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THE URGENCY OF KNOWLEDGE TRANSFORMATION WITH MULTI-, INTER-, AND TRANSDISCIPLINARY APPROACHES IN THE COMPLEXITIES OF HUMANITY'S PROBLEMS

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ABSTRACT

This study tries to transform knowledge to answer various problems amid the complexity of human problems by taking a multi-inter-transdisciplinary scientific approach. At the same time, library research is used in this study with data sources taken from literature searches with a qualitative approach through analysis with a descriptive-analytic pattern. Then, this study states that the transformation of knowledge with a multi-, inter-, and transdisciplinary scientific approach is a pattern of academic interaction that illustrates that the complexity of human problems cannot be responded to by using monodisciplinary alone because each scientific discipline cannot stand alone. Scientific dialogue across disciplines is necessary because every scientific discipline is interrelated and complementary. A multi-, inter-, and transdisciplinary scientific approach will be able to become a solution to the complexity of the problems that occur if policymakers (executive-legislative institutions), academic institutions (universities), and various community leaders sit together to solve various complex problems in community life.

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INTRODUCTION

World civilization and the rapid development of social life are directly proportional to the complexity of the problems it causes, thus demanding a change in mindset and innovation to maintain life and pass on culture. Various world and social problems in people's lives require a way out as a solution to these problems. One of them is regarding the issue of resurrecting and reorganizing various sectors that have been destroyed during the Covid-19 pandemic, thus requiring new handling that is different from what has been done before.

The complexity of the problem after the completion of the Covid-19 pandemic, which occurred amid increasingly complicated people's lives with various complex problems, can no longer be overcome by using only one discipline approach but must find a new, better approach to overcome various problems regarding life. Multi-sectoral society. Therefore, another integrative-interconnective approach is needed to create a dialogue space between scientific disciplines, multi-perspectives, and a more comprehensive problem-solving process within a multi-inter-transdisciplinary scientific approach.

A new understanding is also needed to explore breaking through to all levels of living systems brought about by the dynamics of the

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current revolution, which is a process that is not controlled or directed to reach an understanding and solutions. There are several main issues concerning the problems that are often discussed and require a multi-inter-transdisciplinary scientific approach, namely the aggression of political power by humans, the distribution of resources in an integrated manner, the development of a new anthropocentric worldview, and the realization of human potential and empowerment, through the education system. Some of these problems are not easy to solve because they require hard work and in-depth awareness of various elements related to using an integrative-interconnective approach so that they can cross disciplines, cross perspectives, cross devices, cross views, cross environments, including cross-cultural differences to the broader community.

One form of problem-solving effort to answer the problems mentioned above is the transformation of knowledge with a multi-inter-transdisciplinary approach that can be used in responding to solve the complexity of the problems that are currently happening so that various problems can be solved. The involvement of various scientific disciplines will be more productive in knowledge production work. Related to the production of knowledge that is happening at this time, the production of knowledge has led to the context of the application of knowledge so that the development of knowledge with a multi-inter-transdisciplinary approach model becomes a necessity because there is no longer superiority and inferiority in science. There are no more claims—the truth of science.

Two schools of thought define the multi-, inter-, and transdisciplinary approaches. First, the approach uses reviews from various scientific perspectives that are cognate, relevant and integrated to solve specific problems. The key word is cognate sciences, such as the natural sciences, social sciences, humanities or cultural sciences, religion, and the exact sciences. Second, multi-, inter-, and transdisciplinary also means cooperation from one science to another so that it becomes a single unit with its method (Nasution, 2017). Or it can also be said to be the integration of one science with other sciences, thus giving birth to new knowledge. For example, the combination of biological sciences and chemistry becomes biochemistry, psychology and social sciences become psycho-social, sociology and religion become sociology of religion and so on.

Research on the process of knowledge transformation with a scientific multi-inter-transdisciplinary approach has not been discussed in a study because previous research has its focus of study, even though the subject of the study has similarities. Therefore, it is necessary to investigate further the knowledge transformation process in a multi-, inter-, transdisciplinary approach to respond and provide answers to the problems that occur in a society's life that is so complex. Thus, this research is expected to produce a conceptual formulation of knowledge transformation with a multi-, inter-, transdisciplinary approach so that it can be used as an alternative solution in taking a policy related to the process of solving problems that occur amid the life of the general public carried out by all policymakers in this country.

METHODS

The research method with a qualitative approach through the type of library research is used in this study with data sources taken from literature searches, books, and the latest scientific journals. Meanwhile, the process of compiling this research begins with a search for literature in the form of books and scientific journals, which are then collected and classified based on the object and focus of the research, sorted by credibility and reputation of the publisher. Furthermore, the sorted data was analyzed using a descriptive-analytic pattern.

RESULTS AND DISCUSSION

Multi-, Inter-, and Transdisciplinary Approach

Knowledge production is predominantly regulated within scientific disciplines, and at the same time, multi-, inter-, and transdisciplinary research develops across disciplinary boundaries. Discussing the multi-, inter-, and transdisciplinary conception cannot be separated from the

conception of scientific disciplines. Initiations of mutual dialogue, crossing over, and cooperation between various disciplines and methods accompanied by philosophical changes began to be widely or widely carried out in the 1980s. The movement for mutual dialogue, cross-examination and cooperation of sciences and research methods began and developed quite well in the next period.

Before going further into the study of multi-, inter-, and transdisciplinary approaches, it seems important to explain the three briefly. First, a multidisciplinary approach. This approach combines several disciplines to solve certain problems collaboratively, namely trying to bring various disciplines to provide their respective views in offering solutions to a problem. Multidisciplinary thinking and research occur when research subjects are studied and approached from various points of view while maintaining various disciplinary boundaries and methods (Abdullah, 2020b).

Multidisciplinary approach in solving a problem by reviewing various points of view of many relevant sciences. Alternatively, various relevant sciences can be used in the natural sciences, social sciences, or humanities sciences (Sokolowski & Banks, 2011). The use of various scientific disciplines in solving a problem through this approach is explicitly implied in a discussion or description included in each sub-description if the discussion or description consists of sub-descriptions accompanied by their respective contributions explicitly to the search for solutions. Of the problems at hand. The main characteristic or keyword of this multidisciplinary approach is multi; that is, many scientific disciplines are in the same scientific clump (Hochstadt & Harwicke, 1985).

Second, the interdisciplinary approach seeks to interact intensively between one or more scientific disciplines, whether directly correlated or not, through various research programs to integrate concepts, methods, and analysis, resulting in a combination of two or more scientific disciplines. To create a certain method. Another definition of this approach is using various relevant perspectives or integrating scientific families to solve a problem. Interdisciplinary shows the strong intensity of interaction between one discipline and another, whether it is carried out directly or indirectly through a learning process or research program to integrate various concepts, methods, and analyzes (Fitri, Nafis, & Indarti, 2020).

Interdisciplinary research is a research model that combines information, data, techniques, tools, perspectives, concepts or theories from two or more disciplines in solving a problem by using a review of various perspectives of relevant or appropriate cognate sciences. This approach has the main characteristic of a cognate science point of view that is integrated in an integrated manner. In this context, what is meant by cognate sciences are sciences in a particular science family, namely the natural sciences, the social sciences, or the cultural sciences, as an alternative relevant science means the sciences that are suitable for solving a problem (Schmalz, Janke, & Payne, 2019). As for the term integrated, what is meant is that the sciences used in solving a problem through this approach are intertwined implicitly, which is a unanimity or unity of discussion or description included in each sub-description if the discussion or description consists of sub-sections sub-description. This disciplinary approach's main characteristic or keyword is inter, which is integrated between various scientific disciplines within the same scientific clump.

Third, the transdisciplinarity approach, namely a research and discussion approach that creates a holistic approach by using various scientific perspectives that go beyond scientific disciplines by gathering shared knowledge to solve problems that are much more complex and broad-scale through the development of a new theory or hypothesis with build ties and connections between various scientific disciplines that will result in synthesis through cooperative efforts, to give birth to new knowledge, understanding, and perspectives. This approach seeks to develop new theories by linking various scientific disciplines and the involvement of non-experts to obtain conclusions and policies (Stock & Burton, 2011).

Various scientific disciplines outside the expertise that an expert will use can be one or more sciences. However, usually for the need for depth of discussion, an expert only uses one science outside his expertise (Arthur, Hall, & Lawrence, 1989; Kaufman, Moss, & Osborn, 2003). The relevant sciences can be used in the natural sciences, social sciences, human sciences, and religious studies-conscience as an alternative. Using knowledge or various sciences to solve a problem through this approach can be implied or explicit, but it would be better and usually explicit. This is done to show the scientific account of the person (Jörg, 2011; Wiek & Walter, 2009).

In addition, this transdisciplinary approach integrates and transforms various fields of knowledge from various perspectives to improve the quality of problem-solving by emphasizing the review of the science that is beyond the expertise of an expert on a problem being solved. The transdisciplinary approach aims to understand world problems. One is a unity of knowledge characterized by integrating efforts from various scientific disciplines to understand a problem or problem. Transdisciplinary research can provide direction for the development of various disciplines, and the resulting product is much larger; this distinguishes transdisciplinary research from multidi-sciplinary and interdisciplinary rese-arch.

The multidisciplinary and interdis-ciplinary approaches show segmented disciplines. These two approaches do not have the concept of integration needed to improve understanding of the problem at hand (Ertas, Maxwell, Rainey, & Tanik, 2003). The multidisciplinary approach still shows various monodisciplinary elements in it. To overcome various complex humanitarian problems, we need something qualitative, not just quantitative. This quantitative nature marks the integration of several pieces of knowledge. This integration results from a transdisciplinary redefinition within the framework of the fundamental unity of science, which presupposes an effort to restructure science.

The transdisciplinary approach was previously not accepted because it was considered to violate scientific ethics by scientists, especially by those whose knowledge was used by people who were not experts. However, nowadays, this is possible because of the rapid development of science, technology, and science as well as the complexity of the problems that are generally difficult to solve by only a one-science approach or through a monodisciplinary approach because monodisciplinary is often also referred to to as a structural approach, which is a form or model of approach that only pays attention to one discipline, without connecting with other scientific structures. Even at the same time, it is well accepted by scientists, including expert scientists, as long as in solving a problem, it shows adequate quality and truth.

The main characteristic of the transdisciplinary approach is trans, across sciences within the same scientific clump or across them. The development of the transdisciplinary movement is based on the principle of complexity and productivity of various global problems, especially education, so it requires an approach from three clumps of disciplines/sub-disciplines, as described, rather than using a monodisciplinary approach. Thus, someone who uses a transdisciplinary approach must also meet the following requirements: 1) use knowledge outside of his main expertise, usually in solving a problem using science outside his expertise; 2) the knowledge used is in the same scientific clump as the main expertise it has; 3) have a good understanding of the knowledge used outside of the main science expertise it has; and 4) must be able to show a result with sufficient quality and truth.

Here, we can witness the emergence of the convergence movement in the tradition of modern sciences, namely the motion of compaction, merging, unification, integration, and combining theories and methodologies of various diverse and diverse sciences. For example, mutual dialogue and cooperation between biological sciences and technology gave birth to biotechnology and cooperation between anthropology and psychology resulted in psychological anthropology (Hummel et al., 2013). This confirms that the convergence movement makes specialized scientific disciplines and share methods that

were once separate or particular begin to meet and unite again. In this case, various disciplines and methods are used simultaneously in scientific activities, especially research activities, without having to be called eclecticism, but the combination, mixing and blending.

A multi-, inter-, and transdisciplinary approach is carried out to achieve the objectives, namely, how to deal with aspects of reality and how to understand the various global problems that are so complex. Third, how to encourage synergy between various scientific disciplines. Fourth, how to build cooperation between experts in various sectors. Multi-, inter-, and transdisciplinary implementation implies a very cooperative or synergized work between scientific experts and the various sectors involved. Multi-, inter-, and transdisciplinary applications achieve something beyond the quantitative dimension. The existence of scientific synergy in the multi-inter-transdisciplinary concept is intended to achieve a higher level of harmony from the integration of knowledge called symphonies.

The multi-, inter-, and transdisciplinary approach aims to build the paradigm and understanding needed to solve scientific problems with a reflective nature, which considers the plurality and complexity of the human condition through interdisciplinary processes from various perspectives in the dynamics of an evolving civilization. A multi-, inter-, and transdisciplinary approach that is used to overcome various complex humanitarian problems by having several important elements, namely: 1) active practice involving transformation, integration-interconnection and constitutive activities; 2) non-inclusive, which is developed holistically to develop various potentials that exist both in science, personality and social life; 3) requires a process of self-reflection; 4) has a dimension of complexity with spiritual integrity that characterizes the dynamics of the development of various scientific disciplines, based on not only theoretical but also practical principles; 5) is plural by utilizing different knowledge perspectives, and 6) oriented to the future or future-oriented.

Knowledge Transformation with a Multi-, Inter-, and Transdisciplinary Approach

Knowledge transformation is a change in people's knowledge from simple or traditional to modern. The concept of knowledge transformation can become more realistic and provide solutions to the complexities of human problems. Regarding the transformation of knowledge, it can be found several previous studies related to this issue, as was done by Syarif (2020) provide a response to the problem of the construction of the transformation of science in Islam with an Islamic civilization approach. Turmudi, et al., (2021) conducted a multidisciplinary, interdisciplinary and transdisciplinary study by focusing on the development of Islamic universities in the era of globalization. Kariadi., (2021) conducted a knowledge transformation study to study seismic knowledge based on local wisdom that exists amid the life of the Sasak tribe. Agustina and Salihin (2022) conducted a study that discussed the theoretical framework of Islamic education based on a multi-, inter-, transdisciplinary approach using primary sources from Ian Barbour (conflict, independence, dialogue, and integration).

Transformation refers to the difference in certain characteristics in a certain unit of time. The process consists of three important elements, namely; 1) difference as a manifestation of a transformation process; 2) the concepts used are various political, social, economic, and cultural characteristics or the appearance of something; and 3) the transformation process is always historical which has a relation to the unit of time. Changes in the community have a positive impact, and some hurt every community. Changes can occur in the community due to several things, such as discoveries and conflicts in certain places and can also be caused by natural disasters. Every human being, in general, has knowledge that has become a culture for them. Culture is a system of knowledge which is more or less shared by each individual, which causes them to communicate with each other, give the same meaning, and do things together to achieve common goals (Karimullah, 2021).

The journey of implementing the scientific integration formula allows for refreshment or development that refers to the times, scientific developments and the increasing complexity of the challenges faced. This shows that the problems faced by humans today cannot only be solved with one scientific discipline but with various perspectives or perspectives of various scientific disciplines to solve complex problems. Applying religion, medical science, natural sciences, social sciences, humanities, and cultural sciences to solve practical human needs requires synergy From various other disciplines. For example, when talking about rising after a pandemic, it can not only be solved from the scientific aspect of medicine through health socialization but also requires other sciences such as environmental sciences, political sciences, economics, social sciences, cultural sciences, and so on (Abdullah, 2014).

All the complexities of problems that occur in human life have characteristics: uncertainty, multi-perspective and interconnected. Various transcendental values in social life that occur amid society as a consequence of the development and progress of human civilization, where modernity is claimed as a symbol of success and human superiority in designing life systems, actually raise the complexity of new problems in modern human life systems. This indicates that the natural law (*sunnatūllāh*) regarding the complexity of the problems faced by humans cannot be solved only through one scientific discipline but must be through a combination and dialogue and greetings from various other scientific disciplines (Abdullah, 2020b). Therefore, the multi-, inter-, and transdisciplinary scientific approach becomes a new solution to solving the complexity of the problems.

Initially, the multi-, inter-, and transdisciplinary scientific approach was presented by experts in two domains, namely science and religion, so it gave rise to patterns of pros and cons in the level of discussion and integration between the two. The multi-, inter-, and transdisciplinary approach is flexible and able to reach almost all existing knowledge subjects easily so that opportunities to obtain answers and solutions to various humanitarian problems that occur are increasingly open and more effective because they can understand the issue or problem and aim to build a paradigm that can solve scientific problems across disciplines and different perspectives in undergoing the dynamics of a civilization that continues to develop (Stock & Burton, 2011).

The multi-, inter-, and transdisciplinary approach is very prospective to be used as a starting point for more integrative scientific development to respond to the complexities of the problems of contemporary society. An advantage of multidisciplinary, interdisciplinary and even transdisciplinary knowledge is needed to accelerate development in all fields because multidisciplinary, interdisciplinary and transdisciplinary studies are more complete and integrative, very open to the latest developments in scientific developments and methodologies, and are likely to give birth to various hybrid science.

At the same time, this requires the importance of building an integrative-interconnective paradigm by transforming knowledge that departs from a broader perspective or worldview as the basis for scientific development. Furthermore, this paradigm is the foundation for a knowledge transformation by developing a multi-, inter-, and transdisciplinary research and academic tradition. There are eight stages in the knowledge transformation process, starting from the conceptualization, justification, crystallization, socialization, internalization, externalization, combination, and networking knowledge stages. This implementation can also be seen in the shift in new thinking patterns that adopt the natural sciences, social sciences, and humanities. In addition, this can also be seen in the shift in the traditions of the people whose concept of integrating scientific disciplines is.

Response to the Complexity of Post-Pandemic Human Problems

The rapid spread of the flow of globalization can lead to short links or short circuits, which means that the rapid spread of this globalization process without adequate social life will have more negative than positive impacts on everyday life (Nursyifa,

2019). This globalization issue is extensively or intensively related to human problems directly or indirectly. This is also related to the transformation of science. In the transition from traditional society to modern society, rational, logical, and linear thinking dominates the thinking of intellectuals, so a solution to this complex problem is needed.

Transformation of knowledge between various scientific disciplines is very much needed in solving the complexities of problems in people's lives, let alone getting back up by organizing a better life after the Covid-19 pandemic. An inter-, multi-, and transdisciplinary approach is a logical consequence of the development needs and changing times that are happening today. All knowledge is dynamic, as well as the times that continue to experience changes adapted to the needs and social situations in the sociocultural life of the community. Various scientific and cross-disciplinary disciplines are needed input and criticism to become a solution to respond to the complexity of life that is happening so that it is more well organized.

In the post-Covid-19 situation, the role of natural sciences, such as medicine, pharmacy, health and various social sciences, political sciences, economics and contemporary humanities integration and interconnection is very necessary so that meetings take place in the form of complementation, comparison, confirmation, and contribution to be able to answer the complexity of the current humanitarian problem so that they can rise and reorganize a normal and much better life after the pandemic (Karimullah, 2022). The spirit of humanity and solidarity with the transformation of knowledge with an inter-multi-transdisciplinary scientific approach is very much needed in the search for answers to decide and provide solutions to various problems.

The inter-, multi-, and transdisciplinary scientific approach in responding to the problems of people's lives has implications for overcoming problems that cannot be solved only by monodisciplinary but by various problems that require cross-disciplinary and even scientific trans-disciplinary studies. In addition, the inter-multi-transdisciplinary approach has an impact on strengthening and developing scientific knowledge of the community because it presents cross-perspectives and cross-study so that the results are more comprehensive and comprehensive than mono-disciplinary studies in discussing issues of community life that occur through knowledge transformation (Allchin et al., 2014; Butler et al, 2015; Labaso, 2018).

Knowledge transformation amid life after the Covid-19 pandemic is urgently needed as a spearhead of change towards a better order of life. The spirit to carry out reforms with an inter-, multi-, and transdisciplinary scientific approach should also not be ignored, so it must always be moved because life at this time has changed the social order a lot. The various phenomena that are currently happening cannot be solved with one science or even with religious doctrines, so the role of other sciences is needed to complement and integrate each other in responding to humanitarian problems that occur after the increasingly complex Covid-19 pandemic.

Transformation of knowledge by strengthening scientific knowledge and spreading correct knowledge in rising after the Covid-19 pandemic is very much needed. Therefore, the inter-multi-transdisciplinary scientific approach is very real in responding to various humanitarian problems that occurred in the post-covid-19 pandemic, supported by government policies and all elements of society. From this, it is clear that the transformation of knowledge with an inter-, multi-, and transdisciplinary scientific approach is a primary need as a logical consequence of the times. Because in addition to the knowledge that develops amid people's lives, it is dynamic; the developments and needs of the times always develop according to the needs and social situations in which science is located. This is the main principle of an inter-, multi-, and transdisciplinary scientific approach, as the basis for science to be accepted and understood as a unified whole with an integration-interconnection pattern, a methodological legacy in the spirit of the academic tradition.

CONCLUSION

Knowledge transformation with a multi-, inter-, and transdisciplinary scientific approach is a pattern of academic interaction that illustrates that the complexity of human problems cannot be responded to using monodisciplines alone because each scientific discipline cannot stand alone. Scientific dialogue across disciplines is necessary because each discipline is interrelated and complementary to one another, which aims to overcome a problem by combining interrelated fields of knowledge so that each other penetrates and permeates one science with the other. Other. A multi-, inter-, and transdisciplinary scientific approach can be realized as a solution to the complexity of the problems that occur if policymakers (executive-legislative institutions), academic institutions (universities), and various community leaders sit together to solve various complex problems in community life.

Author's declaration

Authors' contributions and responsibilities

The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

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REFERENCES

Abdullah, M. A. (2014). Religion, Science, and Culture: An Integrated, Interconnected Paradigm of Science. Al-Jami'ah: Journal of Islamic Studies, 52(1), 175–203. https://doi.org/https://doi.org/10.14421/ajis.2014.521.175-203

Abdullah, M. A. (2020a). Mendialogkan Nalar Agama dan Sains Modern di Tengah Pandemi Covid-19. Maarif, 15(1), 11–39.

Abdullah, M. A. (2020b). Multidisiplin, Interdisiplin, & Transdisiplin: Metode Studi Agama & Studi Islam Di Era Kontemporer. Yogyakarta: IB Pustaka.

Agustina, L., & Shalihin, R. R. (2022). Theoretical Framework Pendidikan Islam Berbasis Pendekatan Multi-Inter Transdisipliner. JSG: Jurnal Sang Guru, 1(1).

Allchin, D., Andersen, H. M., & Nielsen, K. (2014). Complementary approaches to teaching nature of science: integrating student inquiry, historical cases, and contemporary cases in classroom practice. Science Education, 98(3), 461–486.

Arthur, M. B., Hall, D. T., & Lawrence, B. S. (1989). Generating new directions in career theory: The case for a transdisciplinary approach. Handbook of Career Theory, 7, 25.

Butler, B. M., Suh, Y., & Scott, W. (2015). Knowledge transmission versus social transformation: A critical analysis of purpose in elementary social studies methods textbooks. Theory & Research in Social Education, 43(1), 102–134.

Ertas, A., Maxwell, T., Rainey, V. P., & Tanik, M. M. (2003). Transformation of Higher Education: The Transdisciplinary Approach in Engineering. IEEE Transactions on Education, 46(2), 289–295. https://doi.org/10.1109/TE.2002.808232

Fitri, A. Z., Nafis, M., & Indarti, L. (2020). Multidisciplinary, Interdisciplinary, and Transdisciplinary (MIT) Learning Approach and Strategy Based on Indonesian National Qualification Framework (KKNI) Curriculum. Ulumuna, 24(1), 183–204. https://doi.org/https://doi.org/10.20414/ujis.v24i1.375

Hochstadt, N. J., & Harwicke, N. J. (1985). How Effective is the Multidisciplinary Approach? A Follow-up Study. Child Abuse & Neglect, 9(3), 365–372. https://doi.org/https://doi.org/10.1016/0145-2134(85)90034-1

Hummel, D., Adamo, S., de Sherbinin, A., Murphy, L., Aggarwal, R., Zulu, L., … Knight, K. (2013). Inter-and Transdisciplinary Approaches to Population–Environment Research for Sustainability Aims: A Review and Appraisal. Population and Environment, 34(4), 481–509. https://doi.org/https://doi.org/10.1007/s11111-012-0176-2

Jörg, T. (2011). New thinking in complexity for the social sciences and humanities: A generative, transdisciplinary approach. Springer Science & Business Media.

Kariadi, D., Kabora, F., Maryani, E., Sjamsuddin, H., & Ruhimat, M. (2021). Transformasi Pengetahuan Kegempaan Berbasis Kearifan Lokal Suku Sasak Dan Aplikasinya Dalam Pembelajaran Ilmu Pengetahan Sosial. Jurnal Pendidikan

Ilmu Pengetahuan Sosial Indonesia, 6(1), 15–20.

Karimullah, S. S. (2021). Tinjauan Antropologi Hukum dan Budaya terhadap Mudik Lebaran Masyarakat Yogyakarta. Sosial Budaya, 18(1), 64–74. https://doi.org/http://dx.doi.org/10.24014/sb.v18i1.12725

Karimullah, S. S. (2022). Urgensi Transformasi Keilmuan Berbasis Paradigma Integrasi-Interkoneksi dalam Menghadapi Pandemi Covid-19. Studi Multidisipliner: Jurnal Kajian Keislaman, 9(1), 97–112. https://doi.org/https://doi.org/10.24952/multidisipliner.v9i1.4486

Kaufman, D., Moss, D. M., & Osborn, T. A. (2003). Beyond the boundaries: A transdisciplinary approach to learning and teaching. Greenwood Publishing Group.

Labaso, S. (2018). Paradigma Integrasi-Interkoneksi di Tengah Kompleksitas Problem Kemanusiaan. Al-A'raf: Jurnal Pemikiran Islam Dan Filsafat, 15(2), 335–352.

Nasution, K. (2017). Berpikir Rasional-Ilmiah dan Pendekatan Interdisipliner dan Multidisipliner dalam Studi Hukum Keluarga Islam. Al-Ahwal: Jurnal Hukum Keluarga Islam, 10(1), 13–22. https://doi.org/https://doi.org/10.14421/ahwal.2017.10102

Nursyifa, A. (2019). Transformasi Pendidikan Ilmu Pengetahuan Sosial dalam Menghadapi Era Revolusi Industri 4.0. Journal of Civics and Education Studies, 6(1), 51–64. https://doi.org/http://dx.doi.org/10.32493/jpkn.v6i1.y2019.p51-64

Schmalz, D. L., Janke, M. C., & Payne, L. L. (2019). Multi-, Inter-, and Transdisciplinary Research: Leisure Studies Past, Present, and Future. Journal of Leisure Research, Vol. 50, pp. 389–393. Taylor & Francis. https://doi.org/https://doi.org/10.1080/00222216.2019.1647751

Sokolowski, J. A., & Banks, C. M. (2011). Principles of Modeling and Simulation: A Multidisciplinary Approach. John Wiley & Sons.

Stock, P., & Burton, R. J. F. (2011). Defining Terms for Integrated (Multi-Inter-Trans-Disciplinary) Sustainability Research. Sustainability, 3(8), 1090–1113. https://doi.org/https://doi.org/10.3390/su3081090

Syarif, F. (2020). Peradaban Islam: Sebuah Konstruk Transformasi Ilmu Pengetahuan. Islamika: Jurnal Ilmu-Ilmu Keislaman, 20(01), 40–54. https://doi.org/https://doi.org/10.32939/islamika.v20i01.560

Turmudi, M., Arifin, Z., & Qomar, M. (2021). Kajian Multidipliner, Interdisipliner dan Transdisipliner di Perguruan Tinggi Islam. International Seminar On Islamic Education & Peace, 1, 274–281.

Wiek, A., & Walter, A. I. (2009). A transdisciplinary approach for formalized integrated planning and decision-making in complex systems. European Journal of Operational Research, 197(1), 360–370.