

Varying ethnicity of students potentially improve the ability of the group in completing bacteriology practice projects

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Abstract: Student ethnicity is one of the internal factors that influence student learning. Bacteriology is a course that examines prokaryotic unicellular living things and is practiced in laboratories that need to implement projects. The aim of this research is to know the distribution of students based on their ethnicity. The research sample was students who programmed the bacteriology course in the Biology Education Study Program at Mulawarman University, in the even semester of the 2022/2023 academic year. The sampling technique is purposive sampling. The research instrument is a questionnaire. The data analysis technique is percentage. The results of the data analysis show that there are various student ethnicities. There are four ethnic groups that dominate other ethnic groups, namely: Javanese (25.5%), Bugis (18.8%), Kutai (16.4%), and Banjar (14.9%). Completion of projects in groups whose members are heterogeneous based on ethnicity allows the participation of every member of the group. The conclusion is that there are various student ethnicities who program bacteriology courses, namely those consisting of ethnic Javanese, Bugis, Kutai, Banjar, Berau, Toraja, Paser, Mandar, Batak, Palembang, and Dayak. It is necessary to add a larger sample size for similar research in order to obtain more information.

Keywords: Bacteriology; ethnicity; practicum; project

Introduction

The learning process is influenced by two factors. These factors are internal factors and external factors. Internal factors include the ethnicity of the students. The character of each type of ethnicity is different. These characters are related to the character to work, study, and others.

Ethnicity is a group of people who share the same fate. Ethnicity has been considered by researchers during the investigation of phenomena involving a range of issues such as acculturation, discrimination, identity processing, migration, interethnic contact, prejudice, neighboring deprivation, social comparisons, stigmatization, terror management and psychiatric health (Zagefka, 2009) and there are differences between people of different ethnic backgrounds within the human race (Tan-Koi et al., 2018). People of the same ethnic background tend to have similar characters, and vice versa.

Varied ethnic conditions in one class allow students to work together in completing a task in groups. Every group or race holds to their respective religion, culture, and language besides drawing a distinction in work distribution according to different races in the economic field (Ahmad & Yusof, 2010). Indonesia, with its very large geographical area, has more than five hundred ethnic groups and has a very diverse local culture (Juhannis et al., 2021).

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The contributions made by each ethnic group provide reinforcement in completing a task. Weak ethnic characters are strengthened by strong ethnic characters. Personality is an inherent characteristic of a person, a family, and a community (Fahmy et al., 2015). In this regard, the values of prophetic education that include humanity are cooperation, generosity, tolerance, courtesy, and honesty (Prayitno et al., 2022). The character can also be considered a behavioral element that emphasizes somatopsychic elements possessed by human beings (Rokhman et al., 2014). Thus, they will strengthen each other in completing a task or project.

The implementation of projects in learning or practicum activities allows students to work in groups to complete them. They often begin with a desire to learn by doing (Sanders et al., 2020). Projects that students work on in groups will produce certain products. The groups formed should be heterogeneous based on ethnicity. Therefore, the lecturer must first have information about the ethnic types of students in the class.

Bacteriology is a course that is practiced in the laboratory. The themes of the practicum of the bacteriology course in the Biology Education Laboratory, Faculty of Teacher Training and Education, Mulawarman University are (1) making bacterial growth media, (2) preparation and calculation of bacterial Total Plate Numbers (ALT), (3) Gram staining, and (4) analysis of Most Probable Number (MPN) of bacteria. These practicum themes in practicum activities need to apply project-based activities. Students will carry out investigations in groups to complete the project. By carrying out investigations, it improves students' ability to collect data needed for project completion. The themes of practicum activities are sought to be carried out by groups of students whose members have different ethnic backgrounds.

The results of observations about the ethnicity of students who programmed bacteriology courses in the even semester of the 2022/2023 academic year have never been carried out. Bacteriology practicum has not been applied to projects, and has not produced products. The grouping of students for bacteriology practicum has not been heterogeneous based on ethnicity.

It is necessary to investigate the ethnicity of students taking bacteriology courses. The types and number of students per ethnicity in a class must be known. Thus, ethnic-based student grouping can be done. Project implementation in bacteriology practicum can be done. The heterogeneous structure of student group members can strengthen project completion. This research is important because we can map the whole in each group. In implementing the bacteriology practicum, we want to apply project-based learning for each practicum theme. In implementing the project, students gathered heterogeneously based on their ethnicity.

The purpose of the study was to determine the ethnic types of students taking bacteriology courses and practicum activities. Thus, an ethnic-based heterogeneous grouping of students in bacteriology practicum activities can be done. Data on the type and number of students per ethnic type will make it easier to group students based on ethnic type. Knowledge of a student's ethnicity is important. This condition is caused because ethnicity is an internal factor that influences student learning in rotiology practicum.

The research carried out made it possible to discover the ethnic types of students. By knowing the ethnic types of students, we can divide work groups in bacteriology practicum. The work group was ethnically heterogeneous. Students' ethnic characters can strengthen each other in bacteriology practicum group work.

Method

Research Sample

The research sample was students who programmed bacteriology courses in class A and class B in the even semester of the 2022/2023 academic year. The sampling technique was purposive sampling. Inclusion criteria were (1) students who programmed bacteriology courses in the 2022/2023 academic year, (2) registered as practicum participants in bacteriology courses, and (3) willing to fill out and return the questionnaire. The number of students in class A was 35 people, and class B was 32 people.

Research Instruments

The research instrument was a questionnaire. The questionnaire was developed by the research team. The instrument was distributed to all sample members to be filled in and returned to the research team. The contents of the questionnaire included (1) respondent's name, (2) father's ethnicity, (3) mother's ethnicity, (4) male grandmother's ethnicity, (5) female grandmother's ethnicity, (6) language spoken on campus, and (7) language spoken at home.

Research Procedure

The research implementation followed the following stages: (1) Development of research instruments. The content of the instrument was completed according to the needs of the data to be collected; (2)

Sample determination. The research sample was students who were in class A and class B, who programmed the course and carried out bacteriology practicum; (3) Distribution of questionnaires to all sample members. The questionnaire that has been developed is then distributed to the entire sample (respondents). Furthermore, the questionnaire was filled in by the respondents; (4) Collection of completed questionnaires from the entire sample. After the respondents filled in the questionnaire completely and correctly, the completed questionnaire was returned to the research team; (5) Selection of questionnaires collected from all sample members. Only questionnaires that have been filled out completely and correctly will be analyzed; and (6). Data analysis. Data that has been recapitulated from the questionnaire, then analyzed using percentage analysis techniques.

Figure 1 shows the flowchart of the research stages.

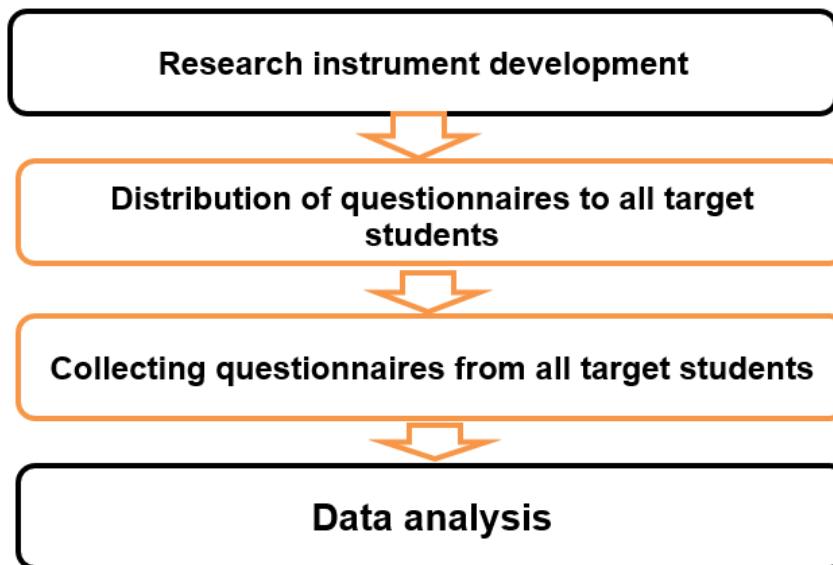


Figure 1. Flowchart of the research stages

Data Analysis Technique

To achieve the research objectives, the research data were analyzed using descriptive techniques (percentage). The data analyzed were data obtained from questionnaires that passed the selection to be analyzed. The questionnaires whose data were analyzed came from class A and class B students who programmed bacteriology courses and took bacteriology practicum.

Results and Discussion

Ethnicity of Students

Students in class A have varied ethnicities. The same applies to the ethnicity of students in class B. The ethnicities of students in class A and class B are predominantly Javanese, Banjar, Bugis and Kutai (Figure 2 and Figure 3). However, although the number is small, there are also other ethnicities, namely: Dayak, Berau, Toraja, Paser, Mandar, Batak, and Palembang.

Data on the ethnicity of total students for class A and class B need to be known in order to obtain an overall picture of the ethnic condition of students in both classes. In general (for the ethnic condition of students in class A and class B), Javanese (25.4%), Banjar (24.9%), Bugis (18.8%), and Kutai (16.4%) are dominant. The percentage of other ethnicities is below 7.5%. Figure 2 shows the percentage of students for each ethnicity (for total class A and class B).

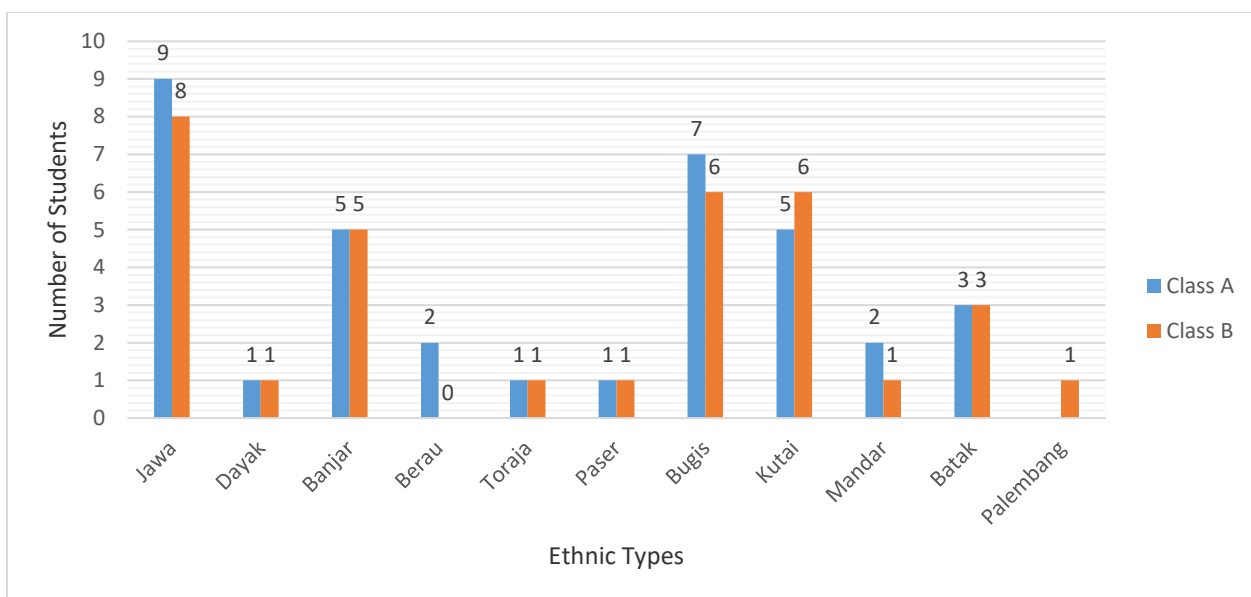


Figure 2. Description of student ethnicity

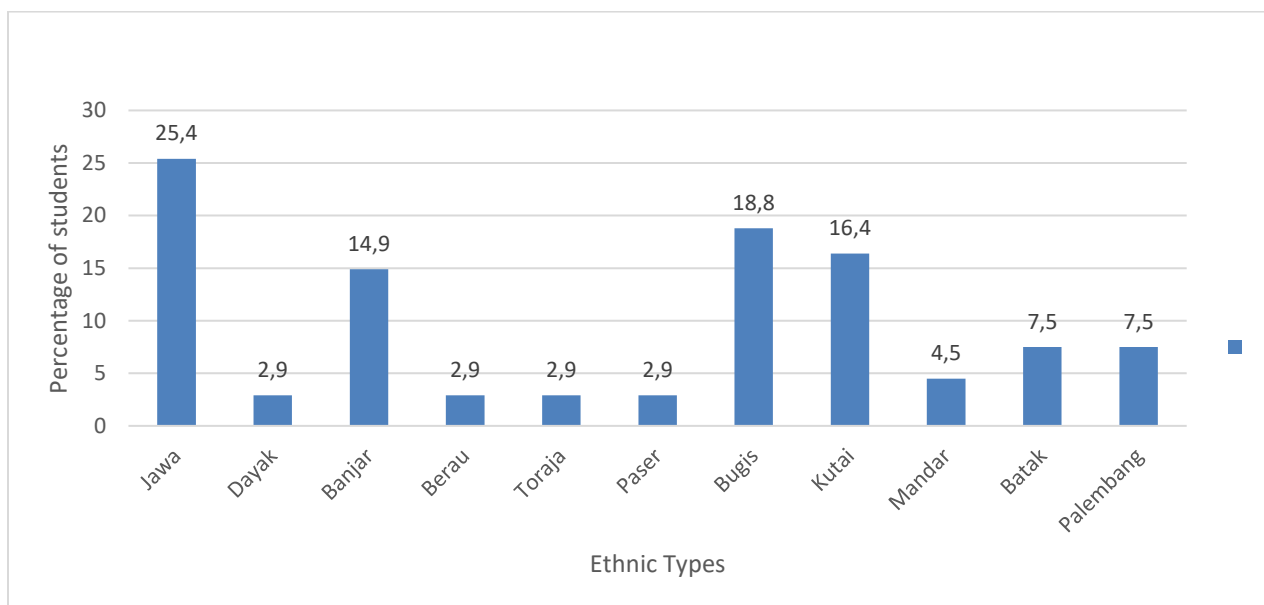


Figure 3. Percentage of students for each ethnicity

The determination of the ethnicity of students in this study is based on the ethnicity of their father. However, if the ethnicity of both parents (father's ethnicity and mother's ethnicity) is examined, it is found that the number of students who have parents of the same ethnicity is greater than parents of different ethnicities. The ethnicity of the students and their percentages in class A and class B are shown in [Table 1](#). [Table 1](#) shows the percentage of students in class A and class B who have parents of the same ethnicity and parents of different ethnicity.

Table 1. Percentage of students based on the ethnicity of their parents

Ethnic similarity of father and mother	N	%
Same	45	67.16
Not the same	22	32.84

Learning with Multiethnic Students

Figure 1 shows that all ethnicities, with the exception of Berau and Palembang, are present in both class A and class B. The most numerous ethnicity in class A is Javanese, and the least are Dayak, Paser, Toraja, Mandaja, and Mandarin. Although not equal in number, all ethnicities are present in both class A and class B. The ethnicity with the most students in class A is Javanese, and the least are Dayak, Paser, Toraja, Mandar, and Palembang ethnicities. In class B, the ethnicity with the most students is Javanese, and the least is ethnic Dayak, Toraja, Paser, and Mandar. The Javanese, the largest and politically and economically dominant ethnic group, and the Toraja, an ethnic minority group, are both considered descendants of indigenous Indonesians (Sari et al., 2019). Indonesia is a multi-ethnic country with more than 1,340 different ethnic groups, more than 2,500 regional languages, and 9 dominant religions (Bilven et al., 2022). This is reflected in the composition of the school-aged population, which in many countries is more ethnically diverse than ever before (Munniksmas et al., 2023). Therefore, in the implementation of the learning process or practicum activities in the laboratory in groups, lecturers need to distribute students of Javanese ethnicity to all work groups.

The condition of students whose ethnicity varies arises because of the condition of the community (parents) in Samarinda City whose ethnicity varies. Indonesia is a diverse country in terms of religion, ethnicity, culture, ethnicity, and language (Hanum, 2006; Zulaeha, 2013) and These racial and ethnic differences persist despite the different characteristics of families, students, and schools (Ho et al., 2019). The ethnic structure of the community in Samarinda City is formed by local residents and migrants. Migrants are generally job seekers in Samarinda City who come from almost all regions in Indonesia and abroad. There are parents who marry a partner of the same ethnicity. However, there are also parents who are married to partners of different ethnicities (Table 1). This condition of the ethnicity of the parents (father and mother) gave rise to the ethnic character of the students, which tended to be different.

Ethnically diverse (multi-ethnic) students are found in both class A and class B. In a multicultural country like Colombia that is constantly exposed to hazards, the importance of involving minority ethnic group (Gomez et al., 2023). Varying ethnic conditions require lecturers to choose learning models that allow the involvement of all ethnicities. Therefore, this article aims to present, through a historical overview, a positive example of a multicultural social system that has overcome all difficulties caused by differences in ethnicity, race, and religion or caused by government policy (Ruthner, 2012). The selection of learning models is sought so that there is a stage for students to form working groups. The formation of heterogeneous working groups is based on the ethnic conditions of students.

Certain ethnicities have different characteristics. When comparing representative groups of students in terms of race, gender, and ethnicity, differences were found in levels of fear/anxiety (Banda et al., 2023; Bates & Glick, 2013; Kippenbrock & Emory, 2022) and asked nursing students across the country to respond differently based on race, gender, and ethnicity (Chong, 2011). In groups consisting of various ethnicities, it allow the involvement of students with different ethnic characteristics in the process of completing group tasks. Thus, they will cooperate with each other in completing the tasks.

Potential Ethnic Characters Influenced in the Process of Completing Learning Projects

Certain ethnicities have unique characteristics. For any culture, there are certain characteristics that are unique and similar to those of other cultures, commonly known as a cultural identity (Masrek et al., 2021). Overall, in both class A and class B, there are four ethnicities that dominate other ethnicities (Figure 2). The ethnic condition of students in class A and class B is due to the fact that in addition to parents in both classes having varied ethnicities, it is also due to the ethnic structure of students who are quite evenly distributed in each class.

There are certain ethnic characters that are strong in carrying out the practicum process. However, there are certain ethnic characters that are weak in carrying out the practicum process. These diverse characters can strengthen each other in carrying out the practicum process. Cultural values associated with three distinct ethnic groups/regions have a significant impact on the education-related behavior of university students, which in turn impacts their academic performance (Banda et al., 2023). Therefore, lecturers need to implement a project-based practicum that allows students in groups to complete the project.

In the process of empowering student character in practicum activities, all members in the group must feel that they are equal in the group. Multicultural education is an educational tool that ensures equality for all students (Jayadi et al., 2022). All group members must be accommodated for their contribution of ideas. All members need to be motivated to follow the practicum process. Thus, all students' ethnic characters can contribute to the process of completing tasks or projects.

The project-based bacteriology practicum process follows the pattern contained in the bacteriology practicum manual. Each student who has a different character according to their ethnicity, is expected to cooperate with each other in completing the project. The process and quality of the results of project completion carried out by the group, in addition to being determined by practicum tools and materials, are also determined by the activities of all group members with different ethnic characters.

Bacteriology Practicum Implementing Project

The themes of bacteriology practicum practiced so far, have not implemented projects. Therefore, lecturers and practicum assistants need to implement projects in the practicum of this course. Projects can be given to students in bacteriology practicum themes such as making bacterial growth media, processing and calculating ALT, MPN analysis, and Gram staining. With the project, students can carry out the stages of problem formulation, investigation, data discussion, problem-solving, discussion, conclusions, and sharing findings with others, including other students, lecturers, and practicum systems. Such a work pattern allows students to select data that is tailored to the problem that has been formulated and produce products. Students with certain ethnic backgrounds in the group, both of whose parents have the same ethnicity and different ethnicities, can support each other in the stages of project completion activities. In this study, students' ethnicity was determined by their father's ethnicity. There is a need for further studies on the ethnic character of students who have parents of the same ethnicity and parents of different ethnicities.

By knowing the ethnicity of students who vary in the bacteriology course practiced, it is hoped that lecturers and practicum assistants can divide students into each work group evenly based on the ethnicity found. Adequate collection and reporting of race/ethnicity data is essential to communicate the generalizability of the findings and the implications of the intervention for racial/ethnic groups specifically (Gaias et al., 2020). In the practicum process, lecturers and practicum assistants need to ensure that all group members can be involved in completing the project. Projects given by lecturers are in accordance with the themes of the bacteriology practicum.

Conclusion

The ethnic types of students in class A and class B are Jawa, Bugis, Kutai, Banjar, Berau, Toraja, Paser, Mandar, Batak, Palembang, and Dayak. There are four ethnicities that dominate other ethnicities, namely Javanese, Bugis, Banjar, and Kutai. By knowing the ethnic types of students, it allows lecturers to group students heterogeneously based on ethnicity in carrying out bacteriology practicum that implements projects in the laboratory. This research has limitations. These limitations include: (1) determining a student's ethnicity is only based on his father's ethnicity, (2) determining a student's ethnicity does not pay attention to his father's and mother's ethnicity, (3) determining a student's ethnicity does not pay attention to the ethnicities of his grandparents for his father and his parents. her mother.

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Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Author Contributions

D.T. Boleng: introduction, methodology, data analysis. **E.T. Maasawet:** writing-original draft preparation. **H. Swandana:** Review and editing.

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