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THE DEVELOPMENT OF MANAGEMENT MODEL ON COLLABORATIVE-BASED STUDENTS' SCIENTIFIC WRITING MENTORING THROUGH AN ONLINE RESEARCH CLINIC APPROACH AT UPBJJ-UT SEMARANG

Binti Muflikah[1], Swidarto[2], Vica Ananta Kusuma[3]

[1]UPBJJ-Universitas Terbuka Semarang,

[2]Tutor UPBJJ-UT Semarang/ Guru SMP Negeri 1 Kayen, Indonesia

[3]FHISIP Universitas Terbuka, Indonesia

[1]binti@ecampus.ut.ac.id, [2]swi.darto70@gmail.com, [3]vicaananta@ecampus.ut.ac.id

ABSTRACT

Scientific writing plays a crucial role in determining the quality of students and universities. So far, the ability of students to establish scientific works is varied. Some students can produce scientific work in an APIK (Asli, Penting, Ilmiah, Konsisten) way which means Original, Important, Scientific, and Consistent), as well as in a "SMART" (Specific, Manageable, Acceptable, Realistic and Time-bound) way. However, some of them also encounter difficulties so they need assistance on a collaborative based scientific writing through Online Research Clinic (ORC) approach. Collaborative-based mentoring can build collegiality and collaboration among tutors, students, and UPBJJ-UT managers. Effective mentoring requires an ORC approach. An online research clinic is a place designed to help students who have difficulty writing scientific papers through clinical methods, starting from problem identification, diagnosis, prognosis, synthesis, treatment, reflection using internet / online network media such as website, email, WhatsApp, telegram, Google classroom, webinars, zoom and so on. Online Research Clinic is a solution to solve students' difficulties in writing scientific papers. The existence of ORC is an innovation to create independent learning in the digital era due to its flexibility and easy accessibility at all times both face-to-face and online. Besides, it is also used by tutors and managers to collaborate in providing consultation services to students. This study aims to analyze and synthesize the management model of scientific work mentoring with a proper online clinical research approach for UPJJB-UT Semarang students. The research method uses Research and Development. Data obtained from the results of scientific work mentoring, needs analysis, testing, and model validation. Data collection techniques use questionnaires, interviews, documentation studies, observation, and FGD. The validity test uses model validation from experts and practitioners. The qualitative descriptive analysis uses data displays, data reduction, data verification, and conclusion. The results of the study conclude that the mentoring management model implemented so far was categorized as sufficient, still theoretical, and not practical yet. ORC assistance model is very important and needed because it is practical, effective, and efficient. The ORC mentoring model is very feasible so that it can be implemented

to improve the quality of students in producing scientific papers for fulfilling assignments, requirements for completing study program, and scientific publications.

Keywords: management, mentoring, scientific work, collaborative, online research clinic.

A. INTRODUCTION

Scientific writing in higher education is essential as a part of formal academic demands. It means that scientific work is part of the academic needs of each university in the context of its efforts to improve the quality and optimization of its roles, missions, functions, and objectives.

Optimizing the role of scientific work is realizing the *tri dharma* of higher education, namely: education, research, and community service. The mission of scientific writing is as a platform to train students to express their thoughts logically and systematically so that they can be scientifically accounted for, and contribute to the development of science (Djuhare, 2001: 66). The functions of scientific writing are self-development, innovative work, and scientific publications (Supardi and Suhardjono, 2013: 4). Furthermore, its purpose is to fulfill assignments, requirements for completion of study programs, and scientific publications (Djuhare, 2001: 66).

Based on its roles, missions, functions, and goals, it shows that scientific work is crucial for higher education. However, tertiary institutions in Indonesia still experience major obstacles because the result of the publication is still very low compared to neighboring countries such as Malaysia, Thailand, and Singapore (Shahjahan & Kezar, 2013). Susanto (2017) elaborated teachers 'perceptions towards teaching writing using word games; the case study of junior high schools in Semarang, central java, Indonesia. In order not to be left behind with other countries, the Director-General of Higher Education issued a letter to the Rector / Chairperson / Director of Higher Education in Indonesia Number 152 / E / T2012 dated 27 January 2012 concerning the Publication of Scientific Papers. This letter has implications on the graduate requirement for undergraduate programs to produce papers published in scientific journals. While for postgraduate students, they are obliged to establish accredited national journals and international journals for doctoral graduates.

The Universitas Terbuka as part of state universities that obtained an ISO9001 certificate responded to Dirjen Dikti's issued letter for the 2013 registration period. Universitas Terbuka obliges its undergraduate students to produce scientific writing as a graduation requirement.

The commitment of Universitas Terbuka in realizing scientific work for students is shown by issuing various policies, including (1) inserting scientific work courses into the curriculum structure of the undergraduate program in all study programs with zero credits (semester credit units); (2) providing various courses that support scientific writing in primary education programs such as PTK, PKM, PKP, writing skills. Whereas, non-primary education's majors are given research methodology, TAP, and scientific work courses; (3) providing face-to-face and online learning assistance in the form of tutorials or writing guidance for scientific work; (4) publishing scientific works' writing guide.

Universitas Terbuka's efforts have not fully produced a good result to enable students in establishing scientific writing. This is based on the results of research by Aslikati et al. (2014)

that the ability to research and write scientific papers of Universitas Terbuka students is still low, only 47% can write well while 53% are still lacking. Pupitasari, et al. (2012) the constraints of Universitas Terbuka's students in writing scientific papers include limited insight; time to write; lack of references; limited time for guidance; lack of clarity of the material delivered by the tutor; difficulty in finding ideas/materials to be written, as well as data processing.

The problems of Universitas Terbuka's students in writing scientific papers were also experienced by UPBJJ-UT students, especially Non-primary education Pokjar Kudus in writing articles (the results of their thoughts, ideas, and research results), for example. In compiling scientific work from their thoughts, students still experience difficulties. in terms of (1) determining a topic which theme is based on the study program; (2) formulating a title under the 5W 1 H principles; (3) making an abstraction that is in accordance to the writing context, objectives, main findings, conclusions, recommendations, and keywords; (4) making an introduction starting from the background, thoughts, ideas, formulating questions, and focus of writing; (5) using relevant theories to answer problems; (6) making citation according to the rules of flagellation; (6) discussions that are not focused yet on answering to problem formulations; (7) making conclusions drawn from concrete findings from the discussion; (8) difficulties in providing new suggestions, new ideas from the discussion and comments for future research; (8) cited a bibliography according to the American Psychological Association (APA) Style. Likewise, students in writing scientific papers in the form of research results also experience difficulties, starting from determining topics, formulating titles, abstracts, introduction (background, problem formulation, objectives, and research benefits), theoretical basis (relevant literature review), research methods ranging from research types and approaches, research subjects and objects, sampling techniques, data sources and data collection, data analysis techniques, and research instruments. The discussion is still difficult to convey data and analysis that makes scientific sense (logically), the delivery of research results is not equipped with tables and graphs (other forms of communication), answers questions that are suitable with the focus of the study and the relevance of the discussion to the research results. In closing, students still have difficulty in making conclusions and suggestions. The conclusions made by students do not reflect the summary of the results and discussion. Suggestions made by students have not been developed based on research findings or conclusions that have been drawn from the research results. The bibliography of students is still not thorough in digitizing under the existing rules of writing used by UPBJJ-UT Semarang, namely the American Psychological Association (APA) Style. Student layouts are still unable to adjust the spacing, margins, direct and indirect quotations as well as good writing layout according to existing rules. Furthermore, students also still have difficulty uploading scientific work to UPBJJ-UT.

The difficulties of UBJJ-UT students, especially non-primary education students of Pokjar Kudus in writing scientific writing, both articles in the form of their thoughts, ideas, and research results need to be found for solutions, one of which is by implementing collaborative-based scientific writing mentoring management with the Online Research Clinic (ORC) approach.

The collaborative-based management of scientific writing mentoring with the ORC approach for students is seen as an effective way in providing concrete solutions to overcome the difficulties faced by students in writing scientific papers because it gives assistance such as designing, implementing, evaluating, and following up so that the scientific papers meets

research quality standards. Good principles based on "APIK" and "SMART". APIK stands for Asli (Original), Penting (Important), Ilmiah (Scientific), and Konsisten (Consistent). SMART means S = specific, M = manageable, A = acceptable; R = realistic, and T = time-bound.

Collaborative-based management of scientific writing mentoring, in essence, can be understood from various points of view both from a narrow and broad meaning, starting from the concept of management, mentoring, scientific work, and collaboration, which are described as follows.

The concept of management in a narrow sense comes from the Latin word "manus" which means "hand" and "agere" which means "to do" (Kristiawan, 2017: 1). The word then developed into management, to manage, manegiare (Maisah, 2013: 4; Suparlan, 2013: 41). Management is defined as the meaning of implementing and managing. To manage means to organize. Maneggiare means controlling or doing Manegiare which means handling something, arranging, making something as desired by utilizing all available resources (Asmendri, 2012: 1).

Management in a broad sense is interpreted as a process of a series of work activities, tools or methods, workflows, frameworks, collectivity, knowledge, art, profession, and power that can be utilized to achieve organizational goals (Swidarto, 2018: 31). Management as a process of a series of work activities is defined as an overall activity directed at achieving goals and management functions in the organization starting from planning, organizing, implementing, and evaluating. Management as a tool or method means that in the process of implementing management activities, a tool is needed to achieve goals. Management as a framework means a working concept. Management as a collectivity, meaning that management is a collection of people who carry out activities in an organization starting from the top, middle and lower levels of management. Management as science means that management is part of systematic science, including rules, principles, and concepts. Management as a strategy means that achieving organizational goals requires collaboration with other people in every job. Management is an art because in carrying out the functions and principles of management we are faced with complex problems that require a leader who has the expertise, proficiency, ability, and skills in applying methods and techniques in using human resources to achieve goals effectively and efficiently. Management is based on organizational ethical values that require special expertise to organize, manage, and direct the field of activity of the expertise.

Assistance can be understood from terms and meanings. From the perspective of the term, assistance is known as mentoring. Meanwhile, from a meaningful point of view, mentoring is interpreted as a process, a way of providing assistance based on the values, principles, and collaborative interactions between mentoring components so that they can be used to achieve goals (Swidarto, 2018: 56). Mentoring as a process is interpreted by Masrukhi (2015: 55) as an action in which a mentor conducts mentoring individually or in groups of the person being assisted (mentee or mentees or mentoring participants). Assistance as a way of assisting is interpreted by Supriano (2016: 23) as an effective mechanism and tool to assist to achieve goals. Mentoring as a value is interpreted by Santoso (2015: 118) that in carrying out mentoring activities, both the mentor and mentoring participants must adhere to moral values or ethics. Mentoring as a principle is interpreted by Mckim (2007: 3) that in conducting various activities one must adhere to the principles used in the mentoring program. Mentoring as interaction is interpreted by Kaswan (2012: 340) that mentoring is carried out jointly between mentors and mentees. Mentoring as a component is interpreted by Gultom (2013: 5) as mentoring activities

are built from several elements/components which include: goals, objectives, materials, mentors (mentors), mentoring participants (mentee), strategies, mentoring activities. Mentoring as a benefit means that mentoring activities must provide good benefits for the mentor, the person being assisted, and the organization to accelerate learning, transfer knowledge in an integrated manner, improve career, competence, motivation and satisfaction, creativity, and productivity (Kaswan, 2012: 353). Mentoring as a goal, interpreted by Gultom (2013: 3) all activities in the mentoring process are oriented towards achieving the goals of the organization, both general and specific goals. The general objective is to ensure the implementation of the assistance program effectively and efficiently. The specific objectives are to provide facilities and consultation, mentoring, coaching for specific matters in the implementation of face-to-face and online mentoring programs and help provide solutions in solving problems faced by mentoring participants.

Scientific writing is written work that examines certain problems using scientific principles ranging from objective, logical, empirical, systematic, straightforward, clear, and consistent. Iskandar (2017: 1) defines scientific work as written works made with scientific principles, based on data and facts (observation, experiment, literature review). Scientific writing given to students aims to fulfill lecture assignments and final assignment requirements, and scientific publications. The purpose of scientific papers related to the fulfillment of lecture assignments such as making summaries and summaries, outlines, concept maps, papers, reviews, essays, articles, and so on. While the objectives related to the requirements of the final project such as thesis, PTK, PKP, TAP, thesis, dissertation. Scientific publications are intended to disseminate student scientific writing in the form of scientific articles, scientific journals, uploading scientific work, proceedings, books, and others through printed and online media (Djuharie, 2001: 66). Types of Scientific writing are papers, articles, opinions, research reports (thesis, thesis, dissertation), and scientific journals (Budiman, 2015: 2).

Collaboration lexically means cooperation. Collaboration is a fundamental process of cooperation that generates trust, integrity, and breakthroughs, through achieving a consensus of ownership and integration in all organizational aspects (Marshall, 1995; Djumara, 2008: 33). Collaboration is a process of participation of several people, groups, and organizations working together to achieve the desired results (Kusnandar, 2013: 1). Thus, collaboration is a form of cooperation process to reach a consensus from several people, groups, and organizations to achieve common goals. The collaboration means here is the creation of a reciprocal relationship between student tutors and UPBJJ-UT managers to improve the quality of scientific work's learning. With collaboration, there is a reciprocal relationship that allows group involvement to work together to find problem-solving related to learning performance (Morales, 2016: 5). Collaboration is used to unify action and reflection, theory and practice, as well as participation to find practical solutions to solve various problems faced by tutors related to learning performance. Through collaboration, it is expected to be able to build collegiality, cooperation between mentors, mentees, and UPBJJ-UT managers to achieve goals in scientific works' learning.

Based on the above conception, it can be understood that collaborative-based management of scientific writing mentoring is a process of a series of work activities, tools or methods, workflows, frameworks that can be used as principles, values in assisting students who

have difficulty compiling scientific work through interaction / reciprocal relationship that allows for involvement between mentors, menteess, and UPBJJ-UT managers.

The development of collaborative-based scientific writing mentoring management is used as a solution because it has theoretical and practical advantages. A theoretical advantage of scientific writing collaborative-based mentoring is that it has the essence of creating social dependence in a group due to interdependency among its members. As a result, it becomes a dynamic unit in the framework of achieving common goals (Johnson, 2012: 23). The practical advantage, according to Zulfiani (2016: 282), the collaborative CAR assistance model can place students as learners, who interact directly with school problems and gain direct experience of pedagogical actions taken by teachers. This means that collaborative mentoring in scientific writing learning can create dependence between mentors, mentees, and UPBJJ-UT in enabling students to compile scientific work in an “APIK" and "SMART" way.

To make scientific writing collaborative-based mentoring management run effectively, ORC approach is needed. Research Clinic is a planned research assistance model that is carried out scientifically, systematically, and logically in clinical ways, starting from activities to identify problems, diagnoses, prognosis, synthesis, intervention/providing assistance, evaluation, and follow-up. The Research Clinic in this study referred to an educational research clinic. Schein (2005: 5) educational research clinic is adopted and adapted from health science. This theory is corroborated by Samad (2012: 2) research clinic education is the method used to obtain useful and accountable information to understand the educational process in formal, informal, and non-formal education environments through clinical methods such as problem identification, diagnosis, prognosis, intervention (recommendation). The research clinic is expected to be online. Online is defined as learning that is carried out electronically using computer-based media and a network. Online learning is also known as electronic learning, e-learning, online learning, internet-enabled learning, virtual learning, or web-based learning.

An online research clinic is a place designed to help students who have difficulty compiling scientific work through clinical methods, starting from problem identification, diagnosis, prognosis, synthesis, treatment, reflection using internet / online network media such as website, email, WhatsApp, telegram, Google classroom, webinars, zoom and so on. Online Research Clinic is a solution to solve student difficulties in writing scientific papers. The existence of ORC is an innovation to realize independent learning in the digital era because it is flexible, easily accessible at all times both face-to-face and online and it is used by tutors and managers to collaborate in providing consultation services to students.

Assistance with the ORC approach is used because it has advantages both theoretically and practically. The theoretical advantage was stated by Kriewaldt (2013: 112) that ORC is a research approach used to help students improve their ability to write scientific papers through online learning through web networks. Andaryani (2013) ORC is a concept that has the meaning of "clinic" and "research", is a clinic that is built to help students who have difficulty writing scientific papers through diagnosis, prognosis, therapy, and intervention/action. Surya (2003: 117) states that ORC can direct student activities in compiling scientific papers starting from the steps: identifying problems, diagnosing, prognosis, and synthesis, intervention/provision of assistance, evaluation, and follow-up. An online research clinic is a place designed to help students who have difficulty writing scientific papers through clinical methods, starting from problem identification, diagnosis, prognosis, synthesis, treatment, reflection using internet/online

network media such as website, email, WhatsApp, telegram, google classroom, webinars, zoom and so on. Online Research Clinic is a solution to solve student such difficulties. The existence of ORC is an innovation to realize independent learning in the digital era because it is flexible, easily accessible at all times both face-to-face and online and it can be used by tutors and managers to collaborate in providing consulting services to students.

The practical advantage of mentoring with the ORC approach was stated by Rose (2015: 2) that ORC was able to empower students who were more focused on practice/training rather than theoretical. Practice in the context of empowerment implies that practitioners/instructors/tutors have the responsibility, awareness, and active participation to guide clients/students to succeed in carrying out their research practices. Robinson (2010) explains the advantage of clinical research is to make it easier for mentors and mentees because it focuses on aspects clinical work process. Bos (2008) states that ORC enable active involvement between clinicians, students, and research objects. Ekawati (2010: 18) concludes that the advantages of ORC are: being able to provide opportunities for students to find their problems and try to make their own decisions in solving them with the help of a clinical advisor.

Based on the theoretical and practical advantages of collaborative-based assistance with the online clinical research approach, it is hoped that it will make it easier for assistants to access, diagnose student difficulties, able to provide direction during the research process, and able to assist the preparation of scientific writing from beginning to end.

Based on the above background, it is important to develop a management model for collaborative scientific writing mentoring with an online research clinic approach for students at UPBJJ-UT Semarang.

The research method uses Research and Development. Data is obtained from the results of scientific writing mentoring, needs analysis, trials, and model validation. Data collection techniques use questionnaires, interviews, documentation studies, observation, and FGD. The validity test uses model validation from experts and practitioners. Qualitative descriptive analysis using data displays, data reduction, data verification, and conclusion.

B. DISCUSSION

1. Factual Model Management of Scientific Writing Mentoring that has been implemented so far

The results of the preliminary study research were conducted to get a general understanding of scientific writing implementation mentoring management for non-primary education UPBJJ-UT Pokjar Kudus students. Through this preliminary study, the information will be obtained about the strengths and weaknesses of mentoring that has been implemented so far, the results of which are used as a basis for formulating the development of a model according to the needs of the mentoring participants.

The factual model of scientific writing mentoring management that has been implemented is divided into two, namely performance management system and components system. A performance management system is a managerial process that reflects the performance of organizational devices (Widodo, 2017). Scientific writing mentoring performance management system includes planning, implementation, and evaluation indicators.

Planning includes goals, objectives, programs, and the involvement of the parties. Implementation includes indicators of coordination between parties, cooperation between parties, and implementation of activities. The evaluation includes indicators of instruments/methods and follow-up. The recapitulation results of the questionnaire calculations are presented in table 1.

Table 1. Summary of respondents' answers distribution on the performance management system and components of the non-primary education Kudus students of scientific writing mentoring system

No.	**Mentoring management aspect**	**Score**	**Range**	**Average**	**Conversion %**	**Category**
A.	System Performance Management					
1.	Scientific work mentoring planning	552	488-698	27,60	49,29	C
2.	The Implementation of scientific work mentoring	616	558-578	30,80	48,13	C
3.	The Evaluation of scientific work mentoring	300	279-399	15,00	48,96	C
The amount of per item indicator		1468	1328-1898	73,40	146,38	C
The average of all indicator		73,40	63-92	24,47	48,79	C
B.	System Component					
1.	Mentor/Tutor	784	699-909	39,20	69,17	B
2.	Students/Mentoring participants	463	453-648	23,15	44,70	C
3.	Facilities	337	313-448	16,85	45,03	C
4.	Scientific work mentoring material	568	523-748	28,40	47,33	C
5.	Duration of scientific work mentoring	319	278-398	15,95	50,29	C

The amount of per item indicator	3939	3393-4848	196,95	402,90	C
The average of all indicator	196,95	167-240	24,62	50,36	C
The total amount of per item indicator	3939	167-240	206,40	418,55	C
The average of all indicator	206,40	19-25	25,80	50,36	C

The table above describes the total score of indicators of all performance systems and components management of the mentoring program of the non-primary Kudus Students. In general, the sufficient category has a total of 3939 indicators, the average value conversion is 206.40 418.55, the average of all indicators is 206, 40 mean, 25.80 and conversions 50.36%. The sufficient category is distributed to scientific writing mentoring performance management system of 1468 in the range 1328-1898, the average number of scores is 73.40 in the range 63-92, the average indicator is 24.47 with a value conversion of 48.53% in the sufficient category. With the details for scientific writing mentoring planning indicators, the average value is 27.60 with a value conversion of 49.29% in the sufficient category. The implementation indicators obtained an average score of 30.80 in the sufficient category. The evaluation indicator obtained was a mean score of 15.00 with a value conversion of 48.96% in the sufficient category.

In terms of management system performance, the indicator with the highest value is the mentoring program with a percentage of 49.29 with a sufficient category. This means that the respondents considered the mentoring program as sufficient. The coherence between the objectives and the final result, mentors' interaction, and mentees' interaction in the mentoring process is considered sufficient. Such indicators should be maintained and improved. Meanwhile, the indicators that were regarded to be inadequate were (1) aim of the mentoring scheme from the element of socialization, measurability of goals; (2) the target of mentoring from the elements of the accuracy of the targeted students, mentors, and materials; (3) program assistance from non-realistic programs, measurement programs, clarity of program objectives; (4) interaction between managers and mentors. This unfavorable indicator requires evaluation and improvement. The value with the lowest point is the implementation of the mentoring program, with an average of 30.80 and a conversion of 48.13%. In other words, respondents who stated that the implementation of the mentoring scheme was good enough are 48.13%. The implementation indicators of the mentoring model which requires development are coordination and cooperation between students and the suitability of methods. Coordination and cooperation between mentors and the management of study groups also demand improvement. Masruki (2015: 59) stated that an effective and efficient mentoring model can be achieved through better coordination and cooperation between parties. Collaboration between parties fosters collegial interactions necessary to assist students in constructing knowledge and improving their practice in writing scientific papers (Zufiani, 2016).

In terms of the mentoring management system, the highest score is the mentors, with a total score of 784 in the range 699-909, and the average indicator is 39.20 with a value conversion of 69.17%. This means that 69.17% of respondents considered the mentors as good, but there were still 30.83% who stated the opposite. Competence, qualification, and strategic ability are considered good, while additional assignments and feedback still need improvement. Mentors should have competencies, qualifications, and strategies (Masrukhi, 2015). The mentors' competencies include mastery of theory, methodology, scientific writing, media, and data processing applications, while the qualifications include academic, mentoring experience, and track record. According to Widodo (2015), mentors should be able to implement the in, on, and in on strategy. Surapranata (2015) added that a good mentor should also be able to guide students wholeheartedly and carry out reflection.

The lowest score of the system component is the students with a total of 463 (453-648), the average of 23.15 (20-30) with a value conversion of 44.70%, and falls into sufficient category. In other words, 44.70% of the respondents believe that the mentees are in sufficient category. The indicators, which are in the good category, include students' ability to determine the theme and their academic qualifications. Meanwhile, the mastery of theory, background, literature review, methodology, scientific writing, data analysis, report, and instruments were included in the poor category. Widodo (2017) stated that the mentees should have competence, qualifications, and the ability to complete assignments. Competence is attitudes and skills mastered by participants, which include the mastery of theory, methodology, and data analysis (Sukanti, 2008). Academic qualification is determined by experience and track record of scientific writing (Widodo, 2017). The factual model of scientific writing mentoring management for non-basic education students of UPBJJ-UT Semarang Pokjar Kudus has been implemented by adopting the concept of system performance management and system components. The model is illustrated in Figure 1.

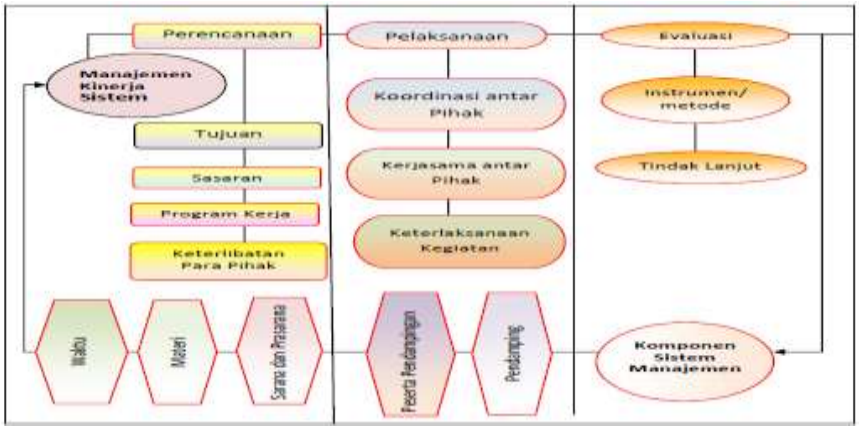

Figure 1. Scientific writing mentoring model of UPBJJ-UT of non-primary education students.

Kosakata pada diagram

Bahasa Indonesia	Bahasa Inggris

Manajemen kinerja sistem	system performance management
Perencanaan	planning
Tujuan	goals
Sasaran	target
Program kerja	work program
Keterlibatan para pihak	the involvement of related parties
Pelaksanaan	Implementation
Koordinasi antar pihak	coordination between parties
Kerjasama antar pihak	cooperation between parties
Keterlaksanaan kegiatan	implementation of activities
Evaluasi	evaluation
Instrument/metode	instrument/methods
Tindak lanjut	follow up
Komponen system manajemen	management system components
Waktu	time
Materi	teaching and learning materials
Sarana dan prasarana	facilities and infrastructure
Peserta pendampingan	mentees
Pendamping	mentors

It is clear from the figure that system performance includes planning, implementation, and evaluation. Planning includes goals, objectives, work programs, and involvement of the parties in the mentoring scheme. Implementation includes coordination between parties, cooperation, and implementation. Furthermore, evaluation includes instruments and follow-up. The mentoring has been in accordance with the system's performance, but the implementation has not yet been optimal. The management of a performance system is a managerial process that reflects the performance of organizational devices in achieving their goals (Widodo, 2017). The supporting components of the mentoring management system include mentors, mentees, facilities and infrastructure, materials, and time allocation. According to Widodo (2017), a system component is a collection of a single element interacting with each other to achieve organizational goals. The system components are the essential elements of the organization (McKim, 2007). The existence of system components should be in line with their roles and functions (Gultom, 2017).

2. Hypothetical Model of Collaboration-Based Scientific Writing Mentoring Management with Research Clinic Online Approach.

The hypothetical model is designed based on needs analysis of the management of mentoring scientific writing based on collaboration with the RCO approach for students of the non-primary education students of Kudus Study Group. The summary of the results of the needs analysis is presented in table 2.

Table 2. Summary of respondents' answers on the needs analysis of system performance management, system components and research clinic online of mentoring for non-primary education students.

No.	Sub Item	Total Score	Range	Average Score	Conversion %	Categories
A.	Mentoring planning for scientific writing	1002	910-1120	50,10	89,46	SP
	1. Mentoring goals	213	195-240	10,65	88,75	SP
	2. Target of mentoring	212	195-240	10,60	88,33	SP
	3. Mentoring program	213	195-240	10,65	88,75	SP
	4. Involvement of parties	364	325-400	18,20	91,00	SP
B.	Mentoring implementation	1136	1040-1280	56,80	88,75	SP
	1. Coordination between parties	355	325-400	17,75	88,75	SP
	2. Cooperation between parties	346	325-400	17,30	86,50	SP
	3. Implementation of activities	435	390-480	21,75	90,63	SP
C.	Mentoring evaluation	567	520-640	28,35	88,44	SP
	1. Instrument/Method	426	390-480	21,30	88,75	SP
	2. Follow Up	141	130-160	7,05	88,13	SP
D.	The mentoring program	1023	910-1120	51,15	90,57	SP
	1. Mentors' competencies	449	390-480	22,45	93,54	SP
	2. Mentors' qualifications	220	195-240	11,00	91,67	SP
	3. Mentors' duties	212	195-240	10,60	88,33	SP
	4. Mentors' strategies	142	130-160	7,10	88,75	SP
E	Mentees	894	845-	44,70	84,88	SP

			1040			
	1. Mentees' competencies	495	315-420	24,75	88,39	SP
	2. Mentees' duties	214	195-240	10,70	89,17	SP
	3. Mentees' qualifications	185	149-194	9,25	77,08	P
F.	Facilities and infrastructure	638	585-720	31,90	88,89	SP
	1. Locations	278	260-320	13,90	86,88	SP
	2. Guide Books	217	195-240	10,85	90,42	SP
	3. Online media/tools (*website, email*, *whatshaap, telegram*, *geogle classrom, webinar, dan zoom)*	143	130-160	7,15	89,38	SP
G.	Mentoring materials	1081	975-1200	54,05	90,08	SP
	1. Mentoring methodology	216	195-240	10,80	90,00	SP
	2. Collaborative learning theory	208	195-240	10,40	86,67	SP
	3. Program theory of scientific writing	222	195-240	11,10	92,50	SP
	4. Data Analysis	218	195-240	10,90	90,83	SP
	5. Scientific writing	217	195-240	10,85	90,42	SP
F.	Mentoring period	560	520-640	28,00	86,67	SP
	1. Mentoring duration	200	195-240	10,00	83,33	SP
	2. Time sufficiency	360	325-400	18,00	90,00	SP
G	*Research Clinic Online*	2534	2340-2880	126,70	87,50	SP
	1. Problems identification	394	390-480	19,70	82,08	SP
	2. Diagnosis of the problems	273	260-320	13,65	85,31	SP
	3. Prognosis	574	520-640	28,70	89,69	SP
	4. Therapy / treatment	724	650-800	36,20	90,50	SP
	5. Evaluation	358	325-400	17,90	89,50	SP
	6. Follow up	211	195-240	10,55	87,92	SP
Total Number of Indicators		9435	8645-	471,75	795,24	SP

		10640			
Average of All Indicators	471,75	432-532	52,42	88,36	SP

Table 2 describes the calculation results of the hypothetical model ranging from the needs analysis of system performance, system components to RCO. In general, the results of the needs analysis for collaboration-based mentoring are considered very important, with an average of 471.75, a range of 432-532, and a percentage of 88.05. This very important category is made up from the needs analysis of system performance with an average score of 135.25 in the range 124-152 with 88.88%; system components average score of 209.80 in the range 192-236 with 88.22%; and RCO average score of 126.70 in the range 117-144 with 85.59%.

The results of system performance need analysis are the planning percentage of 89.46%. In other words, 89.46% of respondents stated that planning is very important. Planning is the initial design that becomes a reference and benchmarks for the success of the mentoring program, which includes goals, objectives, programs, and involvement of the parties (Masrukhi, 2015; Andaryani, 2013). The lowest score of system performance needs analysis result value is an evaluation percentage of 88, 44. Evaluation is an assessment of the success and failure of the collaborative-based mentoring program. According to Suparlan (2013), the evaluation includes the accuracy and ability of the evaluation method in providing reactions, learning behavior, and skills.

The result of needs analysis system components is mentors with a percentage of 90.57. It means that most of the respondents value mentors as very important. The very important indicators include competence, qualifications, and commitment in carrying out tasks, while the less important indicator is academic qualifications. Sumaryanto (2017) stated that mentoring requires qualified, professional, and competent mentors. A mentor is someone in charge of helping, directing, and solving the work and career problems of the person being assisted (Kaswan, 2012). A mentor is a guide, advisor, counselor, instructor, sharer, and encouragement (Ambrosetti, 2010). Furthermore, Waring (2013) added that a mentor is a professional in their field and has interpersonal skills.

The lowest score for the system component was mentees, with a percentage of 84.88. It means that 84.88% of respondents considered the participants very important, while only 15.12% considered it less important. The important indicators include competence, qualifications, and the mentees' ability to complete assignments on time. The highest value of needs analysis of the RCO-based approach is the treatment, with a percentage of 86.88. It shows that treatment is essential in collaboration-based mentoring. Treatment is alternative assistance based on the background of the cause (Wiramihardja, 2012). The treatment, divided into technical and non-technical, is carried out through clinical methods such as therapy, intervention, and consultation (Andaryani, 2013). The lowest value of the RCO needs analysis is problem identification with a percentage of 82.08. Problem identification is the action required to find out the causes of the problem and solutions.

This hypothetical model uses the flow of system performance, system components, and the RCO approach. System performance consists of planning, implementation, reporting,

evaluation, follow-up, and supervision. System components consist of companions, participants, facilities and infrastructure, teaching materials, and time. The RCO approach consists of identification, diagnosis, prognosis, synthesis, treatment, and evaluation/reflection by utilizing internet/ online network media such as websites, email, WhatsApp, telegram, Google classroom, webinars, zoom, and so on. The details of the hypothetical model are presented in Figure 2.

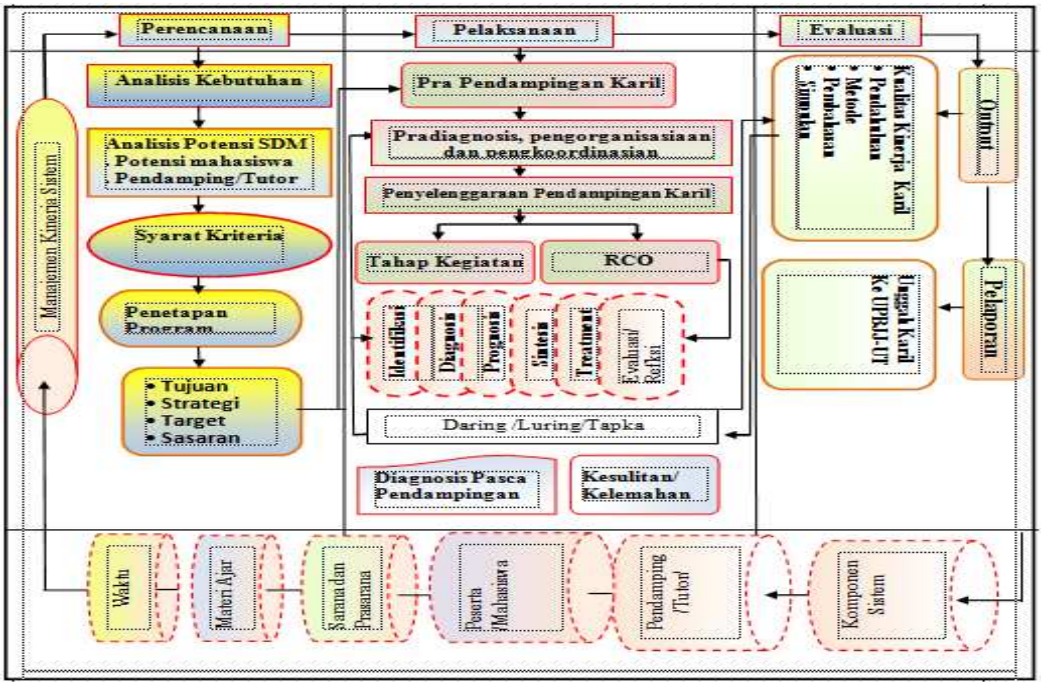

Figure 2. A hypothetical model of collaboration-based scientific writing mentoring management with the research clinic online approach for non-basic education students of UPBJJ-UT Semarang Pokjar Kudus.

Kosakata pada diagram

Bahasa Indonesia	Bahasa Inggris
Manajemen kinerja sistem	Performance system management
Waktu	Time
Materi ajar	Teaching materials
Sarana/prasarana	Facilities/infrastructure
Peserta/mahasiswa	Mentees
Pendamping/tutor	Mentors
Komponen sistem	System components
Perencanaan	Planning
Analisis kebutuhan	Needs analysis
Analisis potensi SDM	Analysis of human resource potentials
Potensi mahasiswa	Mentees' potentials
Potensi tutor/pendamping	Mentors' potentials
Syarat kriteria	Criteria requirements
Penetapan program	Program determination

Tujuan	Goals
Strategi	Strategies
Target	Targets
Sasaran	Targets
Pelaksanaan	Implementation
Pra-pendampingan karya ilmiah	Scientific writing pre-mentoring
Pradiagnosis	Pre-diagnosis
Pengorganisasian	Organizing management
Pengkoordinasian	Coordination
Penyelenggaraan pendampingan karil	Implementation of scientific writing mentoring
Tahap kegiatan	Activity steps
Identifikasi	Identification
Diagnosis	Diagnosis
Prognosis	Prognosis
Sintesis	Synthesis
Treatment	Treatment
Evaluasi/refleksi	Evaluation / reflection
Daring/luring/tapka	Online / offline / face to face
Diagnosis pasca pendampingan	Post-mentoring diagnosis
Kesulitan/kelemahan	Difficulty / weakness
Evaluasi	Evaluation
Output	Output
Kualitas kinerja karya ilmiah	Quality of scientific writing performance
Pendahuluan	Introduction
Metode	Method
Pembahasan	Discussion
simpulan	Conclusion
Pelaporan	Reporting
Unggah karya ilmiah ke UPBJJ-UT	Uploading scientific papers to UPBJJ-UT

Figure 2 describes the implementation of mentoring using the sequence of the system performance and system components management. The performance system management consists of planning, implementing, evaluating, and following up. The mentoring program planning includes needs analysis of human resources, determining requirements, and determining programs, goals, strategies, targets, and targets. The implementation of mentoring involves pre-assistance activity such as pre-diagnostic of mentees' competencies in creating, organizing, and coordinating scientific papers. The implementation of collaborative mentoring using the RCO approach includes mentoring stages, in on, and in methods. RCO encompasses identification, diagnosis, prognosis, synthesis, treatment/therapy, evaluation and reflection, and continued post-mentoring diagnosis. Evaluation is to determine the output of the mentoring program, which includes the quality of the scientific papers, introduction, methods, discussion, conclusions, and bibliography. The report on the results of the mentoring is uploaded at UPBJJ-UT.

The implementation of collaborative-based mentoring using the RCO approach is consistent with the phases of system performance management. System performance

encompasses several steps such as planning, implementation, evaluation, follow-up, and reporting (Mckim, 2007). According to Muniati (2013), research Clinic Online is a place to consult, practice, guide, and assist UPBJJ-UT students who have difficulty creating scientific research in clinical ways such as diagnosis, prognosis, synthesis, and intervention (treatment/therapy) to achieve a successful mentoring program by combining face to face, offline, and online using the media website, email, WhatsApp, telegram, Google Classroom, webinar, zoom. Based on these findings, the collaborative-based mentoring program using the RCO approach must be developed to help Kudus non-primary education students to write scientific papers.

3. The Final Model of Collaboration-Based Scientific Writing Mentoring Management using Research Clinic Approach

This Collaboration-based mentoring management model is declared feasible based on an assessment using a limited-trial and expanded RCO approach. This model was then consulted with experts through FGDs to improve the model and provide provisions, manuals and teaching materials. The results are presented in Table 1.

Table 2. Validation Results from Experts and Practitioners on the Feasibility of Model Books, Handbooks, Guidebooks and Teaching Materials for Mentoring Program using Online Research Clinic Approach.

No.	Evaluated Aspects	Experts' Assessment				
		Score	Range	Average	Conversion (%)	category
1	Model book	394	390-480	19.70	82.08	Very feasible
2	Handbook	405	390-480	20.25	84.38	Very feasible
3	Guidebook	416	390-480	20.80	86.67	Very feasible
4	Teaching materials	3434	3237-3984	20.69	85.19	Very feasible
Total number of indicators		4649	4317-5424	81.44	338.32	Very feasible
Average of all indicators		774.83	734-904	20.36	84.58	Very feasible

Table 1 describes the results of expert validation on the feasibility of the model books, handbooks, guidebooks, and teaching materials of the program. The components were considered very feasible, with an average score of 20.36 and a percentage of 84.58. The highest score was guidebook and mentee, with an average score of 20.80 and a proportion of 86.67%. This means that the teaching and learning manuals are very suitable for classroom action research mentoring. The guidebook is essential because it contains operational technical instructions regarding duties, functions, roles, and rules of conduct to implement the mentoring program (Supranata, 2015). The lowest score was the model book, with an average score of 19.70 with a percentage of 82.08, which indirectly means that the book should be revised. The model book is fundamental to provide a design/pattern that describes the workflow for the

program. The flow of organizing the RCO-based mentoring is based on the management of system performance and system components (Swidarto, 2017).

The findings of the final model of Collaboration-based mentoring using the Research Clinic Online approach are presented in Figure 3.

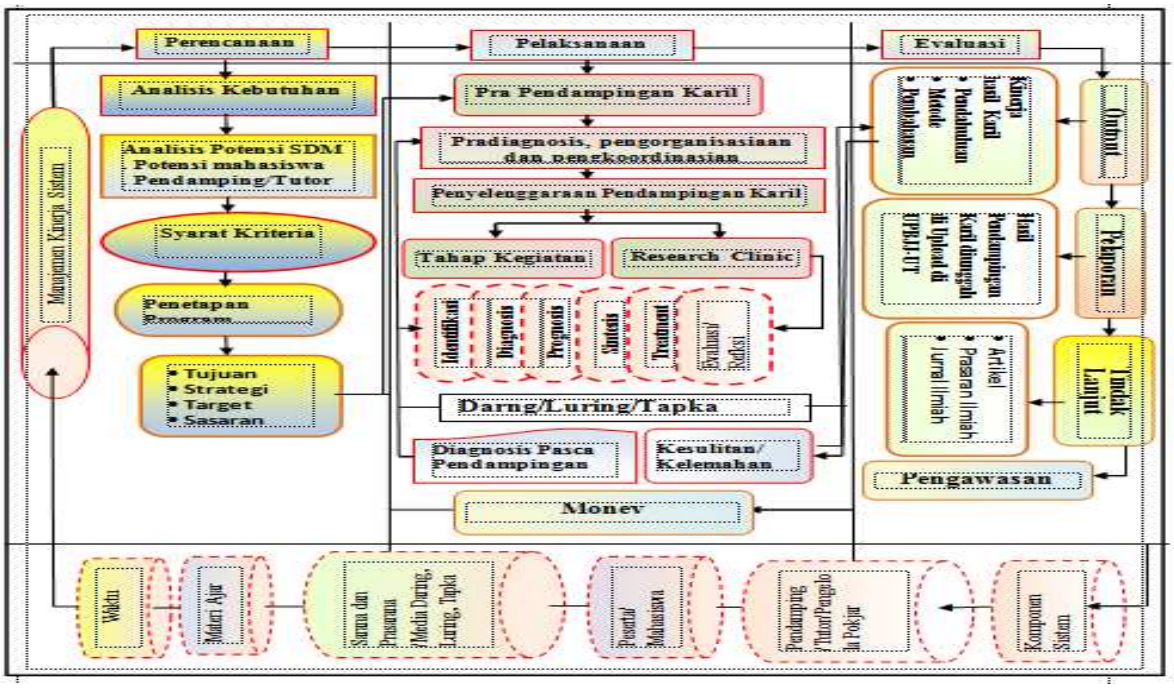

Figure 3. The Final Model of Collaboration-Based Mentoring Management using the Online Research Clinic Approach.

Kosakata pada diagram

Bahasa Indonesia	Bahasa Inggris
Manajemen kinerja sistem	System performance management
waktu	Time
Materi ajar	Teaching materials
Sarana/prasarana/media daring, luring, tapka	Facilities/infrastructure/ media of online. Offline, face to face
Peserta/mahasiswa	Mentees
Pendamping/tutor/pengelola pokjar	Mentors
Komponen sistem	System components
Perencanaan	Planning
Analisis kebutuhan	Needs analysis
Analisis potensi SDM	Analysis of human resource potentials
Potensi mahasiswa	Mentees' potentials

Potensi tutor/pendamping	Mentors' potentials
Syarat kriteria	Criteria requirements
Penetapan program	Program determination
Tujuan	Goals
Strategi	Strategies
Target	Targets
Sasaran	Targets
Pelaksanaan	Implementation
Pra-pendampingan karya ilmiah	Scientific writing pre-mentoring
Pradiagnosis/pengkoordinasian/pengorganisasian	Pre-diagnosis / coordinating / organizing
Penyelenggaraan pendampingan karil	Implementation of scientific writing mentoring
Tahap kegiatan	Activity steps
Research Clinic	Research Clinic
Identifikasi	Identification
Diagnosis	Diagnosis
Prognosis	Prognosis
Sintesis	Synthesis
Treatment	Treatment
Evaluasi/refleksi	Evaluation / reflection
Daring/luring/tapka	Online / offline / face to face
Diagnosis pasca pendampingan	Post-mentoring diagnosis
Kesulitan/kelemahan	Difficulty / weakness
Monev	Monitoring and evaluation
Evaluasi	Evaluation
Output	Output
Pelaporan	Report
Tindak lajut	Follow up
Kinerja hasil karir	Result of scientific writing
Pendahuluan	Introduction
Pembahasan	Discussion
Hasil pendampingan karil diunggah di UPBJJ-UT	The results of scientific writing mentoring are uploaded to UPBJJ-UT
Artikel	Article
Prasaran ilmiah	Scientific targets
Jurnal ilmiah	Scientific journals
Pengawasan	Supervision

Figure 1 shows the final model of mentoring management using the RCO approach, which is a refinement of the factual model and the hypothetical model. Factual and hypothetical models are the results of experts' discussions to obtain validation of feasibility. The validation results include aspects of system performance and system components. Improved system performance aspects include planning, implementation, evaluation, reporting, follow-up, monitoring, and monev (monitoring and evaluation). Component aspects consist of companions;

participants; facilities; infrastructure (online media website, email, WhatsApp, telegram, Google classroom, webinars, zoom) teaching materials; and time.

This RCO-based mentoring program has shown improvement in factual conditions, a hypothetical model design development, and a final model. The factual condition of the mentoring program is in sufficient category, with a percentage of 62.32. The development of a hypothetical model was considered essential, with a percentage of 88.05. The final model was considered feasible, with a percentage of 84.58. Based on these findings, it is clear that the RCO-based mentoring program can improve the quality of students' performance in writing scientific papers by 25.73%.

Based on these findings, the collaboration-based mentoring model using the RCO approach can be applied by tutors and administrators of UPBJJ-UT to both non-basic education students and other students who have difficulty in writing the papers.

C. CONCLusion

1. Conclusion

The conclusions of this study are (1) the factual model of scientific writing mentoring management for non-basic education students of Kudus study groups of UPBJJ-UT Semarang so far has only been categorized as sufficient. (2) The hypothetical model for the development of collaboration-based mentoring management using the RCO approach is considered essential for 88.05% of the non-primary education students of Kudus study groups of UPBJJ-UT Semarang. (3) The collaborative-based mentoring management model using the RCO approach is feasible for improving the quality of the performance of non-primary education students of UPBJJ-UT Semarang in writing scientific papers for fulfilling assignments, requirements for completion of study programs, and scientific publications. The amount of budget contributed to the RCO-based mentoring improves students' performance in writing scientific papers by 25.73%.

2. Suggestion

The suggestions are (1) students should improve their competence and qualifications in writing scientific papers for fulfilling assignments, the requirements for completion of study programs, and scientific publications. (2) The UPBJJ-UT managers, responsible for students' affairs, should work together with the mentors to provide students a consultation forum using the RCO approach. (3) Mentors should carry out mentoring thoroughly to help students who have difficulties in constructing scientific papers both online and offline teaching.

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