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Moral Educational Game Adoption in Formal Classrooms: Experimental Case Study in Indonesia

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ABSTRACT

Educational games are a creative and efficient method that gives a distinctive and powerful way to help learners optimise their performance. This study discusses adopting educational games into the formal classroom, especially in Indonesia. Using a control group experiment and interviews involving 198 students from 4 different high schools, our study displayed the possibility of educational games that enrich the learning process. Integration of educational games into lessons is observed to have increased active participation, enthusiasm, and engagement levels of students in the experimental group as lessons in the control group where traditional teaching methods were used were implemented. Our outcomes also showed students' positive attitude about the games as teaching tools, and they preferred to carry on learning from them not only moral education but also other subjects.

Keywords: Educational Games, Formal Education, Student Engagement, Video Games, Moral Education

INTRODUCTION

Educational games are games designed and developed for educational purposes, which are part of serious games. This differs from video games as a whole because the main objective of educational games is not simply to entertain but to be used as part of the learning process, either accompanied by a teacher or self-learning. Educational games aim to increase student interest by engaging students with learning material beyond what other media provides (Anolli et al., 2010; Pee, 2011; Tamtama et al., 2020). Educational games have huge advantages over other media, such as video, animation, and classic lecture approaches. Video games offer interactivity that becomes a source of immersion, making students engage more with the material. Other media only offer a linear experience, where students can only receive information passively (de Andrade et al., 2020; González Sánchez et al., 2009). Prior studies have already proved that educational games can increase students' learning interest significantly and, in turn, improve their academic achievement (Baig & Alotaibi, 2020; Suh et al., 2010; Yu et al., 2021). Educational game usage has been widely studied in a plethora of materials, education levels, and countries. However, in those studies, many focused on certain topics or specific age groups without considering their placement in formal education and curriculum. This study aims to consider educational games adoption in formal classrooms and curriculum, in particularly in Indonesia.

Indonesia has a very interesting education system, with a base adapted from American and Japanese education systems that heavily focus on STEM and vocational subjects (Akli et al., 2024; Sukmayadi & Yahya, 2020). There are three prominent types of high schools in Indonesia: Senior High Schools (SMA - Sekolah Menengah Atas), Vocational High Schools (SMK - Sekolah Menengah Kejuruan) and Islamic High Schools (MA - Madrasah Aliyah). All three high schools are presented nationally and follow a strict national curriculum, which are now when this paper written are 2013 curriculum that focused on competence derived from Indonesia National Work

Competence Standard (SKKNI - Standar Kompetensi Kerja Nasional Indonesia). Learning modules developed within this curriculum must refer to the competency standards set by SKKNI. Students are tested through a national examination, which becomes one of the requirements to graduate for most, if not all, high school students in Indonesia.

As part of the education management assessment by the government to ensure compliance with SKKNI, every five years or so, all education institution of all levels must submit their re-accreditation level. This accreditation process involves the evaluation of all education aspects, including curriculum management and usage of learning media (Moghavvemi et al., 2018). With the latest instruments, teachers are encouraged to use the latest media, such as short video providers (e.g., TikTok, YouTube Short, Instagram Reel) and extended reality platforms (AR, VR, and MR). However, educational games are not mentioned directly, especially in high school accreditation instruments. Based on our previous study, this is caused by a lack of educational games designed and developed for high school educational needs that comply with the curriculum (Wibowo et al., 2024b).

Moral education is one of the most important subjects. In Indonesia, moral education is taught at all levels, in forms of Education of Pancasila (Indonesia's ideology that served as moral value system). Pancasila is comprised of 5 bases (sila) and derived into four behavioural norms that become a tenet of how Indonesians should act in society (Nishimura, 1995; Sugiati et al., 2021). Despite being taught since early education, Indonesia's citizens often perform negatively in moral actions. Some government officials are still corrupt, piracy is still a problem and considered a norm in lower-income societies, racism and race-based crime still happen, and domestic violence towards women and children is still prevalent. This shows that moral education in Indonesia is still ineffective in producing benevolent individuals (Silalahi & Yuwono, 2018). However, moral education is often neglected compared to other subjects; this is shown by the lack of class time, resources and effort to develop an effective moral education class compared to STEM classes. Teachers and students alike are losing motivation when coming into this subject. Thus, we believe there is a need to develop a more interesting way and media in moral education.

Educational games in moral education have been studied before, and albeit most studies agreed that educational games help in promoting pro-life choice, empathy, and critical thinking within moral dilemmas (Harrington & Connell, 2016; Hodge et al., 2019; Schrier, 2019). Despite that, there are still limited studies that focus on the usage of educational games in moral education. Previous studies are focused on certain aspects of morality, such as pro-life choice (Hodge et al., 2019; Krcmar & Cingel, 2016), utilitarianism of moral action (Hübner & White, 2018) and or faith-based moral paradigm (Auxier, 2018), however, when paired with formal education setting, this area are still very limited. This experimental study aims to fill the gap and provide insight into how educational games should be adopted in formal classrooms. Educational Games development takes a long process involving research, design, development and rigorous testing before being used and adopted in formal classrooms. First, due to the nature of the education method, we must study and understand the needs of SKKNI that be translated into learning modules and chapters. Then, we must design and develop an interesting yet still deliver the learning objective effectively as educational games. In our previous study, we already covered the design and development of our educational games (Wibowo et al., 2024a). This study aims to tests it in formal classroom to assess its acceptance among students and teachers.

METHOD

In this study, we used the class action research approach where we simulated real class conditions and observed the execution (Hewett et al., 2020; Septiani et al., 2019). We used a control group experiment where the participants were grouped into two groups: control group and experimental group. In the control group, participants are taught moral education by a teacher using classical approaches (lecture and slide presentation). The experimental group used our moral educational games corporated to lesson plan. To develop the lesson plan, we consulted with active moral education teachers and came up with a lesson plan that incorporated SKKNI and also adopted moral educational games.

There are four schools involved in this experiment: SMK Multistudi High School (https://multistudi.sch.id/) (MHS), a private vocational high school that focuses on information technology and arts; most students are Malay and Islam and come from middle to lower-income families. This school boasts a high rate of working graduates, with more than 50% receiving job offers before graduating. Work ethics and work culture are prevalent in this

school. SMA Katolik Yos Sudarso (https://www.smakyossudarsobatam.sch.id/) (YS), a private senior high school with Catholic values as part of school culture; most students are Chinese with a Christian religious background and come from all spectrums of financial state families. This school also often competes and wins in national and international STEM competitions and is praised by a high number of graduates who have been accepted into overseas universities. SMK Al-Azhar (https://smk-alazhar-batam.blogspot.com/p/tentang.html) (AA), a private vocational high school that focuses on business administration and Information Technology, most students are Malay, Islam and come from lower-income families. Direct quote their principal, most students from this school are broken home and prefer school life. Moral education is prevalent in this school due to this reason, and it has become their mission to develop the morally sound individual as their graduates. Finally, SMA Cerdas Mandiri (https://www.tabgha.education/sejarah) (CM) is a private senior high school built as part of a series of schools from kindergarten to high school by the local church. Most students here come from middle- to higher-income families and often from the church community. This develops a close-knit relationship between teachers, students and parents due to their closeness outside school.

During the treatment, each participant is observed to find indications of lesson participation (e.g., focus on the study, ask a question) and learning enjoyment (laugh/smile, excitement cue). After the lesson, we randomly choose three students as representatives of their group to be interviewed. Questions are developed using the Expectation Confirmation Theory (Jyothi & Savitha, 2023), where the control group are asked about expectation and the experimental group is asked about confirmation. Questions for control groups are:

1. What are your expectations on moral education?
2. What have you heard about moral educational games?
3. What are your expectations of moral educational games?
4. Do you want to use moral educational games in your moral education class? Why is that?

Questions for experimental group are:

1. What do you think about the moral education class just now?
2. What do you think about the moral educational games you just played?
3. What suggestions could you give to improve moral educational games?
4. Do you want to keep utilise moral educational game in your moral education class? Why is that?

Inductive analyses are performed to gather insight into all interview results, which will be discussed in the next section.

RESULT

Before we performed the experimental study, we first designed our lesson plan. Lesson plans are developed based on Rencana Pelaksanaan Pembelajaran (RPP), a formal document that every teacher in Indonesia must prepare before their class session. It comprised of Learning Objective, Assessment Criteria, Learning Material, Learning Method, Learning Plan, Learning Source and Assessment Plan. The most important part is the learning plan because it details minute-to-minute of the class proceedings. We design the lesson to be 90 minutes or 2 Lesson Hours, the same as the number of lesson hours per week for the Pancasila Education class. For the control group, we adopted a lesson plan designed by a teacher from each school. For the experimental group, we consulted with active moral education teachers from each school to incorporate our educational games into the lesson plan. The lesson plan is as follows:

1. 0-5: Lesson objective statement and motivation
2. 5-10: Instruction to students on how to play and interact with educational games
3. 10-40: Students play the educational games.
4. 40-60: Class discussion about the moral dilemma depicted in the educational games
5. 60-75: Small group discussion about human rights issue
6. 75-85: Group presentation
7. 85-90: class conclusion

There are 198 students from 4 schools involved in this experiment. They are splitted into two groups perschools: control group and experimental group. Students are mostly in their second year, with some from the first year; gender distribution is almost the same, with 100 male students (50.51%) and 98 female students (49.49%). Their composition is shown in the following table.

School	Control Group	Experimental Group
SMK Multistudi High School	21	19
SMA Katolik Yos Sudarso	30	30
SMK Al-Azhar	24	22
SMA Cerdas Mandiri	35	17
Total	110	88

Control group class sessions are performed without a hitch because they are typically conducted in regular classes. Some students were even distracted by our team tasked with observation, and some students even disregarded the subject and talked to each other. Although the teacher tries their best to convey the material, the discussion is short, and the number and quality of questions do not reflect the curiosity and excitement in class. Students contribute a little to the discussion, and all observations are cut short. The class are slightly more active during small group discussions and group presentations. Students asked for more time to prepare their presentations, and the presentations were more active. The duration of each part of the lesson plan for each school is shown in the following table.

Lesson Plan	Planned Duration (minute)	Control Group Duration (minute)			
		MHS	YS	AA	CM
Lesson objective statement and motivation	5	4	4	5	5
The teacher delivers the lecture by using slides	20	18	18	20	21
Class discussion	15	10	11	8	10
Small group discussion	20	26	24	23	27
Group presentation	25	26	24	26	27
Conclusion	5	4	5	7	6
Total Time	90	88	86	89	95

Experimental group sessions are performed much more actively; students are ecstatic when they know their classes are held in computer labs. Students are generally more excited and interested in the class and material. When playing educational games, students who have experience playing video games can control the educational games relatively quickly and even help students who have difficulties. Students who had difficulties at first, after a short period of adjustment, can enjoy the educational games and immerse in the narrative and its outcome. Students are especially excited when they find out that different options lead to different outcomes, and they are eager to know their friends' outcomes and compare their findings. The teacher who is observing the whole proceeding even mentions that this excitement rarely happens. Students contribute more to the discussion in class discussions and cite what happened during their playthrough. During small group discussions, students generally work faster, which makes the presentation phase smoother. After the session is over, most students in the experiment group ask for copies of the educational games to show to their friends who are not joining the experiment. The duration of each part of the lesson plan for each school is shown in the following table.

Lesson Plan	Planned Duration (minute)	Experiment Group Duration (minute)			
		MHS	YS	AA	CM

Lesson objective statement and motivation	5	4	4	5	5
Instruction to students on how to play and interact with educational games	5	6	4	8	6
students play the educational games	30	28	30	30	30
Class discussion	20	21	22	20	23
Small group discussion	15	15	16	14	14
Group presentation	10	8	12	10	11
Conclusion	5	5	3	4	3
Total Time	90	87	91	91	92

Class action observations are focused on lesson participation and learning enjoyment, which are described into four indicators and two indicators each: focus on study, ask a question, answer a question, discuss with each other, excitement cue and laugh/smile (see Figure 1). Based on observation data, it is quite clear that there are significant and positive changes between almost all indicators between the control group and the experiment group in all schools. Observation results are presented in the following table.

Observation Indicators	MHS		YS		AA		CM	
	C	E	C	E	C	E	C	E
Number of Students	21	19	30	30	24	22	35	17
Focus on study	18	17	25	30	19	19	24	17
Asked a question	1	10	0	9	0	3	0	2
Answered a question	16	17	8	24	20	14	12	15
Discuss among themselves	4	19	5	12	6	18	8	12
Excitement Cue	5	19	0	27	5	19	25	15
Laugh/Smile	16	19	12	28	12	19	14	17
C = Control Group; E = Experimental Group								

Figure 1 Experimental Group Session

After the class action research, we asked three volunteers from each group to be interviewed; students were excited, especially the experimental group. From the control group, we asked four questions. When asked about the expectation of moral education, most answered with a neutral answer (e/g its already good, I have no expectation, it is like what I experienced during junior high). Some expected more because of the political

condition of Indonesia during the interview are quite close to presidential election, some students expect teachers to highlight it in class. When asked why they have no expectations regarding moral education, their answer is summed up as boredom. Moral education, or in this case, Pancasila Education, has been taught since kindergarten; they have already memorized what it stands for, and since the tests are multiple-choice, it is generally effortless to ace them. Some students mention that a good teacher can excite the class with their life story or experience. However, since most good teachers teach STEM or "high profile" subjects, most moral education teachers are new teachers who have little experience.

Some students in the control group have heard about educational games; some even question their difference from gamification, another game-based learning approach that is on the rise in Indonesia. However, most associate educational games with early education, like for kindergarten or elementary level. Some students have heard historical content, STEM content and heavy narrative in video games, like Assassin's Creed, Minecraft and Heavy Rain. However, they can't see the possibility of those games being introduced in formal classrooms in Indonesia due to inherent problems like prolonged game time and not meeting the learning objective. Because of their unfamiliarity with moral educational games, they do not expect how good moral educational games should be. Some cited their favourite video games as their expectation. For the same reasons, student are not keen to use moral educational games in their formal classroom; some would like to try them simply out of curiosity. Nevertheless, because of their lack of experience in moral educational games or educational games in general, student interviews in control groups yield a negative perception of educational games.

On the other side, students from the experimental group unanimously would like to continue using educational games not only for moral education but also for other subjects as well. Students are interested in trying because their first impression of our moral educational games is positive. Because of that, students gave many ideas for improvement that could become a strong foundation for our next project. Students considered their experience in the experimental group very interesting and were willing to try other educational games in another subject. One student with experience in programming even suggested some technical improvements and game mechanics ideas to make the educational games more engaging. Students were mostly happy and enjoyed the class more than they expected. They also mentioned that due to the narrative and lesson being delivered in such interactive ways, teachers can focus more on discussion, which also helps young teachers deliver the subject better without relying on experience. Students can also experiment with the subject taught within the educational games environment. Due to our design of educational games, the playing session is also designed to be finished within the lesson plan so that it doesn't disrupt the lesson plan. Teachers who observed the whole thing also added that he had never known that educational games could be a powerful tool for teaching and was willing to learn how to develop educational games for his lessons in the future. Overall, the students from the experimental group have strong positive views on educational games and expect their adoption in formal classrooms.

DISCUSSION

The aims of this study are to give insight into how to incorporate educational games into formal classrooms and comply with the formal national curriculum. In our previous study, we already discussed how the content should be executed in our educational games. In this study, we strengthen that notion with its application within formal classrooms by seamlessly inserting educational games and playing sessions as part of lesson plans. The whole lesson plan is not disrupted, either in its content, learning objective or class duration. With this study, we prove that educational games designed with lesson plans and formal classroom settings can be used relatively well and fit in the existing lesson plan. Teachers do not need to modify the lesson plan drastically by adopting educational games, and lessons can run relatively smoothly. Technical expertise is not needed compulsorily if the educational games have already been developed and tested before.

Based on observation, students, especially in the experimental group, show that it is possible for a boring lesson in the control group to be exciting. When students are generally more active, the whole class dynamics change. The student-centered learning process dictates that students must be the key actors in education where students are motivated and eager to learn and where the teacher facilitates the learning process. We believe that educational games can be a potential answer to improving student engagement in class. This claim needs to be tested with

another area of learning and level of education for us to have a more comprehensive view of this subject matter, but within this study, we can confirm that educational games have a tremendous effect on student engagement.

That notion is supported by interview results, which also show overwhelmingly positive outtakes from students from the experimental group. Development, feature, technical and gameplay ideas from students during our interview are so rich they can become the basis for our future works within educational games. However, our study also proves the lack of usage of educational games, or video games in general, within the education sphere. Students are too focused on grades and knowledge rather than learning experience and engagement towards study. Many students in Indonesia consider school tests as memorization tests, and after the test, almost no knowledge is retained. National examinations become the biggest culprit of this condition; students are conditioned to answer questions well rather than understand a concept well. Learning objective are focused on student knows about something. Based on 21st Century Skills, competence like critical thinking, communication, and collaboration are more appreciated rather than the ability to answer multiple-choice questions. Problems in the real world and especially in jobs and industry don't present themselves with multiple-choice questions; rather, they test one's ability to gather information, think logically and critically thinking and communicate the solution well to others. Why is this outdated education system still used in Indonesia and most of the world in general? During the 21st century and especially in post-pandemic society, we believe the educational system needs to change, and we believe that educational games hold one of the keys to that changes.

In the interview, we also found that most students and teachers are not familiar with educational games, especially in high education environments. Despite the accreditation already incorporating the latest technological updates like short video platforms and extended reality, video games and educational games are often neglected. We believe there are three layers of answers to why this condition persists in Indonesia and Asia in general. Educational games, or video games, are often considered simply as games, albeit in digital format. For many Asian perspectives, games are for children. Most of the children are raised in Asian households, whether they are Mongoloid-descent, Malay-descent, Indus-descent or Arab-descent, parents ask their children to play. However, when a child reaches a certain age, a coming of age, one is expected to work, familiarize themselves with a certain trade, strive for a career, and most of all, leave their childhood behavior. Teenagers, young adults or even adults who are still playing games for children are considered immature, even if their careers are related to video games. This perception is retained in different capacities, even in modern households.

The second layer is also ingrained perception and high priority towards education. Asian parents would love their children to prioritized their education from the early age. Young children's informal educational institutions like math clubs and English courses are filled with Asian children whose parents are willing to pay extra for their children to study more beyond formal school. Art and sports courses are also offered to children as young as three years old. These informal education institutions are not cheap, but most parents, even from lower-income families, are willing to do so because in their mind, children with good education, especially in STEM and/or foreign languages like English and Chinese, with art or sports ability will be successful in life and have a well-paid job in the future. This mindset costs the children time to play, which we mentioned previously. So if they do not play at a later age and play a little in the children's stage, how can one understand what " games " are? Little did they know that future are changing. Now, AI become ingrained in most parts of modern jobs; people are tasked not to perform analysis but to interpret AI results and communicate them well to people. It is expected that conventional jobs, even computer science-related jobs will disappear in the future due to excessive and disruptive usage of AI.

To further firm the condition of why parents and students are not familiar with educational games come with the negative perception towards video games. Since they are not allowed to play in the later stage of life due to being "immature" and rarely having a chance at a young age due to "prioritization to education since early age", video games are the answer for most, if not all, individuals born in this condition. Video games are digital and often played on digital devices like computers and now smartphones, which is easily accessed by all. Video games also offer a "cool" character, environment, action and story. Players can see themselves being "cool" within video games, and thus, video games have become an escapism media of modern society from the mundane, including formal education. Based on our previous study, this perception is also the biggest barrier to implementing educational games in a classroom (Wibowo et al., 2024b).

Despite the bad image of video games, video games in education have limitless applications. Recent studies have demonstrated that video game-based learning gives unique chances for effectively engaging, motivating and developing an innovative learning system (Martinez et al., 2022; Weymouth & Atuah, 2022). Mitigating the existing viewpoint that video games are non-essential educational tools can facilitate educators' use of naturally more attractive learning environments to aid higher student activity and learning. Consequently, the use of educational games today has seen enhanced development, overcoming the weaknesses that were raised in the past. Through the exploration and recognition of the valuable facets of video game-based learning, educators are able to access this medium's power as a tool for education and for the preparation of students for the challenges of the 21st Century.

For adopting educational games to formal education, especially in Indonesia, the government hold the critical key to whether it is successful or not. As long as the government does not issue some suggestion or notification that educational games are viable learning media, the adoption of educational games will be similar to previous studies and simply end up as study cases. Regarding regulation, Indonesia have not decide on regulation on video games. Concern over violent content and sexual content that are published by government are disregarded by most players in Indonesia. Despite the presence of IGRS (Indonesian Game Rating System), due to a lack of socialization, a lot of local game developers are not familiar with and often refer to ESRB (Entertainment Software Rating Boards), which are more internationally recognized. Indonesian government need to step up and produce regulation to promote video games as creative industry and especially usage of educational games in formal education. Some countries in Asia, like Japan and South Korea, already have some regulations that are moving towards that direction; we believe that Indonesia, with the highest number of video game players in Southeast Asia, should have certain movements in regulations towards that direction as well.

Educational games are difficult to design and produced, game developers need artistic skill and technical expertise to be able to develop a video game. To develop decent video games, they need experience. To develop decent educational games, game developers should have accessed to education and pedagogy expertise that are owned by teachers. To develop educational games that are suitable for the learning process in formal classrooms, there is only one solution. This calls for collaboration between game developers and teachers. We suggest adding one more party to the equation: the government. Developing video games takes time, and especially takes quite a sum of funding. Since the objective is to design and develop educational games suitable for formal learning, the government, which is the Minister of Education, could offer funding via competition to excite the local and talented game developers to engage with education practitioners to design better and better educational games. We firmly believe that this condition will be the “end game” of our objective of attempts to adopt educational games in a formal classroom setting.

In formal education, the game educational is a novel and successful technique that provides a unique and inspiring way for learners to improve their learning outcomes. On the other hand, when we think of using game-based learning in the educational process and future research, different problems must be considered. It is a matter of overcoming a hurdle to ensure that the educational games align with the program goals and curriculum. Although education games can be very absorbing and may find students glued to the screen, they must facilitate learning by providing direct links to the core content and skills that students are expected to internalize. The other issue is how to make sure that games are evaluated correctly and properly. The old-fashioned way of evaluation, through exams and quizzes, could be inadequate in measuring the effects of educational games on learning outcomes. The invention of new ways to calculate the progress and cognition accomplishments within the game will also be required. Moreover, researchers and evidence-based practices towards the designing and deploying such educational games are also very important. This primarily encapsulates the study of the effects of various game interactions, information transmission schemes, and learning strategies upon teaching outcome measures. It is also worth mentioning that the integration of educational games into already existing educational systems and structures creates an obstacle. Educational games can only function seamlessly with regular classroom instruction as long as they complement and enhance traditional teaching methods instead of being disruptive to the class.

CONCLUSION

In conclusion, educational games represent a promising avenue for enhancing formal education, particularly in subjects like moral education. These games are purposefully designed to engage students in learning beyond traditional methods, offering interactive and immersive experiences that captivate learners' attention. Unlike conventional media, such as slides and videos, educational games provide a dynamic and participatory environment where students actively engage with the material.

Our study sought to address the gap in incorporating educational games into formal education settings, particularly in Indonesia. Despite the country's diverse education landscape, characterized by various types of high schools and a national curriculum emphasizing competencies aligned with Indonesia's National Work Competence Standard (SKKNI), there has been a notable absence of educational games in accreditation standards and classroom practices.

Through a combination of class action research and interviews with students, our study demonstrated the potential of educational games to enrich the learning experience. By seamlessly integrating educational games into lesson plans, we observed increased student engagement, enthusiasm, and active participation in the experimental group compared to the control group, where traditional teaching methods were employed. Moreover, our findings underscored the positive reception of educational games among students, with many expressing a desire to continue using them not only for moral education but also across other subjects. The interactive nature of these games, coupled with their ability to deliver learning content effectively within the confines of a typical class period, holds promise for transforming classroom dynamics and fostering student-centered learning environments.

However, our study also revealed challenges and shortcomings in the current education system, including a predominant focus on test scores and memorization rather than fostering critical thinking, communication, and collaboration skills. The reliance on traditional assessment methods and outdated pedagogical approaches may hinder students' ability to thrive in real-world scenarios that demand adaptability and problem-solving skills. As we navigate the complexities of 21st-century education, especially in the wake of the COVID-19 pandemic, there is a pressing need for educational reform. Educational games represent just one aspect of this broader transformation, offering a pathway to cultivate the skills and competencies needed for success in the modern world. By embracing innovative approaches like educational games and reimagining the role of technology in education, we can empower students to become lifelong learners equipped to navigate the challenges and opportunities of the future.

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