

The effect of learning methods and motivation on learning outcomes of long jump skills

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Abstract

The results of learning physical education skills were not limited to physical development but also mental development and motivation to learn. The purpose of this study was to determine the effect of the block method (BM) and the play-based random method (RM) on long jump skills (JLS) in terms of motivation (MTV). This type of research is quasi-experimental with a 2x2 factorial design. A sample of 20 Samiun Makassar public primary school students was randomly selected and divided into four groups. Treatment research for eight weeks. Before treatment, the sample was divided into two, high motivation (MTVH) and low motivation (MTVL), through questionnaires and the final test of long jump skills learning outcomes (JLS). The results showed that BM significantly increased JLS compared to RM ($P < 0.05$). There was a significant interaction between Mt and MTV ($P < 0.05$). The MTVH student group using MBB1 had better JLS than MRB1 ($P < 0.05$). The group of students who had MTVL had no difference in results between MBB2 and MRB2 ($P > 0.05$). KLJ in physical education for elementary school students is very good at using MB, and the teacher increases MTV during learning.

Keywords: learning methods, motivation, learning outcomes of long jump skills.

INTRODUCTION

Physical education in schools has various teaching materials, including athletics. Athletics combines several types of sports, broadly grouped into running, jumping, and throwing (Musiandi & Taroreh, 2020). To achieve physical education learning outcomes, students need to be supported by biomotor and non-biomotor factors (Syahrudin et al., 2019a). Internal motor, such as running speed in the early stages, leg strength, body balance when flying in the air, and body flexibility when landing, while non-motor factors include motivation, self-confidence, self-concept, intelligence, emotion, and others. External factors include the

form of methods, models, strategies, learning techniques, infrastructure, and media.

Based on observations at several elementary schools in Makassar City, it is known that long jump lessons still need to be more effective. This is in line with the results of research observations (Deswandi et al., 2018) that Physical Education learning at elementary school (SD) Negeri 28 Air Tawar Timur, North Padang District, Padang City, has gone differently than expected. The teacher's innovation ability in learning could be more optimal because they are still focused on conventional learning, with a rigid presentation of material without being interspersed with the latest game models. Low motor skills are also caused (Deswandi et al., 2018). To overcome this, a teacher must be creative in various learning (Reyes & Brinegar, 2016). Learning objectives can be achieved in a creative game-based learning environment (Lu et al., 2018).

To get maximum learning outcomes in the form of mastery of skills through sports must be varied. That is, the teacher's skills determine optimal results in learning variations in applying learning methods (Soboleva et al., 2018). The learning method that can be applied based on the growth and development of elementary school students is the block method or the random method (Jayadi, Mohammad Furqon Hidayatullah, 2019).

The learning/teaching relationship is generally regarded as a dynamic process, not a one-way knowledge transmission process. Learning Long jump is currently some research using attempts to address issues related to peer-to-peer feedback processes using video technology as a feedback vector (Trabelsi et al., 2020). Students in the intervention group improved performance significantly from pre-to post-intervention in all tests compared to control participants. The results of testing the first hypothesis as a whole showed a significant difference between the training style teaching method and the command style teaching method on the long jump skills learning outcomes. In other words, the results of learning long jump skills using exercise teaching styles are better than

command teaching styles, this means that the first hypothesis has different teaching styles on the long jump skills learning outcomes that have been tested (Ida Zubaida et al., 2021). The block method is a grouping of effective study hours in units of time that is summarized to students to follow and receive learning materials optimally and intact (Kashkari & Syam, 2019). The block exercise is a training schedule in which one skill variation is repeated practice before the exercise effort is given to another variation (Coker, 2017). The blocked practice method is the way in which the teacher teaches two or three trained skills to be implemented one by one until the specified amount of time is completed before proceeding to another skill (Scheiner et al., 2014). The strength of the block practice method lies in the repetitive performance that makes students correct and adapts to aspects of the skills being taught (Edwards, 2011).

The random method is an exercise the teacher gives that does not adjust to the steps and stages of the skill (Saputra et al., 2019). Random exercise is a training schedule in which several task variations are in random order (Coker, 2017). The random practice design does not follow the sequence of movements. Random exercises are the same exercises (movements) that are not repeated throughout the session (Scheiner et al., 2014). The advantage of random practice is that students continue to compare and contrast aspects of the skills being taught, thereby making the memory for each skill more unique and meaningful (Edwards, 2011).

To better understand student learning materials, teachers are required to be more creative and consider the characteristics of students through playing. Playing for elementary school students is an activity that must always be done to color the learning process because playing is very popular with elementary school-age children. The desire to play is something they always want to do and is in accordance with the characteristics of the child's development.

Because the long jump is important to improve the ability of students physical, so the teacher must be able to present interesting, nuanced long jump learning in the form of a game (Maćkała et al., 2015).

The aim is to enrich the movement and excite students. Socialization through sports to students at the elementary level, how they act together, and why team sports facilitate children's development and social integration in society (Sabin & Marcel, 2014).

Learning outcomes of physical education skills are not only limited to physical development but also encourage mental development, especially student motivation. In addition to physical factors, physical activity is also a very much-needed psychological factor. Motivation is one of the special psychics of elementary school students (Chen & Hypnar, 2015). In physical education, the most obvious motivation is the desire to be proud of what has been achieved (Apriansyah et al., 2017). In this study, we tried to use the block and random methods in learning skills improvement in physical education. This discussion will examine the learning method for long jump skills reviewed in terms of elementary school students' motivation.

METHOD

This type of research is quasi-experimental, with the independent variable being the block learning method (BM) through playing and the random learning method through playing (RM); the dependent variable is the long jump skill, while the attribute variable is the level of motivation (MTV). This study uses a 2x2 factorial design. The research population was elementary schools in Makassar. This study, 20 samples were enrolled according to inclusion and exclusion criteria. Inclusion criteria are the following: (1) male and female students; (2) no musculoskeletal injuries; and (3) registered as a student in SD Negeri Samiun. Participants did not include the criteria for this study if they were smokers, had concomitant diseases, had a history of any cardiovascular or respiratory disease, used any anti-inflammatory or anti-oxidant drugs within two months prior to the initial testing or during the experimental period, and had a history of musculoskeletal injury three months prior to the study began.

Determination of the sample begins with an affordable population drawn in stages, with a purposive sample technique of 40 male students.

Then from that number, 30 students were taken randomly. Then a motivation test was carried out, the results of which were arranged from the highest motivation score to the lowest. Divide high and low sample members were carried out using a percentage technique, namely 27% of the upper limit representing the highest value and 27% of the lower limit representing the lowest value of each group, referring to the Verducci theory (Hanafi et al., 2020). The selected samples were divided into four groups, and the contents of each cell were adjusted according to the design of this study. The step taken before the distribution of the sample was carried out by dividing using a ranking system, it was found that 27% were in the upper group, namely the group of students who had a high level of motivation, and the other 27% were in the lower group, namely the group of students who had a low level of motivation. Then a number of high-motivation students were randomly assigned to both groups, BMB1 and BMB2, and the same number of low-motivation students were randomly assigned to both groups, RMB1 and RMB2. Based on the results of this random grouping, the number of samples for each sub-group BMB1, BMB2, RMB1, and RMB2 was five people each. Overall the sample used in this study was 20 people.

The research instrument used was the long jump process skills with a validity of 0.74 and a reliability of 0.94 and a motivational questionnaire with a reliability of 0.85.

STATISTICAL ANALYSIS

Statistical analysis was performed using IBM SPSS software version 25.0. All data were tested normally using the Shapiro-Wilk test and Levene's statistics. A Tukey test was used to determine the difference between men and women for each measurement variable in the laboratory and field tests.

RESULTS

The descriptive analysis consisted of the initial long jump learning test results for the MB and MR groups. Descriptive summary details are shown.

Table 1. summary description of learning outcomes of long jump skills from each group

MTV	Learning methods (LM)	
	BM	RM
MTVH	N = 5 \bar{X} = 50.20 Sd = 1.924	N = 5 \bar{X} = 44.40 Sd = 3.578
MTVL	N = 5 \bar{X} = 35.80 Sd = 1.643	N = 5 \bar{X} = 36 Sd = 2.739
Total	N = 10 \bar{X} = 43 Sd = 7.775	N = 10 \bar{X} = 40.20 Sd = 5.350

Based on table 1, the data description is as follows BM group through MTVH (BMB1), average BMB1 = 50.20, standard deviation 1.924, with a total sample of 5. MB group through MTVL (BMB2), average BMB2 = 35.80, standard deviation 1.643, with a sample size of 5. MR group via MTVH (RMB1), mean RMB1 = 44.40, standard deviation = 3.578, with a sample size of 5. MR group via MTVH (RMB2), mean RMB2 = 36, standard deviation 2.739, with a sample size of 5. BM group, mean MB = 43, a standard deviation of 7,775, with a sample size of 10. RM group, mean MR = 40.20, standard deviation = 5,350, with a sample size of 10.

The results of learning long jump skills found that the effect of BM was significantly higher (better) than RM. This can be seen in Table 2. The Fh value between column A is 5.873 with a probability value of 0.028, which is less than = 0.05. The average long jump learning result for the BM (XBM) group was 43, while the average long jump learning result for the MR (XRM) group was 40.20.

Table 2. Summary of ANOVA results learning outcomes long jump skills

Source of Variation	Sum of Squares	DF	MNS	F	Sig.
Mt	39.200	1	39.200	5.873*	0.028
MTV	649.800	1	649.800	97.348*	0.000
Mt * MTV	45.000	1	45.000	6.742*	0.019
Error	106.800	16	6.675		
Total	35452.00	20			

The variance analysis results prove that there is a significant interaction between the method (Mt) and motivation (MTV). This can be seen in Table 2 from the Fh value of the Mt*MTV column of 6.742 with a probability value of 0.019, which is smaller than = 0.05.

The results of learning advanced skills using the Tukey test showed significant learning outcomes of long jump skills with MTVH. BMB1 learning is higher (better) than RMB1 learning (XBMB1 = 50.20 > XRMB1 = 44.40). This can be seen in Table 1 from the absolute average difference of 5.80. The BMB1 and RMB1 groups have a probability level = 0.013, less than = 0.05.

Table 3. ANOVA results continue to the Tukey test stage

Group Compared	Mean Absolute Difference	Std Error	Sig
BMB ₂ & RMB ₁	5.80*	1.634	0.013
BMB ₂ & RMB ₂	-0.20	1.634	0.999

Table 3 shows the results of the next stage using the Tukey test showed no difference for the low-motivation group. In other words, the improvement is relatively the same for those with MTVL between BMB2 play-based learning and RMB2 learning. For the BMB2 and RMB2 groups, the probability level (sig) = 0.999 is greater than = 0.05. Table 1, the learning outcomes of long jump skills that have MTVL in the BMB2 learning group are as effective as those trained with RMB2 learning (XBMB2 = 35.88 < XRMB2 = 36).

DISCUSSION

Based on the research data analysis, play-based BM is significantly higher than playing RM learning in improving long jump skills learning

outcomes. The advantage of play-based BM is that the form of the learning method presented is very specific and in accordance with the characteristics of elementary school students. Mastery of subject matter does not lead to mastery of one of the stages (stages) in the long jump but the material delivered and adjusted from the block presentation that has been carried out by the teacher, namely the long jump stage (phase). In addition, the material presented is also supported by the growth and development of elementary school students, namely playing age.

The material is given in the long jump model and is identical to the game, such as running while jumping on various colored media pedestals, playing black and green with local nuances, namely calling one of the color groups, which will run as fast as possible so as not to be caught by other color groups. The method of this game, adapted to the stages of the long jump, is running at the start, and when it reaches the starting point, it is continued by jumping past several boxes as high as 30 cm as fast as possible toward the front, then jumping and grabbing the hanging hoops. Then the sample ran to the pole and tried to jump as hard as possible from the top of the 60 cm high box. Overall this move can be made with one or two legs alternating between improving the process of hovering and landing stages.

Furthermore, the order of presentation of the RM material can be in accordance with the stages in the long jump, but everything starts at random, which the teacher does before the learning material is presented. When described, each post has been passed by the sample (students) and not by leap stages. The first meeting and subsequent discussions can only be changed based on unexpected results. For example, at the first meeting, jump the box and then jump to reach the hanging circle, then the green-black game, and finally jump from the top of the box.

Viewed from the pedagogic aspect, elementary school students are very appropriate to be given the play-based block learning (BM) method because students have not been able to master movement skills automatically. This is consistent with the research results showing that

learning practices' beneficial effect on novice participants is applied to learning complex skills (Bertollo et al., 2010). The training method for beginners is the block practice method (Ohnishi & Ohnishi, 2009).

The purpose of learning for elementary school students is only directed at the cognitive domain, namely understanding aspects of the subject matter and the application of the stages of movement being studied. Therefore, the sequence of phases in the long jump will provide adaptation to muscle receptors (muscle spindles) and tendons (Golgi tendon organs) so that the response given will turn into a stimulus and can be stored in memory. When the stimulus is needed, the memory can be recalled. It is appropriate that using block method exercises is very effective for novice students because the block model learns basic movements and identifies cues on a material (Zawawi et al., 2021).

Furthermore, with the random method, students have yet to receive the subject matter properly, or it can be said that the subject matter at the random stage is unsuitable for elementary school students. The reason is that random results stored in memory are difficult to recall the stimulus, and in the end, the results of systematic long jump movements are difficult for students to realize. However, the random learning method (RM) can be used as a variation of the block learning method (BM). Block and random exercises can be effective for learning (Sajid et al., 2016). Block and random exercises can effectively teach swimming skills, although block group exercises perform better than random groups (Rad, 2012). Children and beginners are especially suited to block practice because the exercises benefit students starting to learn new skills.

In physical education, motivation must be owned by every individual because it determines the learning outcomes of skills. However, motivation for each student is one of many requirements to obtain long-jump learning outcomes, meaning that motivation stands alone to influence learning outcomes but must be in harmony with the quality of the learning method process. For elementary school students with lower self-efficacy levels, following the play-based block (BM) learning method becomes very

valuable, meaning that at least in the early stages of learning, students develop schemas and build trust. Increased self-confidence in children will then contribute positively to the child's motivation always to carry out meaningful activities for self-actualization because motivation will affect students in academic activities and learning outcomes (Syahrudin et al., 2019b). The implication is that the motivation that exists in students must be raised and developed continuously. This is closely related to student achievement motivation.

The long jump is a non-locomotor movement. The results of learning skills are developed to generate the necessary high motivation and give the right learning method. The play-based block learning method (BM) and the play-based random learning method (RM) are both appropriate learning methods for the growth and development of elementary school children who like to play. For the block-based play method, the material is continuity-based, so students do not feel pressured and are happy to enjoy the material delivered by the teacher even without intrinsic motivation and without being given reinforcement, students will always enthusiastically be willing to make continuous movements. In the random-based play method, students feel free from pressure from the material presented by the teacher. Relatively the same as the block method, students with high motivation without any reinforcement are always enthusiastic about doing the movements in each post even though there are differences in the random arrangement of the posts. This means both methods are based on play, with high-motivation students enthusiastic about participating in long jump learning. Playing activities are seen as a means of socialization where it is hoped that play can give children an agreement to explore, discover, express feelings, creativity, and have fun learning (Yuliani Nuraini Sujiono dan Bambang Sujiono, 2010).

Play will affect hormones and growth, which is seen from a physiological aspect, and playing games will give you pleasure (Syahrudin, 2019). This is because the brain stimulates the master gland

(pituitary gland) to release endorphins, chemical compounds that make a person happy. This hormone, produced by the pituitary gland, is when we feel happy (laugh) or get enough rest even though this hormone acts like morphine, where the effect on a person's body is 200 times greater than morphine (Syahrudin, 2019).

The long jump is a complex movement to produce learning outcomes that require high motivation and is given the right learning method. The study's results revealed that blocks are the best early-stage learning used in practice. Whereas random practice can be confusing and frustrating for beginners. It was argued that motivation is an important element in the learning process. People with low motivation will experience difficulties learning various motor skills, even though the material provided consists of play elements, including improving long jump learning outcomes. The study's results stated that a person with the effects of contextual interference, centralized exercise, and random exercise affects the results of mastering basic basketball techniques (Wati et al., 2018). This means that psychological factors (motivation) are low, whatever learning method is given the results will be relatively the same (no difference). Block training materials can perform better than individual random exercises during training (Graser et al., 2020).

Motivation is a driving force that can make a person more eager to start an activity, move, or strive to achieve a goal (Cadenas-Sanchez et al., 2021). So motivation is a psychological condition that encourages someone to do an activity. In line with this theory, low-motivation students face difficulty improving long-jump learning outcomes. For this reason, it is demanded that the teacher be able to arouse student motivation. The solution that can be presented in improving long jump learning outcomes for groups of students who have low motivation is to provide both methods. In other words, the use of the two learning methods can still be used interchangeably as an alternative to overcome student boredom. However, it must be based on the objectives and portion of the learning method.

CONCLUSION

This study concludes as follows that BM through playing is significantly better in improving learning outcomes of long jump skills than RM through playing. There is a significant interaction between Mt learning play and MTV on learning outcomes of long jump skills. To improve learning outcomes of physical education skills for elementary school students, using the block learning method (BM) is very appropriate. During learning, the teacher is obliged to consider students' learning motivation. Future research needs to test other methods of learning physical education materials in elementary school students related to motivation. With methods that can increase student motivation, learning material in physical education can be easy.

REFERENCES

- Apriansyah, B., Sulaiman, S., & Mukarromah, S. B. (2017). Kontribusi motivasi, kerjasama, kepercayaan diri terhadap prestasi atlet Sekolah Sepakbola Pati Training Center di Kabupaten Pati. *Journal of Physical Education and Sports*.
- Bertollo, M., Berchicci, M., Carraro, A., Comani, S., & Robazza, C. (2010). Blocked and random practice organization in the learning of rhythmic dance step sequences. *Perceptual and Motor Skills*. <https://doi.org/10.2466/PMS.110.1.77-84>
- Cadenas-Sanchez, C., Lamedona, J., & Huertas-Delgado, F. J. (2021). Association of cardiorespiratory fitness with achievement motivation in physical education in adolescents. *International Journal of Environmental Research and Public Health*, 18(5). <https://doi.org/10.3390/ijerph18052317>
- Chen, W., & Hypnar, A. J. (2015). Elementary school students' self-determination in physical education and attitudes toward physical activity. *Journal of Teaching in Physical Education*. <https://doi.org/10.1123/jtpe.2013-0085>
- Coker, C. (2017). Motor Learning and Control for Practitioners. In *Motor Learning and Control for Practitioners*. <https://doi.org/10.4324/9781315213255>
- Deswandi, D., Syafruddin, S., & Khairuddin, K. (2018). Studi kemampuan motorik siswa sekolah dasar negeri 28 air tawar timur kecamatan padang utara kota padang. *Jurnal MensSana*, 3(2). <https://doi.org/10.24036/jm.v3i2.81>
- Edwards, W. H. (2011). Motor Learning and Control: From Theory to

Practice. In *SAS for Epidemiologists*.

- Graser, J. V., Bastiaenen, C. H. G., Keller, U., & van Hedel, H. J. A. (2020). Contextual interference in children with brain lesions: protocol of a pilot study investigating blocked vs. random practice order of an upper limb robotic exergame. *Pilot and Feasibility Studies*, 6(1). <https://doi.org/10.1186/s40814-020-00694-y>
- Hanafi, S., Asmawi, M., & Dlis, F. (2020). The Influence of Learning Methods and Learning Motivation on Discs Throwing Skills (Experimental Study at SMP Negeri 24 Makassar. *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, 4(2). <https://doi.org/10.33369/jk.v4i2.12515>
- Ida Zubaida, Lestari, A. T., & Bachtiar. (2021). Teaching Methods and Educability Motors: Effectiveness in Improving Long-Jump Skills. *Journal Sport Area*, 6(1). <https://doi.org/10.25299/sportarea.2021>
- Jayadi, Mohammad Furqon Hidayatullah, N. R. (2019). Jurnal Pendidikan Jasmani dan Olahraga, Universitas Musamus. *Jpjo*, 4(1), 103–110.
- Kashkari, B. S. H., & Syam, M. I. (2019). Optimization of one step block method with three hybrid points for solving first-order ordinary differential equations. *Results in Physics*, 12. <https://doi.org/10.1016/j.rinp.2018.12.015>
- Lu, C. F., Wu, S. M., Shu, Y. M., & Yeh, M. Y. (2018). Applying game-based learning in nursing education: Empathy board game learning. *Journal of Nursing*, 65(1). [https://doi.org/10.6224/JN.201802_65\(1\).13](https://doi.org/10.6224/JN.201802_65(1).13)
- Maćkała, K., JÓŻwiak, Łukasz, & Stodółka, J. (2015). Effects of Explosive Type Strength Training on Selected Physical and Technical Performance Characteristics in Middle Distance Running - a Case Report. *Polish Journal of Sport and Tourism*. <https://doi.org/10.1515/pjst-2015-0003>
- Musiandi, T., & Taroreh, B. S. (2020). Pengembangan Pembelajaran Atletik Melalui Pendekatan Permainan Tradisional Sumatera Selatan. *Jurnal Olympia*, 2(1). <https://doi.org/10.33557/jurnalolympia.v2i1.885>
- Ohnishi, S. T., & Ohnishi, T. (2009). Philosophy, psychology, physics and practice of Ki. In *Evidence-based Complementary and Alternative Medicine*. <https://doi.org/10.1093/ecam/nen005>
- Rad, L. S. et. al. (2012). European Journal of Experimental Biology. *European Journal of Experimental Biology*, 2(6), 2073–2076.
- Reyes, C., & Brinegar, K. (2016). Lessons learned: Using the literacy histories of education students to foster empathy. *Teaching and Teacher Education*. <https://doi.org/10.1016/j.tate.2016.06.014>
- Sabin, S. I., & Marcel, P. (2014). Socialization through sport, effects of team sports on students at primary Level. *4 Th International Congress Of Physical Education, Sport And Kinetotherapy, Icpesk*
- Sajid, M. R., Laheji, A. F., Abothenain, F., Salam, Y., AlJayar, D., &

- Obeidat, A. (2016). Can blended learning and the flipped classroom improve student learning and satisfaction in Saudi Arabia? *International Journal of Medical Education*. <https://doi.org/10.5116/ijme.57a7.83d4>
- Saputra, R. N., Yarmani, Y., & Sugiyanto, S. (2019). Pengaruh metode latihan terpusat dan metode latihan acak terhadap kemampuan teknik dasar futsal. *Kinestetik*, 3(1). <https://doi.org/10.33369/jk.v3i1.8819>
- Scheiner, L. R., Sadagopan, N., & Sherwood, D. E. (2014). Effects of Blocked Versus Random Practice on Speech Motor Skill Acquisition and Retention. *Journal of Motor Learning and Development*. <https://doi.org/10.1123/jmld.2013-0028>
- Soboleva, E. V., Galimova, E. G., Maydangalieva, Z. A., & Batchayeva, K. K. M. (2018). Didactic value of gamification tools for teaching modeling as a method of learning and cognitive activity at school. *Eurasia Journal of Mathematics, Science and Technology Education*. <https://doi.org/10.29333/ejmste/89843>
- Syahrudin. (2019). Basic learning movement of javelin through games bombardier: A model development. *International Journal of Scientific and Technology Research*.
- Syahrudin, S., Saleh, M. S., & Saleh, M. S. (2019a). Pengaruh Kinestetik, Sikap, dan Motivasi Terhadap Hasil Belajar Pendidikan Jasmani. *Jurnal SPORTIF: Jurnal Penelitian Pembelajaran*, 5(2), 232. https://doi.org/10.29407/js_unpgri.v5i2.12871
- Syahrudin, S., Saleh, M. S., & Saleh, M. S. (2019b). The influence of kinesthetics, attitude and motivation on the learning results of sports education. *Jurnal SPORTIF: Jurnal Penelitian Pembelajaran*. https://doi.org/10.29407/js_unpgri.v5i2.12871
- Trabelsi, O., Gharbi, A., Masmoudi, L., & Mrayeh, M. (2020). Enhancing female adolescents' engagement in physical education classes through video-based peer feedback. *Acta Gymnica*, 50(3). <https://doi.org/10.5507/ag.2020.014>
- Wati, S., Sugihartono, T., & Sugiyanto, S. (2018). Pengaruh latihan terpusat dan latihan acak terhadap hasil penguasaan teknik dasar bola basket. *Kinestetik*, 2(1). <https://doi.org/10.33369/jk.v2i1.9185>
- Yuliani Nuraini Sujiono dan Bambang Sujiono. (2010). *Bermain Kreatif Berbasis Kecerdasan Jamak*. Indeks.
- Zawawi, I. S. M., Ibrahim, Z. B., & Othman, K. I. (2021). The effect of independent parameter on accuracy of direct block method. *Mathematics and Statistics*, 9(4). <https://doi.org/10.13189/ms.2021.090402>