Research Article doi: 10.12973/ijem.6.3.507

International Journal of Educational Methodology
Volume 6, Issue 3, 507 - 515.
ISSN: 2469-9632
http://www.ijem.com/

The Role of Adversity Quotient in the Field of Education: A Review of the Literature on Educational Development

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Received: February 18, 2020 ▪ Revised: June 4, 2020 ▪ Accepted: July 24, 2020

Abstract: Adversity Quotient is a person's response to overcoming obstacles or problems. Barriers experienced, and the ability to overcome these obstacles vary in each person. This study was a literature review study focusing on adversity quotient in the field of education. This study reviewed several manuscripts that concentrated on research design, type of participants, and the critical role of adversity quotient in the field of education. A total of 18 articles were analyzed by exploring and reviewing manuscripts from trusted database journals, namely Scopus, Science Direct, and ERIC. This review explored three aspects of educational adversity quotient publications, including 1) the type of research design used in research related to adversity quotient in the field of education, 2) the types of participants chosen in research related to adversity quotient, and 3) the role of adversity quotient in education. Based on the results of manuscript reviews, adversity quotient research shows a great influence in the field of education. Research on adversity quotient shows that 1) descriptive and experimental research is the most commonly used design; 2) research participants in adversity quotient research are dominated by students, especially university students; 3) the role of adversity quotient is much shown in learning outcomes in the field of skills.

Keywords: *Adversity quotient, role, education, review.*

To cite this article: Juwita, H. R., Roemintoyo, & Usodo, B. (2020). The role of adversity quotient in the field of education: A review of the literature on educational development. *International Journal of Educational Methodology*, *6*(3), 507-515. https://doi.org/10.12973/ijem.6.3.507

Introduction

The life of each person is never free from difficulties or obstacles that are different in each person. This problem can arise from family's relationships of husband and wife as well as parents with children, social relations in the community and friends, work relationships between employees and superiors, as well as fellow colleagues, and so forth. Difficult situations or circumstances that bring challenges in people's lives are called adversity (Sigh & Sharma, 2017). Whereas, the attitude or response of someone in looking at a problem is known as Adversity Quotient.

According to Stoltz (1997), there are three concepts of adversity quotient, including a conceptual framework for understanding and increasing success, a measure to determine the response to difficulties, and equipment to improve responses to difficulties. Phoolka (2012) and Hidayat (2017) suggested that adversity quotient is intelligence owned by people, to achieve success based on the response to the problems they face. Meanwhile, according to Hastuti et al. (2018) and Wardani and Mahmud (2019), adversity quotient is the ability to survive facing difficulties in life and efforts to solve them. Therefore, adversity quotient can be said as a person's response to survive toward difficulties or problems in his efforts to achieve success by utilizing his potential. Thus, adversity quotient is often used to determine job performance (Thi, 2007; & Tripathi, 2011), or job performance stress (Singh & Sharma, 2017).

The response given to situations, conditions, problems, and emotions will affect someone in solving problems. Someone who responds to difficulties as an opportunity to improve their abilities will show motivation and effort in overcoming their difficulties (Dina et al., 2018). Meanwhile, someone who responds difficulties as something that threatens will face failure that causes him to experience frustration and uncertainty (Astri & Latifah, 2017).

To find out the resilience or level of adversity quotient in facing difficulties, an assessment is carried out using four main dimensions of adversity quotient, namely CO_2RE (Stoltz, 1997).

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1. Control is the ability of a person to control his/her circumstances and him/herself when facing problems
2. Origin is the ability of a person to see where the source of the problem is
3. Ownership is how a person recognizes the consequences arising from the problem
4. Reach is a person's perspective on problems and aspects of his life
5. Endurance is a person's perspective regarding the time period when a problem occurs

The results of this assessment will determine a person's position, whether that person is included in the group of quitters, campers, or climbers (Stoltz, 1977). Quitters (those who stop) are groups of people who tend to have no desire to face challenges or problems that produce an opportunity. Campers (those who camp) are groups of people who accept and are willing to face problems, but they do not like to take risks and give up easily in dealing with existing problems. Meanwhile, the climbers (those who climb) are a group of people who are brave and willing to face the risk of the problems they face. The climber does not look at the abilities or skills he has but instead strives to achieve his goals in solving the problem.

Quitters have some characteristics such as a) Having little or no control over the situation and giving up easily. Quitters tend to be less enthusiastic and give up easily in the face of problems. b) Ignoring responsibilities. Quitters do their job only as necessary, just to reduce the existing task. c) Feeling like a victim and feeling helpless. Quitters tend to feel inferior and see themselves unable to solve existing problems so that they often complain. d) Allowing failures that occur so that it becomes destructive. Quitters usually prefer to avoid challenges and, if they face a problem, they tend to fail but there is no desire to fix it. e) Seeing adversity as an infinite/permanent burden. Quitters negatively view difficulties as burdens they cannot overcome so they always depend on others.

Campers have characteristics such as a) Having good enough control. Campers have enough ability to understand the situation/problem they are experiencing and can determine the right course of action in overcoming it. b) Having responsibilities. Campers begin to realize the task and have a sense of responsibility in completing the task/problem. c) Having the will to try to overcome the difficulties that exist. Campers have the enthusiasm and willingness to overcome problems even though sometimes they also give up quickly in dealing with the problem. d) Seeing adversity as something that needs to be overcome. Campers realize the problems they face will not disappear if they are not dealt with, so they begin to determine ways to overcome each existing problem.

Climbers have the following characteristics: a) Having great control and influence in a difficult situation. Climbers have a good ability to understand and deal with problems and can determine the best way to overcome the problem. b) Influencing other people. Climbers can direct people around to follow them, contribute to them in solving problems. c) Having a great responsibility in dealing with difficult situations. Climbers view problems as something that must be resolved so that they will not stop before the problems they face are finished. d) Viewing failures and challenges as something that must be surpassed. The failure faced by climbers does not break their spirits but encourages them in trying even harder. e) Not letting health affect aspects of work and life. Because of his high enthusiasm for solving problems, climbers never stop trying even in a state of poor health. f) Having the ability to see and get through difficulties. Climbers can see how much difficulty they face, see the opportunities that exist, and determine the right steps in overcoming the difficulty. g) Able to maintain hope and optimism. Climbers respect themselves well so that they have confidence and an optimistic attitude in dealing with various problems.

Education, as part of a person's life, also cannot be considered without difficulty. Education itself is seen as an effort to create desirable behavior, either cognitive, affective, and social (Sahin, 2019). In creating the desired behavior, there will undoubtedly be challenges that must be overcome to achieve the desired goals. Through education, one can take advantage of opportunities and overcome changes in the environment (Shultz, as cited in Listiawati & Sebayang, 2019).

In the field of education, adversity quotient can provide a promising role Adversity quotient can be used to determine the response and ability to survive in the face of difficulties in those related to education fields, such as teachers, administrative staff, student guardians, or children. Several studies of teachers and school administrators showed adversity quotient related to leadership skills (Baroa, 2015). On the other hand, adversity quotient is one of the internal factors that influence children's success (Rahayu & Istiani, 2019). Several studies conducted on students showed adversity quotient related to achievement motivation (Cornista & Macasaet, 2013), cognitive (Pangma et al., 2009), social skills (Maureen, 2015), and academic performance (Huijuan, 2009; Canivel, 2010). Other research showed differences in thought processes (Fauziyah et al., 2013), making interpretations (Suryaningrum et al., 2020) and generalization (Aryani et al., 2018) on quitters, campers, and climbers.

Literature reviews about adversity quotient in the field of education are still scarce, especially those published in Scopus, Science Direct, and ERIC databases. This review explored three aspects of educational adversity quotient publications, including 1) the type of research design used in research related to adversity quotient in the field of education, 2) the types of participants chosen in research related to adversity quotient, and 3) the role of adversity quotient in education.

Method

Research Purposes

The purpose of this study was to systematically review the application of adversity quotient in the field of education. This systematic review covered three aspects of educational adversity quotient publications, namely the type of design research, the type of participant, and the role of adversity quotient in the field of education.

Sampling and Data Collection

The manuscript focused on the application of adversity quotient in the field of education published in the journals of Scopus index, Science Direct, and ERIC. Search for relevant manuscripts was done by searching using the keywords "Adversity Quotient" and "Adversity Quotient and Education." The manuscript was then chosen based on ease of access and download. The main focus of this review was to explore all types of manuscripts that discussed the application of adversity quotient in the field of education.

Table 1. The criteria for inclusion and exclusion

Inclusion	Exclusion
Adversity quotient in education	Adversity quotient outside education
Written in English	Written in a language other than English
The research design is clear	The research design is not clear
Complete findings and conclusions	Findings and conclusions are incomplete

The final search for manuscripts relating to adversity quotient in the field of education obtained 18 articles in the last ten years. The article was collected from three journal databases, 14 from Scopus, 1 from Science Direct, and 3 from ERIC. Some manuscripts could not be accessed for free but were accessed from the university database. This review took data manuscripts that focused on the type of research design, participants, and the role of adversity quotient.

Data Analysis

This review data was obtained from manuscripts related to adversity quotient in the field of education attained from three journal databases. Data analysis was performed by the Tesch step (as cited in Yuliono et al., 2018). This data analysis included eight stages, including 1) taking the essence of all data, 2) taking one document (considering understanding and recording concepts), 3) registering, grouping, and classifying topics, 4) coding text, 5) taking the most descriptive phrases and classifying, 6) abbreviating categories and sorting, 7) compiling the code and making a preliminary analysis, and 8) recoding (if needed).

Finding/ Results

Type of Research Design Used in the Research of Adversity Quotient in the Field of Education

Many research designs can be used in a study. This review went over the research designs used by researchers. The manuscripts used were only those that clearly stated the research design. Table 2 shows some of the research designs used in adversity quotient research in the field of education.

Table 2. Type of Research Designs

Research Design	Number of Manuscript	Percentage	Sample
Descriptive	8	44.44%	Purnamasari et al. (2019)
Experiment	5	27.78%	Dewanto et al. (2019)
Survey	2	11.11%	Suryadi & Santoso (2017)
Correlation	1	5.56%	Hidayat, Noto et al. (2019)
Case study	1	5.56%	Hastuti et al. (2018)
Cross-sectional	1	5.56%	Tian & Fan (2014)

Table 2 shows the use of varied research designs in adversity quotient research in education. The most widely used research design was Descriptive study (44.44%). The second most research design after the descriptive study was Experimental (27.78%). Then, there was a survey research design (11.11%), followed by Correlational (5.56%), Case study (5.56%), and Cross-sectional (5.56%).

Types of Participants in the Adversity Quotient Research in the Field of Education

This review was to reexamine research studies and obtain data related to research participants. Based on the results of the review, it was known that research on adversity quotient in the field of education involved a lot of participants from among students.

Table 3. Types of participants

Participant	Number of Manuscript	Percentage	Sample
Elementary school students	1	5.56%	Suryaningrum et al. (2020)
Junior high school students	6	33.33%	Purnamasari et al. (2019)
High school students	4	22.22%	Darmawan et al. (2019)
University students	7	38.89%	Shipai (2015)

Table 3 presents that the most used study participants were university students (38.89%). The use of university students in measuring adversity quotient was closely related to the field of work they would do in the future. For prospective teachers, the measurement of adversity quotient was employed to determine the relationship with understanding the material (Hidayat et al., 2019) and the ability of the fields (Hidayat et al., 2018b) they had. In addition to university students, there were also participants from junior high school students (33.33%), high school students (22.22%), and elementary school students (5.56%). Based on the results of a review of research participants, it showed that research adversity quotient in the field of education focused a lot on students.

The role of Adversity Quotient identified from Adversity Quotient research related to the Field of Education

A study has an outcome, which provides input in knowledge. In this review, determining the role of adversity quotient in education was carried out by identifying the findings, discussions, and conclusions of each manuscript. Based on several manuscripts, it was known that adversity quotient played a role in learning outcomes, which included achievement, positive attitude, skill, knowledge, and understanding.

Table 4. Role of Adversity Quotient in Education

Category	Number of Manuscript	Percentage	Sample
Achievement	3	16.67%	Suryadi & Santoso (2017)
Positive attitude	1	5.56%	Shipai (2015)
Skills	9	50.00%	Hulaikah et al. (2020)
Knowledge and understanding	5	27.78%	Hidayat, Noto et al. (2019)

Table 4 indicates that the role of adversity quotient was most on ability (50.00%). The abilities associated with adversity quotient included adaptability (Tian & Fan, 2014) and creative thingking abilities (Putri et al., 2019). Furthermore, the most common role was found in knowledge and understanding (27.78%), followed by achievements (16.67%), and a positive attitude (5.56%).

Shiphai (2015) conducted descriptive research on students at Rajabhat University in the Northeast region of Thailand by collecting data using adversity questionnaires based on the concept of the Stoltz adversity quotient. This questionnaire consists of 28 items based on assessing the aspects of controlling problem, finding out the cause and owner of the problem, evaluating the problem effectively, and coping with the problem continuation. Shipai concluded that adversity quotient had a great influence on the development of good citizenship. Adversity quotient helps to control oneself in the face of uncertainty and difficulties to shape the character of the self as a good citizen in communities, societies, and nations.

Another descriptive study was conducted by Darmawan et al. (2019) at a vocational high school in Gunungkidul Regency of Yogyakarta with tenth-grade student participants. Data collection was performed using an adversity quotient questionnaire consisting of 40 statement items. Darmawan et al.'s research concluded that students with climber-type adversity quotient had better mathematics learning achievement than those with camper- and quitter-type adversity quotients. Similarly, camper students have better mathematics learning achievement than quitter students.

Nahrowi et al. (2020) also conducted a similar study on the tenth grades of students of Mathematics and Science Studies of state senior high schools, and the data collection was done by questionnaire. The results of their research show that quitter and camper students do not meet the qualifications of creative thinking skills while climber students demonstrate creative thinking skills both in fluency and flexibility.

At the junior high school level, it was obtained that descriptive research was carried out by several researchers. Dina et al. (2018) conducted a descriptive study on junior high school students in Surabaya city, Indonesia by collecting data

using Adversity Response Profile (ARP). This study concludes that climber students show good flexibility and ability to deal with difficulties, camper students are less able to show flexibility because they are unable to deal with difficulties in the second strategy, and quitter students cannot show flexibility because they only use one strategy in solving problems.

Other research by Putri et al. (2019) was also carried out on the seventh-grade students using the ARP instrument to collect the data. This study shows that there are differences in the ability to think creatively in students with adversity quotient types of climbers, campers, and quitters. Climber and camper students show moderate creative thinking skills while quitter students show low creative thinking skills.

Meanwhile, descriptive research by Aryani et al. (2018) was carried out on the eighth-grade students using adversity quotient questionnaires to collect the data. Aryani et al. conclude that there are differences in algebraic reasoning abilities in students with adversity quotient types of quitters, campers, and climbers. In quitter students, problem-solving is done by the pattern recognition and generalization of the solution. In camper students, problem-solving is done by understanding abstraction, finding patterns (drawing lines of a cube), and generalizing by finding the similarities in the relationships of each element of the pattern. For climber students, problem-solving is done by finding patterns (drawing cube rows) and formulating patterns through analyses and general conclusions that are known.

In line with Aryani et al., a descriptive study of Purnamasari et al. (2019) was also conducted on the eighth grade of junior high schools in the Karanganyar area by collecting the data using an adversity quotient questionnaire. The results of this study conclude that there are differences in reflective thinking processes in students with adversity quotient types of climbers, campers, and quitters. Reflective thinking in defining the problem in climbers includes analyzing problems, selecting categories, analyzing information, giving solutions, choosing solutions, implementing solutions, and analyzing feedback. Their reflective thinking is only in the stage of analyzing information, providing solutions, and implementing solutions.

At the elementary level, Suryaningrum et al. (2020) conducted a descriptive study of semantic reasoning. Suryaningrum concludes that, in semantical reasoning, there are differences in how to interpret signs, look for signs, and find the nature of flat builds on the three types of adversity quotient. Quitters found two characteristics of a flat figure which were then used to conclude. Campers found four characteristics of a flat shape, but only two characteristics were used to make conclusions. The characteristics used by campers are more specific than the conclusions made by quitters, while climbers found six characteristics of flat shape and made conclusions with the four characteristics they obtained.

Other studies were conducted with surveys such as the study of Suryadi and Santoso (2017) in the ninth-grade students of MTs Pembangunan UIN Jakarta by collecting data using a questionnaire of 39 items with a 4-point Linkert scale adapted from Stoltz. The questionnaire used contained four dimensions of adversity quotient (control, origin, and ownership, reach, and endurance). In their research, Suryadi and Santoso concluded that there was a significant effect from the aspect of adversity quotient (CO_2RE) on students' mathematics learning outcomes specified in the dimensions of control, origin, and ownership.

Wardani and Mahmudi (2019) with a similar research design researched tenth-grade students in vocational high schools in Jakarta by collecting data using a closed questionnaire consisting of 60 statement items with a 5-point Linkert scale. This study concludes that, when facing difficulties in learning mathematics, climber students have a strong desire so that they struggle to face difficulties until successfully understanding the concepts that exist. Camper students have the strength to struggle quite well in learning mathematics while quitter students have struggled quite well in learning mathematics but, they quickly give up when experiencing difficulties and understanding concepts.

In addition to descriptive and survey research designs, an experimental research design was obtained on adversity quotient in the field of education. Hidayat et al. (2018b) conducted their research on prospective mathematics teachers in the city of Cimahi, West Java, Indonesia, by collecting data using an adversity quotient questionnaire with a 4-point Linkert scale. This study concludes that adversity quotient has a positive impact on the development of mathematical argumentation abilities of pre-service mathematics teachers. Mathematical argumentation abilities of climber students show a good thinking process and contain data, claims, warranties, supporting arguments, and disclaimers. The camper students show the ability to understand concepts well but the thinking process is still based on memorization (imitative reasoning) while quitters still find difficulties in understanding the concepts and disclaimers that are given contrary to the results provided (guarantee provided).

The same study by Hidayat et al. (2018a) with experimental designs on prospective mathematics teacher students in the city of Cimahi regarding mathematical creative reasoning concludes that adversity quotient affects the level of students' mathematical creative reasoning. Students with quitter-type adversity quotient tend to have difficulty and give up easily in solving problems while camper and climber students tend to be careful and try to double-check the solutions provided.

Furthermore, Hidayat and Husnussalam (2019) experimented on prospective mathematics teachers in the city of Cimahi, West Java, Indonesia, concluding that adversity quotient had a positive influence on the development of

mathematical understanding abilities. The ability to understand mathematics of climber students is better than the campers and quitters.

Experimental research was also conducted on university vocational diploma students in Indonesia by Hulaikah et al. (2020) by collecting data using Student Adversity Quotient Profile (SAQP) consisting of 20 statements with a 5-point Likert scale containing four indicators of adversity quotient (CO_2RE). The research of Hulaikah et al. concludes that students with high adversity quotient have better problem-solving skills than students with low adversity quotient. They show better performance by clearly describing the problem, listing possible steps to answer the problem, setting the correct steps for the solution, and checking the answers.

Besides, there is also an experimental study by Dewanto et al. (2019) on vocational school students in Gunungkidul by collecting data using an adversity quotient questionnaire consisting of 40 items. This study concludes that climber students have better mathematics learning achievement than campers and quitters. Camper students have better mathematics learning achievement than quitters.

Another study by Hidayat, Noto et al. (2019) used a correlational research design conducted on prospective mathematics teachers in the city of Cimahi by collecting data using an adversity quotient questionnaire with a 4-point Linkert scale. They conclude that adversity quotient has a positive influence on mathematical understanding skills. Quitter students have not yet shown a good understanding process where quitter students have difficulty understanding existing concepts and giving opinions.

Hastuti et al. (2018) stated their findings through case study research in Regina Pacis Junior High School students in Surakarta using an adversity quotient questionnaire consisting of 20 supporting and 20 non-supporting statements. The results showed that students with high adversity quotient (climbers) had high achievement motivation and were able to deal with mathematics learning in a variety of materials and with different learning models.

Besides, there is an interesting cross-sectional research design in adversity quotient research in the field of educational research. This study was conducted by Tian and Fan (2014) on nursing students from a state university in the Shandong province of China by collecting data using ARP with a five-point bipolar scale. The results showed that adversity quotient was associated positively with student nurses' career adaptability.

Discussion

Based on the description of some of the manuscripts above, there are variations in the selection of research designs used which indicate that adversity quotient is increasingly considered in research, especially in the field of education. This is because the ability to measure adversity quotient is considered better for knowing one's success. Thus, it does not rule out the possibility that in the future there will be other studies that use research designs that are different from those used by some of the researchers above. Judging from the research participants' adversity quotient in the field of education, the manuscripts above tend to focus on students. This is because students are the main and central subjects in learning activities so that a lot of research uses students as participants (Kartikaningtyas et al., 2018). However, adversity quotient research in the field of education is not limited to students, it can be developed more broadly for both teachers, school staff, and parents.

The use of adversity quotient instruments in adversity quotient research in the field of education was adapted from Stoltz with several changes. This can be seen from the different statements, the number of statement items, and the scale used by researchers in the adversity quotient instrument. Nevertheless, each instrument is still based on Stoltz's adversity quotient dimension theory, namely control, origin, and ownership, reach, and endurance (CO_2RE).

Each of the research results above shows positive results related to adversity quotient where adversity quotient affects character building and student learning outcomes. At the level of adversity quotient, climber students show a better ability to struggle with difficulties. Climbers have a strong desire and motivation to solve their difficulties so that they have better potential than campers and quitters. Climbers can analyze the situation in-depth and determine steps/conclusions that are systematic and specific. Camper students also show the ability to struggle in the face of difficulties, but they are still not persistent in fighting so that, when the difficulties they face feel heavy, they will give up. Campers have not been able to maximize their potential and achievements; they are easy to be satisfied with the results they get. They can do a good analysis and determine steps/conclusions even though still limited. Quitter students fighting less persistently than climbers or campers, so they give up quickly when facing difficulties. Quitters have not been able to do the analysis independently; they need the help of others in analyzing or determining steps/conclusions on a process/concept. Quitters need guidance in developing their potential.

This reinforces the view that adversity quotient can be used to determine one’s ability to control and solve problems (Nahrowi et al., 2020). Therefore, actions can be taken in accordance with the needs of students as directed guidance to students to improve their adversity quotient (Listiawati & Sebayang, 2019). Through directed guidance, adversity quotient can be improved to provide opportunities for students to achieve success by taking advantage of weaknesses and making improvements.

Conclusion

Adversity quotient, as a response in facing difficulties to achieve success, had a significant influence on a person. Based on the results of manuscript reviews from several journal databases, adversity quotient research shows a great influence in the field of education. Research on adversity quotient shows that 1) descriptive and experimental research is the most commonly used design; 2) research participants in adversity quotient research are dominated by students, especially university students; 3) the role of adversity quotient is much shown in learning outcomes in the field of skills. The application of adversity quotient in the field of education provides information on one's poor resilience so that follow-up can be determined according to the needs of each individual in developing their abilities.

Suggestion

Current education not only focuses on Intelligence Quotient (IQ) but also develops Emotional Quotient (EQ) and Spiritual Quotient (SQ). It is because intelligence is not the main factor that brings success to someone. This review provides a new picture of another success factor in the form of using the adversity quotient. Looking at the results of this review, it is hoped that other studies can be developed with more varied research designs related to adversity quotient in the field of education. The application of adversity quotient in the field of education that focuses on students can be used to develop the character of students so that they have a strong mentality in the face of difficulties. In addition, adversity quotient can provide an overview of individual abilities so that activities and learning can be determined in accordance with needs and develop the capabilities of individuals.

Limitation

This review has limitations, in which it could not analyze all manuscripts due to limitations on access, and some manuscripts were not written in English. Besides, this review was still limited to the three journal databases studied. It is expected that future researchers will be able to understand and analyze manuscripts written in languages other than English and review other journal databases to provide further information about adversity quotient. Participants reviewed in this manuscript are still limited to students so that future researchers are expected to review not only students but also teachers and education staff.

Reference

Aryani, F., Amin, S. M., & Sulaiman, R. (2018). Students' algebraic reasonsing in solving mathematical problems with adversity quotient. *Journal of Physics: Conference Series*, *947*(1), 1-5. https://doi.org/10.1088/1742-6596/947/1/012044

Astri, W., & Latifah, L. (2017). Pengaruh personal attributes, adversity quotient dengan mediasi self efficacy terhadap minat berwirausaha [Effect of personal attributes, adversity quotient with self efficacy mediation towards entrepreneurial interest]. *Economic Education Analysis Journal*, *6*(3), 737–751.

Baroa, E.D. (2015). *Adversity quotient and leadership skills of school administrators: basis for leadership enhancement program* [Unpublished masters' thesis]. Philippine Normal University Visayas.

Canivel, L.(2010). *Principals' adversity quotient: styles, performance and practices* [Unpublished master's thesis]. University of the Philippines, Diliman.

Cornista, G., & Macasaet, C. (2012). *Adversity quotient and achievement motivation of third year and fourth year psychology students of De La Salle Lipa* [Unpublished master's thesis]. College of Education, Arts and Sciences De La Salle Lipa.

Darmawan, M., Budiyono, B., & Pratiwi, H. (2019). Mathematics learning achievement of vocational high school students' viewed by adversity quotient. *Journal of Physics: Conference Series*, *1157*(4), 1-8. https://doi.org/10.1088/1742-6596/1157/4/042121

Dewanto, M. D., Budiyono, & Pratiwi, H. (2019). The experiment of TAPPS, TSTS, and DL learning models viewed through adversity quotient in mathematics learning achievement. *IOP Conference Series: Earth and Environmental Science*, *243*(1), 1-10. https://doi.org/10.1088/1755-1315/243/1/012124

Dina, N. A., Amin, S. M., & Masriyah. (2018). Flexibility in mathematics problem solving based on adversity quotient. *Journal of Physics: Conference Series*, *947*(1), 1-5. https://doi.org/10.1088/1742-6596/947/1/012025

Fauziyah, I. N. L., Usodo, B., & Henny, E. Ch. (2013). Proses berpikir kreatif siswa kelas x dalam memecahkan masalah geometri berdasarkan tahapan Wallas ditinjau dari *adversity quotient* (AQ) siswa [The creative thinking process of tenth-grade students in solving geometry problems based on the Wallas stage reviewed of students' adversity quotient (AQ)]. *Journal of Mathematics Education Solutions/ Jurnal Pendidikan Matematika Solusi*, *1*(1c), 75–89.

Hastuti, T. D., Sari, D. R., & Riyadi. (2018). Student profile with high adversity quotient in math learning. *Journal of Physics: Conference Series*, *983*(1), 1-6. https://doi.org/10.1088/1742-6596/983/1/012131

Hidayat, W., & Husnussalam, H. (2019). The adversity quotient and mathematical understanding ability of pre-service mathematics teacher. *Journal of Physics: Conference Series*, *1315*(1), 1-5. https://doi.org/10.1088/1742-6596/1315/1/012025

Hidayat, W., Noto, M. S., & Sariningsih, R. (2019). The influence of adversity quotient on students' mathematical understanding ability. *Journal of Physics: Conference Series*, *1157*(3), 1-5. https://doi.org/10.1088/1742-6596/1157/3/032077

Hidayat, W., Wahyudin, & Prabawanto, S. (2018a). Improving students' creative mathematical reasoning ability students through adversity quotient and argument driven inquiry learning. *Journal of Physics: Conference Series*, *948*(1), 1-5. https://doi.org/10.1088/1742-6596/948/1/012005

Hidayat, W., Wahyudin, & Prabawanto, S. (2018b). The mathematical argumentation ability and adversity quotient (AQ) of pre-service mathematics teacher. *Journal on Mathematics Education*, *9*(2), 239–248. https://doi.org/10.22342/jme.9.2.5385.239-248

Hidayat, W. (2017). Adversity quotient dan penalaran kreatif matematis siswa SMA dalam pembelajaran argument driven inquiry pada materi turunan fungsi (Adversity quotient and mathematical creative reasoning of high school students in argument-driven inquiry learning on function derivatives material). *Journal of Mathematical Education Kalamatika/ Jurnal Pendidikan Matematika Kalamatika, 2*(1), 15-28.

Huijuan, Z. (2009). *AQ and academic performance among college students at St. Joseph College, Department of Psychology, Quezon city* [Unpublished undergraduate thesis]. St Joseph College.

Hulaikah, M., Degeng, I. N. S., Sulton, & Murwani, F. D. (2020). The effect of experiential learning and adversity quotient on problem solving ability. *International Journal of Instruction*, *13*(1), 869–884. https://doi.org/10.29333/iji.2020.13156a

Kartikaningtyas, V., KusmayadI, T. A., & Riyadi. (2018). The effect of brain based learning with contextual approach viewed from adversity quotient. *IOP Conf. Series: Journal of Physics: Conf. Series, 1022(1), 1-7*. https://doi.org/ 10.1088/1742-6596/1022/1/012014

Listiawati, N., & Sebayang, S. K. (2019). The association between sociodemographic factors and teachers' guidance towards students' adversity quotient. *International Journal of Education*, *11*(2), 109-116. https://doi.org/10.17509/ije.v11i2.15341

Maureen, M. (2015). *The level of adversity quotient and social skills of student leaders* [Unpublished undergraduate thesis]. College of Education, Arts and Sciences De La Salle Lipa.

Nahrowi, N., Susanto, & Hobri. (2020). The profile of student's creative thinking skills in mathematics problem solving in terms of adversity quotient. *Journal of Physics: Conference Series*, *1465*(1), 1-5. https://doi.org/10.1088/1742-6596/1465/1/012064

Pangma, R., Tayraukham, S., & Nuangchalerm, P. (2009). Causal factors influencing adversity quotient of twelfth grade and third-year vocational students. *Journal of Social Sciences*, *5*(4), 466–470.

Phoolka, S., & Kaur, N. (2012). Adversity quotient: A new paradigm in management to explore. *TIJ's Research Journal of Social Science & Management - RJSSM*, 109–117.

Purnamasari, F. E., Sujadi, I., & Slamet, I. (2019). Effect of adversity quotient of junior high school students on reflective thinking process in mathematical problem solving. *Journal of Physics: Conference Series*, *1321*(2), 1-5. https://doi.org/10.1088/1742-6596/1321/2/022128

Putri, I. W. S., Trapsilasiwi, D., Hobri, H., Oktavianingtyas, E., Safrida, L. N., & Aini, N. (2019). Creative thinking skill with adversity quotient based on lesson study for learning community. *Journal of Physics: Conference Series*, *1211*(1), 1-8. https://doi.org/10.1088/1742-6596/1211/1/012110

Rahayu, S., & Istiani, A. (2019). Experimentation on bamboo dancing learning model on student's mathematics learning outcomes viewed from adversity quotient (AQ). *Journal of Physics: Conference Series*, *1155*(1), 4–9. https://doi.org/10.1088/1742-6596/1155/1/012045

Sahin, U. (2019). Parents' participation types in school education. *International Journal of Educational Methodology*, *5*(3), 315–324. https://doi.org/10.12973/ijem.5.3.315

Singh, S., & Sharma, T. (2017). Affect of adversity quotient on the occupational stress of it managers in India. *Procedia Computer Science*, *122*, 86–93. https://doi.org/10.1016/j.procs.2017.11.345

Stoltz, P.G. (1997). *Adversity Quotient: Turning obstacles into opportunities*. John Wiley & Sons, Inc.

Sunan, S. (2015). Influences of moral, emotional and adversity quotient on good citizenship of Rajabhat Universitys Students in the Northeast of Thailand. *Educational Research and Reviews*, *10*(17), 2413–2421. https://doi.org/10.5897/err2015.2212

Suryadi, B., & Santoso, T. I. (2017). Self-efficacy, adversity quotient, and students' achievement in mathematics. *International Education Studies*, *10*(10), 12-19. https://doi.org/10.5539/ies.v10n10p12

Suryaningrum, C. W., et al. (2020). Semiotic reasoning emerges in constructing properties of a rectangle: A study of adversity quotient. *Journal on Mathematics Education*, *11*(1), 95–110. https://doi.org/10.22342/jme.11.1.9766.95-110

Thi, E.L. (2007). *Adversity quotient in predicting job performance viewed through the perspective of the big five* [Unpublished master's thesis]. University of Oslo.

Tian, Y., & Fan, X. (2014). Adversity quotients, environmental variables and career adaptability in student nurses. *Journal of Vocational Behavior*, *85*(3), 251–257. https://doi.org/10.1016/j.jvb.2014.07.006

Tripathi, S. (2011). *Use of adversity quotient in creating strong business leaders of tomorrow* [Unpublished doctoral dissertation]. SNDT Women's University, Mumbai.

Wardani, Y., & Mahmudi, A. (2019). A profile of vocational high school students' adversity quotient towards mathematics. *Journal of Physics: Conference Series*, *1320*(1), 1-6. https://doi.org/10.1088/1742-6596/1320/1/012062

Yuliono, T., & Rintayati, P. (2018). The promising roles of augmented reality in educational setting: a review of the literature. *International Journal of Educational Methodology*, *4*(3), 125–132. https://doi.org/10.12973/ijem.4.3.125