



Integrating Sandur Madura as a Cultural Context in Science Education: An Ethnographic Study on Migration and Acculturation in West Kalimantan

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Abstract: Immigration by Madurese natives in West Java was carried out due to economic and geographical factors and supported by an independent, dynamic, and courageous nature. This economic factor is indicated by the still high poverty rate in East Java and the high level of competition in getting jobs. Migration is an option for Madurese people to find sources of life that are starting to be limited; one of the migration destinations is in West Kalimantan. Many Madurese people migrate to West Kalimantan because they already have relatives there and have opportunities to improve their economy. This migration certainly affects the culture of the community, where Madura has a culture that must be maintained by its people even though they are outside the Madura area; the goal is to preserve and maintain the culture. Sandur is one of the Madurese cultures in the form of a theatre performance that integrates music, dance, and acrobatic silat movements. Education is one of the keys to preserving Madurese culture for immigrant communities in West Kalimantan. The method used is a qualitative ethnographic approach through observation and structured in-depth interviews to understand the dynamics and interactions of the Madurese ethnic group with local ethnic groups. The results of the study show that the Sandur performing arts not only function as entertainment, but also as a means of social education that conveys moral and ethical values, a bridge of acculturation. The process of enculturation and acculturation creates cultural harmony that enriches the identities of both parties, marked by the modernization of Sandur in its performances to adapt to local culture in West Kalimantan. The existence of a curriculum that supports Sandur culture can support students' sense of pride and active participation so that students will have awareness and participate in preserving Sandur culture. These findings support the integration of local cultural values into science education, fostering both scientific literacy and cultural identity among students.

Keywords: Acculturation; Enculturation; Migration; Sandur Culture; Science Education

Introduction

Sandur art is a traditional theatre performance from the Madurese ethnic group; this theatre integrates music, dance and acrobatic silat movements. The Madurese ethnic group can be found in various regions in Indonesia, but the Madurese ethnic group originates from East Java. The development of the times has brought changes that have modified the art of Sandur

Madura. So, the Madurese ethnic group who immigrated to several provinces in Indonesia can still maintain the Art of Sandur. However, it is undeniable that modifications can occur, and this is important to adapt to the times and maintain this art. So that the younger generation can easily accept and preserve the art of Sandur Madura anywhere.

Eyerman and Jamison (1998) describe traditions in society that tend to connect the past with a

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contemporary future (Cancellieri et al., 2022). Likewise, the art of Sandur Madura, which is still maintained and performed, contains values of modern life or issues that are developing in the modern era. The goal is for Sandur art to be easily accepted and preserved by the younger generation and even local people who live side by side with the Madurese ethnic group. Sandur art is a local Madurese tradition that was brought to the destination of the immigration area. This is done to preserve the Madurese tradition. In this case, (Sohrah et al., 2023) stated that the beliefs of the related community drive the preservation of tradition. Thus, the study was conducted to explore or dig deeper into the process or any modifications to Sandur art with the aim of preservation, acceptance by local communities, educating through art and encouraging young people to play a role in Sandur Madura art. This is because the challenges faced by Sandur Madura art are in the midst of cultural diversity, the flow of globalization, and the pace of modernization that is occurring in West Kalimantan. In this case, community habits in the form of traditions are knowledge that is carried out continuously because it is considered a source of capital in the community (Franco et al., 2022). If studied more deeply, this statement suggests that Sandur art contains values that can provide moral education to the community, especially young people. So the involvement of young people is very important. This study will describe efforts to preserve culture and social interaction among Madurese people who migrate to West Kalimantan through science education.

Economic and geographic factors drive the increasing population migration factor. The Madurese ethnic group comes from the province of East Java, which has a high population density and limited economic opportunities. This is supported by the results of research (Amalia et al., 2024), that East Java is still a category of provinces with a large and high level of poverty and population. The high level of competition indicates this in terms of getting jobs, education services, health services and so on. The results of the study (Bawono et al., 2023) explain that there have been several long-standing customs of the Madurese ethnic group marrying off their children at an early age, so until now, it still occurs and is quite high. So, it is not surprising that due to the density, the decision of the Madurese ethnic group tends to migrate to the island of Kalimantan, such as to West Kalimantan.

Communities are forced to migrate to find sources of life that are starting to be limited. At the same time, other factors are independent, dynamic and brave characters in expanding the reach of the area or environment they have. However, the impact of new problems cannot be avoided; the culture brought by migrants from their home areas will mix with the culture

in their destinations. This condition will create a change if it occurs over a long period. In addition to economic processes and changes, adjustments in terms of habits and customs of a society will also occur directly. The process of enculturation and acculturation is one of them. Cultural acculturation certainly occurs in areas inhabited by residents and immigrants. How much acculturation occurs will be greatly influenced by the intensity of interaction between the two (residents and immigrants). Culture is a belief in the form of behaviour (Tolkach & Pratt, 2021). Thus, different cultures in the midst of diversity must be tolerated. The factors that cause acculturation in the migration process include the duration of migration, marriage, intensity of social interaction, education and income. In addition to acculturation, enculturation also greatly influences social change in society. Enculturation is a social process carried out by certain individuals in learning and adjusting their thoughts and ways of behaving with a particular culture. This will provide an overview of the differences between enculturation and acculturation.

Sandur has various values that make it usable as a medium for enriching science learning. Sandur art provides ethical values in the form of self-discipline and responsibility as well as respect and humility. Martial arts such as silat in sandur art emphasize self-discipline, perseverance, and responsibility that can be reflected in science education to foster a disciplined approach to scientific investigation and experimentation (Cynarski, 2019; Cynarski & Johnson, 2023). Respect for others and humility are core points of martial arts, this can be integrated into collaborative science projects that promote a respectful and cooperative learning environment (Cynarski, 2019; Li & Zheng, 2021). Sandur also provides traditional values. The integration of local wisdom and traditional practices in learning can increase students' interest in learning, such as research by (Elvianasti et al., 2023) which applies the Betawi tribe's silat beksi to teach biological concepts related to the body's movement system. The integration of culture in learning activities can help students develop a sense of identity and responsibility that is in line with the Pancasila student profile (Mujahid & Mukminin, 2025).

However, realizing this requires mutual adaptation, even collaborating cultures through acculturation. As in the Madurese ethnic group who immigrated to West Kalimantan, they had to acculturate with the culture and life of the local community. Of course, creative power is needed to create acculturation. The development of the arts should involve the younger generation (Jaeni, 2023). As in the Madurese ethnic group, preserving the Sandur performing arts involves the younger generation, even though they have to modify it through adaptation to community life as well as local culture and are relevant to modernization in

West Kalimantan. In-depth research is needed to find out how the migration process can affect the preservation and development of Sandur art in West Kalimantan, so researchers want to study more deeply the influence of migration and acculturation of Sandur art in West Kalimantan in the context of science education.

Method

The method and approach of this research is qualitative ethnography, the aim is to explore in depth the process of enculturation and acculturation through the performing arts of Sandur Madura. The Ethnographic approach is appropriate as an approach to this research because the main focus of this research is related to the culture, customs and social life of the community. So that it supports researchers in finding answers to research questions that encourage exploring the interaction of the Madurese ethnic group with local society and culture, direct observation of Sandur art as a link to West Kalimantan culture, gaining perspectives from various views of research subjects on the preservation of Sandur art and the challenges faced by the younger generation with modifications, Sandur art as a means of moral and ethical education through ethnography that observes the contributions of young people that can be known directly. Participants or subjects of this research are the Madurese ethnic group who immigrated to Mempawah and the local community of Mempawah, West Kalimantan.

Data collection was conducted through observation and in-depth interviews. Observations were conducted through observation guides with a designed observation focus or concepts relevant to the research questions. Observations were conducted during the preparation, implementation and closing of the Sandur performing arts. The observations conducted were non-participatory. In this type of observation, the researcher did not involve the subject in the activities but only as an external observer. The aim was to avoid the risk of bias, and the researcher focused on the object of research.

Furthermore, interviews were conducted through structured interview guidelines with questions that focused on the modification and strategy of the Madurese ethnic group towards the preservation and adaptation of the Sandur performing arts. Interviews were conducted to obtain individual perspectives and experiences related to the preservation of Sandur art. In contrast, non-participatory observations were conducted during the Sandur performance to understand the dynamics and interactions that occurred in it. The observation was done at 10 January 2025 in

Mempawah, West Kalimantan. The interview was conducted by 325 Mempawah people at 13 January 2025.

Data validation analysis is carried out with the aim of ensuring the accuracy and credibility of study results (Utami, 2019). The data validation technique in this study uses a triangulation model on the data source. This analysis was carried out by comparing data from informants, namely respondents who are residents who migrated in Mempawah. These respondents consisted of teachers, students, and parents.

Data analysis was conducted through the Milles and Huberman approach; at this stage, the information from observations and interviews was categorized and then linked to relevant theories.

Result and Discussion

Madurese Tribe Migration

The Madurese ethnic group immigrated to West Kalimantan, precisely in Mempawah Regency, driven by geographical and economic factors of the area of origin to move. So that the ethnic diversity in the West Kalimantan region is very multicultural but remains harmonious. In the 13th to 20th centuries, the Madurese ethnic group migrated to West Kalimantan (Afifah et al., 2023). Other factors for the Madurese ethnic group to Mempawah are the orientation of life that comes out, beliefs and thoughts of continuing life are not only limited to the land on the island of Madura but also the West Kalimantan area, which is considered worthy and appropriate and able to be a source that can support their lives and the existence of an independent, dynamic character and dare to take action.

The island of Kalimantan has become one of the areas of the Madurese ethnic distribution map in carrying out migration, one of which is the West Kalimantan region. An interesting finding from the migration of the Madurese ethnic group in Mempawah Regency is that they tend to live in groups with other immigrants from the same area. Even though they are in a group life, adaptation or adjustment is still carried out. Every individual who immigrates really wants their life at their destination to be accepted by the local population (Husna & Djamaruddin, 2024). Regarding the drivers of Madurese ethnic immigration to West Kalimantan, this is in line with the theory put forward by Ravenstein. Immigration laws include immigrants tend to choose the location closest to the destination area (Kamajaya & Edgar, 2024), the difficulty of earning income in the area of origin and the possibility of earning better income in the destination area, the higher the individual's income, the higher the frequency of mobility of that person, news obtained from relatives or friends who have moved to other areas is very important

information, Madurese ethnic immigrants tend to choose to migrate to West Kalimantan where some friends or relatives live, unmarried residents migrate more than married residents, and residents who have a higher level of education will usually be more mobile. Culture and life may be brought. One of them is the uniqueness of the arts, which is a cultural wealth (Ramadhan & Mualimin, 2024), as in the Sandur performing arts. The strategy of the Madurese ethnic group is to preserve the existence of their culture in West Kalimantan with various efforts.

Enculturation and Acculturation of Sandur Culture

The Madurese ethnic group successfully carried out the immigration process through a process of adaptation and tolerance in living life amidst ethnic diversity in West Kalimantan. The cultural diversity of each ethnic group is a network of meanings that can guide or limit people's thoughts and behaviour and even influence social structures (Zhao, 2024). As is the case with the Sandur performing arts for the Madurese ethnic group in West Kalimantan. The process of enculturation and acculturation of the Madurese ethnic group in West Kalimantan reflects cultural dynamics. The Madurese ethnic group maintains the culture it brings, one of which is in the Sandur performing arts. Culture is built socially as a result of interactions and bonds between humans (Webb, 2021). So, the Sandur performing arts adopt the lives of local communities, especially the Mempawah community.

Adaptation to Mempawah culture has created a harmony that enriches the cultural identity of both parties. The enculturation carried out by the Madurese ethnic group through efforts to learn more deeply and adjust their thoughts and ways of behaving with the basis or purity of Sandur art. The goal is to strengthen their own cultural identity and attract the interest of the young generation of Madura to study the Sandur performing arts.

However, in order for the performing arts of Sandur Madura to exist abroad and be preserved and maintained by the Madurese ethnic group as well as the local community in Mempawah, the acculturation process is needed and has been carried out. Cultural practices direct individuals to collaborate in achieving goals and passing on shared values (Butt et al., 2024). The Sandur Madura performance as a result of enculturation and acculturation by inserting the values of modern society in Mempawah, original folk stories and customs of the Madurese community. The Sandur performance, as a unique art that combines music, dance and acrobatic martial arts, is in line with the statement (Aditya & Ramadhan, 2024) that art is culture. The involvement of teenagers in the Sandur performance using Madurese and Malay languages, traditional

clothing and social roles inherent in the Madurese ethnic group. So, the Sandur performing arts have the function of conveying moral and ethical values in community life. Sandur is a means of education as well as entertainment for the Madurese community and the local community in Mempawah. Thus, the efforts made are a process of enculturation and acculturation.

Enculturation as part of the inheritance of native culture cannot survive and develop without the support of immigrant and local communities. Circumstances or things that are done repeatedly can form habits that eventually become their own culture (Sukmani, 2024). Enculturation refers to the process by which customs or culture are transmitted from one generation to the next while still including the authenticity or purity of culture. Enculturation or the process of acculturation that occurs in social relations that continue to develop in a society, starting from childhood through socialization in the family, social circles, friends, schools to religious institutions and government institutions that are regulated according to the norms and rules that have been established in society (Dakhi & Sos, 2024). This shows that humans in their lives need each other to achieve common goals (Suriyanisa et al., 2023) as in the ability of the existence of Sandur Madura in West Kalimantan.

The process of acculturation of the Madurese ethnic group in the Sandur performing arts is the use of musical instruments and dance styles that are influenced by Mempawah culture and are relevant to modern life. This shows the influence of local culture on the Sandur performance. The Malay language that is mostly used by the Mempawah community is also used by the Madurese ethnic group, although the Sandur performance uses the Madurese language. The Madurese language is used to strengthen their identity and existence (Fadhilah et al., 2019). This certainly helps the Madurese ethnic group in building better social relationships and expanding the social networks of the local community. The Madurese ethnic group involves themselves in the practice of community traditions in Mempawah. A good understanding between different cultures in each ethnic group is realized because of good interactions (Verkuyten et al., 2019).

Such as Robo-robo activities and so on. Acculturation is their flexibility and ability to adapt without losing their identity. Acculturation in the integration of Islamic teachings with Madurese cultural values. Culture and religion as contextual elements in society (Zheng et al., 2024). This facilitates acculturation; the Malay community in Mempawah is mostly Muslim. The moral values taught in the Sandur performance often reflect Islamic teachings, thus creating synergy between local religious beliefs and Madurese culture (Budiman, 2015). Social interaction is also driven by

social, economic, and cultural factors, which allow for cultural exchange. The diversity of culture and local knowledge of the community is influenced by social, cultural and economic factors (Levers, 2013). The instillation of the values of the Sandur performing arts is the community's hope for the young generation of the Madurese ethnic group. This involvement accelerates the acculturation process, where they learn from each other and influence each other. Acculturation is understood as a result of the encounter and contact of different cultural groups, which takes place continuously over an unlimited period.

The art of Sandur Madura has been developed in Bangkalan Madura, Madura Island, East Java Province, since 1940. In addition to developing in the Bangkalan area, this art has also developed in several areas of East Java, such as Surabaya, Jombang, Pamekasan, Jember, and Probolinggo. Sandur Madura Theatre uses the Madurese language in its performances. This art was brought by the Madurese people, who migrated and settled in Mempawah. Sandur Madura art is a semi-theatrical art that contains poems or conversations that are carried out using the Madurese language. The poems in this art are also accompanied by original Madurese music and East Javanese movements that are presented spontaneously to respond to the poems and conversations that occur in the performance. Sandur Madura can also be categorized as an art that can support and preserve Madurese's literature to this day. The poems and conversations in the Sandur Madura performance usually contain social problems that exist in the community, which are then continued with speeches or reminders to the community about how to overcome these problems. Sandur is one of the many performing arts that the Madurese tribe has. Like other performing arts, Sandur has certain characteristics in the form of performances similar to traditional theatre arts, such as Drunk in East Java. Still, in this Sandur performing art, there is also a musical performance, or there is singing in it.

Looking at its development, the art of Sandur Madura in the Bangkalan area once experienced its heyday in the 1970s. In terms of the frequency of performances, it could reach 26 times in one month, very different from the current conditions, which can only hold performances once or twice a year, likewise with the state-of-the-art Sandur Madura in the West Kalimantan area. Sandur, as the identity of the Madurese tribe, is currently very rarely found. Remoh or celebratory events in the Madurese tribe, such as weddings, thanksgiving, etc., which usually feature this performing art, are very rarely found. Events such as those described above currently use modern performances, such as bands or just single organ performances, and sound players, such as VCD players.

To maintain the existence of Sandur Madur, the involvement of the younger generation is needed, especially young men and women of the Madurese tribe in the migration areas. Globalization has an impact on the speed of the flow of more popular foreign cultures (Ramadhan et al., 2023). Madurese people in several areas in West Kalimantan have made several efforts to maintain the sustainability of this art, one of which is the Madurese tribe in the Mempawah area. The Sandur Madura performance has begun to be reintroduced to the community and young people to maintain its sustainability.

Sandur Cultural Learning in Science Education

Sandur has values that can be implemented in science learning. The existence of silat movements in sandur can be used as a medium for students to learn. The study of human movement can be related to Sandur through motion and biomechanical analysis. This involves an understanding of the mechanical principles of movement. This implementation can be done by giving students worksheets on human movement to integrate students' science understanding (Widodo et al., 2018). The music used in Sandur can be explored through acoustic and cymatics treatments to teach the material on waves, resonance and physical vibrations (Bunawan & Yanti, 2020). Implementing Sandur in learning can also foster students' science skills through worksheets that focus on investigative skills, critical thinking, and problem solving (Gumilar et al., 2021).

Efforts to preserve the culture and social interaction of Madurese immigrant communities in West Kalimantan through science education can be done in several ways, as: (a) Integrating culture with science education by applying ICT to incorporate indigenous cultural elements into science education to help students appreciate the scientific aspects of their heritage and stay connected to their cultural roots (Wu et al., 2024); (b) Promoting social integration through ethnic broadcasts and community-based programs can foster tolerance and shared responsibility among diverse ethnic groups, thereby creating a more harmonious environment (Purwasito & Hastjaryo, 2024); (c) Collaboration between schools and the community to teach tolerance and cultural understanding, supported by community and family involvement (Raihani, 2014); (d) Encourage participatory dialogue by providing participatory discussions and critical thinking to help empower communities to address local challenges and contribute to cultural preservation and social integration (Fernando et al., 2024).

By combining the above approaches, it will be possible to create a supportive environment for

Madurese migrants who value their cultural heritage and their integration into the wider society. Integration of Madurese cultural knowledge into science education can significantly support social cohesion in West Kalimantan through the following mechanisms:

a. Cultural relevance and inclusivity

- 1) Integrating local knowledge related to culture, such as Sandur culture, into science education makes the curriculum more relevant and inclusive for students from various backgrounds. This approach helps students see the value of their cultural heritage in the context of modern education, fostering a sense of belonging and respect for their cultural identity (Handayani, 2020; Rahmawati & Ridwan, 2017; Tapia, 2020).
- 2) Incorporating local cultural elements into learning can help students better understand the content, which increases their engagement and motivation to learn. The connection between their cultural background and education can bridge the gap between home and school environments, thus encouraging the creation of a more cohesive community (Handayani et al., 2018; Tapia, 2020).

b. Social justice and equality

- 1) Integrating cultural knowledge into science education addresses issues of social justice and equity by giving marginalized groups a voice and representation in the curriculum. This inclusion helps counteract the marginalization these groups often experience in standard educational systems (Isa et al., 2022; Photo & McKnight, 2024).
- 2) A culturally responsive curriculum ensures that all students have an equal opportunity to succeed, regardless of their cultural background. This approach can reduce educational disparities and promote a more equitable and cohesive society (Isa et al., 2022; Rahmawati & Ridwan, 2017).

c. Empowerment and identity

- 1) Integration of cultural knowledge that empowers students can lead to the development of positive ethnic identities and a stronger sense of self-esteem among students (Rahmawati & Ridwan, 2017; Tapia, 2020).
- 2) Cultural integration in student education will increase students' sense of pride in their cultural heritage, enabling them to make a positive contribution to their community. This pride and active participation can strengthen social ties and foster a sense of unity (Rahmawati & Ridwan, 2017; Tapia, 2020).

d. Community engagement and sustainability

- 1) Involving communities in the education process by incorporating local knowledge and practices can increase community engagement and support for education. This engagement can result in a more collaborative and supportive educational environment (Handayani et al., 2018; Wu et al., 2024).
- 2) Integrating cultural knowledge also helps preserve and sustain indigenous practices and wisdom, ensuring that these valuable cultural assets are passed on to future generations. This preservation fosters a sense of continuity and shared heritage, which is vital for social cohesion. (Handayani et al., 2018; Wu et al., 2024).

Integrating local culture, such as the Madurese art form Sandur, into science education in West Kalimantan can provide a rich context for learning. This approach not only aids in understanding scientific concepts but also helps preserve and promote cultural heritage. The success of similar initiatives in other areas underscores the potential benefits and importance of developing culturally responsive educational materials. Integrating local cultural practices into science education can enhance student engagement and understanding. For example, the traditional martial art "silat best" from the Betawi people has been used to teach biology concepts related to the motor system, demonstrating the potential of local wisdom to enrich science learning (Elvianasti et al., 2023). Ethno pedagogy that incorporates local wisdom into the curriculum has been shown to make learning more meaningful for students. For example, integrating the cultural practices of various ethnic groups in Indonesia into science lessons helps students connect scientific concepts to their daily lives, thereby improving their scientific literacy (Rahmawati et al., 2021; Supriyadi et al., 2024). Incorporating traditional arts into the curriculum not only helps in teaching scientific concepts but also helps preserve these cultural practices. For example, traditional music from South Kalimantan has been used as a resource in social studies to promote cultural preservation among students (Jumriani et al., 2024). Although integrating cultural elements into education presents initial challenges, such as developing appropriate materials and familiarizing students with new methods, the long-term benefits include increased student engagement and deeper understanding of scientific and cultural concepts (Rahmawati et al., 2021; Supriyadi et al., 2024). Research has shown that such integration can foster a harmonious blend of cultural identity and academic achievement, thereby promoting a more inclusive and contextually relevant educational experience (Mairing, 2023; Supriyadi et al., 2024).

Conclusion

The results of the study indicate that the process of migration of Madurese people to West Kalimantan can affect cultural acculturation and enculturation. Sandur art, which is a traditional Madurese theatre, has undergone modernization by combining local West Kalimantan culture. Preserving Sandur culture is very important to maintain, continue, and preserve it. Education is the key to preserving Sandur culture, by including a culture-based curriculum. This can help students to understand their native culture and increase students' sense of pride so that it will increase students' active participation in maintaining their native culture.

Furthermore, the integration of Sandur culture into the science education curriculum not only enhances cultural preservation but also supports the goals of science education by providing a contextualized learning experience. Through this integration, students in multicultural communities can better understand scientific concepts in a way that is relevant to their daily lives and cultural backgrounds. This approach strengthens the link between cultural acculturation, local wisdom, and scientific literacy, thus contributing to the development of a culturally responsive and meaningful science education. Implementing Sandur in learning can also foster students' science skills through worksheets that focus on investigative skills, critical thinking, and problem solving.

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Conflicts of Interest

The authors declare no conflict of interest.

Author Contributions

Conceptualization, M.C.P.A.; methodology, A.R.O.S.; formal analysis, R.T.; resources, R.T.; writing—review and editing, M.C.P.A. and A.R.O.S. All authors have read and agreed to the published version of the manuscript.

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