Intermedia Books: a Concept of Book And Multimedia Integration for Remedial

Damar Yogananta✉, Yuli Utanto, Kustiono Kustiono

Pascasarjana, Universitas Negeri Semarang, Indonesia

Article Info	Abstract
	The research and development of the Intermedia Book are motivated by the remedial implementation conditions of Indonesian lessons that have not been optimal. The preliminary research results that students need a book that can accommodate the remedial process by the learner's era. The concept of multimedia and book integration is a good solution for Indonesian remedial learning. The purpose of this research is to develop the Intermedia Book for remedial processes of Indonesian subjects. This research used the ten steps Borg & Gall model. From the ten steps Borg & Gall, the researcher modifies into three main steps: (1) preparation, (2) development, and (3) validation. The product of this research is the Intermedia Book of Indonesian Subject for VII grade students. The implication of this research is to bring multimedia products closer to learners through the intermedia book. This development becomes one of the techniques to increase the interactive learning process.

✉ Correspondence address:
Pascasarjana, Universitas Negeri Semarang, Indonesia
Jalan Kelud Utara III Semarang, Jawa Tengah Indonesia
E-mail: yogananta@students.unnes.ac.id

INTRODUCTION

Today we are familiar with a new learning concept known as "XXI Century Learning." The XXI century learning concept is a development of the learning process paradigm. Students in the XXI century have many ways to learn and use all their power to achieve their goals. The XXI century learning is closely related to the use of technology to achieve learning goals. The use of technology for learning is becoming a necessity in modern times (Chaeruman, 2018). In the XXI century learning process, teacher creativity becomes essential for adapting, reusing, and finding new purposes using technology in the classroom (Koehler et al., 2011). The development of this learning concept forces education practitioners (as the 'incumbents' of the primary market owners) to move from their comfort zone. We know this transition as a disruptive era. In this era, innovations emerged and challenged the incumbents (primary markets). Disruptive processes occur in various fields, including education. Clayton M et al. (2015) said disruptive processes occur due to the increased needs by majority markets, and every disruptive process always occurs due to rapid technological developments. Because of this, creative and innovative steps to develop learning models are the era's demands. Education practitioners need to give serious attention to following the 'new era education.' Educators and learners must be in harmony with the era. Do not let the learning process turn into an outdated concept that makes learners reluctant.

The face-to-face learning process is already losing its charm in this XXI era (Wardani, Nanindya, et al., 2018). The current pandemic situation does not change the learning process but only accelerates the change that is certain to occur. To connect the development of technology and classical learning, integrating book materials and multimedia is chosen. The integration of textbook-based learning with multimedia attempts to achieve learning effectiveness by assimilating classical and modern processes.

Assimilation of classical and modern learning processes must occur at planning, learning, and assessment. The role of teachers to develop, manage, and utilize integration is the key to achieve a new learning model.

Assessment is one of the most critical levels of learning. With the assessment, the weaknesses and strengths of learners can be reflected clearly (Permendikbud Number 104 of 2014). The remedial process is one form of assessment as part of learning that must be complete by learners who have not reached the completion criteria (Kemendikbud, 2017). According to Zainul (2018), the remedial process has various implementation strategies: (1) Remedial can be done directly face-to-face by the teacher. (2) Learning with peer tutors. (3) Provide learning media to be studied independently by learners. Each choice of the remedial process has its advantages and disadvantages. The issue is that during a pandemic, not all standard models will work. As a result, the remedial process does not occur as expected (i.e., to help learners achieve minimal competence). Zainul's first and second strategies have reduced their effectiveness due to limited interactions during pandemics. Then the third strategy needs to be strengthened. Fortunately, the development of technology supports the development of learning media.

Multimedia books with integrated content are becoming increasingly popular. The way it integrates is to use the Quick Response Code (QR Code). Integration is getting easier to do, thanks to QR Code technology. Guntur & Didik (2019) said this QR technology could be combined in books to support learning. QR technology also makes learners more interactive (Mustakim et al., 2013). Intermedia is the name given to the concept of interactive multimedia used in collaboration with the book. As the name implies, intermedia is a combination of '*intermediate'* and '*media'* which have the meaning of connecting several media. Today's students (digital natives) prefer to learn through pictures, movies, or games. This condition means that students prefer something interactive and streamline the

learning process (Kasinathan et al., 2014). The integration of books and technology is considered a learning practice that matches today's learners' needs. The integration will effectively create a wide range of possibilities and help learners see and build related concepts (Bahri et al., 2020).

Half a century ago, there was a prediction that someday would come when teachers (instructors) could no longer provide adequate information and handed over learning tasks to learners to find it and learn it themselves (Hergenhahn & Olson, 2008). That prediction has come true now. Teachers today need to turn traditional classrooms into learning facilitator concepts. Teachers should not be afraid to offer space to younger students and believe in their potential; as a result, a new type of teacher will emerge. If we look back for a while, Skinner has also proposed alternative teaching called programmed learning. Maybe that teaching model can solve the problem of remedial implementation in the current pandemic conditions. Learning will be effective if: (1) provides information gradually; (2) learner is immediately given feedback on the accuracy of its learning; (3) Learners can learn in their way (Hergenhahn & Olson, 2008). With the limitations of remedial implementation, programmed learning becomes a solution to help the self-evaluation process.

It could be that this is the day when teaching machine materializes dominance. There are already many individuals who learn self-taught using teaching devices. The emerging digital courses such as Ruangguru, Coursera, Udacity, Udemy, and many more, prove the teaching machine materialized widely. In this new era of education, it is necessary to developing learning innovations. Develop a book that integrates multimedia for the remedial process is one of learning innovation.

The developed book should facilitate the various learning techniques. In order to accommodate various learning techniques, the book development needs to implement various learning methods. One of the main methods

chosen by researchers is OEL (Open Ended Learning). The OEL method has widely applied to Indonesian textbooks published by the Indonesian Ministry of Education. In OEL-based learning, we will get to know Open-Ended Questions, Open-Ended Problems, and various methods based on open problem-solving. The OEL model is considered capable of improving cognitive processes (Huda, 2014) and can help foster the mindset of learners (Micah et al., 2018). Applying the OEL method in the Indonesian textbook is appropriate because the Indonesian subject has complexity and an open-ended answer. The complexity of learning means that solving problems can be used in various ways. This principle is the same as remedial processes. The teacher can implement remedial with various approaches to achieving the minimum criteria set.

The development of intermedia books for remedial purposes is one use of the TPACK idea. TPACK (Technological Pedagogy and Content Knowledge) by Mishra & Koehler is a concept that connects technology and learning. The concept has begun to be adopted by practitioners. For example, research by Rafi & Sabrina (2019), in the study of TPACK interpretation, can develop the professionalism of teachers in learning Geometric Transformation. The research conducted by Wijayanto (2017), which produced a formulation regarding the fast growth of technology, must also impact educational systems. A teacher needs a TPACK framework in the learning process. The TPACK framework can assist teachers in building and developing learners' understanding.

With the rapid development of technology, integration occurs not only between disciplines. In the field of technology, there is also integration. One of the results of such integration we know as multimedia. Multimedia has begun to assimilate with classroom learning. Priyanto's research (2009) concludes the urgency of developing computer multimedia for learning to improve the quality of education. In addition, the multimedia products developed can facilitate the learning process of active learning

and increase learning effectiveness. Teachers can use the benefits of multimedia-based teaching materials to overcome the limitations of teaching and learning activities. Zahro (2016) agreed with the remarks, and his research produced a multimedia-based teaching book that proved effective. Another study by Suandi & Pamungkas (2019) on interactive multimedia also concluded that multimedia improves quality and makes learning unlimited in space and time. Various positive things can be obtained by creatively integrating technology.

The increased learning innovation can occur by combining appropriate technology and learning approaches. The open-ended learning (OEL) approach is renowned for improving learning achievement compared to conventional approaches. Fatah et al. (2016) prove that learning with the OEL approach is more effective than conventional means. Besides being useful for the implementation of learning, the creativity of learning media development can be increase by OEL methods. Rohaeti et al. (2019) revealed that implication in their research. Learning activities are always related to many aspects. One aspect that is overgrowing today is technology. Research by Wicaksono et al. (2020) revealed that e-learning media in web programming subjects could help teachers in terms of presentation, increase student interest, and improve learners learning outcomes. The study results support the need for development, especially in the realm of learning technology.

The TPACK concept will only be a concept without the support of development power. The development of technology-based learning that is separate from the learning habits of learners makes the development effort so far less utilizable. The development of learning CDs, learning websites, learning videos, or other stand-alone multimedia products makes it difficult for learners to access them. The difficulty of access occurs mainly because the products are not assimilating the learning processes of learners. With the open learning model (OEL) that allows students to explore the most comprehensive range, intermedia books

are good for exploration exercises. The concept of intermedia is a response to unify the access of learning development and assimilate it into commonly learning materials used by learners. This unification enhances the interactiveness of books and facilitates learners' access to multimedia products. The subject of this study is the VII grade students of Maria Mediatrix Junior High School. The previously observed problems become the reason the researcher chose VII grade students as subjects.

METHOD

This research modified Borg & Gall's development model in Sugiyono (2013). The ten steps Borg & Gall's of development research are (1) potential and problems, (2) data collection, (3) product design, (4) design validation, (5) design revision, (6) product trials, (7) product revisions, (8) usage trials, (9) product revisions, and (10) production. According to Sugiyono, the researcher adjusts the ten research and development steps into three main steps: preparation, development, and validation.
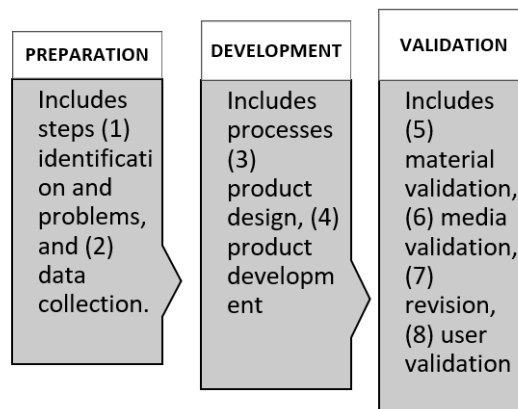
Figure 1. Three Steps Development

The data collection instruments used in this study include observations and questionnaires. The researcher conducted five scale questionnaires on students' perceptions of the Indonesian textbook for VII grade and their perceptions of the remedial implementation of Indonesian lessons. A multilevel scale is also an option for questionnaires in this study because it can provide an overview of the perceptions of using Indonesian textbooks. Multilevel scale

questionnaires are presented by showing statements followed by columns that show levels ranging from agreeing to disagree or scales 1-5 (Arikunto, 2013).

Data collected in the preliminary research includes the perceptions of Indonesian textbooks usage and the remedial implementation of Indonesian lessons. Learners' perceptions of textbooks usage collected emotive aspect data when the students used Indonesian textbooks. These aspects include feelings of pleasure, attention, curiosity, and learning power. The aspects of usage perception include the students' perspective on the graph, the intensity of the book's usage, and the experience of integrating materials or learning resources in the learning process. Teachers' perception collects perception data of textbook usage in the learning activities, teacher assessment of the material provided, the flexibility of use, attractiveness, graphics, and experience of integrating materials or learning resources conducted by teachers. The development stage consists of designing and developing (1) the book, (2) multimedia, (3) connecting applications. The product is an Intermedia Book Indonesian for Class VII that can support the remedial process. It provides a QR-based integrated print version of multimedia content. The location of multimedia integration is in the assessment or exercises that lead users to use several applications such as Quizizz and Ispring. Multimedia-based books allow users to display videos, evaluations, and scores that trigger interactive learning activities.

In order to determine the validity of a product, it is essential to depend on the views of experts (expert judgment). The research instrument is consulted to the expert before use for collect data. The experts will give their opinion about the instrument. The decision of this instrument may be (1) used without repair, (2) by repair, (3) overhauled. The data analysis technique that researchers use to test the feasibility of research is interval data analysis.

RESULTS AND DISCUSSIONS

Preparation

Preliminary research conduct on eleven Indonesian teachers and 123 students. The perception of the book's usage in learning received a good response with an average score of 3.90. However, the implementation of the remedial process is less than optimal, with a score of 2.76.

The unoptimized remedial implementation is because: (a) learners tend to forget to carry out remedial because it carried outside the learning schedule; (b) difficulty finding engaging media and strategies for remedial implementation; (c) limitations of book material; (d) teachers should also managing the learners who are not doing the remedial process. As a result, the assessment model became the only process for remedial.

Development

The development phase consists of book creation, companion multimedia creation, and the creation of connecting applications. Book development consists of stages: (a) designing a concept map of the book. Books are developed with various learning methods but still boil down to the open-ended learning process; (b) write the material; c) the book's layout. Figure 2 shows the design of the book components.
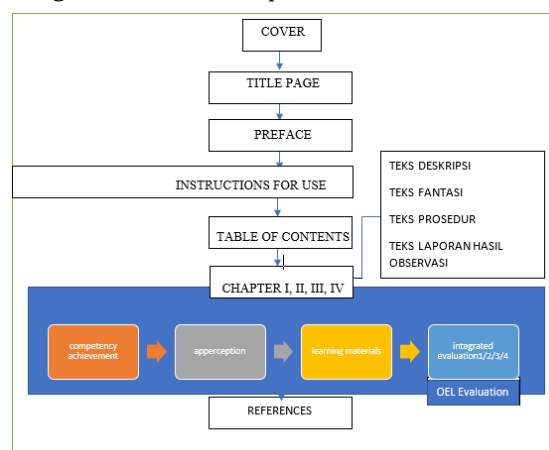

Figure 2. Intermedia Book Component Design

Before starting the development of the book, researchers design the components of the book. With this component, the development of

the book becomes more targeted. Researchers limited the amount of material to just four chapters. The purpose of the material restriction is the time limitations of research and book development.

Multimedia creation includes: (a) concept creation, (b) filling in the material, (c) adding video and audio, (d) multimedia upload, (e) link creation and QR. The multimedia companion in this research uses web apps like Quiziz and Ispring. This research has several companion multimedia designs, such as learning cards, problem exercises (stuffing, drag & drop, multiple-choice), and discussion. The consequence of selecting Quiziz and Ispring applications is that the display design cannot be modified. However, with the support of HTML-based programming (HyperText Markup Language), multimedia products will be accessible on various devices responsively.

The multimedia integrated into the textbook through QR Code (Quick Response Code). Users only need to perform a QR scan to open it. Multimedia companion books are available in various methods such as (a) study cards, (b) multiple-choice, (c) drag & drop, (d) open-ended, (e) discussion. Based on the results

of trials of several QR applications, the researchers found a shortage of QR applications that circulated. The drawbacks of the QR usually cannot automatically open media. On that consideration, The Researchers created a QR reader application that can directly open the multimedia companion. Figure 3 shows the appearance of the developed product.
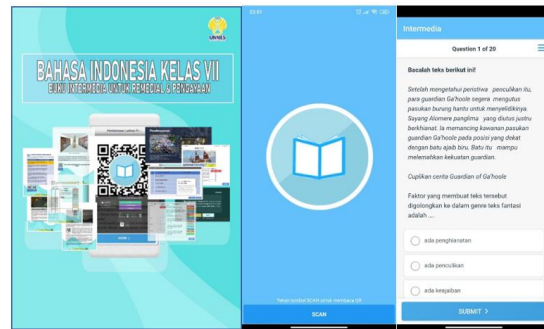
Figure 3. The Indonesian Intermedia Book for VII Grade & The Scanner Application

Validation

After the product development stage, the researcher implements validation. Four people consisting of one book expert and four teachers do the book validation. The average score of book validation is 4.33, with excellent categories. The results of the book validation are in Table 2.

Table 2. Book Validation Results

Evaluators	Content	Serving	Graphic	Integrations
Book expert	4.15	4.92	4.31	3.92
Teacher 1	4.17	4.75	4.58	3.50
Teacher 2	4.00	4.82	f4.53	3.59
Teacher 3	4.50	5.00	4.50	4.00
average	4.21	4.87	4.48	3.75

Media experts and three teachers validated the media, and it earned an average score of 4.29 with excellent classification. Media validation results are present in Table 3. Researchers revised the product based on development recommendations after receiving feedback from experts, teachers, and users. Validation results from 56 users averaged 4.23 out of five points, indicating excellent categorization. Table 4 shows the frequency distribution statistics for validation by users.

Table 3. Media Validation Results

Evaluators	Content	Serving	Graphic	Integrations
media expert	3.00	3.00	2.67	2.56
Teacher 1	4.00	4.67	4.67	4.22
Teacher 2	5.00	5.00	5.00	5.00
Teacher 3	5.00	5.00	5.00	4.89
average	4.25	4.42	4.33	4.17

Table 4. User validation frequency distribution

Aspects	Answer Score										Average Value
	1		2		3		4		5		
	F	%	F	%	F	%	F	%	F	%	
Content	0	0	0	0	10	17.9	32	57.1	14	25	4.07
Serving	0	0	2	3.6	5	8.9	25	44.6	24	42.9	4.27
Multimedia	0	0	0	0	9	16.1	26	46.4	21	37.5	4.21
Attraction	0	0	0	0	6	10.7	26	46.4	24	42.9	4.32
Accessibility	0	0	0	0	7	12.5	28	50	21	37.5	4.25
Total Average											4.23

Discussion

The remedial processes should implement various methods to adapt to learners' level of difficulty. These methods include (1) individual guidance, (2) group guidance, (3) relearning, (4) utilization of peer tutors (Kemendikbud, 2017). The implementation of the remedial process of Indonesian Class VII at Maria Mediatrix Junior High School can be said not optimal based on the results of initial identification. The problems occur due to several factors such as media, time, heterogeneity of student abilities that result in remedial lasting in only one way.

Sinar et al. (2017) concluded that multimedia could be said good-quality if it meets effective, practical, and valid criteria. In terms of effectiveness, Zainul (2018) proves that multimedia affects improving remedial effectiveness. The Indonesian textbook for VII grade students was rated good at initial identification but has not facilitated the remedial process. Indonesian textbooks have an important position in Indonesian subjects, both for students and teachers (Suryaman, 2015). Therefore, the choice of integrating multimedia with Indonesian textbooks for Class VII in this research is appropriate. The integration of multimedia with the books will simplify multimedia learning and increase the effectiveness of books to deliver subject matter.

The researcher adjusts the development needs by modifying the development step during the development phase. Gustiani (2019) found at least twelve studies that modified the ten steps of Borg & Gall's research. The modifications range from three to eight research phases. As per the research needs of Intermedia Book development for Indonesian subjects, researchers modified the ten steps of Borg &Gall development into three main steps (1) planning, (2) development, and (3) validation. Theoretically, according to Amrulloh et al. (2013), the feasibility of media may be determined by the judgment of media experts, the judgment of books experts, and the judgment of teachers. In this research, book experts, media experts, teachers, and students all judge the product. From the judgment result, the product of Intermedia Book for VII grade has a very suitable category.

CONCLUSION

Research and development of the Intermedia Book for Indonesian Class VII is motivated by remedial implementation conditions of Indonesian lessons that have not been optimal. The Indonesian subject needed a book that could accommodate the remedial process of learners. This research product is an Intermedia book for Indonesian Class VII to support the implementation of remedial processes. It developed with three stages (1) planning, (2) development, (3) validation. The book experts, media experts, teachers, and students conclude that the product is excellent and ready to use.

REFERENCES

Arikunto, S. (2013). *Prosedur Penelitian*. Rineka Cipta.

Amrulloh, R., Yuliani, & Isnawati. (2013). Kelayakan Teoritis Media Pembelajaran Multimedia

Interaktif Materi Mutasi untuk SMA. *BioEdu*, *2*, 134–136.

Bahri, M. S., Florentinus, T. S., & Haryono. (2020). Development of Nested-Integrated Learning Model in Indonesian Subjects Based on 21 st Century Learning. *Innovative Journal of Curriculum and Educational Technology*, *9*(1), 10–16. https://journal.unnes.ac.id/ sju/index.php/ujet/article/view/33130

Chaeruman, U. A. (2018). *Pembelajaran Abad 21. April.*

Clayton M, C., Raynor, M. E., Rory, M., & McDonald, R. (2015). What is Disruptive Innovation. *Harvard Business Review*, *93*(12), 44–53. https://doi.org/10.1353/abr.2012.0147

Fatah, A., Suryadi, D., Sabandar, J., & Turmudi. (2016). Open-Ended Approach: An Effort in Cultivating Students' Mathematical Creative Thinking Ability and Self-Esteem in Mathematics. *Journal on Mathematics Education*, *7*(1), 9–18. https://doi.org/10.22342/jme.7.1.2813.9-18

Gustiani, S. (2019). Research and Development (R & D) Method as a Model Design in Educational Research and Its Alternatives. *Holistics Journal*, *11*(2), 13–14. https://jurnal.polsri.ac.id/index.php/holistic/ article/view/1849/892

Hergenhahn, B. R., & Olson, M. H. (2008). *Theories of Learning* (7th ed.). Kencana.

Kasinathan, V., Azlina, N., Rahman, A., Firdaus, M., & Abdul, C. (2014). Approaching Digital Natives with QR Code Technology in Edutainment. *International Journal of Education and Research*, *2*(4), 169–178.

Kemendikbud. (2017). *Panduan : Penilaian oleh Pendidik dan Satuan Pendidikan Sekolah Menengah Pertama*. Kementrian Pendidikan dan Kebudayaan Direktorat Jenderal Pendidikan Dasar dan Menengah Pertama.

Koehler, M. J., Mishra, P., Bouck, E. C., DeSchryver, M., Kereluik, K., Shin, T. S., & Wolf, L. G. (2011). Deep-Play : Developing TPACK for 21st Century Teachers. *International Journal of Learning Technology*, *6*(2), 146–163.

Permendikbud nomor 104 tahun 2014 Tentang Penilaian Hasil Belajar oleh Pendidik pada Pendidikan Dasar dan Pendidikan Menengah, Pub. L. No. 104, Kementrian Pendidikan dan Kebudayaan RI 1 (2014). https://luk.staff.ugm.ac.id/atur/bsnp/Perme ndikbud104-2014PenilaianHasilBelajar.pdf

Rafi, I., & Sabrina, N. (2019). Pengintegrasian TPACK dalam Pembelajaran Transformasi Geometri SMA untuk Mengembangkan Profesionalitas

Guru Matematika. *Supremum Journal of Mathematics Education*, *3*(1), 47–56. https://journal.unsika.ac.id /index.php/supremum/article/view/1430

Rohaeti, E. E., Bernard, M., & Primandhika, R. B. (2019). Developing Interactive Learning Media for School Level Mathematics Through Open-Ended Approach Aided by Visual Basic Application for Excel. *Journal on Mathematics Education*, *10*(1), 59–68. https://doi.org/10.22342/jme.10.1.5391.59-68

Sinar, J. A., Arsyad, N., & Syam, R. (2017). Development of Interactive Multimedia for Remedial Programs in Mathematics Learning. *Journal of Chemical Information and Modeling*, *21*(2), 1689–1699. https://www.oecd.org/dac/accountable-effective-institutions/GovernanceNote book 2.6 Smoke.pdf

Suandi, A., & Pamungkas, P. D. A. (2019). Multimedia Interaktif Pembelajaran IPS Kelas 7 Berbasis Android pada MTs Al-Wasliyah Jakarta Timur. *JIPI (Jurnal Ilmiah Penelitian Dan Pembelajaran Informatika)*, *4*(2), 66. https://doi.org/10.29100/jipi.v4i2.1087

Suryaman, M. (2015). Dimensi-Dimensi Kontekstual Di Dalam Penulisan Buku Teks Pelajaran Bahasa Indonesia. *Diksi*, *13*(2), 165–178. https://doi.org/10.21831/diksi. v13i2.6456

Wardani, Nanindya, D., Anselmus J.E., T., & Wedi, A. (2018). Daya Tarik Pembelajaran di Era 21 dengan Blended Learning. *Jurnal Kajian Teknologi Pendidikan*, *1*(April), 13–18. http://journal2.um.ac.id/index.php/jktp/issu e/view/704

Wicaksono, A., Florentinus, T. S., & Ahmadi, F. (2020). Development of E-Learning in Web Programming Subjects for Moodle Based Vocational Students. *Innovative Journal of Curriculum and Educational Technology*, *9*(199), 1–9. https://journal.unnes. ac.id/sju/index.php/ujet/article/view/33095

Wijayanto, B. (2017). Urgensi Technological Pedagogical Content Knowledge (TPACK) dalam Pembelajaran Geografi. *Jurnal Geografi*, *6*(1), 54. https://doi.org/ 10.24036/geografi/vol6-iss1/178

Zahro, L. (2016). Pengembangan Buku Ajar Berbasis Multimedia POP UP di Kelas II MI-AZHAR Bandung Tulungagung [Uneversitas Islam Negeri Maulana Malik Ibrahim Malang]. In

Central Library of Maulana Malik Ibrahim State Islamic University of Malang. https://doi.org/https://doi.org/10.3929/ethz -b-000238666

Zainul, M. (2018). The Effect of Interactive Multimedia on Remedial Learning to. *Jurnal Teknodik*, *22*(2), 121–132. https://jurnalteknodik.kemdikbud.go.id/inde x.php/jurnal teknodik/article/view/329/323