



The Effect of Family Welfare on Students' Cognitive Abilities

Faradiba Faradiba ^{a*}

^a Physics Education Study Program, Universitas Kristen, Indonesia.

Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/AJESS/2023/v47i41031

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/103586>

Original Research Article

Received: 19/05/2023

Accepted: 22/07/2023

Published: 26/07/2023

ABSTRACT

Education is a basic need that must be obtained by everyone. To measure student success, one of which can be seen through students' cognitive abilities. This study aims to determine the effect of family welfare on students' cognitive abilities using the test score approach. This study uses data from the Indonesian Family Life Survey (IFLS5). The statistical method used in this research is multiple linear regression analysis. This research revealed that family welfare plays a very important role in students' cognitive abilities. Diverse family welfare results in disparities between students. Therefore, a program is needed to overcome the welfare gap so students can obtain optimal quality education.

Keywords: Family well-being; cognitive; multiple linear regression.

1. INTRODUCTION

Learning is an important activity in the educational process [1]. In other words, learning activities are part of the educational process that takes place inside and outside of school and

even lasts a lifetime. This means that learning activities occur not only in the classroom but also outside the classroom [2]. Learning is essential in human life and is an obligation that must be fulfilled by everyone [3]. Learning is one of the efforts to improve individual quality.

*Corresponding author: Email: faradiba@uki.ac.id;

Improving the quality of human resources is an absolute prerequisite for achieving national development goals. Improving the quality of education in Indonesia is the dream of all parties, especially those involved in educational institutions [4]. Improving the quality of education is not an easy task because it is not only related to technical issues but includes several very complex and difficult problems, both internal to the school and problems arising from external schools, such as the school environment and the welfare of students' families [5].

The family has its role in the development of a child's personality. Through social relations within the family, a person learns about behaviour patterns, attitudes, beliefs, ideals and values adopted in society as part of personality development [6]. In the implementation of education, the level of family welfare is one of the determining factors and an integral part of the implementation of education, which aims to improve student achievement [7]. In this study, the focus of family welfare lies on the financial ability of students' parents [8,9].

This learning opportunity can only be fulfilled if the level of family welfare supports it [10]. If a child lives in a family whose welfare is weak, the child's needs are not met, and the child's health is disturbed, so the child's learning is also disrupted. As a result, children are always sad, so children feel inferior to other friends, which hinders children's achievements. Children also have to work to earn a living to help their parents, even though the children are not yet working. This also hinders children's learning.

This research was conducted to obtain relevant and in-depth information regarding the effect of welfare on students' learning outcomes. In education, students' welfare is considered an important factor that can affect their learning outcomes. Through this research, it is hoped that a better understanding of how factors related to well-being, such as mental health, socio-economic conditions, and the school environment, can influence students' ability to achieve optimal learning outcomes. With a deeper understanding of this relationship, it is hoped that effective strategies and interventions can be developed to improve students' well-being and learning outcomes. This research also has the potential to contribute to developing a more holistic education policy which recognizes the importance of welfare factors in achieving broad educational goals.

2. DATA AND METHODOLOGY

This study uses data from the Indonesian Family Life Survey (IFLS) wave 5. IFLS is a household survey conducted in Indonesia to gather information on various aspects of family life, including education, health, and the economy. Wave 5 refers to the fifth wave of this survey, carried out in a certain period. Data from IFLS wave five is used in this study as a source of information that can provide a comprehensive picture of the factors related to the welfare and ability of student learning outcomes. Using the data collected through this survey, it is hoped that this research can provide more accurate and detailed insights into the effect of welfare on students' learning outcomes in Indonesia.

This research uses descriptive and inferential analysis methods to achieve the research objectives. The descriptive analysis provides a systematic and comprehensive description of the observed variables, such as the welfare and ability of student learning outcomes. This analysis involves calculating statistics such as the mean, median, and frequency distribution to analyze the data collected from the respondents. In addition, this study also uses inferential analysis, specifically the Ordinary Least Square (OLS) method. OLS is one of the statistical techniques commonly used in research to test the causal relationship between the dependent and independent variables. Using OLS, this study aims to identify a significant influence between the well-being and ability of student learning outcomes. With the combination of these two methods, it is hoped that this research can provide a more in-depth and valid understanding of the effect of well-being on students' learning outcomes.

3. RESULTS AND DISCUSSION

Based on the tabulation results, information is obtained that most respondents currently tend to be at the bottom three levels. Similar conditions can also be seen in respondents' perceptions in the last five years. However, as a percentage, respondents believe they will be more prosperous in the next five years.

Based on the data from the IFLS enumeration, it is known that the current family conditions tend to be adequate. In general, perceptions regarding the current standard of living tend to be more adequate than necessary. Perceptions related to food consumption tend to be more

adequate than needed. Perceptions related to health conditions tend to be more adequate than needed.

The enumeration results show that around 23.56 per cent of households have children aged 15 and under. 23.56 per cent of households will be followed up with several additional questions.

Most households with children believe they can meet their children's standard of living. Most households with children also believe they can meet their children's food consumption needs. Most households with children are also confident they can provide child health care. Most households with children also believe they can meet their children's educational needs.

Table 1. Levels of current economic conditions according to household perceptions

On which economic step do you consider yourself today	freq	Percent	Cum.
1 : Poorest	266	4.34	4.34
2	730	11.91	16.25
3	3,037	49.55	65.80
4	1,874	30.58	96.38
5	173	2.82	99.20
6 : Richest	30	0.49	99.69
8 : Don't Know	19	0.31	100.00
Total	6,129	100.00	

Table 2. Level of economic conditions in the last 5 years according to household perceptions

On which economic step where you five year ago	freq	Percent	Cum.
1 : Poorest	677	11.05	11.05
2	1,975	32.22	43.27
3	2,104	34.33	77.60
4	983	16.04	93.64
5	307	5.01	98.65
6 : Richest	46	0.75	99.40
8 : Don't Know	37	0.60	100.00
Total	6,129	100.00	

Table 3. Levels of economic conditions for the next 5 years according to household perceptions

On which economic step will be five year from now	freq	Percent	Cum.
1 : Poorest	46	0.75	0.75
2	163	2.66	3.41
3	569	9.28	12.69
4	1824	29.76	42.45
5	2264	36.94	79.39
6 : Richest	1084	17.69	97.08
8 : Don't Know	179	2.92	100.00
Total	6129	100.00	

Table 4. Family life current conditions

Current family life less or very satisfying	freq	Percent	Cum.
1 : Less adequate	699	11.40	11.40
2 : Adequate	3,519	57.42	68.82
3 : More than adequate	1,906	31.10	99.92
8 : Don't Know	5	0.08	100.00
Total	6,129	100.00	

Table 5. Perceptions regarding current standards of living

Concerning current standart of living	freq	Percent	Cum.
1 : It is less than adequate for my needs	805	13.13	13.13
2 : It is just adequate for my needs	3,290	53.68	66.81
3 : It is more than adequate for my needs	2,031	33.14	99.95
8 : Don't Know	3	0.05	100.00
Total	6,129	100.00	

Table 6. Perceptions related to food consumption

Concerning your food consumption	freq	Percent	Cum.
1 : It is less than adequate for my needs	463	7.55	7.55
2 : It is just adequate for my needs	3,107	50.69	58.25
3 : It is more than adequate for my needs	2,556	41.70	99.95
8 : Don't Know	3	0.05	100.00
Total	6,129	100.00	

Table 7. Perceptions related to health conditions

Concerning your health status	freq	Percent	Cum.
1 : It is less than adequate for my needs	772	12.60	12.60
2 : It is just adequate for my needs	3,233	52.75	65.35
3 : It is more than adequate for my needs	2,113	34.48	99.82
8 : Don't Know	11	0.18	100.00
Total	6,129	100.00	

Table 8. Presence of children aged 15 and under in the household

Do you have child under 15 years that live in this HH	freq	Percent	Cum.
1 : Yes	1,444	23.56	23.56
2 : No	4,685	76.44	100.00
Total	6,129	100.00	

Table 9. Perceptions of children's living standards

Concerning child standard of living	freq	Percent	Cum.
1 : It is less than adequate for my needs	146	10.11	10.11
2 : It is just adequate for my needs	751	52.01	62.12
3 : It is more than adequate for my needs	546	37.81	99.93
8 : Don't Know	1	0.07	100.00
Total	1,444	100.00	

Table 10. Perceptions of children's food consumption

Concerning your children food consumption	freq	Percent	Cum.
1 : It is less than adequate for their needs	101	6.99	6.99
2 : It is just adequate for their needs	721	49.93	56.93
3 : It is more than adequate for their needs	620	42.94	99.86
8 : Don't Know	2	0.14	100.00
Total	1,444	100.00	

Table 11. Perceptions of children's health conditions

Concerning your children healthcare	freq	Percent	Cum.
1 : It is less care	122	8.45	8.45
2 : Good care	705	48.82	57.27
3 : Very good care	616	42.66	99.93
8 : Don't Know	1	0.07	100.00
Total	1,444	100.00	

Table 12. Perceptions of children's educational conditions

Concerning your children education	freq	Percent	Cum.
1 : It is less than adequate for children needs	119	8.24	8.24
2 : It is just adequate for children needs	704	48.75	56.99
3 : It is more than adequate for children needs	562	38.92	95.91
8 : Don't Know	59	4.09	100.00
Total	1,444	100.00	

The level of satisfaction has a significant and positive influence on one's cognitive ability. Research has shown that individuals who are highly dissatisfied with their lives tend to have lower cognitive abilities than satisfied individuals. Low life satisfaction can impair cognitive function, including memory, problem-solving, attention, and abstract thinking. When a person feels dissatisfied, stress and the associated emotional tension can impair brain function and hinder their cognitive abilities. In contrast, individuals who are satisfied with their lives tend to have lower stress levels and a more stable emotional state, which supports optimal brain function and better cognitive abilities [11-13].

The condition of a person's wealth has a positive influence on their cognitive abilities. Various

studies have shown a relationship between wealth and individual cognitive abilities. The richer a person is the higher his cognitive ability. Wealth provides access to resources and opportunities that can influence cognitive development, such as quality education, a stimulating environment, and access to adequate health services. These factors can boost the development of cognitive skills, such as problem-solving, creativity, and critical thinking. In addition, wealth can also provide economic stability and financial security, which results in lower stress levels. This low stress can support optimal brain function and better cognitive abilities [14-16]. However, it should be noted that wealth is only one factor that influences cognitive abilities, and other factors such as education, social environment, and genetics also play a role.

Table 13. The effect of life satisfaction level on cognitive ability

Linear regression						
					Number of obs. = 6,129	
					F (4,6124) = 5.07	
					Prob > F = 0.0004	
					R-squared = 0.0033	
					Roor MSE = 18.064	
Score_n	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
2 : Very satisfied	1.542839	1.065934	1.45	0.148	-0.5467661	3.632445
3 : Somewhat satisfied	2.81871	1.06532	2.65	0.008	0.7303079	4.907113
4 : Not very satisfied	1.003227	1.279041	0.78	0.433	-1.504143	3.510598
5 : Not all satisfied	-4.481793	2.521522	-1.78	0.076	-9.424862	0.461276
_cons	71.42857	1.005371	71.05	0.000	69.45769	73.39945

Table 14. The effect of one's wealth on cognitive ability

Linear regression						
				Number of obs. = 6,129		
				F (6,6122) = 24.23		
				Prob > F = 0.0000		
				R-squared = 0.0277		
				Roor MSE = 17.845		
Score_n	Coef.	Robust Std. Err.	t	P> t 	[95% Conf. Interval]	
2	7.161457	1.43884	4.98	0.000	4.340825	9.98209
3	11.13516	1.302215	8.55	0.000	8.582364	13.68796
4	13.08966	1.322666	9.90	0.000	10.49677	15.68255
5	7.146692	2.045366	3.49	0.000	3.137055	11.15633
6 : Richest	1.816305	4.535271	0.40	0.689	-7.074421	10.70703
8 : Don't Know	8.513932	4.514649	1.89	0.059	-0.3363659	17.3623
_cons	62.6935	1.262557	49.66	0.000	60.21844	65.16855

Table 15. The influence of one's ability to meet life's needs on cognitive ability

Linear regression						
				Number of obs. = 6,129		
				F (3,6125) = 27.72		
				Prob > F = 0.0000		
				R-squared = 0.0152		
				Roor MSE = 17.955		
Score_n	Coef.	Robust Std. Err.	t	P> t 	[95% Conf. Interval]	
2 : Adequate	6.813619	0.789238	8.63	0.000	5.266436	8.360803
3 : More than adequate	7.270215	0.8426054	8.63	0.000	5.618413	8.922018
8 : Don't Know	1.105781	6.401352	0.17	0.863	-11.44312	13.65468
_cons	67.12951	0.7319098	91.72	0.000	65.69471	68.56431

Households that can meet their daily needs positively influence individual cognitive abilities. When a household can meet basic needs such as food, clothing, shelter, and health, the individuals in that household have greater opportunities to develop their cognitive abilities. A materially stable life provides better conditions for learning, thinking and developing cognitive skills. Individuals who don't have to worry about fundamental flaws or deficiencies can better focus on their intellectual development. In addition, households that can provide for themselves often have access to educational resources and a more stimulating environment. These factors can enrich the learning experience and support the development of cognitive abilities, such as problem-solving, analysis, creativity, and logical reasoning. In this context, it is important to encourage equal access to resources and opportunities for households still struggling to meet their basic needs to have the same opportunities to develop their cognitive abilities.

A person's ability to meet their children's food needs positively influences the child's cognitive

abilities. Adequate nutrition is very important in children's brain development and cognitive function. When a parent or guardian can provide their child with a balanced and nutritious diet, they provide the fuel needed to repair, build, and maintain a child's brain health. Adequate nutrition also impacts better concentration, memory and information processing. Children who get foods that meet their nutritional needs tend to have better cognitive abilities, including thinking, learning, and retaining information. In addition, adequate food intake is also associated with developing children's language skills, motor skills, and executive functions [17-19].

A person's ability to fulfil their children's maintenance or health care positively influences their cognitive abilities. Optimal health is important to a child's cognitive development and functioning. When a parent or guardian can provide access to adequate health care, including routine health check-ups, vaccinations, disease management, and needed care, they provide a strong foundation for a child's brain and cognitive development. Good health allows a child to function well physically, emotionally, and

mentally, which is an important foundation for optimal cognitive abilities. Children who receive adequate health care tend to have higher energy levels, better concentration and better memory. In addition, adequate health care is also related to the development of children's language skills, motor skills, and executive functions [20-22].

A person's ability to fulfil their children's education positively influences the child's cognitive abilities. Education is a key aspect of a child's cognitive development, which involves the process of learning, understanding, and developing cognitive skills such as problem-solving, creativity, and analytical thinking. When a parent or guardian can provide access to quality education, including formal education, stimulating learning opportunities, and a supportive learning environment, they provide a strong foundation for a child's cognitive abilities. Children with adequate education tend to have better thinking skills, broader knowledge, and communication skills. They also have a better

chance of developing cognitive skills that are essential for succeeding in life. In addition, adequate education is also related to developing social skills, language acquisition, and adaptability.

A person's level of happiness has a positive influence on their cognitive abilities. Happiness is a subjective condition involving positive feelings, satisfaction, and well-being. Research has shown that happier individuals tend to have better cognitive abilities. When people are happy, their brains experience positive changes, including increased blood flow to areas of the brain associated with cognition. It can improve thinking skills, memory, focus and problem-solving. In addition, happiness is also associated with lower stress levels, which can inhibit cognitive function. When people feel happy, they tend to have lower stress levels, contributing to better cognitive performance. In addition, happiness can also affect motivation and interest in learning, improving cognitive abilities [23-25].

Table 16. The influence of one's ability to sufficient food needs on cognitive ability

Linear regression						
				Number of obs. = 1,444 F (3,6125) = 9.57 Prob > F = 0.0000 R-squared = 0.0194 Roor MSE = 18.947		
Score_n	Coef.	Robust Std. Err.	t	P> t 	[95% Conf. Interval]	
2 : It is just adequate for their needs	7.283452	2.064322	3.53	0.000	3.234051	11.33285
3 : It is more than adequate for their needs	10.32953	2.054539	5.03	0.000	6.299321	14.35974
8 : Don't Know	12.49722	10.58986	1.18	0.238	-8.280493	33.26593
_cons	61.03669	1.927011	31.67	0.000	57.25664	64.81674

Table 17. The influence of someone's ability to adequate health care on cognitive ability

Linear regression						
				Number of obs. = 1,444 F (2,1444) = . Prob > F = . R-squared = 0.0067 Roor MSE = 19.07		
Score_n	Coef.	Robust Std. Err.	t	P> t 	[95% Conf. Interval]	
2 : Good care	4.341561	1.80466	2.41	0.016	0.8015164	7.881606
3 : Very good care	5.740523	1.821012	3.15	0.002	2.168402	9.312644
8 : Don't Know	-5.737705	1.652184	-3.47	0.001	-8.97865	-2.49676
_cons	64.56123	1.652184	39.08	0.000	61.32029	67.80218

Table 18. The influence of one's ability to sufficient education on cognitive ability

Linear regression						
				Number of obs. = 1,444		
				F (3,1440) = 6.37		
				Prob > F = 0.0003		
				R-squared = 0.0132		
				Roor MSE = 19.007		
Score_n	Coef.	Robust Std. Err.	t	P> t 	[95% Conf. Interval]	
2 : Good care	6.237221	1.93811	3.22	0.001	2.435401	10.03904
3 : Very good care	7.759608	1.951405	3.98	0.000	3.931707	11.58751
8 : Don't Know	10.6504	2.932883	3.63	0.000	4.897221	16.40358
_cons	62.62976	1.792409	34.94	0.000	59.11375	66.14577

Table 19. The effect of someone's happiness on cognitive ability

Linear regression						
				Number of obs. = 6,129		
				F (3,6125) = 6.68		
				Prob > F = 0.0002		
				R-squared = 0.0045		
				Roor MSE = 18.052		
Score_n	Coef.	Robust Std. Err.	t	P> t 	[95% Conf. Interval]	
2 : Happy	1.40469	0.6701526	2.10	0.036	0.0909555	2.718425
3 : Unhappy	-0.0605686	1.222231	-0.05	0.960	-2.456571	2.335434
4 : Very unhappy	-11.90384	3.498788	-3.40	0.001	-18.7627	-5.044988
_cons	72.26799	0.6193304	116.69	0.000	71.05388	73.48209

4. CONCLUSION

Education is a basic need that all people must obtain. To measure the success of students, one of which can be seen through the cognitive abilities of students. The results of this study indicate that family welfare plays a major role in students' cognitive abilities. Diverse family welfare results in disparities between students. Therefore, a program is needed to overcome the welfare gap so students can obtain optimal quality education. One effort that can be built by the government is to provide a free online portal that the whole community can enjoy. This effort can also develop economic aspects for the development of features and social aspects if there are service providers who wish to share knowledge for free with the surrounding community, both online and offline.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard guideline participant consent and

ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Lomu L, Widodo SA. The effect of learning motivation and learning discipline on students mathematics learning achievement; 2018.
2. Sudarsana IK. Improving the quality of out-of-school education in efforts to develop human resources. *Journal of Quality Assurance*. 2015;1(1):1–14.
3. Rini YS, Tari JPS. Education: Nature, purpose, and process. Yogyakarta: Education and Arts, State University of Yogyakarta; 2013.
4. Purba S, Sandalwood W, Darmawati D, Salamun S, Kato I, Prijanto JH, et al. Educational leadership. Our Writing Foundation; 2021.
5. Ginting R, Haryati T. Leadership and the context of improving the quality of

- education. CIVIS: Scientific Journal of Social Sciences and Citizenship Education. 2012;2(2).
6. Subianto J. The role of family, school and community in the formation of quality character. *Edukasia: Journal of Islamic Education Research*. 2013;8(2).
 7. Al-Jawi MS. Education in Indonesia: Problems and solutions. Paper in the National Seminar on Portraits of Indonesian Education: Between Concepts of Reality and Solutions, Organized by Ukhwah Forum and Islamic Studies (FUSI) State University of Malang. 2006;7.
 8. Chotima C. The influence of financial education in the family, socio-economic parents, financial knowledge, spiritual intelligence, and peers on the personal financial management of S1 students of accounting education, Faculty of Economics, Surabaya State University. *Journal of Accounting Education (JPAK)*. 2015;3(2).
 9. Santana FDT, Zahro IF. The relationship between family involvement and the social-financial education ability of children aged 5-6 years. *Golden Generation: Journal of Early Childhood Islamic Education*. 2020; 3(1):1–7.
 10. Irianto HA. Education as an investment in the development of a nation. Golden; 2017.
 11. Agung I, Capnary MC, Zuhdi W, Sofyatiningrum E, Hidayati S, Ahmad I, Iskandar ML. Impact of learning from home on mental, emotional conditions, psychological well-being, and student learning outcomes: A case study. *Journal of Management Information & Decision Sciences*. 2022;25.
 12. Bergstrom K, Özler B. Improving the well-being of adolescent girls in developing countries. *The World Bank Research Observer*. 2023;38(2):179–212.
 13. Kiuru N, Wang MT, Salmela-Aro K, Kannas L, Ahonen T, Hirvonen R. Associations between adolescents interpersonal relationships, school well-being, and academic achievement during educational transitions. *Journal of Youth and Adolescence*. 2020;49:1057–72.
 14. Calverley TA, Ogoh S, Marley CJ, Steggall M, Marchi N, Brassard P, Lucas SJE, et al. Hitting the brain with exercise: Mechanisms, consequences and practical recommendations. *The Journal of Physiology*. 2020;598(13):2513–2530.
 15. Drigas A, Mitsea E. Metacognition, stress-relaxation balance & related hormones. *int. J. Recent Contributions Eng. Sci. IT*. 2021;9(1):4–16.
 16. Zhang F, de Dear R, Hancock P. Effects of moderate thermal environments on cognitive performance: A multidisciplinary review. *Applied Energy*. 2019;236:760–777.
 17. Costello SE, Geiser E, Schneider N. Nutrients for executive function development and related brain connectivity in school-aged children. *Nutrition Reviews*. 2021;79(12):1293–1306.
 18. Desai G, Barg G, Vahter M, Queirolo EI, Peregalli F, Mañay N, et al. Executive functions in school children from Montevideo, Uruguay and their associations with concurrent low-level arsenic exposure. *Environment International*. 2020;142:105883.
 19. Shokrkon A, Nicoladis E. The directionality of the relationship between executive functions and language skills: A literature review. *Frontiers in Psychology*. 2022; 13:848696.
 20. Jirout J, LoCasale-Crouch J, Turnbull K, Gu Y, Cubides M, Garziane S, et al. How lifestyle factors affect cognitive and executive function and the ability to learn in children. *Nutrients*. 2019;11(8):1953.
 21. Obradović J, Willoughby MT. Studying executive function skills in young children in low-and middle-income countries: Progress and directions. *Child Development Perspectives*. 2019;13(4): 227–234.
 22. Rafiei Milajerdi H, Sheikh M, Najafabadi MG, Saghaei B, Naghdi N, Dewey D. The effects of physical activity and exergaming on motor skills and executive functions in children with autism spectrum disorder. *Games for Health Journal*. 2021;10(1):33–42.
 23. Sutarto S, Sari DP, Fathurrochman I. Teacher strategies in online learning to increase students interest in learning during the COVID-19 pandemic. *Journal of Counseling and Education (JKP)*. 2020;8(3):129–137.
 24. Widana IW, Sumandya IW, Sukendra IK, Sudiarsa IW. Analysis of conceptual understanding, digital literacy, motivation, divergent thinking, and creativity on the teachers' skills in preparing hot-based assessments. *Journal of Advanced*

- Research in Dynamical and Control Systems-JARDCS. 2020;12(8):459–466.
25. Yu Z, Gao M, Wang L. The effect of educational games on learning outcomes, student motivation, engagement and satisfaction. Journal of Educational Computing Research. 2021;59(3):522–546.

© 2023 Faradiba; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/103586>