EDUHUMANIORA: Jurnal Pendidikan Dasar

Journal homepage: https://ejournal.upi.edu/index.php/eduhumaniora/

Teacher's Strategies in Fostering Motivation to Learn Mathematics Based on Behavioristic Theory in Malaysian Primary Schools

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ABSTRACT

This study aims to analyze teacher's strategies in fostering motivation to learn Mathematics based on behavioristic theory in Sekolah Rendah Islam Tahfiz Integrasi (SRITI) Malaysia and its impact on students' motivation to learn. This study uses a qualitative approach of the type of case study with observation, interview, questionnaire, and documentation techniques. The results of the study show that teachers apply the principles of behavioristic theory through the provision of reinforcement, punishment. The strategy triggers students' enthusiasm and active participation during Mathematics learning. Other findings suggest a combination of behavioristic theory with cognitive and constructivistic elements, where teachers provide opportunities for self-exploration and group discussion. In conclusion, the application of contextual behavioristic strategies can increase students' motivation to learn.

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ARTICLE INFO

Article History:
Submitted/Received 01 Oct 2025
First Revised 02 Dec 2025
Accepted 20 Dec 2025
First Available online 05 Jan 2026
Publication Date 01 Jan 2026

Keyword:
Learning motivation,
Mathematics,
Teacher strategy,
Theory behavioristics.

1. INTRODUCTION

Learning motivation is indispensable in classroom learning. Learning motivation can be interpreted as a motivation that is a factor in influencing students' interests and efforts in learning, both internally and externally. The interests and talents possessed by students are included in internal factors. Meanwhile, parental encouragement, learning environment, and teacher strategies are included in external factors (Riki & Kusno, 2023). Learning motivation, both internal and external, both affect each other in learning activities.

Learning motivation also plays an important role in the student learning process. When students are highly motivated, they show perseverance, curiosity, independence, and active participation, all of which are important indicators in learning Mathematics (Iqbal et al., 2021). Meanwhile, students who have low motivation usually have a decrease in enthusiasm in the learning process so that it will affect the desires and results achieved (Muslimin et al., 2024). In addition, learning is said to run optimally if there is reciprocity between students and teachers which is expected to produce high learning motivation (Nafida et al., 2024). High motivation to learn can make it easier for students in the learning process, especially in Mathematics subjects.

Mathematics is one of the subjects that is important to be taught starting from elementary school to higher levels. Mathematics learning has an important role in forming critical thinking skills to face life's challenges (Safari & Wicaksono, 2024). In other words, mastering Mathematics from an early age can help students solve problems in various real-world situations. This is in line with the opinion that Mathematics has an important role in solving problems that occur in daily life (Siswanto & Meiliasari, 2024). Therefore, learning Mathematics in elementary school is an important foundation in facing challenges and solving problems that students often experience.

Learning Mathematics in practice is often considered a difficult subject by most students. Many of them feel insecure when dealing with Mathematics problems (Tuljanah et al., 2021). This leads to low motivation in learning Mathematics, which negatively impacts students' academic success (Fitriani et al., 2023). Research at SD Negeri 5 Garut found that students' motivation to learn Mathematics is low influenced by a lack of interest in materials and a lack of external support which negatively impacts students' confidence (Firdaus, 2024). Similar findings also appeared at SD Negeri 4 Bringin, where only a few students showed interest and enthusiasm for Mathematics (Budi et al., 2024). The low motivation for this subject shows the importance of the role of teachers in fostering motivation to learn Mathematics in students.

Based on the results of observations in grade 3 at the Sekolah Rendah Islam Tahfiz Integrasi (SRITI) Malaysia, an interesting phenomenon was found, namely that students actually showed high motivation to learn. It is shown by students actively answering questions, daring to express opinions, and learning results during exams are also good according to Mathematics teachers. This condition is interesting to be researched further because it shows the existence of effective teacher strategies in fostering student learning motivation, especially in Mathematics learning in elementary school.

In the context of learning, teachers have a strategic role in designing interesting and meaningful learning. Teachers are tasked with planning and developing strategies, learning media, and methods needed to foster students' motivation to learn. Teachers' strategies also aim to achieve learning goals, including to foster student motivation (Futri et al., 2024). Teachers' strategies in fostering learning motivation can be explained through behavioristic theories, especially those put forward by B. F. Skinner. In behavioristic theory, learning is

DOI: http://dx.doi.org/10.17509/eh.v18i1.91783
p- ISSN 2085-1243 e- ISSN 2579-5457

understood through the stimulus-response principle, where behavior is influenced by reinforcement or punishment *to* see changes in response or behavior (Hastiwi et al., 2021). Teachers' can use verbal praise, small gifts, points, or other positive reinforcement as a stimulus that motivates students to learn. Meanwhile, punishment is used to reduce inappropriate behavior (Manjani et al., 2025). Thus, behavioristic theory is used as a basis to understand how teachers' strategies can foster student learning motivation.

Several previous studies have also reinforced the importance of teachers' strategies in fostering learning motivation. Previous research mentions seven teacher strategies to foster students' motivation to learn, but has not yet used the point of view of behavioristic theory, only describing the form of strategy used by teachers (Putri & Mujazi, 2024). Another study stated that teachers' strategies based on behavioristic theory were effective in fostering learning motivation. For example, the provision of rewards has a significant influence on students' learning motivation in Indonesian learning in the first grade. When students are rewarded, students become happy and try to show a positive attitude, namely having a desire to learn and try new things (Putri et al., 2023). In addition, other research also confirms that rewards and punishments as educational aids are proven to be effective if applied correctly. If you give rewards and punishments too often, it is also not recommended because it makes the habit less profitable (Lena et al., 2023).

Based on the research, there are two research gaps. First, previous research that only discussed teacher strategies in general has not gone through behavioristic theory. Second, research that has used behavioristic theory but is still limited to rewarding and punishment, has not used behavioristic theory in its entirety. Therefore, this study focuses on teachers' strategies in fostering motivation to learn Mathematics in Malaysian primary schools based on behavioristic theory. This study can provide an overview of the real practice of teachers in the field, how their strategies arouse learning motivation through behavioristic theories implemented in the context of Mathematics learning in elementary schools.

This study not only describes the form of strategy used by teachers, but also looks at its impact on students' motivation to learn. However, this study also has some limitations, namely the research is only conducted in one school and one teacher as the main subject. So the results cannot be generalized to all schools. In addition, the limited observation time makes the observation not in-depth to the entire learning process. The results of the research are expected to contribute to the development of more effective mathematics learning strategies, not only in Malaysia but also in Indonesia, by combining behavioristic theory and other more contextual approaches.

2. METHODS

This study uses a qualitative approach of case studies, which aims to describe in depth the strategies of teachers in fostering motivation to learn Mathematics grade 3 at Sekolah Rendah Islam Tahfiz Integration (SRITI) Malaysia based on behavioristic theory. This approach is appropriate to understand the actions of teachers as they are in the classroom without any specific treatment, then relate them to behavioristic theories. The main data source in this study is 1 teacher who teaches Grade 3 Mathematics. Teachers are chosen as the main subjects because teachers are the direct implementers of learning strategies that affect students' learning motivation. Additional data obtained from 5 Grade 3 students as supporting informants to validate the results of observations. Documentation in the form of photos of student activities and learning outcomes was used to strengthen the findings.

DOI: http://dx.doi.org/10.17509/eh.v18i1.91783
p- ISSN 2085-1243 e- ISSN 2579-5457

Data collection techniques were taken through observation, interviews, questionnaires and documentation. Observation is carried out directly in grade 3 during Mathematics learning to observe the forms of teacher's strategies in fostering student learning motivation. The researcher paid attention to the way the teacher provided reinforcement, used media, and recorded the students' response to the action. Observations are carried out repeatedly to ensure the consistency of teacher behavior and the validity of the data.

In addition to observations, researchers also conducted interviews with teachers and students. Interviews with teachers are focused on what strategies are used in learning. Interviews with students aim to find out their responses to the strategies applied by teachers, for example how they feel when receiving praise, participating in a game, or getting a small prize. The interview is conducted in a semi-structured manner with guidelines that have been prepared and questions can develop following the answers from the speakers. In the interview process of teachers and students, the researcher recorded the interview process using a mobile phone, and then transcribed it for analysis. The questionnaire is used to find out students' perceptions of their learning motivation which is described in the form of statements in the table.

Documentation was used to complete observation, interview and questionnaire data. The data collected was in the form of photos of learning activities, videos, workbooks, and student learning outcomes. All of these documents serve to strengthen the validity of findings in the field. The research instruments were prepared based on two main aspects, namely teacher strategy indicators and learning motivation indicators. Learning motivation indicators are used as a reference in the preparation of observation and interview instruments so that the data obtained is relevant to the research objectives. The teacher strategy indicators were compiled by referring to the results of qualitative research on the impact of reward and punishment on the external motivation of elementary school students (Fauziddin et al., 2023). In addition, indicators were also developed from the principles of behavioristic theory and the results of the researchers' initial observations in the field, to suit the learning context in Malaysian primary schools, as shown in **Table 1** below.

Table 1. Indicators of teacher's strategies in fostering learning motivation based on behavioristic theory

No.	Aspects	Teacher Strategy Indicators	Instruments	Subject
1.	Providing positive reinforcement	Teachers give compliments, awards, or rewards for student learning outcomes such as verbal speech or in the form of items to reinforce positive learning behaviors.	Observation guides, interview guidelines, and questionnaire sheets.	Teacher and Students
2.	Negative reinforcement	Teachers reduce the workload or give certain freedom as a form of appreciation for students' efforts and discipline.	Observation guide	Teacher
3.	Pemberian *punishment*	The teacher gives reprimands or consequences to students to discipline and improve student behavior.	Observation guide	Teacher

DOI: http://dx.doi.org/10.17509/eh.v18i1.91783
p- ISSN 2085-1243 e- ISSN 2579-5457

4.	The use of media and stimuli is interesting	Teachers use media, learning videos, or challenging questions to engage students and elicit positive responses.	Observation, interview, and documentation guide	Teacher and Students
5.	Fun learning	Teachers hold games or challenges between groups to foster the spirit of learning and social cooperation.	Observation guide	Teacher and Students

In addition to teacher strategy indicators, this study also uses learning motivation indicators as a reference in the preparation of observation and interview instruments. This indicator helps researchers determine the focus of observations on student behavior that shows learning motivation and adjust interview questions to teachers to remain relevant to the research objectives. The following are indicators of student learning motivation observed during the Mathematics learning process in grade 3 (Sardiman in Suharni, 2021). The indicators are presented in the form of a **Table 2**.

Table 2. Indicators of student learning motivation

Indicator	Form of Observation
Perseverance	Students collect math assignments according to the allotted time
Curiosity	Students ask questions related to ununderstood material
Pleasure	Students show enthusiastic expressions during math learning
Independence	Students try to solve the problem independently before asking for help
Active Participation	Students participate in class discussions by answering or asking questions

Data analysis was carried out using the Miles & Huberman Model (1984) which includes three stages: data reduction, data presentation, and conclusion drawing or verification (Amananda et al., 2025). Data reduction is carried out by filtering and simplifying observation data and interview transcripts to find teacher strategy patterns that are in accordance with behavioristic principles. The data is then presented in the form of narratives, tables or graphs so that it is easy to understand and analyze its relevance to the theory. Conclusion drawing and verification is carried out by interpreting the results of the analysis to draw conclusions about the form of teacher strategies that are effective in fostering students' learning motivation, then verifying conclusions with documentation data. The analysis is carried out repeatedly to ensure that the conclusions obtained truly reflect the conditions in the field.

3. RESULTS AND DISCUSSION

The results and discussions in this study are presented descriptively based on data that has been collected through observation, interviews, questionnaires, and documentation, so various strategies used by teachers in fostering students' learning motivation during the learning process are obtained. Strategies in this study include giving verbal praise and

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p- ISSN 2085-1243 e- ISSN 2579-5457

rewards, giving freedom of activity for students who complete assignments faster or additional time collecting homework for students who are active in class, light reprimands for students who do not pay attention to teachers and punishments, giving perception, using learning video media, using number card media, and group games with points. Most of these strategies show the application of the principles of behavioristic theory.

3.1 Verbal Praise and Reward as Positive Reinforcement

The results of observations in the classroom show that teachers give verbal compliments such as "smart", "good" when students manage to answer questions or questions correctly. The provision of positive reinforcement was carried out spontaneously and delivered in a firm but friendly voice. Teachers also give prizes to students who score well during exams that make students' enthusiasm grow. This strategy has a positive impact on students' behavior and enthusiasm for learning. Students look more enthusiastic and show happy expressions when they receive praise from teachers. Giving rewards also makes students seem excited to try again in the next exam. This is reinforced by the teacher's statement when interviewed by the researcher about the teacher's strategies that are usually carried out in fostering the learning motivation of grade 3 students, namely:

> *"With gifts, if not in terms of gifts, it is also a compliment to him. The reason I didn't know was that in my class, I said that the student was good, it must be very fun to get a prize. But thank God they are very good. Most of the time I do give gifts. So, if they get excellent results, for example for the middle of the year I put A with B. if they get A with B, they get a prize. If the exam is only for the year, I will narrow it down a little to see who gets an A. So, he is a very enthusiastic person to wait for the prize".*

Based on the teacher's statement when interviewed, the strategy used is to give gifts and praise to make students memorable as well. When the teacher says "good" students must be very happy like getting a gift. Giving prizes greatly affects students' motivation to learn, This is corroborated by four students who checked in the column strongly agree with the questionnaire in the statement: *"I am more enthusiastic about learning if there is an award or praise from the teacher"*. Meanwhile, one student checked the disagreement column on the questionnaire in the statement: "*I am more enthusiastic about learning if there is an award or praise from the teacher"*. That's shown in **Table 3** below.

Table 3. Student responses to the questionnaire for strategy used is to give gifts and praise to make students memorable as well

Student Name	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
SMA, NH, KM, and UA	I am more enthusiastic about learning if there is an award or praise from the teacher	✓			
MH	I am more enthusiastic about learning if there is an award or praise from the teacher			✓	

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p- ISSN 2085-1243 e- ISSN 2579-5457

Based on behavioristic theory, especially the concept of positive reinforcement from B.F. Skinner, behaviors that are followed by pleasant consequences tend to be repeated. Praise and rewards are a motivator for students to maintain good study habits, because both reinforce the positive responses that students show, thus making students more motivated (Sazidah et al., 2023).

The praise and reward strategies implemented by teachers in Malaysia show strong consistency with behavioristic theories that emphasize the importance of external reinforcement in shaping learning behaviors. However, in giving rewards, teachers must be wise and not too often or continuously give rewards, especially in material form. Giving rewards too often can have a negative impact on the teaching and learning process because students have the potential to be only motivated and will carry out the teacher's orders if they get a reward (Nainggolan et al., 2024). This creates bad habits for students. Giving the right rewards can help form positive behavior in children if done in the right way.

3.2 Granting Freedom of Activity for Students Who Complete Assignments Faster and Additional Homework Collection Time for Active Students

Students are free to do other activities such as playing chess, chess and reading fun books after finishing exercises or problems early. This strategy is different from positive reinforcement, because it does not add a fun stimulus, but removes the obligation to learn for certain students. In a behavioristic framework, this includes negative reinforcement in which the teacher reduces unpleasant situations (continuous learning) as a form of reward for the desired behavior (faster completion). It is the same as giving additional time to collect homework for students who show activeness in learning. The goal is to eliminate unpleasant conditions (time limits) to reinforce positive behaviors. Students' motivation to learn can be increased by using negative reinforcement (Sofyani et al., 2025). This method works by reducing the conditions that students don't like, so that their behavior becomes better. So that the impact, students feel appreciated and motivated to be active again in the next learning. This is reinforced by the teacher's answer during the interview saying:

> *"I give them a little advantage over other friends such as the flexibility of time to send homework".*

This strategy both shows the application of behavioristic theory in the context of learning in elementary school. However, the granting of freedom of activity needs to be managed wisely. If done excessively, it can shift students' focus from the learning process to the desire to complete tasks immediately so that they can play. In this context, the strategy shows 2 possibilities, namely it is effective as a reinforcement of positive behavior, but has the potential to reduce the depth of learning if it is not balanced with reflection or academic reinforcement. In addition, providing additional time in collecting homework for active students can also be an effective form of negative reinforcement if applied selectively and proportionately. Teachers need to ensure that this reinforcement does not cause dependence, but still fosters students' intrinsic motivation to learn independently as seen in **Figure 1**.

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p- ISSN 2085-1243 e- ISSN 2579-5457



Figure 1. Students do other activities after quickly completing assignments

3.3 Light Reprimands and Standing Punishments as a Form of *Punishment*

Based on observations in class, teachers also use corrective strategies in the form of light reprimands for students who do not pay attention to the teacher when explaining and punishment for standing on their respective chairs for students who do not do homework. This strategy reflects the principle of punishment in behavioristic theory. Punishment is given to reduce behavior by facing unintended consequences (Fauziddin et al., 2023). From the results of interviews with teachers in class, the teacher said that:

> *"I only impose punishment on students who do not complete their homework so that they are angry and do not do the same thing again. All students will be punished regardless of whether they are mentally strong or not unless they are really sick. I don't always give punishment, because year 3 students mostly hear the word so they are always ready to do homework".*

According to the Mathematics teacher, punishment is given to students who do their homework (homework) so that students are deterred and do not repeat it again. However, the imposition of this punishment is also very rare because 3rd grade students are obedient when they hear the teacher's words, so students always do homework. Punishment that is given appropriately and consistently has an impact can have a deterrent effect and foster student discipline, but excessive punishment can cause negative impacts such as emotions among students and teachers (Kirmala et al., 2024). This strategy shows a balance between control and empathy which is characteristic of the behavioristic approach in education, where the teacher plays the role of a behavioral controller through the provision of measurable consequences.

3.4 Giving Perception at the Beginning of Learning

During the observation period, it was seen that the teacher always started learning by providing interesting perceptions to arouse students' enthusiasm. Perception is carried out through simple activities such as asking about students' daily experiences or delivering short stories that are relevant to Mathematics material. For example, before starting the lesson on the value of places in the thousands, the teacher asked, *"Harraz bought a laptop for 3750 dollars, what is the value of the place from the number 7?"* The light question made students enthusiastically answer with a smile. The teacher explained that perception is important in learning. The impact of giving perception is that students are ready to receive new lessons by remembering the previous material and not feeling tense at the beginning of the lesson. As the teacher said during the interview, namely:

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p- ISSN 2085-1243 e- ISSN 2579-5457

"I use perception before entering the new title so that they remember the previous title as a review".

This strategy is still related to behavioristic theory because teachers provide stimuli that function to prepare students' mental and emotional readiness for learning. In behavioristic theory, learning is the impact of the stimulus given by the teacher with a response in the form of a student reaction from the stimulus given by the teacher (Almizri & Neviyarni, 2022). Thus, the perception carried out by the teacher becomes the initial reinforcement to give rise to external motivation, which then leads students to active learning behavior in the next stage as seen in **Figure 2**.



Figure 2. Giving perception at the beginning of learning

3.5 Use of Learning Video Media

Teachers also use learning video media as one of the strategies to foster student learning motivation which contains animations and illustrations of Mathematics material. The use of this media aims to attract students' attention, help understanding concepts, and make the learning atmosphere more enjoyable. The impact is that students become more enthusiastic and seem happy in learning Mathematics. The use of educational videos such as YouTube serves more than just a tool for teachers and students, but also as a motivator that can increase student interest and understanding, especially in subjects that are considered difficult such as mathematics (Ramadhanty et al., 2024). Other research also revealed that teachers who use visual media can clarify concepts in learning materials and improve student understanding (Amananda et al., 2025). The teacher explained that the use of video was chosen because the learning medium is limited and students prefer it when the teacher uses video in learning see **Table 4**. The teacher also said during the interview:

"Most of the reason is that nowadays there are not many teaching aids, so I use a lot of laptops to show him videos so that they understand better".

Table 4. Student responses to the questionnaire for learn Mathematics using learning media

Student Name	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
KM, SMA, and UA	I love learning Mathematics using learning media and teaching aids.	✓			
NH and MH	I love learning Mathematics using learning media and teaching aids.		✓		

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p- ISSN 2085-1243 e- ISSN 2579-5457

Meanwhile, ticked in the agree column on the questionnaire given to students with the statement *"I like to learn Mathematics using learning media".*

This strategy differs from other behavioristic strategies because it does not focus on providing direct stimulus-responses, but also on presenting information that makes students better understand the material. It is an interesting finding that teachers do not fully apply behaviorism purely but combine it with cognitive approaches for more optimal learning outcomes.

3.6 Use of Number Card Media

Another strategy used by teachers is the media of number cards, where the teacher gives questions or questions orally to students, then the student who raises his hand the fastest is appointed to answer. Students take the number cards on the teacher's desk, then arrange the cards according to the answers to the questions given on the board. This activity fosters students' enthusiasm because it combines physical movement, speed of thought, and interaction. So that the impact for students is that students look more active and enthusiastic when answering questions and questions from teachers. The Mathematic teacher also said that the use of number card media makes learning fun. She says:

"They are fun because of the attractive colors and draw their attention to learning".

This number card media also encourages active learning through direct involvement of students in finding answers, rather than just imitating or memorizing. This is in line with constructivist theory, which emphasizes that knowledge is built by students through active participation and interaction that will be applied in real life (Nurhayati et al., 2025). Thus, this strategy is a finding beyond behavioristic theory that shows how Malaysian teachers are able to combine cognitive and constructivist elements that emphasize hands-on learning experiences and social interaction to build meaning and foster students' motivation to learn.



Figure 3. Use of number card media

3.7 Pointed Group Games

In learning activities at different times, teachers divide students into several groups with certain names. The teacher reads the questions, and the group is the fastest to lift the right hand to answer. If the answer is correct, the group gets points, if the answer is wrong then the question is thrown to another group. This game has a tremendous impact on students, the game takes place with enthusiasm and laughter, showing a competitive and collaborative learning atmosphere between students in their respective groups. In addition, Mathematics games are also effective in increasing students' interest and motivation in

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p- ISSN 2085-1243 e- ISSN 2579-5457

learning, while helping to reduce their anxiety about the lesson (Pangestika et al., 2025). See **Table 5** and from the results of the interview, the teacher said:

"Through this game they learn to work together to complete the assigned tasks".

Table 5. Student responses to the questionnaire for more motivated to learn

Student Name	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
NH and UA	I am more motivated to learn if the teacher uses games	✓			
MH, SMA, and KM	I am more motivated to learn if the teacher uses games		✓		

From a behavioristic point of view, giving points is a form of reinforcement that fosters motivation to achieve. However, group dynamics also contain social and cognitive elements as is the case with constructivist theory, as students discuss with each other to find answers (Firdaus et al., 2023). The strategy of the point game shows a mixed approach between behavioristic theory in the reinforcement aspect, namely points, and also constructivism in the way knowledge is socially constructed. This strategy has proven to be effective because all students are actively involved, support each other, and show high enthusiasm in solving math problems.



Figure 4. Pointed group games

4. CONCLUSION

Teachers strategies in fostering motivation to learn Mathematics in Malaysian primary schools reflect the unity of behavioristic, cognitive, and constructivistic theories. Behavioristic strategies seem dominant through the provision of praise, rewards, light reprimands, and educational punishments that have proven effective in fostering student discipline and learning encouragement. Meanwhile, the use of video media, number cards, and point-based group games shows the application of cognitive and constructivistic elements that encourage students to think actively, collaborate, and learn meaningfully. The implementation of this strategy has a positive impact on students' learning motivation. Students look more enthusiastic, active, happy and have a high enthusiasm in learning Mathematics. Thus, teachers in Malaysia show adaptive ability to combine various approaches according to the needs of the class.

DOI: http://dx.doi.org/10.17509/eh.v18i1.91783
p- ISSN 2085-1243 e- ISSN 2579-5457

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DOI: http://dx.doi.org/10.17509/eh.v18i1.91783
p- ISSN 2085-1243 e- ISSN 2579-5457