportion of the total effect explained by the mediator. In this case, the mediation effect size is -2.4319, indicating a large mediation effect; however, this ratio loses meaning when the total effect is not significant, as observed here.

In summary, the findings reveal that the predictor *challenge* has a marginally significant positive direct effect on the outcome variable *benefit*. However, considering the mediator *practice*, the indirect effect of *challenge* on *benefit* becomes negative and significant. This suggests that the relationship between *challenge* and *benefit* is partially mediated by *practice*, highlighting the importance of this mediating role in understanding how *challenge* influences *benefit*.'

Moderated Mediation Model

The results of the moderated mediation model are presented below, illustrating how 'challenge' (X) influences 'benefit' (Y) through the mediating effect of 'practice' (M) and the moderating role of teaching experience (W). Comprehensive details from the SPSS PROCESS procedure are provided in Appendix 2.

The interpretation of the results of the moderated mediation model summary reveals that the model tested incorporates *challenge* as the predictor, *practice* as the mediator, *benefit* as the outcome, and *teaching experience* as the moderator. The results indicate that *practice* has a significant positive effect on 'benefit' (coeff = .4359, $p < .0001$), suggesting that higher levels of practice are associated with increased perceived *benefits*. Additionally, *teaching experience* significantly positively affects 'practice' (coeff = .2541, $p < .05$), indicating that more experienced participants tend to engage in more practice.

However, the interaction between *challenge* and *teaching experience* on 'practice' was not significant (coeff = -.0600, $p = .1152$), meaning the effect of *challenge* on *practice* is independent of experience levels. Similarly, the interaction between *challenge* and *teaching experience* on *benefit* was also not significant (coeff = -.0103, $p = .7996$), suggesting that the effect of *challenge* on *benefit* does not depend *on teaching experience*.

The direct effects of *challenge* on *benefit* were not significant at any *teaching experience* level, showing no direct impact. However, the indirect effects of *challenge* on *benefit* through practice were negative and significant for the most experienced participants (effect = -.0786, $p < .05$). This suggests that higher *challenges* reduce *practice*, leading to lower *benefits* for highly experienced participants. For other experience levels, the indirect effects were not significant, indicating no impact of challenge on benefit through *practice*.

Finally, the index of moderated mediation was not significant (index = -.0261, $p > .05$), indicating that the indirect effect of *challenge* on *benefit* through *practice* did not vary significantly across levels of experience. In summary, the findings suggest that *challenge* has a significant direct effect on *benefit*, with higher levels of *challenge* associated with increased levels of *benefit*. Additionally, the effect of *challenge* on *benefit* is partially mediated by

practice, with the negative indirect effect indicating that the relationship between *challenge* and *benefit* is partly explained by the impact of *challenge* on *practice.*

Analysis of Qualitative Data

Demographic Characteristics of Participants

The qualitative data involved 14 predominantly male supervisors (92.9%) in interviews, with ages ranging from 35 to 48. Most (64.3%) were aged 40–49, and their qualifications included BA (57.1%) and BSc (42.9%) degrees. Their specializations varied, with Afan Oromo (21.4%) being the most common. Participants had 15–29 years of experience, averaging 20.2 years. For the FGDs, 13 sessions involved 94 students, with nearly equal gender representation (48.9% male, 51.1% female). Participants were from grades 7 (52.1%) and 8 (47.9%), ensuring balanced gender and grade perspectives in discussions.

Challenges to Distributed Leadership

In analyzing challenges to distributed leadership in primary schools, the transcribed qualitative data revealed diverse obstacles. Participants highlighted that challenges varied significantly across schools, with prominent issues in one school not necessarily being the focus in another. A notable quote from a 42-year-old male interviewee illustrated this:

In my cluster, staff and principal collaboration is generally positive, with principals delegating significant responsibilities. However, challenges exist, including staff resistance to reform and long-serving staff focusing on principals' shortcomings. Additionally, severe teacher shortages create heavy workloads, preventing teachers from taking on extra responsibilities (Int12, BSc in Biology, 22 years of service).

On the other hand, a 37-year-old male supervisor attributed challenges to distributed leadership to principals in their respective schools. He elaborated that:

In certain schools, principals fail to establish rapport with teachers, possibly due to their inherent personality traits or other factors. They ultimately become victims of their own behavior. They fail to garner adequate support from their staff when necessary, resulting in their own overwhelming workload due to their reluctance to delegate tasks to teachers. Sometime, they also become vulnerable to staff conspiracy, leading to a cloudy school climate. Consequently, the

overall school environment becomes inhospitable to embracing distributed leadership, presenting a significant challenge in this regard (Int5, BA in Afan Oromo, 20 years of service).

In a similar manner, FGDs were held to solicit answers to the previously posed question regarding the challenges to distributed leadership. In the discussions, participants mentioned that: Regarding challenges to distributed leadership…some staff members are isolated and may resist reforms, preferring to maintain the status quo. Additionally, some staff members undermine others and do not seem to collaborate well within the distributed leadership framework, which presents challenges for its implementation. At times, certain staff members are unfriendly, especially towards students, and are reluctant to involve them in school activities. Moreover, some principals exhibit a 'standing alone' leadership style, being unwilling to share power with others for unknown reasons. These are some of the challenges to distributed leadership (**F6, 3 males and 4 females**)

In another FGD session, a student representative's speech was directly quoted as it provided a different perspective: "Sometimes, even when we are asked to participate in decisions, we do not feel like our opinions really matter. It feels like the teachers have already made up their minds. Also, some of my classmates do not want to participate because they think it is the teachers' job to make all the decisions, not ours." (**F9, size 9, 5 males and 4 females**).

The qualitative data showed that participants generally viewed distributed leadership positively, emphasizing its role in empowering teachers and fostering collaboration. Most schools had a positive foundation for implementing it through shared decision-making and committees, though consistency varied. Benefits included improved teacher collaboration, student engagement, and a positive school culture where all members felt valued. Students also reported increased ownership and responsibility. However, challenges like staff resistance, focus on principals' shortcomings, and staff shortages affecting workloads hindered its full implementation in some schools.

Analysis of Integrated Quantitative and Qualitative Data

The quantitative and qualitative data related to the challenges of implementing distributed leadership in public primary schools are integrated here to provide a comprehensive view of the

barriers encountered. This integration highlights areas of alignment and contrast, with a particular focus on addressing the core research question posed earlier.

In response to the question of the practice of distributed leadership in Arsi Zone public primary schools, the quantitative data indicated a high to very high level of implementation, with most respondents agreeing or strongly agreeing. This aligns with the qualitative data, though expressed with different terminology. In these data, no contaradictory ideas were obseerved.

Regarding the benefits of distributed leadership, the quantitative data rated each listed benefit from high to very high, recognizing its significant role in enhancing school effectiveness. Similarly, interviewees and FGD participants reinforced these findings, highlighting various benefits within their respective institutions with no contaradictory ideas with the quantitative data.

In examining the extent of challenges to distributed leadership, both the quantitative and qualitative data highlighted common obstacles, particularly heavy workloads and unsupportive environments. In both data sets, workloads hindered teachers from assuming leadership roles, with staff shortages worsening the problem in some schools. Additionally, a non-supportive school culture, characterized by resistance to reform and lack of collaboration, emerged as a key challenge across both data sources.

However, some differences emerged. While the quantitative data did not rank principals' reluctance to share power as a major issue, qualitative findings highlighted it as a significant challenge in certain schools. Similarly, teachers’ lack of confidence and experience, rated as less significant quantitatively, was noted in interviews and FGDs as a barrier for some staff. Challenges varied across schools, with some reporting positive collaboration, while others faced resistance and jealousy among staff. Students also noted inconsistencies in their involvement in decision-making, reflecting the variability of distributed leadership practices across schools.

Regarding to the mediation analysis, the total effect of challenge on benefit is 0.0243, which is not significant, showing no overall relationship. However, the direct effect of challenge on benefit is 0.0834, marginally significant ($p = 0.0506$), suggesting a weak positive relationship after accounting for practice. The indirect effect, mediated by practice, is -0.0591 and significant

($p < 0.05$), indicating that higher challenge leads to lower practice, which in turn results in lower benefit. In conclusion, practice partially mediates the relationship between challenge and benefit. While challenge directly has a weak positive effect on benefit, it indirectly leads to a negative effect through reduced practice.

The moderated mediation model shows that practice positively affects benefit (coeff = .4359, $p < .0001$), and teaching experience positively influences practice (coeff = .2541, $p < .05$). However, the interaction between challenge and teaching experience on both practice and benefit was not significant, meaning challenge's effects are independent of experience. Challenge did not directly impact benefit at any experience level, but for the most experienced participants, higher challenge led to lower practice, reducing benefit (effect = -.0786, $p < .05$). The index of moderated mediation was not significant, indicating the indirect effect of challenge through practice did not vary across experience levels.

DISCUSSIONS

Distributed Leadership: Extent of Practice

Response rates for distributed leadership dimensions ranged from 'high' to 'very high,' indicating widespread effective practice in public primary schools. Qualitative data corroborated this, with interviewees highlighting the prevalence of distributed leadership. This finding aligns with previous studies, including Liu's (2020) global research on varied implementation levels across 32 countries and local studies (Easaw & Ayalew, 2021; Mesfin, 2019; Belayneh, 2020) showing moderate distribution of leadership. In short, the data suggest promising development and implementation of distributed leadership in the study area's primary schools.

Distributed Leadership: Benefits

Distributed leadership was perceived as beneficial both institutionally and individually, with nine aspects yielding various advantages. Qualitative data emphasized shared leadership's role in fostering staff unity, motivation, collaboration, and reducing disputes, supported by FGDs that highlighted a collaborative school culture. This aligns with prior findings indicating that distributed leadership cultivates ownership (Özek & Büyükgöze, 2023), enhances commitment to a shared vision (Hulpia et al., 2012), fosters team spirit (Botha & Triegaardt, 2015), and

promotes collaborative decision-making (Kilicoglu, 2018). Conversely, comments from a contrasting group illustrated adverse conditions in schools lacking distributed leadership.

Distributed Leadership: Challenges

Analysis of ten statements on distributed leadership challenges revealed that challenges 6, 8, and 10 ranked highest, while challenges 7, 4, and 5 received lower ratings. Qualitative data echoed these findings, identifying resistance to reform, jealousy, and teacher shortages as significant hurdles. Notably, principals' reluctance to delegate authority aligns with prior research (Grenda & Hackmann, 2013; Lárusdóttir & O'Connor, 2017), while teachers' lack of confidence and interest in leadership roles echoes findings by MacBeath (2005) and Mafora (2014). Additional challenges included insufficient experience among teachers, time constraints due to workloads (Hulpia et al., 2009), and a lack of supportive policy environments (Williams, 2011; Ashenafi, 2019). Moreover, insufficient resources and principals' fear of accountability were identified as significant barriers, supported by prior studies (Harris, 2004; Dampson et al., 2018). Lastly, a lack of supportive school culture emerged as a critical challenge, consistent with findings from Lovett and Andrews (2011) and Shimelis (2018).

Mediation Analysis and Moderated Mediation Model

In the SEM-based mediation analysis, challenges (X) were the independent variable and benefits (Y) the dependent variable, with practice (M) serving as a mediator. A negative relationship between challenge and benefit, mediated by practice, indicated that higher challenges led to lower practice and subsequently lower benefits. The moderated mediation model revealed that practice positively affects benefit, while teaching experience positively influences practice. However, interactions between challenge and teaching experience on practice and benefit were not significant, suggesting that challenges affect these variables independently of experience. Conditional direct effects of challenge on benefit were insignificant, while conditional indirect effects were negative and significant for the most experienced participants, indicating that higher challenges resulted in lower practice and benefits. The index of moderated mediation was not significant, showing that the indirect effect of challenge on benefit through practice did not significantly vary across experience levels.

In general, this study verified the findings of previous research conducted in the same area of focus. The alignment with earlier studies enhances the validity of the results and underscores the consistency of distributed leadership practices across various contexts. By confirming established trends and insights, this study contributes to a deeper understanding of the dynamics of distributed leadership in public primary schools.

Summary of Findings, Conclusions and Recommendations

Summary of Findings

Based on the data analysis, the following major findings were identified:

- Both quantitative and qualitative data show a high to very high level of distributed leadership practice in Arsi Zone public primary schools.
- Quantitative data rated the benefits of distributed leadership as high to very high, a view echoed by qualitative insights that highlighted various advantages within institutions.
- Common challenges identified included heavy workloads and unsupportive environments. Heavy workloads hindered teachers from assuming leadership roles, while staff shortages and a non-supportive culture characterized by resistance to reform were prevalent.
- Differences arose in identifying certain challenges; quantitative data toned down principals' reluctance to share power, whereas qualitative findings emphasized it as significant. Similarly, teachers' lack of confidence and experience, viewed as less significant quantitatively, was noted as a barrier in qualitative responses.
- The total effect of challenge on benefit was not significant (0.0243), indicating no overall relationship. However, a marginally significant direct effect (0.0834) suggests a weak positive relationship. A significant indirect effect (-0.0591) reveals that higher challenges reduce practice, leading to lower benefits, indicating that practice partially mediates this relationship.
- Practice positively impacts benefit (coeff = .4359, $p < .0001$), and teaching experience enhances practice (coeff = .2541, $p < .05$). However, the interactions between challenge and teaching experience on practice and benefit were not significant, indicating that challenge's effects are independent of experience. For highly experienced participants, greater challenge led to lower practice, which reduced benefits (effect = -.0786, $p < .05$).

Conclusion

The study indicates that distributed leadership is generally well-implemented and beneficial in public primary schools in the Arsi Zone, despite encountering common challenges like heavy workloads and a non-supportive school culture. While challenges can weaken the practice of distributed leadership, the mediation analysis reveals that practice plays a crucial role in how challenges affect benefits. Specifically, higher challenges can negatively impact practice, leading to diminished benefits. The findings also emphasize that the relationship between challenges and benefits is not significantly influenced by teaching experience.

Recommendations

To overcome challenges and maximize the benefits of distributed leadership, the following strategic actions are recommended for the Oromia Education Bureau and the Federal Ministry of Education, to be implemented through their subordinate structures:

1) Prioritize capacity building through targeted training for school leaders and staff to enhance their understanding and implementation of distributed leadership.
2) Ensure adequate resource allocation, including time, facilities, and materials, to support collaborative practices.
3) Develop and implement supportive policies to foster a conducive culture.
4) Strengthen stakeholder engagement by promoting collaboration among teachers, students, and supervisors for shared ownership and responsibility.
5) Establish regular monitoring and evaluation mechanisms to identify gaps and improve practices.

REFERENCES

Ajay K. J. & Hans, J.J. (2014). Conceptualizing and Implementing the Distributed Leadership Practices in Indian Organizations. *Journal of Management Development, 33*(3), 258 – 278. http://doi.org/10.1108/JMD-12-2012-0154

Akdemir, Ö. A. & Ayik, A. (2012). The Impact of Distributed Leadership Behaviors of School Principals on the Organizational Commitment of Teachers. *Universal Journal of Educational Research*, *5*(12B): 18-26. http://dx.doi.org/10.13189/ujer.2017.051402

Arrowsmith & J. Parker (2013). The Meaning of 'Employee Engagement' for the Values and Roles of the HRM Function, *The International Journal of Human Resource Management*, *24*(14), 2692-2712, http://dx.doi.org/10.1080/09585192.2013.763842

Ashenafi M. (2019). Assessment of Relation between Distributed Leadership Practices and the Role of Principals in Preparatory and Secondary Schools' Effectiveness of

Gondar City Administration, Ethiopia. *Research Journal of Social Science and Management*. *8*(11).

Asrat D. (2017). The Practice and Challenges of Distributed Leadership at Some Selected Primary Schools of Debark District: Ethiopia. *British Journal of Education, Society & Behavioral Science*, *20*(3), 1-10https://core.ac.uk/download/pdf/144777025.pdf

Belayneh, A. (2020). A Study on the Practice of Distributive Leadership in Debre Markos Town Government Secondary Schools, Amhara Region, Ethiopia. *International Journal of Multidisciplinary*, *5*(6). https://doi.org/10.31305/rrijm.2020.v05.i06.022

Botha, R.J. & Triegaardt, P.K. (2015). The Role of Distributed Leadership in Functional South African Schools, *Journal of Social Sciences*, *43*(3), 207-215.

Bush, T. & Glover, D. (2014) School Leadership Models: What Do We Know? *School Leadership & Management*, *34*(5), 553-571. https://doi.org/10.1080/13632434.2014.928680

Creswell, J. W. (2016). 30 Essential skills for the qualitative researcher. London: Sage.

Dampson, D. G., Havor, F. M. and Laryea, P. (2018). Distributed Leadership an Instrument for School Improvement: The Study of Public Senior High Schools in Ghana. *Journal of Education and e-Learning Research 5*(2), 79-85, https://doi.org/10.20448/journal.509.2018.52.79.85

Easaw, A. & Ayalew, S. (2021). Distributed Educational Leadership in the Private Schools of Addis Ababa, Ethiopia: Perceptions, Practices, Challenges and Opportunities. *Organizational Leadership & Administration*, *25* (3), 1-21.

Education for Development (2022). School Leadership in Africa: A Review of Empirical Research. A working Paper.

Fitzsimons, D. James, K.T. & Denyer, D. (2011). Alternative Approaches for Studying Shared and Distributed Leadership. *International Journal of Management Reviews*, *13*, 313-328. https:// doi.org/10.1111/j.1468-2370.2011.00312.x mr_312x

Eryilmaz, N. & Hernandez, A. S. (2023). Is Distributed Leadership Universal? A Cross-Cultural, Comparative Approach across 40 Countries: An Alignment Optimization Approach. Educ. https:// doi.org/10.3390/educsci13020218

Gronn, P. (2000). Distributed Properties: A New Architecture for Leadership. *Educational Management & Administration*. *28*(3).

Gronn, P. (2009). From Distributed to Hybrid Leadership Practice. *Journal of Educational Administration*, *46*(2), 141–158. https:// doi.org/10.1007/978-1-4020-9737-9 11

Harris, A. (2004). Distributed Leadership and School Improvement: Leading or Misleading? Educational Management Administration & Leadership. 32(11). https://doi.org/10.1177/1741143204039297

Harris, A. (2009). Distributed Leadership: Different Perspectives. London: Springer. http://library.lol/main/9CEA03595A76B8434F8C1AA629C3F99E

Harris, A. & Muijs, D. (2005). Improving Schools through Teacher Leadership. London: Open University Press.

Hartley, W. D. (2007). The Emergence of Distributed Leadership In Education: Why Now? British Journal of Educational Studies, 55(2), 202–214. https://doi.org/number: 10.1111/j.1467- 8527.2007.00371. x

Himoonga, R., & Phiri, J. (2020). Increasing the Use of eLearning Platforms in Tertiary Learning Institutions for Blended Distance Program in Zambia. *Open Journal of Social Sciences*, *8*, 174-190. https://doi.org/10.4236/jss.2020.88016

Hristov, D. & Zehrer, A. (2017). Does Distributed Leadership have a Place in Destination Management Organizations? A Policy-Makers Perspective, Current Issues in Tourism, https://doi.org/10.1080/13683500.2017.1364715

Hulpia, H., Devos, G., Rosseel, Y. & Vlerick, P. (2012). Dimensions of Distributed Leadership and the Impact on Teachers' Organizational Commitment: A Study in Secondary Education. *Journal of Applied Social Psychology,*

Irvine, J. (2018). Distributed Leadership in Practice: A Modified Delphi Method Study. *Journal of Instructional Pedagogies*, *25*, 1-29. https://eric.ed.gov/?id=EJ1294092

Kilicoglu, D. (2018). Understanding Democratic and Distributed Leadership: How Democratic Leadership of School Principals Related to Distributed Leadership in Schools? *Educational Policy Analysis and Strategic Research, 13*(3).

Liang, J.G. and Sandmann, L. R. (2015). Leadership for Community Engagement: A Distributed Leadership Perspective. *Journal of Higher Education Outreach and Engagement, 19*(1), p. 35,

Liu, Y. (2020). Focusing on the Practice of Distributed Leadership: The International Evidence From the 2013 TALIS. *Educational Administration Quarterly*, *56*(1), https://doi.org/10.1177/0013161X20907128

Lodico, M. G., Spaulding, D.T. & Voegtle, K. H. (2010). Methods in Educational Research: From Theory to Practice (2nd ed.). San Francisco: John Wiley & Sons. http://library.lol/main/9FAE23B336965A34A45FD2FF0AC41D60

Lumby, J. (2016). Distributed Leadership As Fashion or Fad. *Management in Education. 30*(4), https://doi.org/10.1177/0892020616665065

Mbonu, V.C. & Azuji, I.M. (2021). Relationship between School Principals' Distributed Leadership Style and Teachers' Organizational Commitment in Public Secondary Schools in Anambra State, Nigeria. *European Journal of Education and Pedagogy*. http://dx.doi.org/10.24018/ejedu.2021.2.1.19

Mckenzie, K. B. & Locke, L.A. (2014). Distributed Leadership: A Good Theory but What If Leaders Won't, Don't Know How, or Can't Lead? *Journal of School Leadership* 24. https://journals.sagepub.com/doi/abs/10.1177/105268461402400106

Mesfin. M. (2019). Practice and Challenges of Distributed Leadership at Public Secondary Schools of Dessie City Administration. *Asian Journal of Education and e-Learning*. *7*(4), www.ajouronline.com

Miskolci, J., Armstrong, D. & Spandagou, I (2016). Teachers' Perceptions of the Relationship between Inclusive Education and Distributed Leadership in two Primary Schools in Slovakia and New South Wales (Australia). *Journal of Teacher Education for Sustainability, 18*(2), pp. 53-65, https://doi.org/10.1515/jtes-2016-0014

Özdemir, N., Kılınç, A.C., Polatcan, M., Turan, S. & Bellibaş, M.S. (2023). Exploring Teachers' Instructional Practice Profiles: Do Distributed Leadership and Teacher Collaboration Make a Difference? *Educational Administration Quarterly*. https://doi.org/10.1177/0013161X231159092

Özek, B.Y. & Büyükgöze. H. (2023). Examining the Relationship of Distributed Leadership and Job Satisfaction: On the Mediating Roles of Teacher Self-efficacy and Co-Operation. *Education and Science*, *48*(213) 1-23.https://doi.org/10.15390/EB.2023.11759

Sentoènik, S. and Rupar, B. (2009). School Leadership of the Future**:** How the National Education Institute in Slovenia Supported Schools to Develop Distributed Leadership

Practice. *European Education*, *41*(3), https://doi.org/ 10.2753/EUE1056-4934410301

Spillane, J. P., Halverson, R. & Diamond, J.B. (2004). Towards A Theory of Leadership Practice: A Distributed Perspective, *Journal of Curriculum Studies*. *36*(1), 3-34. http://dx.doi.org/10.1080/0022027032000106726

Spillane J. P. (2005) Primary School Leadership Practice: How the Subject Matters. *School Leadership & Management 25*(4) 383–397.

Spillane, J. P. (2006). Distributed leadership. San Francisco, CA: Jossey-Bass. https://www.scirp.org/(S(i43dyn45teexjx455qlt3d2q))/reference/referencespapers.aspx?referenceid=768106

Supovitz, J., Jonathan A.; D'Auria, John; & Spillane, J. P. (2019). Meaningful & Sustainable School Improvement with Distributed Leadership. *CPRE Research Reports*. https://repository.upenn.edu/cpre_researchreports/112

Tahir, L., Lee, S., Musah, M., Jaffri, H., Said, M. & Yasin, M. (2016). Challenges in Distributed Leadership: Evidence from the Perspective of Head-teachers. *International Journal of Educational Management*, *30*(6), http://dx.doi.org/10.1108/IJEM-02-2015-0014

Tian, M. and Risku, M. (2018). A Distributed Leadership Perspective on the Finnish Curriculum Reform 2014, *Journal of Curriculum Studies*, https://doi.org/10.1080/00220272.2018.1499806

Watson, S. T. & Scribner, J.P. (2007). Beyond Distributed Leadership: Collaboration, Interaction, and Emergent Reciprocal Influence. *Journal of School Leadership*. *17*(4). http://doi.org/10.1177/105268460701700404

Williams, C.G. (2011). Distributed leadership in South African schools: Possibilities and Constraints. *South African Journal of Education*. *31*, 190-200. https://www.ajol.info/index.php/saje/article/view/66452

APPENDICES

Appendix- 1

Output for PROCESS Procedure for SPSS Version 4.2 for Mediation Model

Model: 4

Y: Benefit

X: Challenge

M: Practice

Sample size = 301

Outcome Variable: Practice

Model Summary

R	R-sq	MSE	F	df1	df2	p
0.1913	0.0366	0.3809	11.3553	1	299.0000	.0009

Model

	coeff	se	t	p	LLCI	ULCI
Constant	4.2776	.1264	33.8543	.0000	4.0289	.5263
Challenge	-.1331	.0395	-3.3698	.0009	-.2108	-.0554

Outcome Variable: Benefits

Model Summary

R	R-sq	MSE	F	df1	df2	p
.3891	1514	.4248	26.5806	2.0000	298.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
Constant	2.1328	.2934	7.2703	.0000	1.5555	2.7101
Challenge	.0834	.0425	1.9631	.0506	-.0002	.1671
Practice	.4439	.0611	7.2678	.0000	.3237	.5641

Direct and Indirect Effects of challenge (X) on benefit (Y)

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
.0834	.0425	1.9631	.0506	-.0002	.1671

Indirect effect of X on Y

	Effect	BootSE	BootLLCI	BootULCI
Practice	**-.0591**	.0186	-.0975	-.0250

- Level of confidence for all confidence intervals in output: 95.0000
- Number of bootstrap samples for percentile bootstrap confidence intervals: 5000

Appendix- 2

Output for PROCESS Procedure for SPSS Version 4.2 for Moderated Mediation Model

Model: 8

Y: Benefit

X: Challenge

M: Practice

W: Experience

Sample size = 301

Outcome Variable: Practice

Model Summary

R	R-sq	MSE	F	df1	df2	p
.2371	.0562	.3757	5.8985	3.0000	297.0000	. .0006

Model

	coeff	se	t	p	LLCI	ULCI
Constant	3.4513	.4282	8.0595	.0000	2.6086	4.2941
Challenge	.0597	.1310	.4556	.6490	-.1981	.3174
Experience	.2541	.1253	2.0285	.0434	.0076	.5006
Interaction 1	-.0600	0380	-1.5798	.1152	-.1347	.0147

Product terms key:

Interaction 1: Challenge x Experience

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
.X*W	.0079	2.4958	1.0000	297.0000	.1112

Outcome Variable: Benefit

Model Summary

R	R-sq	MSE	F	df1	df2	p
.3928	.1543	.4263	13.4984	4.0000	296.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI

Constant	1.9503	.5036	3.8728	.0001	.9592	2.9413
Challenge	.1138	.1395	.8155	.4154	-.1608	.3884
Practice	.4359	.0618	7.0514	.0000	.3142	.5575
Experience	.0672	.1343	.5002	.6173	-.1972	.3316
Interaction 1	-.0103	.0406	-.2541	.7996	-.0903	.0696

Product terms key:

Interaction 1: Challenge x Experience

Test(s) of highest order unconditional interaction(s):

	R2-chng	**F**	**df1**	**df2**	**p**
.X*W	.0002	.0646	1.0000	296.0000	.7996

Direct and Indirect Effects of X on Y

Conditional direct effects of X on Y

Experience	**Effect**	**se**	**t**	**p**	**LLCI**	**ULCI**
2.0000	.0932	.0670	1.3908	.1653	-.0387	.2250
4.0000	.0725	.0520	1.3950	.1641	-.0298	.1748
4.0000	.0725	.0520	1.3950	.1641	-.0298	.1748

Conditional Indirect Effects of X on Y:

Indirect Effect:

Challenge -> Practice -> Benefit

Experience	**Effect**	**BootSE**	**BootLLCI**	**BootULCI**
2.0000	-.0263	.0289	-.0894	.0258
4.0000	-.0786	.0215	-.1232	-.0396
4.0000	-.0786	.0215	-.1232	-.0396

Index of Moderated Mediation

Experience	**Index**	**BootSE**	**BootLLCI**	**BootULCI**
	-.0261	.0165	-.0581	.0062

- Level of confidence for all confidence intervals in output: 95.0000
- Number of bootstrap samples for percentile bootstrap confidence intervals: 5000
- W values in conditional tables