

International Journal of Multicultural and Multireligious Understanding

http://ijmmu.com editor@ijmmu.con ISSN 2364-5369 Volume 8, Issue 11 November, 2021 Pages: 112-121

Mapping Managerial Competence of Primary School Principals in South Sumatera

Alamsyahril¹; Muhammad Syukri²; Muhammad Kristiawan³; Nila Kesumawati⁴; Rohana⁴

¹BKPSDM Kota Lubuklinggau, Indonesia
 ²SMK Negeri 1 Pangkalan Kuras, Indonesia
 ³Universitas Bengkulu, Indonesia
 ⁴Universitas PGRI Palembang, Indonesia
 http://dx.doi.org/10.18415/ijmmu.v8i11.3101

Abstract

In this quantitative research, we drew the managerial competence considered weak from 16 (sixteen) managerial competencies of Primary School's Principals in South Sumatera based on Regulation of National Education Minister Republic Indonesia Number 13 of 2007. The instrument used was questionnaire. The result mentioned that there were 8 (eight) sub managerial competencies considered weak and need to be coached 1) developing the school's organization; 2) creating the conducive and innovative school's culture; 3) managing teachers and staff optimally; 4) managing school and community relationships; 5) managing students; 6) managing curriculum development and learning activities; 7) managing school information system; 8) monitoring, evaluating and reporting the implementation of school's program activities. The results contributed to the Ministry of Education and Culture Republic Indonesia in conducting the managerial competence of Primary School's Principals in South Sumatera.

Keywords: Managerial; Competence; Principal

Introduction

This research started from the principal's strategic issue has a very decisive role in the learning process by involving various components around the school (Ali et al., 2014). The principal is required to have relevant competencies to fulfill his duties and functions, they could manage administration of students' recruitment, curriculum, educators and staff, and counseling (Kristiawan et al., 2018). The principal is responsible on determining the direction and purpose of the school, organizing the school, communicating, motivating and solving problems, improving teachers' competence, teachers' work performance and teachers' discipline. In line with Sulan (2008), the principals leadership role is very influential on teachers' performance and students' achievement, he states job satisfaction amongst teachers in the school is closely related to teacher effectiveness that contributes to student achievement. Then Babayimi (2006) states that principals' managerial competency has a relationship with students' academic performance.

The qualified teachers' performance will have an impact on improving students' achievement. Thus the leadership of the principal both directly and indirectly will effect toward the improvement of learning outcomes. Cruz (2005) found the students' performance is related to teacher factor, parental factor, economic factor, social factor and principal's leadership behavior and competence. The principal's managerial competency as a potent factor for students' performance.

The Principal's duties should be applied maximally, because excellence and high performance of a school is determined by the ability of principals in mobilizing the staff and stakeholder efficiently and effectively to achieve the goals of the school (Ministry of Education Malaysia, 2014; Leithwood, 2012; Hallinger, 2007). Amuche et al. (2013) positioned the level of achievement in any institution of learning lies mainly with how competent the school leadership is in the area of managing the human, material and financial resources at his disposal.

Improving the quality of education should be begun from the improvement of the Principal's professionalism. The key to quality improvement is the commitment to change, always innovating to develop themselves and keep the development and demands of the profession. Therefore, the improvement of educational quality needs to be supported by optimal management by the Principal (Kristiawan et al., 2017). The success of a school is heavily influenced and caused by the Principal's effective leadership. Leadership is the one that moves a school forward or otherwise (Ministry of Education Malaysia, 2014; Ibrahim, 2012; Marzuki, 1997).

From the various explanations, it gives an idea that the principal in directing and utilizing all available resources greatly determine the quality of teachers' performance and will also impact on students' learning outcomes. As stated by Wahab et. al. (2014) there was a significant relation between the level of transformational leadership and teachers work commitment. The Principal should also achieving efficient teaching and learning in the school. Since the missionaries handed over the responsibilities of the schools, there had not been any significant successes in the mission schools (Okpilike, 2010). In order to realize these responsibilities, the principal is an instrument in controlling the success of educational activities, improving the implementation of school administration according to educational goals, and professionally manage the utilization and maintenance of educational facilities and infrastructure.

Hamzah (2009) found the Principal should make sure that the physical aspects of the school are clean, neat, safe and adequate. To fulfill these challenging tasks, a Principal has to be excellent in administrating his school. The principal's managerial technical skills include a wide range of skills, a broad understanding of all school's operations related to the technical demands including curriculum development, students' management, personal, finance, administration, facility maintenance, support services and school's relationships with community.

Based on the explanation about the importance of the Principal's role on the quality of learning encourages researchers to map the managerial competence of the Primary School's Principal in South Sumatera. This research maps the managerial competence considered weak from 16 (sixteen) managerial competencies of Primary School's Principals in South Sumatera based on (National Education Minister Republic Indonesia Number 13 of 2007). This study contributed to the Ministry of Education and Culture Republic Indonesia in conducting the managerial competence of Primary School's Principals in South Sumatera. This research was supported by (Amuche, 2013) from Nigeria states the most ECWA Secondary School principals were not professionally competent in school administration and planning. Also, principals' managerial competence had a negative relationship (-0.02) with students performance in ECWA secondary schools.

Mapping the managerial competence of the Primary School's Principal in South Sumatera was done because (Sergiovanni, 1987) argues the school principal is the most important and influential in any schools. He sets the tone of the school, the climate of learning, the level of professionalism and morale of

teachers and the degree of concern for what students may or may not become. Fullan (2000) also states almost every single study of school effectiveness has shown both primary and secondary leadership to be key factors. Udoh, et. al. (2000) states the level of achievement in any institution of learning lies mainly with how competent the school leadership is in the area of managing the human, material and financial resources at his disposal.

The importance of mapping the managerial competence of the Primary School's Principal in South Sumatera relevant with the argumentation of Ministry of Higher Education (KPT) monitoring the management level at the schools level is imposed that the Principals should be given training in management (Ministry of Higher Education, 2007). This course has to expose new development in the management fields to all Principals so that they will be able to give more effective leadership. The research results from Ali et al. (2014) and Ibrahim et al. (2012) also state that Principals are often seen as a determinant towards the sustainability of a school". Therefore a school's academic success is very dependent on school's leader. Other relevant research also found the school leaders had links with academic success either directly or indirectly (Ibrahim et al., 2012; Leithwood, 2008; Hallinger, 2007; Mortimore, 1995; Purkey, 1983).

Method

This research used quantitative (Creswell, 2014). The quantitative approach used to obtain data assessment of managerial competence Principal. Data were collected by using questionnaire. This research was conducted to produce descriptive data of managerial competence considered weak from 16 (sixteen) managerial competencies of Primary School's Principals in South Sumatera. The population in this study is the managerial capability of Primary School's Principal in South Sumatera (17 districts). The sample selection was done purposively. According to Sudjana (1988), purposive sampling occurs when sampling is done based on consideration of researcher. Based on the consideration, the Regency election is conducted based on the representation of urban and regency areas and the distance to the provincial capital. The sample in this research was the managerial capability of Primary School Principal in 6 (six) districts included in South Sumatera were Kota Palembang, Kota Prabumulih, Ogan Ilir, Ogan Komering Ilir, Ogan Komering Ulu, Banyuasin, and Musi Banyuasin. Quantitative data analysis was done by descriptive statistics aimed at describing the principal's mastery of managerial competence.

Result and Discussion

Here, we reported eight competencies were low. First, respondents' ability in developing the school organization according to the need concluded that the respondents' ability was low because the average score of their achievement was 60,71.

Group	No.	Sub-Competence	Total Score	Aver age	Achiev ement	Average achievement
Developing the school reganization ccording to the need	1	School organization structure	34	2,43	60,71	
velop scho aniza ordin e nee	2	The unit of organizational structure	35	2,50	62,50	60,71
Deve the sorgan organ accor	3	The committee composition of the temporary activities	33	2,36	58,93	

Table 1: Respondents' Ability in Developing the School Organization

Second, the respondents' ability in creating a conducive and innovative school's culture and climate for the learning of students showed that the ability of respondents is not good because the average score of achievement was 64,50.

Table 2: Respondents' Ability in Creating a Conducive and Innovative Climate

					Achie	
Group	No.	Sub-Competence	Total Score	Aver	vemen	Average
			Score	age	t	achievement
ıts	1	Able to arrange a comfortable and	46	3,29	82,14	
дет		conducive school headroom Able to arrange teacher room, BK		ŕ	•	
štu	2	room, comfortable and conducive	46	3,29	82,14	
JC 3	_	office space	10	3,27	02,11	
		Able to arrange learning space/skill				
nir	3	room/practice room that is	32	2,29	57,14	
ear		comfortable and conducive				
e <u>J</u> e	4	Able to organize laboratory space, computer room, exhibition space	37	2,64	66,07	
. th	4	comfortable and conducive	31	2,04	00,07	
for	5	Able to arrange a comfortable and	25	2.50	(2.50	
ıte	5	conducive library space	35	2,50	62,50	
ms	6	The presence of the students'	29	2,07	51,79	
cli		restroom		_,~.	,	
pu	7	Able to manage the OSIS room, UKS space, cooperative room	32	2,29	57,14	
e e	,	comfortably	32	2,27	37,14	
tuī	8	Able to arrange other spaces	31	2,21	55,36	
cul	0	comfortable and conducive	31	2,21	33,30	64,50
$\frac{2}{s}$	9	Able to organize pages and school's	31	2,21	55,36	01,50
00		environment Able to create a harmonious				
sch	10	working relationship among teachers	34	2,43	60,71	
9	11	Able to create harmonious working	26	2.57	64.20	
ativ	11	relationships among employees	36	2,57	64,29	
0 V.	10	Able to create a harmonious	25	2 6 4	O.	
nn	12	working relationship between	37	2,64	66,07	
i þi		teachers and employees Able to create a sense of security in				
ar	13	the school's environment	39	2,79	69,64	
1V6	14	Able to create and socialize	27	1,93	48,21	
luc	14	environmental maintenance	21	1,93	40,21	
onc	15	Able to apply the principle of	39	2,79	69,64	
3 C		appreciation Able to apply the punishment				
. g	16	principle	46	3,29	82,14	
Creating a conducive and innovative school's culture and climate for the learning of students		Able to apply/develop internal and				
rea	17	external motivation for school's	37	2,64	66,07	
		residents				

Third, the respondents' ability in managing teachers and staff in the framework of optimal utilization of human resources concluded that the ability is less good because the average score of achievement was 70,89.

Table 3. Respondents' Ability in Managing Teachers and Staff

Group	No.	Sub-Competence	Total Score	Aver age	Achiev ement	Average Achievement
	1	There are references to broaden teacher/employee insight	38	2,71	67,86	
	2	There are educational programs/training of teachers and employees	33	2,36	58,93	
staff	3	There is a note of guidance on MGMP school activities	38	2,71	67,86	
s and	4	Having a record of participation of teachers/other personnel in MGMP activities	39	2,79	69,64	
Managing teachers and staff	5	There is a collection of Teacher certificates/employees attending the training/seminars/ workshops	41	2,93	73,21	70,89
aging	6	Having a program and record of conducting comparative studies for principals and teachers	41	2,93	73,21	
Man	7	There are notes about teachers/ employees who continue their formal education	39	2,79	69,64	
	8	There is a career enhancement program for teachers/employees	38	2,71	67,86	
	9	There are notes/documents on teacher/employee promotion and career development	36	2,57	64,29	

Fourth, the respondents' ability in managing school and community relationships in order to search support ideas, learning resources, and financing schools concluded that the ability of respondents is not good, because the average achievement was 64,56.

Table 4. Respondents' Ability in Managing School and Community Relationships

Group	No.	Sub-Competence	Total Score	Aver age	Achiev ement	Average Achievement
-	1	Likes to cooperate	39	2,79	69,64	
ips	2	Having extensive network	42	3,00	75,00	
ıshi	3	Coordinating the related parties	37	2,64	66,07	
ion	4	Having a spirit of investment	35	2,50	62,50	
lat	5	Ability to minimize the negative risks	29	2,07	51,79	
' re	6	Having a spirit of renewal	32	2,29	57,14	
nit y	7	Able to identify school's excellence	31	2,21	55,36	
nmu	8	Able to read the situation of community needs	31	2,21	55,36	
ю ри	9	Able to communicate with various communities	34	2,43	60,71	64,56
l aı	10	Able to promote school's excellence	36	2,57	64,29	
Managing school and community relationships	11	Able to foster commitment to achieve school's independence	45	3,21	80,36	
ging	12	Able to equip school's facilities for independent business	41	2,93	73,21	
Mana	13	Able to improve the welfare of teachers/employees for independent business	38	2,71	67,86	

Fifth, the respondents' ability in managing learners in order to receive new learners, and placement of learners and capacity building learners concluded that the ability of respondents is not good, because the average score of achievement was 65,05.

Total Aver Achiev Average Group No. Sub-Competence Score ement age Achievement 34 2,43 Having new student admission data 60,71 Managing learners 2 Having student administration data 35 2,50 62,50 3 Having extracurricular activity data 33 2,36 58,93 Having a complete data of relation school 42 3,00 75,00 65,05 with parents 5 40 2,86 Having a student attendance document 71,43 Having documents of active student 6 33 2.36 58,93 awareness and involvement

Table 5. Respondents' Ability in Managing Learners

Sixth, the respondents' ability in managing curriculum development and learning activities according to objectives of national education concluded that the ability of respondents is not good, because the average score of achievement was 69,90.

Table 6. Respondents' Ability in Managing Curriculum

Group	No.	Sub-Competence	Total Score	Aver age	Achiev ement	Average Achievement
Managing curriculum development	1	Having complete administrative data of learning process	38	2,71	67,86	
	2	Having complete administrative laboratory	33	2,36	58,93	
	3	Having complete administrative library	38	2,71	67,86	60.00
ole ole	4	Having data of teachers	39	2,79	69,64	69,90
igir lev	5	Having data of staff	41	2,93	73,21	
Mana d	6	Having list of attendance and recap of teachers and staff	41	2,93	73,21	

Seventh, the respondents' ability in managing school information systems to support program and decision making concluded that the ability of respondents is not good because the average achievement was 63,39.

Table 7. Respondents' Ability in Managing School Information System

Group	No.	Sub-Competence	Total Score	Average	Achieve ment	Average Achievement
ring ol atio	1	Having school information systems	35	2,50	62,50	_
Managing school informatic n systems	2	Implementing Information Based Systems Website	36	2,57	64,29	63,39

Eighth, the respondents' ability to monitor, evaluate, and report the implementation of school's activities with appropriate procedures, and plan the follow-up concluded that the ability of respondents less good because the average achievement was 73,81.

Table 8. Respondents' Ability to Monitor, Evaluate, and Report School's Activities with Appropriate Procedures, and Plan the Follow-Up

Group	No.	Sub-Competence	Total Score	Aver age	Achieve ment	Average Achievement
ement on of itorin	1	Implementing a clinical supervision program and counseling guidance	42	3,00	75,00	73,81
Impler ation monit	2	Implementing an extracurricular supervision program	41	2,93	73,21	

3	Implementing a library supervision program	41	2,93	73,21	
4	Implementing a laboratory supervision program	42	3,00	75,00	
5	Implementing supervision program of comprehensiveness assessment of each competency	40	2,86	71,43	
6	Carrying out supervision of other activities	42	3,00	75,00	

This research found there were 8 (eight) sub managerial competencies considered weak and need to be coached. Many aspects of managerial competence, to meet the aspects of managerial competence, the principal's skill is required to always grow. The development of the principal is required because Gibson et. al. (1982) state that principal is perhaps the single most significant factor in establishing an effective school. Maekenzie, (1983) argues effective school is school that demonstrate high standards of achievement in academics have a culture characterized by a well-defined set of goals that all member of school administration, faculty and student-value and promote. According to Shannon, et. al. (2007) in obtaining an effective school predicate, the school must implement nine criteria are a clear and shared focus; high standards and expectations for all students; effective school leadership; high levels of collaboration and communication; curriculum, instruction and assessments aligned with state standards; frequent monitoring of learning and teaching; focused professional development; a supportive learning environment; and high levels of family and community involvement. To meet the nine criteria, the principal's managerial competence is the answer in making it happen. Karpin, (1995) states good managers are the key for a better competitive economy and better organizational results.

Krajcovicova, (2012) argues managerial competence is more than just knowledge and skills. It involves the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context. Wahab, et. al. (2014) argues the managerial competence as sets of behaviors that enable individuals demonstrate the effective performance of tasks within the organization. The result investigation of Martina, et. al. (2012) assume the managerial competence consists in its application in the areas (1) recruitment, (2) employee evaluation, (3) training, (4) employee development, (5) carrier management, (6) adaptation to changes, (7) enhancement of productivity of labour and (8) an organization's performance. According to [28] managerial competence provides a sound basis for an effective performance management program. So did the results of the investigation Abraham, et. al. (2001) concluded that the successful manager was substantially greater than the percentage of organizations that used the same competency in the managerial performance appraisal process. Chen, et. al. (2010) also state the managerial competence strategically driven by organizational core competence. Employee competency and organizational core competence are similar and linked in terms of person-organization fit and person-job fit. The last, Mumford, et. al. (2002) state the successful innovation management, a manager must acquire or possess expertise in the domain at hand, creativity, ability to carry out transformational leadership behaviours, planning and sense-making, and social skills.

Conclusion

There were 8 (eight) sub managerial competencies considered weak and need to be coached; 1) developing the school's organization according to the need, 60,71%; 2) creating the conducive and innovative school's culture and climate, 64.50%; 3) managing teachers and staff optimally, 70.89%; 4) managing school and community relationships, 64.56%; 5) managing students 65.05%; 6) managing curriculum development and learning activities according to national educational goals, 69,90%; 7) managing school information system, 63,39%; 8) monitoring, evaluating and report the implementation of school's program activities appropriate with procedures, and planning for follow-up 73.81%. The results of this study contributed to the Ministry of Education and Culture Republic Indonesia in conducting the managerial competence of Primary School's Principals in South Sumatera.

Acknowledgements

We would like to express our special thanks and gratitude to our rector (Bukman Lian) who gave us the golden opportunity to do this wonderful project on the topic (Mapping Managerial Competence of Primary School Principals in South Sumatera). Secondly, we would also like to thank our graduate director (Houtman) dean (Dessy Wardiah) and friend (Muhammad Syukri) who helped us a lot in finalizing this project within the limited time frame.

References

- Abraham, S. E., Karns, L. A., Kenneth, S., and Manuel, A. M. (2001). Managerial Competencies and the Managerial Performance Appraisal Process. The Journal of Management Development; 2001; 20, 9/10; ABI/INFORM Global.
- Ali, N., Jan, S., Ali, A., & Tariq, M. (2014). Transformational and Transactional Leadership as Predictors of Job Satisfaction, Commitment, Perceived Performance and Turnover Intention (Empirical Evidence from Malakand Division, Pakistan). Life Science Journal, 11(5s).
- Amuche, C. I., & Saleh, D. A. (2013). Principals Managerial Competence as A Correlate Of Students' Academic Performance In Ecwa Secondary Schools In North Central Nigeria. Journal of Education and Practice Vol.4, No.4, 2013
- Babayimi, A. (2006). Principalship. New York: Longman Inc.
- Chen H. M., & Chang, W. Y. (2010). The Essence of the Competence Concept: Adopting an Organization's Sustained Competitive Advantage Viewpoint. Journal of Management & Organization 16: 677–699.
- Creswell. (2014). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. SAGE Publishing.
- Cruz, P. A. (2005). The leadership Action of Principals in Schools that Have Experience Academic Success with Hispanic Students. Dissertation Abstract International.
- Fullan, M. (2000). The New Meaning of Educational Change. Teachers College Press, USA.
- Gibson J. W., & Richard, M. H. (1982). Organizational Communication: A Managerial Perspective. Academic Press Inc, Orlando, Florida.
- Hallinger, P. (2007). Leadership for Learning: Reflections on the Practices of Instructional and Transformational Leadership. Paper Presented in Seminar at East Asia University.
- Hamzah, M., Sahandri, G., Yusof, H. Bt. & Saifuddin, K. A. (2009). Headmaster and Entrepreneurship Criteria. European Journal of Social Sciences-Volume 11, Number 4 (2009).
- Ibrahim, M. S., & Wahab, J. A. (2012). Educational leadership. Universiti Kebangsaan Malaysia, Bangi.
- Karpin, D.)1995). Enterprising Nation-Rewarding Australia's Managers to Meet the Challenges of the Asia-Pacific Century. Executive Summary, Camberra.

- Krajcovicova. C., and Cambal. (2012). Key Managerial Competencies and Competency Models In Industrial Enterprises. Annals of DAAAM for 2012 & Proceedings of the 23rd International DAAAM Symposium, Volume 23, No.1.
- Kristiawan, M., & Asvio, N. (2018). Pengelolaan Administrasi Madrasah Tsanawiyah Negeri Dalam Meningkatkan Kualitas Pendidikan Madrasah [Administrative Management of State Madrasah Tsanawiyah in Improving the Quality of Madrasah Education]. Kelola: Jurnal Manajemen Pendidikan, 5(1), 86-95.
- Kristiawan, M., Safitri, D., & Lestari, R. (2017). Manajemen Pendidikan [Education Management]. Deepublish, Yogyakarta.
- Leithwood, K. A., & Sun, J. (2012). The Nature and Effects of Transformational School Leadership a Meta-Analytic Review of Unpublished Research. Educational Administration Quarterly, 48(3), 387-423.
- Leithwood, K. A., & Mascall, B. (2008). Collective Leadership Effects on Student Achievement. Educational Administration Quarterly, 44(4), 529-561.
- Maekenzie. (1983). Organization Culture in the Study of Higher Education. Ginn Press, Massachusetts.
- Martina, K., Hana, U., Fejfar, J. (2012). Identification of Managerial Competencies in Knowledge-based Organizations. Journal of Competitiveness Vol. 4, Issue 1, pp. 129-142, March 2012.
- Marzuki, C. (1997). Effective School Studies in Malaysia: Model 5 Factors. Doctoral Dissertation Universiti Kebangsaan Malaysia.
- Ministry of Higher Education (KPT). (2007). The Foundation of Entrepreneurship Culturing. UUM Sintoh: Publisher of Universiti Utara Malaysia.
- Ministry of Education Malaysia. (2014). Educational Development in Malaysia 2013-2025. KPM, Putrajaya.
- Mortimore, P. (1995). Key Characteristics of Effective Schools: A Review of Effectiveness Research. Effective School Seminar, Ministry of Education Malaysia, 13-14 July 1995.
- Mumford, M. D., Scott, G. M., Gaddis, B., & Strange, J. M. (2002). Leading Creative People: Orchestrating Expertise and Relationships. The Leadership Quarterly 13: 705–750.
- National Education Minister Republic Indonesia Number 13 of 2007
- Okpilike, F. M. E. (2010). "Steps in the Sociotherapeutic Approach to School Discipline: A Human Touch Deviant Control". Pakistan Journal of Social Sciences 7 (2): 143-145, 2010.
- Panduan Teknis Penelitian Kebijakan Pendidikan dan Kebudayaan. (2017). Penelitian Pengelolaan Sekolah [School Management Research]. Jakarta: Kementerian. Pendidikan dan Kebudayaan.
- Pickett, L. (1998). Competencies and Managerial Effectiveness: Putting Competencies to Work. Public Personnel Management, Vol. 27, No. 1, pp 103.
- Purkey, S. C., & Smith, M. S. (1983). "Effective schools: A Review". The Elementary School Journal, 83, 426-452.

- Sergiovanni, T. J. (1987). The Principalship a Reflective Practice Perspective. Allyn and Bacon, USA.
- Shannon, G. S., & Bylsma, P. (2007). The Nine Characteristics of High Performing Schools: A Research Based Resource for Schools and Districts to Assist with Improving Student Learning. (Second Edition). OPSI, Olympia, WA.
- Sudjana, N. (1988). Metoda Statistika: Bandung: Tarsito.
- Sulan, F. (2008). Relationship between Communication of Principals and Teachers' Commitment at a School in Jempul, Negeri Sembilan. Thesis Universiti Malaya.
- Udoh, S. U., Akpa, G. O., & Gang, G. (2000). Educational Administration and Management in Nigeria: Theory and Practice. Ichejum Printers, Jos.
- Wahab, J. A., Fuad, C. F. M., Hazita, I., & Samsidah, M. (2014). Headmasters' Transformational Leadership and Their Relationship with Teachers' Job Satisfaction and Teachers' Commitments. International Education Studies; Vol. 7, No. 13; 2014.
- Whiddett, S., & Hollyforde, S. (2003). A Practical Guide to Competencies: How to Enhance Individual and Organizational Performance. CIPD, London.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/4.0/).