

SCIENCE'S TEACHERS CONCERN ON IMPLEMENTATION OF GENDER RESPONSIVE PEDAGOGY IN TEACHING PROCESS: AN APPLICATION OF CONCERN BASED ADOPTION MODEL (CBAM)

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Abstract

This study explores science teacher's stages of concern towards the implementation of gender responsive pedagogy in their science teaching process. Concern Based Adoption Model (CBAM) had been used as the theoretical framework for this study. The participants of this study consist of 380 primary school science teacher in Malaysia and had been selected randomly. Each of the participants completed the Stage of Concern Questionnaire (SoCQ) comprising 35 items, which was published, based on CBAM. The researcher had conduct the descriptive analysis using mean and percentage based on SoCQ Quick Scoring Device, while inferential statistics using T-test and ANOVA was used to see the difference between science teacher's level of concern in term of gender and education level. The study show that the science teachers' level of concern in implementing gender responsive pedagogy is at the stage concern of self, which is the level of concern in information. In other word, this finding revealed that science teachers have low knowledge and need more information on how to implement gender responsive pedagogy in their science teaching process. Furthermore, there was no significant relationship between all levels of teachers' concern with gender, but for teachers' level of concern based on academic qualifications, there were a significant difference for the level of concern in personal between teachers with a bachelor's degree and teachers with a doctorate.

Keywords: Teacher's Concern, Teacher's Pedagogy, Gender Responsive Pedagogy, Science Teaching.

INTRODUCTION

Implementing a quality and balanced education system will drive the country to move forward and produce more professionals who can contribute energy, ideas, skills and ultimately to improve the country's level of sustainability. Quality education is one of the seventeen goals contained in the Sustainable Development Goals (SDGs) presented by the United Nations (UN).

The goals of SDGs emphasize quality, inclusive, gender equality and lifelong learning opportunity for every individual. The 2030 Education Agenda outlines that in order to achieve the goal of gender equality, a holistic approach needs to be empowered so that every child, regardless of whether male or female, has equal access to education. The gender equality issue is a global priority that is given a lot of attention because this issue is in line with the effort to promote the need for each individual to get the necessary education. To realize the wishes and dreams in the 2030 Education Agenda, everyone

should have rights, equal opportunities, and suitable responsibilities regardless of gender in order to gain knowledge and improve their self-potential.

Gender equality in the education system refers to the opportunity for male and female students to experience the learning process from the same educational source (Akhigbe & Adeyemi, 2020). In addition, Geven et al. (2021) said that there is a need for teachers to give equal achievement expectations without any gender bias in their teaching and learning process experienced by the students at school. Through the implementation of gender-equal education system, a greater number of skilled and educated professionals will be born, which will simultaneously increase the country's productivity and innovation to a higher level (Dorji, 2020)

In line with the current needs, Malaysia is also committed to eradicating the gender stereotypes that has been contagious in the community for a long time. Teachers are the group of individuals who are able to prevent the spread of gender stereotypes into our education system. Therefore, gender equality in the teachers' teaching process is one of the main targets set in the goal of quality education. Therefore, to achieve gender equality in the teaching process, teachers should know and implement a pedagogical approach that will help them create a learning environment that is gender-responsive, conducive and able to meet the needs of male and female students.

(UNESCO, 2015; Dorji, 2020; Hom, 2021) stated that Gender Responsive Pedagogy (GRP) is an approach that promotes gender equality in the teachers' teaching process. Gender Responsive Pedagogy requires teachers to improve their knowledge and skills to plan and implement the teaching process, manage students and create a classroom-learning environment that meets the needs of male and female students fairly and equitably.

The adaptation and implementation of the gender responsive pedagogy elements into the teaching process will help the teachers to reduce gender bias and create a gender responsive classroom environment. Research conducted by Dorji (2020) also show that there is an increase in the teacher's pedagogical skill in gender equality when they have enough practice and information regarding the gender responsive pedagogy approach.

Teachers are individuals who act as initiators, promoters and executors of the implementation of innovation in the curriculum. The effectiveness of implementing innovation depends entirely on the level of concern, knowledge, awareness and commitment of teachers responsible for implementing the innovation (Fullan, 2006). This statement shows that if teacher have high level on concern they will ensure that implemented innovations run successfully. Furthermore, according to Hall and Hord (2001), positive views and acceptance by the implementing group must first be established to realize innovation at the organizational level. Gender Responsive Pedagogy is a new innovation in Malaysian Education system. Therefore, it is crucial to identify the level of concern of the teachers involved so that the innovation can be implemented smoothly and effectively (George et al., 2013).

GENDER RESPONSIVE PEDAGOGY

The quality of education implemented at the school level is determined by strengthening the following four elements: teaching methods, pedagogical skills, teaching level, and teaching time allocated (Slavin, 1991). This means that if the teachers implements the teaching process effectively and practices the correct pedagogical skills, student mastery in the learning process will be enhanced. Teachers are the main medium that determines the quality of their teachings. The teachers' low pedagogical skills will have a direct impact to the student achievement level Therefore, to produce high-quality teachers, efforts to increase and improve mastery of teachers' teaching and pedagogical skills should be taken seriously by all parties concerned (Ngali, 2019).

Inequality or gender bias exists when teachers cannot implement accurate and appropriate pedagogical skills according to the needs of the students of a class (Akhigbe & Adeyemi, 2020). Gender Responsive Pedagogy is a pedagogical approach that requires teachers to pay attention to gender differences in a classroom. Siobhan, Sue and Flora (2018), in the publication of *International Network for International Network for Advancing Science and Policy* (INASP) gender guidebook, define gender responsive pedagogy as a teaching approach designed to meet the needs of male and female students and reduce gender bias in the teaching and learning process both outside and inside the classroom. This definition is in line with FAWE (2016a), which also states gender responsive pedagogy refers to teaching and learning processes that pay special attention to the learning of girls and boys.

Gender Responsive Pedagogy is a pedagogical skill that helps teachers plan and implement gender-equitable teaching processes. This pedagogy emphasizes the need for teachers to focus on the teaching plan, language of learning, classroom interaction, classroom layout and gender-responsive classroom management. In addition, teachers are also expected to be professional and to set aside gender stereotypes that have long been spreading in society. The teachers' perception and treatment of students should be neutral so that each student will feel valued and motivated to actively participate in the learning process.

CONCERN-BASED ADOPTION MODEL

Concern-Based Adoption Model (CBAM) is a concern model that was developed in 1969 by researchers at the Teacher Education Development Center, University of Texas. This model was developed to explore and identify the level of concern of individuals towards the changes occurring in the organization (George et al. 2013). Hall and Hord (2006) improved the CBAM based on the Fuller Model (1969) and focused on the three dimensions: Stages of Concern, Level of Use and Innovation Configuration.

Each teacher has a different level of concern from one another because teachers' concern is determined through acceptance, knowledge, professional values and awareness of the teachers themselves (George et al. 2013). This model also emphasises the need for teachers to have a high level of concern for the changes in the curriculum system. Teachers should have a high level of concern in implementing the change

because when teachers have a high level of concern, they will show interest, give commitment and improve efforts so that the objective of implementing innovation can be achieved successfully.

Aware of the importance of identifying teachers' level of concern, this model provides a complete guide for researchers to study and analyse teachers' level of concern towards the innovation carried out. Teachers' stages of concern can be classified into four parts: unrelated, self, task and impact. These four stages of concern are developed into seven levels of concern: awareness, self, personal, management, impact, collaboration and refocus. Table 1 below details the four stages and seven levels of Concern found in Hall & Hord's Dimension Level of Concern (2006). To identify teachers' level of concern, an instrument named Stages of Concern Questionnaire (SoCQ) with 35 items was introduced by CBAM and used by previous researchers.

If teachers' level of concern is low, the concerned parties can take drastic measures by formulating and implementing an action plan to increase teachers' level of concern. The production of more references and the implementation of in-service training workshops related to innovation are among the methods that can be used to increase teachers' level of concern so the implementation of innovation can be carried out according to the objectives set.

Table 1: Description of Level of Concern Based on Innovation (Adaptation from George, Hall & Stiegel Bauer 2013)

Stage of Concern	Level of Concern	Definition
Unrelated	0 Awareness	Teachers are unaware / are not interested in the curriculum innovation that is carried out.
	1 Information	Teachers have general awareness and are interested in learning about innovation being carried out.
Self	2 Personal	Teachers feel worried about their role and ability to implement innovation and the impact of innovation on themselves and their routine activities.
	3 Management	Teachers focus on the process and tasks in implementing innovation. They try to use available information and resources optimally. Issues of efficiency, organization, management, scheduling, and the required period are prioritized.
Impact	4 Impact	The teacher's focus is on the impact of changes on students, especially the assessment of student achievement and competence.
	5 Collaboration	Teachers collaborate with other teachers to implement d innovation.
	6 Refocusing	Teachers reflect and refocus their attention to explore the benefit of implemented changes. They search for other possibilities or alternatives to improve the innovation that is taking place.

CBAM has been widely used to identify teachers' level of concern in the implementation of curriculum innovation. A study conducted by Rubanathan and Nasri (2018) related to teachers' level of concern in the implementation of *I-Think* across the curriculum showed that teachers have a high level of awareness in the implementation of I-think, but they are seen to have the lowest intensity percentage at the level of concern of impact. This

findings show that the teachers involved are familiar with the implementation of *I-Think* but they do not think about the impact of implementation on their students critically.

Meanwhile, Norlina's (2022) study related to teachers' level of concern in implementing problem-based learning shows that teachers' level of concern is highest at the personal level and lowest at the management level. From this finding, it can be concluded that the teachers have low knowledge and need more information on how to implement the problem based learning in their teaching process. Furthermore, this finding also shows that teachers are more concerned on how the innovation will affect themselves in context of their responsibility and ability to implement the innovation in their teaching process.

The research findings of the study by Lo and Nasri (2022) on science teachers' level of concern in the implementation of the dual language programme (DLP) show that teachers have a high intensity of concern at the awareness, personal and information levels while the level of concern of collaboration shows the lowest intensity. It also shows that the respondents are non-users and they are not interested to discuss more on the innovation with their colleagues.

The gender responsive pedagogy approach is an innovation in implementing curriculum in Malaysia (Shock, 2021). Based on the literature review, there is still a lack of research conducted to identify teachers' level of concern toward implementing gender responsive pedagogy. Therefore, the researcher feels there is a need to study science teachers' level of concern towards implementing gender responsive pedagogy in their teaching process so that further action can be taken by the concerned party based on the study findings obtained. This is important in order to make sure the desire for gender equality in the education system can be realized successfully. Therefore, in the context of the implementation of this study, the researcher would like to review science teachers' level of concern towards the implementation of a gender responsive pedagogy approach in their teaching process.

RESEARCH OBJECTIVE

1. To identify the general profile of teachers' level of concern in the implementation of Gender Responsive Pedagogy based on gender and education level.
2. To identify whether there is a significant difference between teachers' level of concern towards the implementation of Gender Responsive Pedagogy in gender and teachers' education level.
3. To identify the general profile of science teachers' level of concern towards the implementation of Gender Responsive Pedagogy in their science teaching process.

RESEARCH METHODOLOGY

Research Design

This quantitative research uses a survey method to review teachers' level of concern toward the implementation of gender responsive pedagogy in the teaching process.

Research Respondents

The study wants to explore the science's teacher level of concern in implementation of gender responsive pedagogy in their teaching process. Based on the purpose of this study, 380 primary school science teacher been selected randomly by the researcher. Data from the Ministry of Education (MOE) shows that the primary school science teachers population is 28 654. The determination of the number of this sample followed the recommendation of Krejcie and Morgan (1970) by referring to the sample determination table based on population. Table 2 below shows the profile of respondents based on demographic background, namely gender and teachers' education level.

Table 2: Summary of Respondents' Descriptions

Variables	Demography	Frequency	Percentage
Gender	Male	136	35.8
	Female	244	64.2
Education Level	Bachelor's degree	237	62.4
	Master's degree	98	25.8
	Doctorate	45	11.8

Research Instrument

The research instrument has two parts for which Part A involves the demography of the respondents, while Part B is adapted from the SoCQ instrument developed based on CBAM (George et al. 2013) related to teachers' level of concern. Instrument in Part B includes 35 questions covering four stages of concern and further focuses on seven levels of concern.

Validity and Reliability of Research Instrument

The researcher has conducted a Content Validity Index (CVI) by involving four experts in the field related to the implementation of the study. The researcher has identified items that need improvement based on the CVI analysis. A pilot study involving 32 respondents was also conducted to identify the instrument's reliability. The alpha coefficient value obtained is 0.802, which shows the instrument's reliability is high (Bond & Fox, 2015).

Data Collection and Analysis

The questionnaire distribution has been done online to make it easier for the respondent to answer the questions. The researcher has distributed the study implementation notification letter and the link to the questionnaire to the school through official email and face-to-face. Descriptive analysis was used to generate a general profile of teachers' level of concern based on gender and education level. This analysis was guided by the SoCQ Quick Scoring Device by George et al. (2006), while the inferential statistics using T-test

and ANOVA were used to see the difference between the level of concern and respondents' gender and education level.

RESEARCH FINDINGS AND DISCUSSION

Teachers' Level of Concern towards Implementing Gender Responsive Pedagogy Based on Gender

Male and female teachers showed the highest percentage at the stage of concern of self which is at the level of concern of information. This shows that both teachers have limited knowledge and information on the implementation of gender responsive pedagogy. At the same time, these two groups of teachers showed the lowest concern percentage at the stage of concern of impact. This finding shows that both teachers agree that there is no need for them to know the impact of implementing gender responsive pedagogy on the students.

The percentage score value for the stages of concern for unrelated, self and task is high compared to the stage of concern of impact, showing both genders of teachers are the profile of non-users of innovation. This finding aligns with the study conducted by Rubanathan (2019), which also shows a non-use profile for both male and female teachers.

The tail increase in the level of concern of refocusing for both groups of teachers shows that the implementation of gender responsive pedagogy in the teaching process is not the main focus. This finding shows that teachers are negative toward the implementation of gender responsive pedagogy in their teaching process. The tail increase in the female teachers is higher than the male teachers. Therefore, female teachers are seen to exhibit more negative concerns towards the implementation of gender responsive pedagogy than male teachers. This finding contradicts the study conducted by Al Shahabat (2014), which shows the tail increase for male teachers is higher than for female teachers. Figure 1 shows teachers' level of concern based on gender.

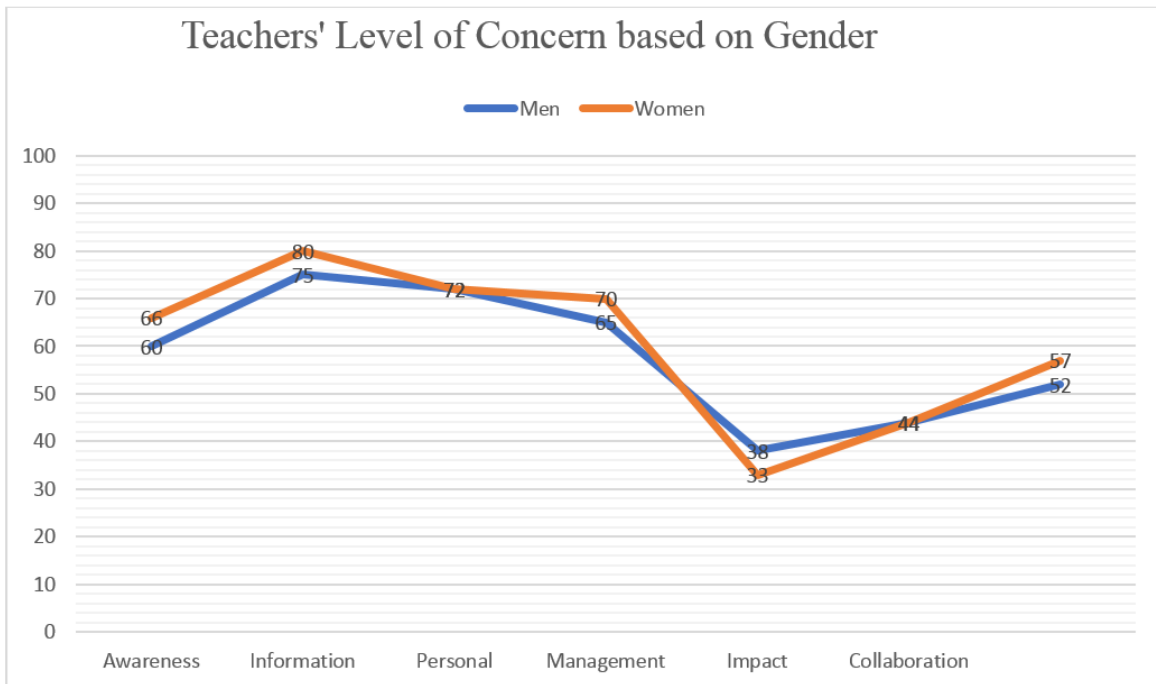


Figure 1: Teachers' Level of Concern based on Gender

Relationship between Teachers' Level of Concern and Gender Factor

A T-test was conducted to test the difference in teachers' level of concern toward the implementation of gender responsive pedagogy based on the different genders of teachers. The findings of the study found that there was no significant difference at each level of concern, such as the following level of concern of awareness (Level 0) with values ($t = -1.456, p = 0.146, p > 0.05$); level of concern of information (Level 1) with values ($t = 0.763, p = 0.446, p > 0.05$); level of concern of personal (Level 2) with values ($t = -0.050, p = 0.960, p > 0.05$); level of concern of management (Level 3) with values ($t = -0.204, p = 0.838, p > 0.05$); level of concern of impact (Level 4) with values ($t = 0.292, p = 0.770, p > 0.05$); level of concern of collaboration (Level 5) with values ($t = 0.389, p = 0.697, p > 0.05$); and level of concern of refocusing (Level 6) with values ($t = 0.051, p = 0.959, p > 0.05$) based on gender.

Teachers' Level of Concern towards the Implementation of Gender Responsive Pedagogy Based on Education Level

Teachers with Bachelor's and Doctor of Philosophy degrees showed high concern at the stage of concern of self, which is the level of concern of information. This means that teachers in both groups are interested and open to implementing gender responsive pedagogy. The findings also show that teachers' knowledge regarding gender responsive pedagogy is limited. Nevertheless, teachers with Master's degrees showed a high level of concern at the level of concern of management. This finding also shows that teachers with Master's degrees are more concerned with management, preparation of materials and time allocation to carry out innovation. Research conducted by Sharifah, Azman, and

Kamaruzaman (2011) also showed that a group of teachers with Master's degrees showed a high level of concern at the level of concern of management. A parallel finding has been identified in the study by Lee and Zanaton (2019).

However, these three groups of teachers have the lowest percentage score of the level of concern, which is the level of concern of impact. This situation shows that teachers from the three groups are less concerned about the effectiveness of gender responsive pedagogy in their teaching process. The tail increase seen at the level of concern of refocusing for all groups of teacher's shows gender responsive pedagogy implementation is less than satisfactory at the school level.

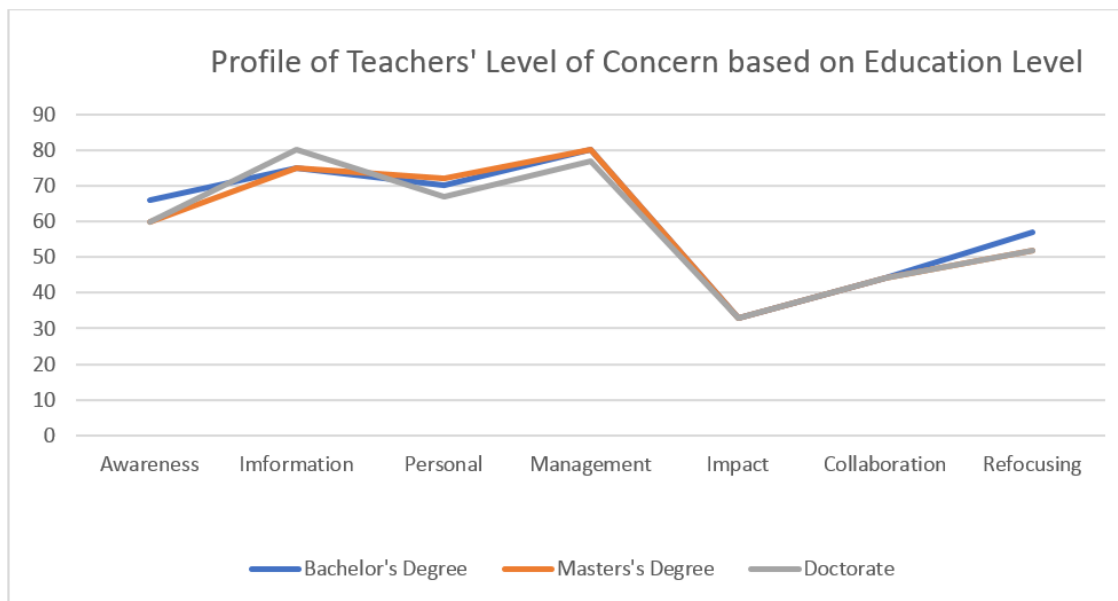


Figure 2: Profile of Teachers' Level of Concern based on Education Level

The Relationship between the Teachers' Level of General Concern and Education Level

A one-way ANOVA analysis was carried out to test the difference in science teachers' level of concern towards the implementation of gender responsive pedagogy based on education level. The findings of the study found that there was no significant difference in the level of concern of awareness (Level 0) with values ($F(2, 377) = 0.390, p = 0.677, p > 0.05$); level of concern of information (Level 1) with values ($F(2, 377) = 0.554, p = 0.575, p > 0.05$); level of concern of management (Level 3) with values ($F(2, 377) = 0.548, p = 0.579, p > 0.05$); level of concern of impact (Level 4) with values ($F(2, 377) = 0.225, p = 0.798, p > 0.05$); level of concern of collaboration (Level 5) with values ($F(2, 377) = 0.332, p = 0.718, p > 0.05$); and level of concern of refocusing (Level 6) with values ($F(2, 377) = 1.908, p = 0.150, p > 0.05$) based on education level.

However, the results of the study show that there is a significant difference in the level of concern of personal (Level 2) with values ($F(2, 377) = 3.266, p = 0.039, p < 0.05$) based on education level. Findings from post-hoc Tukey also found there was a significant mean difference of $p < 0.05$ in the teachers' level of concern of personal (Level 2) between the group of respondents with a Bachelor's degree education (mean = 20.06, SP = 3.445) and respondents with a Doctor of Philosophy education (mean = 18.47, SP = 4.257).

General Profile of Science Teachers' Level of Concern towards the Implementation of Gender Responsive Pedagogy in the Teaching Process

In this study, teachers' level of concern towards the implementation of Gender Responsive Pedagogy in the teaching process was measured by referring to the SoCQ Quick Scoring Device by George et al. (2006). First, the researcher needs to add the scores of the five items on each level of concern. Next, the total scores need to be divided according to the number of respondents. The value obtained is then converted to a percentage score (Percentile Score) by referring to the Level of Concern Percentage Conversion. Finally, the percentage score is interpreted by referring to Kew and Zainaton (2019). The sum of the percentage scores for each level of concern is shown in Table 3.

Table 3: General Profile Level of Concern

Stages	Level of Concern	Score Percentage	Interpretation	Mean	Deviation Value
Unrelated	Awareness (Tahap 0)	60	Low	1.29	.799
Self	Information (Level 1)	75	Moderate	4.16	.926
	Personal (Level 2)	72	Moderate	3.97	.775
Task	Management (Level 3)	70	Moderate	4.14	.787
Impact	Impact (Level 4)	33	Low	3.78	.907
	Collaboration (Level 5)	44	Low	3.81	.862
	Refocusing (Level 6)	57	Low	3.58	.764

Overall, the stage of concern of self has the highest percentage score value: the level of concern of information (75%) and level of concern of personal (72%). Based on the CBAM Model, this finding shows that science teachers have a low level of knowledge and information towards the implementation of gender responsive pedagogy towards the implementation of gender responsive pedagogy. This statement is supported by Lee and Zanaton (2019), who state that level of information is the highest level of concern. This shows that the teachers have basic information related to innovation and trying to explore the implementation of the innovation. Nevertheless, according to George et al. (2013) and Rubanathan (2019), when the percentage score of the level of concern of information is higher than the level of concern of personal, this shows that teachers still have an interest and are open in implementing innovation in their teaching process.

Next, the findings of the general profile for the stage of concern of task show a percentage score of 70%, and the level of concern of management is the third highest level. This percentage score also shows the teachers' level of concern of management is moderate. Teachers are seen to be unable to optimally use the information and resources related to gender responsive pedagogy. Teachers are also still worried about the efficiency,

organization, management, scheduling and time required to implement the gender responsive pedagogy approach in their teaching process.

Stage of concern of unrelated shows a percentage score of 60%. This finding shows that teachers know the need to implement the gender responsive pedagogy approach in their teaching process. According to Lee and Zanaton (2019), if the percentage score of the stage of concern of unrelated is high, this shows that teachers are not interested in innovation being carried out. A low percentage score of the level of concern of awareness was also seen in the research conducted by Polancos (2021) regarding teachers' level of concern in the implementation of K-12 basic education programmers.

The percentage score of the stage of concern of impact is the lowest compared to other stages of concern. According to Hasyati and Nik (2018), the low percentage score of the stage of concern of impact shows that teachers do not strive to implement innovation in their teaching process. This finding also shows that the level of concern of impact has the lowest percentage score in the stage of concern of impact, which is 33%. This shows that teachers are not interested to know the impact of the implementation of gender pedagogy responsive on students. The same findings are also seen in the research conducted by Rubanathan (2019), Kew and Zainaton (2019), and Dele et al. (2021). However, this situation contradicts the research findings conducted by Rosalita et al. (2017), which shows that teachers have a high level of concern of impact. The level of concern of collaboration shows a low percentage score value of 44%. This shows that science teachers have a low collaboration level to exchange opinions on the implementation of gender responsive pedagogy.

CONCLUSION

Overall, the general profile teachers for this study can be interpreted as non-users. The findings of this study also show that teachers' level of concern toward implementing gender responsive pedagogy is still in the stage of concern of self, which is the level of concern for information. Teachers still need information and guidance to implement gender responsive pedagogy in their teaching process. This coincides with the statement of Hall and Hord (2011), who stated that implementing innovation should be seen as an ongoing process, not just an event. Therefore, teachers not only need to be provided with information and implementation guidelines but need to be given guidance relating to innovation from time to time.

A tail increase at the refocusing level shows that teachers face resistance to implementing change. This situation should be taken seriously, and quick action should be taken to overcome the problems that arise. Therefore, further study needs to be conducted to identify obstacles and challenges teachers face in implementing gender responsive pedagogy in their teaching process.

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