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Shaping the academic productivity: Theory on the early scientific article writing among the lecturers

Syarief Fajaruddin [a,b,1,*], Heri Retnawati [b,2], Caly Setiawan [b,3], Zalik Nuryana [c,4], Rosid Bahar [d,5], Alfred Irambona [e,6]

[a,b] Universitas Sarjanawiyata Tamansiswa. Jl. Batikan UH III 1043, Yogyakarta 55167, Indonesia
[b] Universitas Negeri Yogyakarta, Jl. Colombo No. 1, Yogyakarta 55281, Indonesia
[c] Universitas Ahmad Dahlan, Jl. Kapas 9, Semaki, Umbulharjo, Yogyakarta 55166, Indonesia
[d] Sekolah Tinggi Agama Islam Idrisiyyah. Jl. Raya Rajapolah - Tasikmalaya No.49, Tasikmalaya, 46153, Indonesia
[e] Burundi University. Boulevard Mwezi Gisabo, Bujumbura, Burundi

[1]syarief.fajaruddin@ustjogja.ac.id*; [2]heri_retnawati@uny.ac.id; [3]csetiawan@uny.ac.id; [4]zalik.nuryana@pai.uad.ac.id; [5]rosidbahar@gmail.com; [6]alfredirambona66@gmail.com
* corresponding author

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ABSTRACT

The study aims at uncovering the factors that influence the early productivity of lecturers in writing scientific articles. The main problem under review is how the early writing experience shapes the continuity of academic productivity. In conducting the study, the qualitative approach of Grounded Theory was used with the data gathered from in-depth interviews with 18 lecturers throughout Indonesia. The research participants were purposively selected and were interviewed in stages by means of theoretical sampling. Then, the data were analyzed by using ATLAS.ti, and the data validity was tested by using method and theory triangulation. The results of the study show that publication productivity does not take place naturally but is shaped through social intervention, personal strategy, technology mastery, academic literacy, reading habit, and target stipulation. These results highlight the need to foster a supportive academic ecosystem to sustain lecturers' writing productivity over time.

1. Introduction

Writing skills and scientific article publication are indeed the main indicators of lecturers' productivity since scientific publication does not only improve the individual reputation of the lecturers but also the reputation of the institution where they have been working. In addition, the two main indicators also contribute to the science development and the higher education quality [1]–[3]. Despite that, the reality in the field shows that not all lecturers, especially the junior ones, have the sufficient preparedness and courage to get into the world of scientific publication [4]–[8]. Many of these lecturers become awkward, burdened and even alienated by the demand to write, especially because they have not been accustomed to the academic ecosystem that puts emphasis on the achievement of output-based performance. This condition is exacerbated by the lack of writing experience, the lack of coaching and the dominance of administrative workloads and time- and energy-consuming teaching activities. These facts become peculiar problems that should not be put aside. If such problems are not seriously handled, then there will be a gap between the institution's expectation to the lecturers' productivity and the reality on the actual skills of the junior lecturers. Such reality describes the presence of the gap between the role of the lecturers as the agent of knowledge generation and the concrete support to carry out the role optimally. Therefore, it is important to see further the concrete experience of the junior lecturers in the early writing process and the scientific article publication as a matter of reflection and the foundation for the development of more applicative

strategy to support the improvement of scientific publication productivity in the higher education environment.

Numerous literatures that discuss the lecturers' productivity in writing scientific articles generally focus on the aspects of writing techniques, intrinsic motivations and institutional encouragement such as incentives and promotion [2], [9]–[11]. On the other hand, the theories on the lecturers' professional development often put writing into the part of the career development cycle without reviewing the initiation stage that has been experienced by the junior lecturers in-depth whereas the early process of writing is not only about understanding the article structure or following the journal template but also related to the affective factors, such as self-confidence, academic anxiety, and first experience, that shapes the perception toward the world of scientific publication [12], [13]. Many literatures have not highlighted how the subjective experience of the junior lecturers in dealing with the publication process can influence their long-term motivation. The aspects of early experience thus become the blind spot in multiple theoretical approaches that have been available. Consequently, the approaches that have been offered often become too normative and do not meet the real needs of the junior lecturers in the field. Therefore, a reflective and narrative review against the direct experience of the junior lecturers become crucial in enriching the understanding on how the real process of academic growth through the writing activities begins and develops.

This article aims at reviewing the early experience of junior lecturers in writing and publishing scientific articles as part of academic growth process in a descriptive and reflective manners. The main focus of the study is to understand the personal, academic and institutional dynamics that influence the initial process of scientific writing by the junior lecturers. The current study does not only document the challenges that have been encountered but also the adaptive strategies that have been used by the lecturers in dealing with the process. Thereby, the current article is expected to provide a complete description of how the publication process does not only serve as administrative activity but also becomes an integral part of intellectual development and academic identity enforcement among the lecturers. On the contrary, the current study also aims at contributing to the development of more empathic and scientific writing contextual mentoring and training approach especially for the junior lecturers. This objective is in line with the efforts of improving the higher education quality which is not only measured from the publication quantity but also the supporting academic process quality. Therefore, the current study is directed to describe the personal journey of junior lecturers in writing as an important foundation in establishing healthy and productive academic culture. Through the exposure of empirical facts and research objectives, it becomes clear that the review is important to conduct to answer the needs upon more in-depth understanding regarding the preliminary phase of lecturers' productivity in scientific publication. The main argument of the study is that the early experience of writing scientific article has a very strategic role in shaping the perception and the continuity of lecturers' academic productivity in the future. If the early experience is full of obstacles, pressures, or uncertainties, then it will be very possible that long-term resistance appears in the publication activity. On the contrary, if the early experience is facilitated well through coaching, reflective space and acknowledgement upon the undergoing learning process, then the junior lecturers will have a strong foundation to keep developing themselves as both writers and researchers. With the basis on the research objectives that aim to uncover these aspects in-depth, it can be concluded that the current study has a high sense of urgency not only in the development of individual capacity development among the lecturers but also the academic ecosystem reinforcement throughout the universities. Therefore, the article does not only become an experiential report but also a systematic effort to narrate the meaningful learning for wider academic communities.

2. Method

2.1. Objects

The focus of the study is the phenomenon of academic productivity among the lecturers in writing and publishing scientific articles through journals. The phenomenon becomes important as the scientific publication productivity is one of the lecturers' performance indicators that have been very highlighted in the world of higher education [14]–[18]. The research is based on the gap between the institutional expectation on the lecturers' publication and the reality in the field that many lecturers have obstacles in writing and publishing their works [19]–[25]. The objects in review within the study are the behaviors, the strategies and the dynamic changes that have been experienced by the lecturers who previously have lower publication productivity level but eventually manage to show improvement in scientific article writing. The study is focused on the efforts of the lecturers to improve

their productivity through personal strategies, institutional support, and intrinsic and extrinsic motivations. By uncovering the experience of the lecturers who undergo the transformation of productivity, the current study aims at identifying the key factors that influence scientific writing productivity. The objects of the study are relevant to analyze as they reflect the complexity of the actual conditions in field and deliver important contribution to the development of the lecturers' academic performance improvement strategy in Indonesia. Through the qualitative approach, the study strives to capture the personal and institutional nuance and dynamic that cannot be solely achieved by the quantitative method.

2.2. Research and Data Type

The approach that has been used in the study is the qualitative approach with the Ground Theory strategy and the approach enables the researcher to develop a theory based on the empirical data that have been collected systematically [26]. The Grounded Theory has been selected as the Theory enables an in-depth understanding toward the complex social process such as the scientific writing dynamics among the lecturers. Then, the type of the research is explorative and interpretive with the focus on the subjective meaning of the participants' experience. Furthermore, the type of the data that have been collected include the primary data and the secondary data. The primary data have been attained through an in-depth interview with the lecturers who have met the criteria of participation. The interview itself was conducted in several stages, and it took place for 22 sessions with the involvement from 18 participants. The determination of 22 interview sessions was based on the sample size guidelines in the Grounded Theory studies [27]–[29]. Meanwhile, the secondary data have been collected from the document analysis and the documents in the study include the scientific publication of the participants, the observation notes, and the documentations pertaining to the scientific writing activity of the lecturers. The secondary data that have been collected are useful for enriching and confirming the information that has been attained from the interview sessions. This approach thus ensures that the findings in the study do not only rely on the verbal perception of the participants but also the concrete evidence that support the data validity. By combining the two types of data, the study is able to generate more comprehensive and in-depth understanding toward the factors that influence the lecturers' productivity in writing and publishing their articles on scientific journals.

2.3. Data or Information Source

The main data source in the study is the lecturers who have already had academic position in Indonesia, starting from Expert Assistant until Associate Professor. These lecturers have been selected based on the criteria of relevance with the topic of the study, the experience of writing scientific articles, and the provision of in-depth information on academic productivity. The lecturers who have been selected show improvement on the scientific articles writing productivity and, thus, these lecturers have been considered capable of representing the dynamics of change that will be studied. In total, there are 18 participants and some of these participants have been interviewed more than once in order to uncover more information as the information that has been provided is unclear or needs to be confirmed. The researcher does not involve any Professors in the study due to their time limitation and the focus of the study that has been directed more to the lecturers who have been in the stages of establishing publication track records. In the practice, the interview has been conducted both online and offline under consideration on the convenience and the availability of the participants. Every interview begins with the distribution and the signing of participation consent form in order to guarantee the code of ethics and the confidentiality. The identity of the participants has been disguised to maintain privacy and neutrality of the data that have been gathered. Then, the additional information sources are gathered from the documents of participants' scientific publication documents, which have been analyzed to identify the theme, the trend, and the frequency of publication that may reflect the productivity level of the lecturers in the academic contexts.

2.4. Data Gathering Process and Technique

The research was conducted in stages and took place throughout 2024, following the principle of iterative in the Grounded Theory approach [26]. The main data gathering technique that had been used was an in-depth interview, which was conducted in three stages as follows: (1) a preliminary interview for exploring the phenomenon of productivity; (2) subsequent interview for pursuing in-depth understanding toward the theory that has been developing; and (3) final interview for confirming and completing the findings. In total, there were 22 interview sessions with 18 participants as some of the participants have been interviewed more than once. For the selection of additional participants, the theoretical sampling approach had been used. Through the approach, the additional participants were selected based on the theoretical needs that arose from the results of the previous interview sessions.

Then, the interview was conducted by using the semi-structured guidelines with open-ended questions as this enables the in-depth exploration toward the participants' experience. In addition to the interview, the data was also collected from the observation note-taking activities while the interview sessions were taking place. Within the interview sessions, the researcher operated digital recorders through both Zoom and direct recording and the recorders were backed up with the data from the field notes [30]. The triangulation has been conducted through interview data, documents, and field notes to ensure the data validity. Such approach enables the study to run in a flexible manner, but it is still systematic and follows the grounded theory principles in combining the data gathering and analysis simultaneously and continuously.

2.5. Data Analysis Technique

The data analysis technique that has been used in the study refers to the Grounded Theory approach by benefitting ATLAS.ti version 24.2.0.32043 software. The analysis has been conducted simultaneously by gathering the data through open, axial, and selective process. In the open coding stage, the researcher classified the initial codes based on the important meaning in the interview transcript. Then, the axial coding was conducted to connect the categories and the sub-categories and identify the conditions, the actions, and the consequences experienced by the participants. Next, the selective coding was used to compose the main theoretical narrative that explains the dynamics of lecturers' writing productivity. Afterward, the ATLAS.ti was used to help organizing the data, tracking the code sources, and visualizing the concept network [31], [32]. Despite the assistance, the researcher still held onto the central role in the data interpretation by considering the context and the nuance of the statements from each participant. The data triangulation and the analytical memo were used to reinforce the credibility of the analysis results. In addition, the data validity was also tested through the methodological and theoretical triangulation, including the cross-data source comparison and the interview results testing with the theoretical foundation. The analysis process was conducted under reflective and repetitive manner and, thus, each finding was tested in depth to ensure the consistency and the relevance. With this approach, the theory that has been resulted is not only born out of the data but also developed systematically and well proven in the context of lecturers' scientific writing productivity in Indonesia.

3. Results and Discussion

In the process, the data analysis was conducted systematically through three stages of Grounded Theory. In the initial stage (open coding), the researcher read the interview transcripts in-depth to identify the initial codes that appear to the surface organically from the data. This stage resulted in 8 main categories that reflect the lecturers' strategy in improving the publication productivity. Then, in the axial coding the researcher connected the categories by using the Strauss and Corbin's paradigm to understand the cause-effect relationship, the context, and the consequence of each strategy. In the final stage (selective coding), the researcher focused on the integration of the categories to shape the substantive theory that centers on the concept of productivity initiation strategy.

3.1. Open Coding Findings

3.1.1. Research Collaboration

The findings in the study shows that the collaboration with the senior lecturers has become the main entry for the junior lecturers in beginning their career of scientific publication. The initial experience is marked by the invitation from the senior lecturers to join the research team in which the participants are involved as the group members with the role of assisting the research conduct. Such collaboration does not only provide practica experience but also serves as the learning space that reinforces the motivation and establishes the self-confidence in writing activities. The role of senior lecturers as mentors look significant because the senior lecturers do not only facilitate the involvement in the research but also act as the motivator who encourage the writing interest, deliver directions, and expand the writing skills and knowledge. Thereby, the initial collaboration becomes an important foundation that shapes the preparedness and the optimism of the junior lecturers in continuing their progress in the scientific article publication. The example of the quote on this topic is as follows:

> *"Long time ago, at the beginning I was quite fond of writing when I was invited by a senior lecturer to join her research. … Ever since that day, with the late Mrs. Utari I was invited to join her research. She prepared the draft, and I was asked to complete several parts of the draft. For example, she said, 'Please interpret this part as well.' That was part of the article instead of the whole article; so, we have some sort of job*

> *division. Let's say at the beginning I need to develop the students' worksheet. Lecturer A focused on the development of the worksheet. Lecturer A focused on the data gathering, Lecturer A focused on the material analysis. This is how I learned to write at the beginning, So, we contribute these parts in the draft of the article. Later, we are entrusted to compose new articles under her guidance. From this point forward, I started to develop my writing desire. I found that it was very great to compose article, and it was very clear as well. Soon after that, I start to actively writing 4:1, 14 – 16 in Interview with Saepul*

3.1.2. Research Collaboration

The findings in the study show that the participants have developed multiple forms of strategic collaboration in the scientific article writing as a response to the needs of publication quality and productivity. The working system of the team that has been shaped reflects the creativity in and the adaptation into each academic context. One of the prominent collaboration forms is "paper lottery." Paper lottery is a writing rotary system that encourages active participation and collective responsibility. In the paper lottery, the division on the role of the writers is based on the skills, such as data analysis or composition on certain parts of the article, and this will be efficient manner for accelerating the writing process and the result improvement. The participants also benefit the multidisciplinary collaboration as a strategy to enrich the scientific perspective, expand the academic network, and improve the research relevance. Such collaboration is not limited to the fellow lecturers in an institution but also involves the colleagues from the different disciplines or institutions. The role of the senior lecturers or the experienced researchers in the collaboration also strengthens the guidance process and the knowledge transfer. In fact, in several cases the demand on the scientific journal encourages the writers to work in a bigger and more organized team; this included the presence of correspondence writers that are responsible for the official communication with the publishers. All forms of such collaboration show that the open, flexible, and organized team structure is the key to improving the quality and the productivity of the scientific publication. The example of the quote on this topic is as follows:

> *So, the other factor is collaboration. Apart of myself, several articles are born out of collaboration with my colleagues; therefore, we can improve our productivity. For example, our friends invite us into their project and, in turn, whether I like it or not, I have to invite them to collaborate in my article. 24:3 ¶ 2 in Interview with (2)*

3.1.3. Establishing Academic Networks

The findings in the study show that the development of academic networks through both the seminar participation and the digital platform use has become an important strategy in opening wider and continuous collaboration opportunity. For some of the participants, the national seminar is the first step into the world of scientific publication through independent manner. This activity does not only serve as a means for exercising writing and presentation skills but also the initial meeting point in developing the academic networks. Over time, the network develops into the international level and opens access to cross-country collaboration that encourages the participants to contribute to the globally reputable publication. Digital platforms such as ResearchGate are also used by the participants as tools for expanding the networks and measuring the impacts of their articles. The demand for article access by researchers from all over the world becomes an initial indicator from the attraction of the global scientific community. In several cases, the connection with the well-known figures of researchers all over the world gives rise to opportunities of becoming co-authors in the internationally reputable journal. In addition, the flexible management of the team of writers – for example, by switching the roles in the writing projects – is a form of adaptation for maintaining the collaboration continuity and the publication productivity. Therefore, the academic networks that have been established from the combination of active participation and digital technology use have become the key element in expanding the collaboration horizon and improving the scientific productivity of the lecturers. The example of the quote on this topic is as follows:

> *"Indeed, I have found such question. Then, ResearchGate is very helpful for opening the networks, Sir. I have just realized it lately when the people request access to the articles. That means the articles are very interesting to read although we do not know whether the articles are useful for them or not" 21:12 ¶ 6 in Interview with Mawar (2)*

3.1.4. Mentoring

The findings in the study show that the mentoring from the senior lecturers or the experienced academicians has become an important stage in the development of writing capacity among the junior lecturers. This process appears after the solid collaborative relation and academic networks have been formed. The guidance that has been delivered does not only focus on certain technical aspects of scientific writing such as argumentation structure, style and quality but also includes practical strategies in the process of submitting the draft articles to the reputable journals. Thereby, mentoring becomes an effective learning space for understanding the overall ecosystem of scientific publication. The participants inform that the presence of the mentors who actively give directions, give corrections, and recommend reading sources is very useful in shaping the self-confidence and improving the article quality. In the process, the mentors do not only serve as the technical directors but also serves as the motivational sources who are able to develop the spirit and the diligence in the writing activities. Learning directly from the other writers and collaborating with more competent academic colleagues become the effective strategies for accelerating the adaptation process in the world of scientific publication. In addition, the discussion with colleagues and the idea trade becomes an integral part of the mentoring process that encourages the occurrence of constructive criticism and academic insight expansion. Thereby, mentoring has been proven to play a central role in shaping competence, the attitude and the direction of the lecturers' productivity in writing scientific articles. The example of the quote on this topic is as follows:

> *"So, my mentor trains me brick by brick. I feel like a pearl that needs to be sharpened. With my colleagues in UNYD16, we have been drilled. The drill starts from how to read the articles. Afterward, I start learning the structure of the article. What kind of structures do I learn? For example, I learn about how the introduction section has been written. I have exercises on this part. I was trained on how to understand in depth … (humming) … the process of writing scientific articles. Furthermore, I learn about how the social facts and the literary facts are put in the introduction. I also learn about how to put the novelty gap of the research as well as how to open and end the sentences. I have this kind of exercise with Prof. Heri and my colleagues in D16. …" 14:3 ¶ 2 in Interview with Sandi*

3.1.5. Academic Work Processing

The findings in the study show that the participants have actively benefitted the previous academic works, such as papers, essays, theses or dissertations, as the foundations for writing the scientific articles. This strategy has been considered effective in overcoming the idea of stagnancy and maximizing the academic resources that have been available. Several participants mention that processing papers or essays into articles does not only participate in the initial writing process but also motivates the participants because of concrete results from the academic process that have been previously undergone. As having been explained by Kardi, the essay that he composed in 2021 has successfully been converted into a scientific article and the article has been published despite the simple initial quality. The publication thus becomes a milestone that encourages the writers to keep learning and developing their writing skills. Such a statement has been delivered by Nurdin, who has managed to convert several papers in his postgraduate study into scientific articles and present it in international conferences. He emphasizes that the content and format adjustment become the main key in the process. In addition, several participants also benefit from the activity documents of university students as the publication matters. Zico, for example, has developed activity reports into articles with several university students. The articles are later sent to the national journal with the grade Sinta 5 to Sinta 3. Such a strategy does not only involve the productivity of the lecturers but also delivers the first experience of publication for the university students. The process of benefitting the academic works is considered delivering double benefits namely serving as practical solutions to avoid idea stagnancy and serving as the training means to improve the writing quality in stages. Yono explains that the success of paper-based submission in the next steps. Thereby, the strategy becomes a significant initial approach in improving the academic contribution of the lecturers through the continuous scientific publication. The example of the quote on this topic is as follows:

> *"And … indeed in 2022 we have so many academic works. I just searched through the files from my postgraduate study. I also publish some of these works from my assignments during the postgraduate study although these works were written in 2017. I made this decision because I was running*

> *out of idea but I had a strong will to write the articles. That explains why I open again my files from the postgraduate study and I recompose it to be published as scientific articles and it turns out to have been published." 7:22 ¶ 45 in Interview with Erwin*

3.1.6. Technology Utilization

The findings in the study show that technology utilization has been one of the important strategies implemented by the participants to improve efficiency and productivity in scientific article writing. The artificial intelligence-based applications such as SciSpace, Quillbot, and Publish or Perish have been used to support multiple writing stages, starting from understanding the methodology structure, performing efficient paraphrase and even analyzing the citation. The participants suggest that the utilization of SciSpace, for example, has been very helpful in summarizing the methodological parts of the articles automatically so that they can save time in understanding the references. In the meantime, the Quillbot has been mostly utilized for rearranging quotations so that the quotations will be in line with good academic rules and avoid plagiarism. In addition, the participants also utilize the automatic translation technology available at the browsers to understand the foreign language articles as it becomes a peculiar obstacle. This technology does not only accelerate the academic literacy process but also improve the motivation to keep exploring the international scientific sources. In terms of reference search and literature mapping, platforms such as Dimensions and Scilit have also been used to identify the relevant publications; meanwhile, the application Publish or Perish has been used for conducting bibliometric analysis independently. In addition, the findings in the study also show that digital technology supports the other technical aspects in the research process such as the data processing activities by using SPSS and the data visualization through multiple statistical software. Some of the participants attend the training or the workshop related to the bibliometric analysis to expand their knowledge and integrate new approach into the scientific writing. Furthermore, academic collaboration has been more facilitated through the access-sharing service through the digital resources such Scopus database that has been attained from the professional networks. In overall, the digital technology utilization has contributed to the optimization of the process for searching, managing, and processing the academic works. Technology does not only accelerate the technical works but also delivers additional motivation for the participants to keep learning, conducting experiments, and improving the scientific publication quality. The example of the quote on this topic is as follows:

> *"With these applications, such as SciSpace for example, we can click over the methodology and start making our own summary. It helps us to save time, indeed. That is the greatest motivation in the meantime. A long time ago, I was very reluctant to do the paraphrase; now, when we find good quotation, we can paraphrase it by using Quilboat. It is the motivation, Sir, from the factors related to the writers." 20:22 ¶ 8 in Interview with Abdul (2)*

3.1.7. Reading Literacy

The findings in the study show that the habit of reading scientific articles in a routine manner has become one of the important strategies implemented by the participants for improving the writing quality and productivity. This habit does not only help us understand the academic writing structure but also facilitate the participants in identifying the research trend and find the novelty in the scientific study. The participants suggest that reading articles consistently have resulted in better understanding toward the introduction composition, the literature use, the argumentation development, and the findings placement into the appropriate theoretical context. Kardi, for example, has turned the habit of reading articles into parts of his daily routines before sleeping or after waking up through the access to the credible sources such as Google Scholar, Scopus, dan Taylor & Francis; he has done this to follow the latest development in his scientific field. In addition, the participants emphasize the importance of selectivity in selecting well-qualified references so that the information that has been referred to is truly relevant and supports the research validity. In this regard, Rina asserts that reading is not only a passive activity but is also a critical process for filtering and understanding the information in-depth. Strong reading literacy shapes productive academic mindset. Hence, the reading activities are not considered as an obligation anymore but, instead, they have been considered as parts of intellectual needs that continuously encourage the motivation and the consistency in the writing activities. Thereby, the reading literacy skills become an important foundation in the well-qualified and competitive scientific writing process. The example of the quote on this topic is as follows:

> *"That's the point, Mr. Arif. However, for now ever since in Bone I have been making myself accustomed to opening the Google Scholar before sleeping and after waking up and heading to campus. This has been my new habit. I also access the Google Scholar to see the latest update. To me, this can be some sort of discussion materials with my fellow lecturers. For example, we found the latest development in our scientific field" 14:20 ¶ 16 in Interview with Sandi*

3.1.8. Target Stipulation

The findings in the study show that the participants have benefited from the concrete target and deadline stipulation as the strategy for maintaining consistency and improving the productivity in scientific article writing. Such stipulation serves as an external reminder and a self-regulation that helps the participants to remain focused, organized, and more structured in completing the writing obligation. Some of the participants state that the personal target stipulation, such as composing two articles per year or deciding the article submission deadline for certain journals, has resulted in additional motivation and helped maintaining the academic work rhythm. This strategy has also been implemented in the form of writing stage scheduling; for instance, the participants compose the preliminary draft within two weeks or finish the revision within the designated timeline. In this regard, Kris has shared a unique practice in the form of writing the writing target at the door of the room as the daily visual reminder. Meanwhile, Mawar strives to maintain the momentum of productivity by directly sending each completed draft to the publication process without any delay. Meanwhile, other participants suggest that the deadline from the collaborator or the place where they have been working results in positive pressure to complete the articles on time as a form of professional integrity. Thereby, the target and deadline stipulation serve as an important mechanism in managing the writing process systematically and becomes an effective strategy in establishing the personal and collective commitment toward the scientific productivity continuity. The example of the quote on this topic is as follows:

> *"So, in 2013 I wrote the target of writing articles for two national journals and two international journals at the door of my room and the door of my cupboard." 8:15 ¶ 1 in Interview with Kris*

3.2. Axial Coding Findings

The findings of axial coding analysis in the study show a strong association among the causal conditions, the action strategies, the contexts, and the consequences in shaping the lecturers' publication productivity. The institutional demands, such as the obligation to write articles for promotion, and the intrinsic motivation to keep developing themselves, become the main triggers that encourage the lecturers to select the productive strategies, such as establishing initial collaboration and benefitting the supporting technology. These strategies do not take place in an empty space; instead, these strategies have been influenced by the context of competitive academic environment that grows the needs toward the external support such as networks and mentoring programs. Such relationship pattern shapes a peculiar developmental trajectory: initial collaboration with the reinforcement from the mentoring sessions and the continuation to the network expansion and eventually the technology optimization has all contributed to the productivity improvement. These overall aspects also contribute to the formation of the lecturers' identity as the active and acknowledged researchers in the academic community. Thereby, the action strategies that have been taken are not random but instead these strategies are adaptive responses toward the demands and the opportunities that have been present in the professional context of the lecturers.

3.3. Selective Coding Findings

The findings in the study uncover the main categories of *Publication Productivity Initiation Strategy*, which represents the gradual and dynamic process in establishing the scientific article writing productivity among the lecturers, see Fig. 1. This process begins from the simple collaboration as the initial foothold in which the lecturers start to be engaged in the writing activities with their colleagues or mentors. Then, the individual capacities are developed through the intensive mentoring process and the academic literacy improvement under conceptual and technical manner. After the foundation has been laid down, the lecturers expand the impact of their publication by establishing the academic network and benefitting the publication-supporting technology. In the final stage, the consistency of productivity is maintained through the stipulation of clear targets and the continuous management of academic works. The substantive theory that has been formed from the analysis puts emphasis that the publication productivity is not something that appears all in a sudden but, instead,

the publication productivity is an accumulation of interconnected and mutually reinforcing structured strategies.

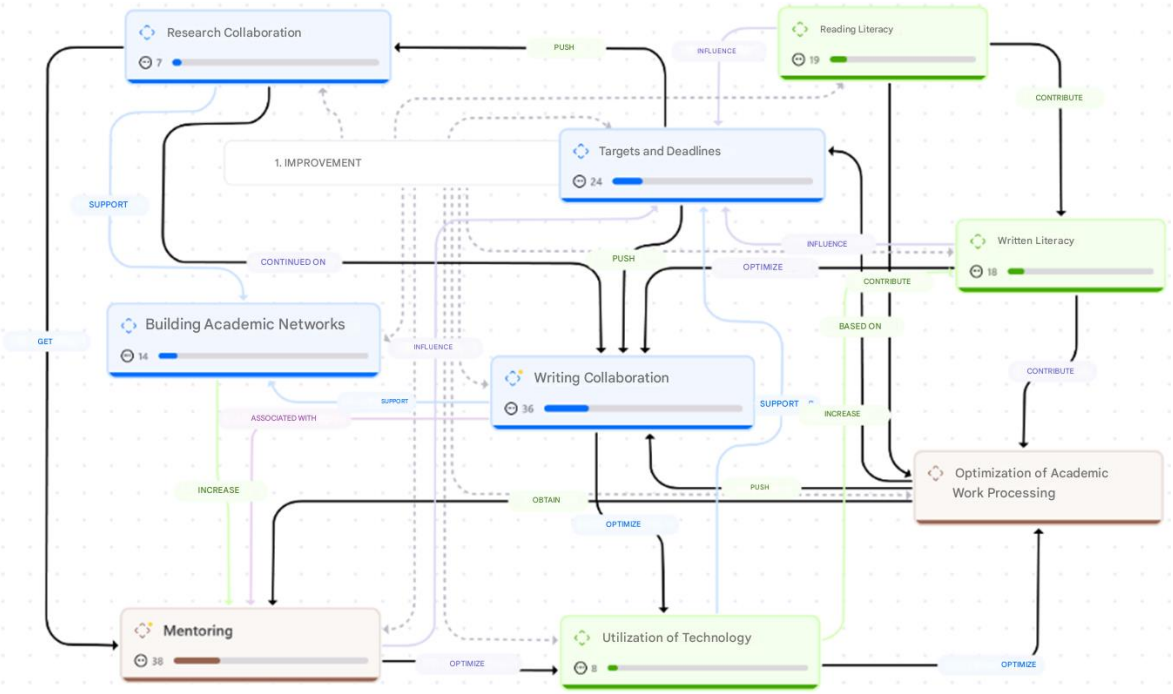

Fig. 1. The Inititation Phase in Establishing the Publication Productivity

3.4. Discussions

The findings in the study show that the phase of lecturers' publication productivity initiation in general does not develop in autonomous manner but, instead, it is mediated by the social intervention such as senior lecturer mentoring, scientific forum participation, and conversion of academic works into scientific articles. In addition, the individual factors such as technology mastery, reading-writing literacy, and personal target stipulation also appear as the important strategies that support the initial phase. The senior mentoring and the collaborative research involvement has proven to be more effective in comparison to the autodidact strategy as the mentoring and the collaboration provide direct exposure to the academic practice and the scientific network. This finding is in line with the social learning theory in which the interaction with the competent model accelerates the skills internalization [33]. The involvement in the conference, the convention of academic works, and the use of supporting technology also support the process of junior lecturers' identity transformation into the active researchers-publishers. Although the autodidact approach and the independent exploration have been considered as the evidence of academic autonomy [34], [35], this finding instead shows that the two strategies have been less effective in the initiation phase. The strategy of independent exploration tends to deal with the limitation on the aspects of access to academic standards, feedback, and networks. On the contrary, the social collaboration-based strategy provides wider access to the cognitive and social resources so that the initial productivity can be accelerated [36]–[38].

In the context of previous studies, the findings in the study support the report [39]–[42] pertaining to the important role of mentoring in the development of academic professionals. However, the findings in the study expand the findings of these reports by uncovering that mentoring does not only improve the technical skills but also shape the epistemological awareness of the junior lecturers toward the value of scientific publication as part of intellectual integrity. Furthermore, the contribution of these findings to the development of Grounded Theory on the scientific productivity of the lecturers lies in the identification of the productivity's "initial ecosystem." The initiation phase is not only influenced by the individual factors but also the social structures, the technology, and the academic cultures. This highlights the necessity of the systemic approach in the policy development of the lecturers' scientific publication, which has not been exposed further as having been conducted by the previous studies such as [43] or Or *et al*. [44] with more emphasis on the technical factors. Thereby, the initiation phase of lecturers' scientific publication productivity heavily depends on the involvement with the social structure learning (mentoring and collaboration), the exposure to the scientific forum (seminar and conference), and the use of supporting technology and personal strategy

(academic work conversion, reading-writing literacy, and publication target). The interaction between these elements shapes the academic scaffolding that highly determines the preliminary success of the lecturers in establishing their academic identities as researchers-publishers

4. Conclusion

The main findings in the study surprisingly show that the lecturers' scientific publication productivity is not shaped in natural settings, but it resulted from the mutually reinforcing social intervention and personal strategy. Despite being developing along with the experiences, the writing habit appears through the academic mentoring, the scientific forum, and the conversion of academic works into academic articles. Such productivity does not stand alone but is shaped in the ecosystem that involves social factors, technology mastery, academics, and personal target stipulation. The current study provides theoretical contribution by offering the productivity conceptual model that integrates the social factors, the individual factors, and the institutional factors under the Grounded Theory framework. In the practice, the findings in the study becomes the basis for the preparation of institutional strategy that supports the lecturers' productivity such as mentoring programs, writer communities, and contextual trainings. Hence, the results of the current study provide new directions to the development of productivity ecosystem-based academic policy development. The current study has been limited to the non-Professor lecturers and the context of certain institutions; consequently, the current study has not represented the overall dynamics of the productivity. However, this situation opens the opportunity for the continued research or the future study through the quantitative approach, the cross-institutional approach, or the longitudinal approach for testing the model validity and tracing the productivity dynamics in the longer time and multiple institutional contexts.

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Declarations

Author contribution : SF was responsible for conceptualization, methodology, original draft preparation, and visualization. HR contributed to the supervision, validation, and critical review of the manuscript. CS was involved in developing the methodological framework, conducting data analysis, and editing the manuscript. ZN and RB provided supervision, resources, and assisted with field research. AI contributed to language-related aspects of the manuscript.

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