Science Technology, Ethics

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Abstract

Research Aims: Science and science technology are closely related to education, research and policy. Science technology is expected and obliged to apply ethics in all fields. The application of ethics in scientific technology starts from the educational sector, both academic and non-academic. Applying scientific ethics when conducting research can produce research results that are ethical or in accordance with the norms that apply in society. Scientific technology that applies scientific ethics will receive a positive perception by society. Scientific ethics in the field of scientific technology already exist informally and are strengthened by normative and formal policy rules. The scientific ethics policy was created not to limit the development of scientific technology, but to direct scientific technology in a direction that is in accordance with the norms that apply in society. This research method uses SLR (Literature Review system).

Keywords: science, technology, ethics

1. Introduction

Science and technology play an important role in every society's life, both academic and non-academic, for most people. In modern times, humans are almost unable to carry out work activities, whether communicating, traveling or even eating without the important support of today's modern technological developments.

Scientific literacy is the ability to apply scientific knowledge, identify questions and draw conclusions based on existing evidence to understand and make decisions regarding events in the natural environment (Noor, 2020). In addition, it is important for students to acquire scientific literacy to understand the environment, health, economy and other problems of modern society, which are very dependent on the progress and development of technology and science (Meuthia & Ahmad, 2021).

Ethics are human actions or behavior in their lives, namely about the good and bad of a person's behavior in certain things. Ethical values and human responsibility in developing science and technology for use for human benefit so that its application has a negative bias so that values and norms are needed. To control the potential of human knowledge. This is where ethics becomes an absolute requirement for the use of science.

Science is knowledge that does not just come like a ready-made item, but knowledge is a way of thinking that is so complex and in-depth about a specific object with a unique approach that it produces a conclusion in the form of reliable knowledge. Where reliable knowledge is a system and structure of knowledge that can be accounted for openly for testing and verification by anyone (Weinbaum et al., 2019).

2. Writing Method

Systematic Literature Review (SLR) is a term for identifying, evaluating and interpreting all available research that is relevant to the problem formulation or topic area being studied. The data collected are journals that discuss information system development from 2019 to 2023. The data was identified using the Systematic Literature Review (SLR) method. By using the SLR method, it is possible to review and identify journals systematically, in each process following predetermined steps or protocols. Apart from that, the SLR method can avoid subjective identification and it is hoped that the identification results can add to the literature on the use of the SLR method in journal identification.

3. Discussion

Hersh, Marion in his journal entitled "Science, technology and values promoting ethics and social responsibility" discusses the limitations of techniques paying attention to ethics as applied in practice, focusing on the fact that engineering and other activities are carried out without considering whether these activities are themselves ethical, and the gap between legality and ethics. This leads to three main ideas following the paper. The first is the need for engineers to be aware of and critical of their own values and to be able to broaden their perspectives compared to those of ‘others’, namely, marginalized and minority groups and environmentalists. This understanding of the 'other' and its values is also applied to the discussion of ethical issues relating to world minority ('developed') country engineers working in majority ('developed country ing') countries. The second central idea is the fact that structural and contextual factors in the form of obstacles and supporting factors influence ethical values and practices. Individuals are not necessarily unethical in themselves, but organizational context and ethos may present obstacles to ethical behavior and encourage the development of unethical values. These barriers and enabling factors were investigated through a pilot survey. The third central idea is the relationship between individual and collective responsibility and the need for support to enable engineers to think and behave ethically.

In the journal Abel, Gunter 2020 "Bounded Responsibility and Bounded Ethics of Science and Technology" The main question of this article is: Where does the ethical

normativity of science and technology come from? This is a challenging question given that traditional sources of comfort (such as metaphysical universalism) are no longer as available as they once were. This paper is divided into eight parts: (1) It explains specifically what challenges must be faced by non-foundationalist justification and normativity. (2) The three-dimensional concept of responsibility was developed based on the human triangle relationship I–We–World. (3) The concept of bound responsibility and ethics tied to science and technology is formulated. (4) The principle of reflective balance is introduced as a principle of rationality, and it is shown how this principle produces rational and reasonable justification in the ethics of science and technology. (5) Against this background, a reconceptualization of the internal and external responsibilities of science is given. (6) The type of responsibility required can be exemplified by current climate research. (7) This paper proposes a model of uncertainty in science and the ethical obligation to preserve the conditions of human life on earth. Ethical arguments are spelled out in terms of ethical care, conservation, and precautions. (8) In addition, several arguments are developed to answer the question of why preserving human life on earth makes sense.

In the jurnal Rhee, Hyang-yon; Choi, Kyunghee, (2013), "Development and Implementation of Science and Technology Ethics Education Program for Prospective Science Teachers,Science & Education" The aim of this research is (1) to develop science and technology (ST) ethics education program for prospective science teachers, (2) to test the effect program on participants' perceptions, in terms of their ethics and education existing problems, and (3) to evaluate the impact of program design. The program was utilized Problem-based learning (PBL) is carried out as an iterative process for two cycle. A total of 23 and 29 teacher candidates in each cycle carried out team activities. A PBL-based ST ethics education program for effective science classrooms in increasing participants' perceptions of ethics and education at ST. This perception motivate prospective science teachers to develop and implement ST ethics education in their future classroom. Changes in prospective teachers' perceptions of ethics the problem and need for ethics education is greater when the topic is controversial.

In the jurnal Wickson, Fern; Strand, Roger; Kjølberg, Kamilla Lein, The Walkshop Approach to Science and Technology Ethics,Science and Engineering Ethics. n research and teaching on ethical aspects of emerging sciences and technologies, the structure of working environments, spaces and relationships play a significant role. Many of the routines and standard practices of academic life, however, do little to actively explore and experiment with these elements. They do even less to address the importance of contextual and embodied dimensions of thinking. To engage these dimensions, we have

benefitted significantly from prac- tices that take us out of seminar rooms, offices and laboratories as well as beyond traditional ways of working and interacting. We have called one such practice the ‘walkshop’. Through walkshops, we have spent several days walking together with our colleagues and students in open outdoor spaces, keeping a sustained intellectual discussion on ethical aspects of science, technology and innovation while moving through these landscapes. For us, this has generated useful opportunities to escape established hierarchies, roles and patterns of thought and to rethink conceptual and philosophical issues from new perspectives, under new attitudes and with renewed energy. In this paper we wish to highlight the potential benefits of the walkshop approach by sharing some of our experiences and describing how we have prepared for and carried out these events. We share this information in the hope that we may encourage others to both experiment with the walkshop approach and exchange information on their own innovative processes for research and teaching in science and engineering ethics.

In the jurnal Wang, Qian; Yan, Ping, (2019), “Development of Ethics Education in Science and Technology in Technical Universities in China,Science and Engineering Ethics” in order to solve a series of problems brought about by rapid development of science and technology, it is necessary not only to conduct in-depth research on science and technology ethics, but also to strengthen ethics education in science and technology. China’s five technical universities (5TU) exemplify the specific situation and char- acteristics of ethics at Chinese technical universities, and can be compared to the situation in South Africa. China’s ethics education in the 5TU emphasizes the use of traditional ideological and cultural resources, and practical cases. The teaching methods focus on combining traditional Chinese ethics with foreign experience and teaching methods, aiming at cultivating students’ ability to solve specific problems in the real world. This paper also evaluates and reflects on the short-term and long- term effects of China’s ethics education in science and technology, revealing some special problems. Ethics education in science and technology at the 5TU is based on the principle of “unity of knowledge and behaviour”. It is hoped that China’s ethics education founded on traditional Chinese thought, can make a valuable contribution to the development of global engineering ethics.

In the jurnal Winance, Myriam, (2016), “Rethinking disability Lessons from the past, questions for the future. Contributions and limits of the social model, the sociology of science and technology, and the ethics of care,Alter”. In this article, I analyze one evolution in disability research over the past 30 years: the shift from an individual to a social approach to disability. While most disability research has currently “social- ized” disability or at the least situates disabled people within a social context, not all do so in

the same way nor based on the same assumptions. They lead to different concepts of the person and soci- ety and different concepts of disability and normalcy. I analyze this evolution by looking at three approaches to disability: the social model, the approach taken in the sociology of science and tech- nology, and the ethics of care. I show how each, by renewing the analysis of disability, has brought about changes for disabled people.

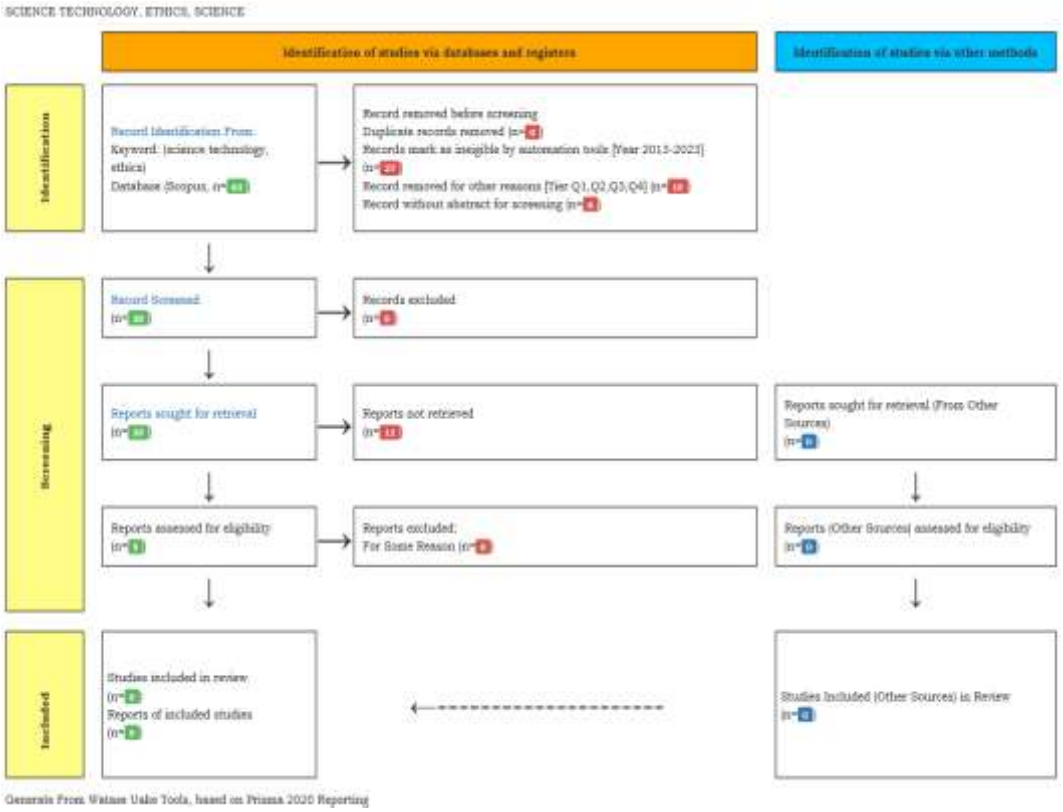
In the jurnal Chen, Haidan, (2023), “Ethics of emerging science and technology needs strengthening interdisciplinary research,Chinese Science Bulletin.” Emerging technologies are developing rapidly, and related scientific and technological ethical issues continue to emerge.Strengthening research on the ethics of science and technology will help achieve better ethical governance of science and technology Different scientific disciplines research, research on the ethics of science and technology involves various disciplines sciences, such as natural sciences (biology, medicine, agriculture, chemistry, physics, etc.), social sciences (social science, anthropology, political science, management, law, etc.) and humanities (philosophical studies, religious studies, history, etc.), requires mutual penetration and integration of various scientific disciplines, and interdisciplinary/interdisciplinary research.

In the jurnal Torras, Carme, (2018), “Xarxes socials i companyia rob tica tecnologia, tica, i ci ncia-ficci, Metode Revista de difusie de la investigacie.” Information technology has become part of our daily lives and plays an increasingly important role intermediary in our workplace and personal relationships or even replace them. It's growing interaction with machines raises several questions that we have never experienced before, nor can we predict with certainty how it will affect the evolution of society. This has led to The convergence of technology and humanities in ethical debates is starting to bear fruit only by setting regulations and standards, but also by educational initiatives at universities teaching, professional improvement, and adjustment to public opinion. Interestingly, science fiction often plays a prominent speculative role in highlighting the pros and cons of potential scenario.

Figures

This image shows the prism methodology in article writing methodology

Figure 1.Prisma Methodology



Source: PNG Wataseuake 2023

Table

This table shows literature review content of discusion

Table 1.Literature Review

No	Authors	Year	Title	Journal	Laya Nan	Cita tion
1	Hersh	2013	Science, technology and values promoting ethics and social responsibility	AI & SOCIETY		7
2	Abel	2020	Bounded Responsibility and Bounded Ethics of Science and Technology	Axiomathes		3

3	Rhee and Choi	2013	Development and Implementation of Science and Technology Ethics Education Program for Prospective Science Teachers	Science & Education		4
4	Wickson et al.	2014	The Walkshop Approach to Science and Technology Ethics	Science and Engineering Ethics		25
5	Wang and Yan	2019	Development of Ethics Education in Science and Technology in Technical Universities in China	Science and Engineering Ethics		11
6	Berridge et al.	2023	Correction Domain Experts on Dementia-Care Technologies Mitigating Risk in Design and Implementation	Science and Engineering Ethics		0
7	Winance	2016	Rethinking disability Lessons from the past, questions for the future. Contributions and limits of the social model, the sociology of science and technology, and the ethics of care	Alter		26
8	Chen	2023	Ethics of emerging science and technology needs strengthening interdisciplinary research	Chinese Science Bulletin		1
9	Torras	2018	Xarxes socials i companyia rob tica tecnologia, tica, i ci ncia-ficci	M&#65533;todeRevista de difusi&#65533; de la investigaci&#65533;		2

4. Closing

Based on the research results, does scientific technology have an effect on ethics? The first is the need for engineers to be aware and critical of their own values and to be able to broaden their perspective compared to the perspective of 'others', namely marginalized and minority groups and environmental activists. This understanding of the 'other' and its values is also applied to the discussion of ethical issues relating to engineers from minority ('developed') countries working in majority ('developed') countries. The second central idea is the fact that structural and contextual factors in the form of inhibiting and supporting factors influence ethical values and practices. Individuals are not necessarily unethical in themselves, but organizational context and ethos can create barriers to ethical behavior and encourage the development of unethical values. These barriers and supporting factors require a pilot survey. The third central idea is the relationship between individual and collective responsibility and the need for support to enable engineers to think and behave ethically. This journal proposes a model of scientific intelligence and ethical obligations to preserve the conditions of human life on earth. Ethical arguments are spelled out in terms of ethical care, conservation, and preventive measures.

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Wang, Qian; Yan, Ping, **(2019)**, Development of Ethics Education in Science and Technology in Technical Universities in China,*Science and Engineering Ethics*. DOI: 10.1007/s11948-019-00156-6