Awareness of education university’s preschool students about the impact of 4.0 industrial revolution in education and role of STEM education in teaching

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Abstract. The article talks about the awareness of preschool students about the impact of the 4.0 industrial revolution in education. Research results show that: Most of the students in the University and College of Education are aware of the importance and impacts of the 4.0 industrial revolution in education in general and in the changes of goals, contents, methods, and forms from the impact of 4.0 industrial revolution. However, there still have been spartities between students of Universities and Colleges of Education, which show that students at universities of education are better aware of the others at the College of Education. And, there are still some students who are not really aware of the changes in the goals, contents, methods and forms of education from the impacts of the 4.0 industrial revolution. However, STEM education also significantly affects the change of teaching methods, towards interdisciplinary teaching and development of learners skills through many experiential activities to adapt and integrate.

1. Introduction
The 4.0 industrial revolution is currently taking place every day and every hour and will certainly have strong impacts to higher education as well as employers [1]. Universities, therefore, cannot be satisfied with the test results but need to actively approach the situation of the 4.0 industrial revolution to change the development. In order to improve the education quality, the movement of innovation of teaching methods has been promoted at universities, including the policy of education associated with 4.0 industrial revolution in teaching [2]. Accordingly, universities must guide students to apply the 4.0 industrial revolution in learning and practicing [3]. This change requires educators to provide learners with both new skills, creativity, and adaptability to new challenges and requirements that are not satisfied with traditional education methods [4], [14].

The 4.0 industrial revolution also requires people to have creative ability, innovation, skills in analyzing and synthesizing information, being able to work independently and make decisions based on analysis data evidence [5]. These are also skills that Vietnamese students are most lack of. To tackle this problem, 4.0 education will be one of the effective measures which need to be deployed at universities [6].

We are now entering the 4.0 industrial revolution. In addition to the knowledge provided at schools, students have a huge resource on the Internet [7]. Education university, therefore, is also required to transfer from studying (E-learning) to studying (students) and students must be actively self-study [8].

There is a problem raised is whether students of Preschool Education get to know about the 4.0 industrial revolution? How did they perceive its impacts?

In addition, the role of STEM education is very important in changing teaching methods and forming skills for learners [9]. It help learners quickly adapt to work and modern life, new thinking, creativity and independence in thinking. It can be said that STEM education is the right development orientation in the current global education trend [10], [13], [15], [16]
2. Researching
Survey content: Survey the Preschool Education students’ awareness of the 4.0 industrial revolution’s impacts and the role of STEM education in teaching: educational objectives, educational content, as well as educational methods and forms.

We use the synchronous research methods such as: General analysis of theory, interview methods, survey methods, observation methods, mathematical statistics (calculate the percentage of average marks) to collect the most objective information.

The Objects of the survey: 50 preschool students - K50B Faculty of Preschool Education, University of Education - Thai Nguyen University; 50 Kindergarten students - K15A Primary School - Kindergarten, Thai Nguyen College of Education.

3. Research results
3.1. Preschool students’ awareness of the 4.0 industrial revolution’s impacts
In order to understand the awareness of Preschool Education students about the 4.0 industrial revolution’s impacts in education, we have set up the criteria to assess the awareness of students of Thai Nguyen University and College of Education. And here are the results:

Table 1. Awareness of preschool students about impacts of the 4.0 industrial revolution in education

| Criteria Place | Criteria 1 | Criteria 2 | Criteria 3 |
|----------------|------------|------------|------------|
|                | High level | Moderate level | Low level | High level | Moderate level | Low level | High level | Moderate level | Low level |
| University of Education | 3.02 | 3.55 | 1.22 | 3.20 | 3.00 | 1.33 | 2.95 | 3.20 | 1.45 |
| College of Education | 2.75 | 2.48 | 1.42 | 2.97 | 2.50 | 1.64 | 2.70 | 3.25 | 1.83 |

Table 1 shows that:
- Criteria 1: Awareness of Preschool Education students about the importance of the 4.0 industrial revolution.

The level of the awareness of students of the University of Education is higher than awareness of the importance of the 4.0 industrial revolution in higher than students of the College of Education. Specifically, the awareness of students of the University of Teachers Training is 3.02 while the one of the College of Education is 2.75. However, there is a difference in the level of awareness of the importance of the 4.0 industrial revolution between the students of the University of Education, with 3.55% while the awareness level of the students of the College of Education with (2.48). This is also a negligible difference.

Thus, we can see that most Preschool Education students have become aware of the 4.0 industrial revolution’s importance of the moderate level education (2.88).

- According to the criteria 2 on the Awareness of Preschool Education students about the nature of the 4.0 industrial revolution based on the results of Table 2.1, we can see that the level of University of Education students’ awareness of 4.0 industrial revolution is higher than that of College of Education students. Specifically, at the level of University Preschool Education students’ awareness is higher than the awareness level of those of the Teacher Training (2.97) is 0.23. At the moderate level, the awareness of the nature of 4.0 industrial revolution in education of the students at the University of Education is 0.5. This is a big difference. However, at the moderate level of students at the College of Education is 0.31 higher than those of the University of Education.

The criteria assessment results othe of Preschool Education students of the 4.0 Industrial Revolution’s nature shows that the almost of the students have fully been aware the 4.0 Industrial Revolution’s nature.
Revolution’s nature, which is the revolution of applying scientific and technical progress of previous revolutions and using artificial intelligence to connect it, serving human development in a more positive way. However, the level of awareness and understanding of the 4.0 Industrial Revolution’s nature in education is only at the moderate level. It means that students only know about the nature of 4.0 industrial revolution but not really understand it.

- According to Criteria 3: Student's awareness of the 4.0 industrial revolution’s impacts on education.

The awareness level of Students of the College of Education about the impact of the 4.0 industrial revolution in education. Specifically at the high level, the awareness of the students of the College of Education (2.7) is lower than the students of the University of Education (2.95). At moderate and lower levels, the level of students the College of Education is higher than those of University of Education with 0.25 and 0.38, respectively.

Through the criteria on Preschool Education students’ awareness of the 4.0 Industrial Revolution’s impacts, we realized that many students have got to know it in education, but only at the average level.

To learn more about the 4.0 Industrial Revolution’s impacts, we undertook a survey with 100 students of both University and College of Education with the question: "On what aspects does the The 4.0 Industrial Revolution impact in education?". And the results are shown in the chart:

![Chart of Preschool Education Students’ Awareness about the manifestations of the impact of the 4.0 industrial revolution in education.](image)

The results show that: Most of the students believe that the 4.0 industrial revolution’s impacts are reflected in educational methods, educational contents, educational forms and educational curriculum.

There are 52% of students at the University of Education think that the impacts of the CMCN 4.0 industrial revolution are reflected in the educational methods. This is a true perception because the 4.0 industrial revolution impacts in education have promoted the education development, then the methods in teaching are also one of the essential things to help students. Students to have new ways of learning, practicing experiences, independence, creativity and better master the knowledge. And 50% of students at the College of Education also agree with this. Thus, the difference between the university and the college of Education is not large, only 0.2%, indicating that students in both schools are aware of the impact of 4.0 industrial revolution to the teaching methods but still only at the moderate level.
The impact of 4.0 industrial revolution in education manifests itself in educational content, this is a true impact because the educational content is very important to organize diverse activities, in order to form and develop human qualities and capacities that could meet the society’s requirements and during the period of the 4.0 industrial revolution. Thus, students at college of Education (48%) are aware of this, which is 0.4% higher than that of University of Education students (44%). This shows that students from both university and college have been aware of the impacts of the 4.0 industrial revolution in educational content.

There are 40% of students of University of Education and 42% of those of College of Education believe that the impacts of the 4.0 industrial revolution manifest itself in the form of education. This is the right perception because when 4.0 industrial revolution impact education, the requirement is to change the form of education to meet the requirements of society, change the form of education that helps student to learn. They can learn how to study, having a sense of self-awareness, and the skills needed in the learning process. Looking at the performance chart, we can see that there is a difference of rate, but generally speaking, the students of both university and college are aware of the 4.0 industrial revolution impacts in education, but compared to the perception of the work, the impact of 4.0 the 4.0 industrial revolution to methods and contents is quite low.

There are 48% of students of University of Education and 44% of those of College of Education believe that the impact of the 4.0 industrial revolution is reflected in the educational goals. This is a true perception because the 4.0 industrial revolution requires educational goals to be developed and constantly updated to show their functions, contributing to creating resources to meet the requirements of society. With not much difference in the percentage of students from both the University of Education and the College of Educaction, the impacts of the 4.0 industrial revolution in education programs is well recognized.

Thus, we can see that the most of the students have a very good awareness of the impact of the 4.0 industrial revolution in education affecting educational methods, forms of education, educational content and educational goals but awareness level is moderate. However, the comparison between students of University of Education and those of College of Education has a difference, but the difference is only from 0.1 to 0.2%. But it also shows that the awareness of universitiy of Education students is always higher.

3.2. Awareness of Preschool Education Students about educational goals from the impact of the 4.0 industrial revolution

During the 4.0 industrial revolution, a change in education is required. Of which one of the impacts on education in the period of 4.0 industrial revolution is the educational goal. In order to understand the Preschool Education students’ awareness of educational goals from the impact of 4.0 industrial revolution, we conducted a survey with 50 Preschool Education students, University of Education - Thai Nguyen University and 50 students of Thai Nguyen Primary School - Preschool, Thai Nguyen College of Education, with the question "In what aspect is the education goal in 4.0 industrial revolution shown". And the results are:

Table 2. Preschool Education students’ awareness about educational goals from the impacts of the 4.0 industrial revolution

| Targets                  | University of Education | College of Education |
|--------------------------|-------------------------|----------------------|
|                          | Correct | Wonder | Incorrect | Correct | Wonder | Incorrect |
| 1. Learn to know         | 24/48   | 19/38  | 7/14      | 21/42   | 20/40  | 9/18      |
| 2. Learn to work         | 22/44   | 20/40  | 8/16      | 20/40   | 17/34  | 13/26     |
| 3. Learn to live together| 19/38   | 22/44  | 9/18      | 16/32   | 23/46  | 11/22     |
| 4. Learn to assert yourself| 18/36  | 18/36  | 14/28     | 16/32   | 20/40  | 14/28     |
The results of table 2 show that: In general, preschool education students are aware of the impact of the 4.0 industrial revolution on educational goals. Specifically:

Educational goals in the 4.0 industrial revolution are considered by students to be "learn to know". There are 24/50 students of university of Educaction (accounting for 48%) and 21/50 students of college of education (accounting for 42%) agree that this goal is correct. There are 38% of students of university of Education and 40% of students of college of education are still confused with this goal. With the aim of learning to know (according to 4 pillars of educational pillars of UNESCO), the goal of learning is to acquire information, knowledge, know how to create and use knowledge proficiently as Psychological tool. Because knowledge is extremely rich and can grow immensely, it is useless for someone to try to learn everything. The school needs to teach students the ability to think (thinking skills), memory skills and concentration. These are the three basic types of psychological tools, as keys for people to continue to open doors of knowledge: Creating positive teaching and learning, moving towards self-learning. People will learn one - know ten. Thus, the goal of learning to know is an important target in the period of industrial revolution 4.0. However, there are still 16/100 students (accounting for 16%) who are not aware of this goal

With the goal of learning to do, it means that in the 4.0 industrial revolution, learning and practice is the one. The new working model, in both the industry and service sectors, will require the application of information, knowledge and creativity ... Personal competitiveness will be based on theoretical knowledge and practice combined with personal motivation and good skills in problem solving, decision making, rich creative initiatives and teamwork. Thus, with this goal, there are 40% of pedagogical university students and 40% of pedagogical students are aware of this goal. Up to 80% of students at both University and College of Education still confused and 21% of students at both University and College of Education think this goal is not correct. Therefore, the number of students who are aware of this goal is at moderate level, besides that the number of students who are not aware. That is also the basis for me to propose recommendations to help raise awareness for students about this issue.

There are 19/50 university of Educaction students and 16/50 students of College of Educaction believe that the educational objective from the impacts of the 4.0 Industrial Revolution is to learn to live together. Although the number has not exceeded the average, most students are aware of this goal. The number of students wondering about this goal is quite high (accounting for 38%). Thus, they have been dreamy with this issue.

34/100 students (accounting for 34%) said that the educational goal from the impacts of the 4.0 industrial revolution is to assert themselves. Because when having knowledge, skills and attitudes from learning, the most important goal is to assert yourself, expressing your own thinking, expressing your creativity, thereby helping your personality develop. more comprehensive.

In summary, the students’ awareness of educational goals from the impact of the impacts of the 4.0 industrial revolution are still at an average level. The number of students with correct awareness is quite low compared to students who are wondering about the goal. That is the basis for me to propose recommendations to enhance the students’ awareness of the impact of the 4.0 industrial revolution.

3.3. Awareness of preschool students in education content from the impact of the 4.0 industrial revolution

In order to examine the Preschool Education Students’ awareness of education content from the impact of the 4.0 industrial revolution, we conducted a survey among 100 students at the University and College of University with the question: Does educational content change to meet the 4.0 industrial revolution’s requirements? Most of the students said yes. Especially with the second question related to the shortcomings and limitations of educational content during the 4.0 industrial revolution, I conducted a student survey, and the results are showed in Table 3.

The results in Table 3 show that there are 59/100 students (accounting for 59%) believe that there are still limitations the educational content despite some of innovations: "The content of training knowledge still focus on theory, and has not created a unity to link educational goals with the goal of finding jobs for the learners”. This is a very correct point of view because when the content of
education changes during the period of the 4.0 industrial revolution. It must ensure the comprehensiveness, modernness and systematicness. The contents of education at this time do not only focused on textbooks but also experiences from life, expanding the people’s knowledge. But things it is very difficult to change them immediately because there has not been so much practice in the content of knowledge. Therefore, this is one of the limitations. There are 32% of students are still confused by this limitation and 9% of students think this limitation does not exist. Thus, most of the students are aware of inadequacies and limitations with a lot of knowledge, and limitations in the practice besides only a few students do not understand this.

Table 3. Awareness of Preschool Education students about educational content from the impacts of the 4.0 industrial revolution

| Limits                                                                 | Levels                                                                 | Correct | Wonder | Incorrect |
|------------------------------------------------------------------------|------------------------------------------------------------------------|---------|--------|-----------|
|                                                                        | Quantity | %     | Quantity | %     | Quantity | %     |
| 1. The content of training knowledge still focus on theory, but not practice and has not reached a unity to link educational goals with the goal of finding jobs for learners. | 59       | 59    | 32       | 32    | 9        | 9     |
| 2. There is no connectivity between national and international university education standards. | 34       | 34    | 55       | 55    | 11       | 11    |
| 3. The curriculums have focused on large quantities.               | 62       | 62    | 34       | 34    | 4        | 4     |

34% of students said that one of the limitations and shortcomings in changing educational contents during the 4.0 industrial revolution is not to create a connectivity between domestic and international university education standards. Because in the period when the country is entering during the 4.0 industrial revolution, the demands of people are getting higher and higher, and the demand for transferring schools and transferring majors is also a trend. This not only makes it difficult for learners to move to foreign educational institutions, but also to receive diplomas and certificates of domestic educational institutions in countries where they move to settle or work is not easy. There are 55% of students are still wondering about this regime, and 11% of students think that this is not one of the limitations of changing educational content due to the 4.0 industrial revolution’s impacts.

The curriculum is still heavy and learning time amount is limited. This is one of the limitations on content that many students easily find out. There 62/100 students (accounting for 62%) think that this is a true limitation while 34% of those have still been still confused 4% think that this restriction is not correct.

So, it can be seen that the majority of students are aware of the limitations in educational content the 4.0 industrial revolution’s impacts. However, there are some students who are not aware of this, which is also the basis for me to give some advices for the Preschool Education students to be better aware of changes in contents of education from the impacts of the 4.0 industrial revolution

3.4. The role of STEM education in teaching under the impact of the 4.0 industrial revolution

* Purposes of using teaching methods in STEM education:

In order to understand the Preschool Education students’ awareness of the purpose of teaching methods in STEM education from the impacts of the 4.0 industrial revolution, we conducted a survey among students of the University and College of Education with the question: "What is the method of teaching during the period of the 4.0 industrial revolution under the impact of STEM?". The results are showed in Table 4.

Firstly, the purpose of teaching methods in education from the impact of the 4.0 industrial revolution is "Improve the quality of teaching". There are 34/100 students (accounting for 34%) think
that this is the right purpose, because the goal of innovating teaching methods in education from the impact of 4.0 industrial revolution is to help students grasp the knowledge and have the best skills and to do it well, it is a need to improve the quality of teaching. However, there are 36/100 students (accounting for 36%) still confused, and 30/100 students (accounting for 30%) say that this is not the right purpose. Therefore, the number of correct and wonder answer sheets is rather high. It can be seen that they have not understood the purpose of teaching methods in education from the impacts of the 4.0 industrial revolution.

Table 4: Purpose of using teaching methodology in STEM education from the impacts of the 4.0 industrial revolution

| No. | Purposes | Correct | | | | Wonder | | | | Incorrect | |
|-----|----------|---------|------------------|------------------|------------------|---------|------------------|------------------|------------------|---------|------------------|---------|
|     |          | Quantity| %     | Quantity | %     | Quantity | %     |                   |                   |         |                   |         |
| 1   | Improving teaching quality | 34      | 34    | 36      | 36    | 30      | 30    |                   |                   |         |                   |         |
| 2   | Stimulating learning interests, promoting students' positiveness in learning | 52      | 52    | 35      | 35    | 13      | 13    |                   |                   |         |                   |         |
| 3   | Implementing the policy of education reform | 30      | 30    | 41      | 41    | 29      | 29    |                   |                   |         |                   |         |
| 4   | Meeting teaching requirements during the 4.0 industrial revolution, interdisciplinary integration teaching | 42      | 42    | 33      | 33    | 25      | 25    |                   |                   |         |                   |         |
| 5   | Getting achievements for the schools | 27      | 27    | 26      | 26    | 47      | 47    |                   |                   |         |                   |         |

Secondly, the purpose of teaching methods in education from the impacts of the 4.0 industrial revolution is to: "Stimulate learning interests, promoting students' positiveness in learning". There are 52/100 students (accounting for 52%) completely claim that this is the right purpose. Because when renewing the teaching method, students must be more excited and proactive in the lessons, thereby improving the positiveness for students. If the teaching method is renewed without making students interested in the lessons, the knowledge provided to them is very difficult. However, there are still 35/100 students (35%) are still confused and there are 13/100 students (accounting for 13%) think this purpose is not correct.

Thirdly, the purpose of teaching methods in education from the impact of the 4.0 industrial revolution is to: "Implement the policy of innovation of the education sector". There are 30 out of 100 students (accounting for 30%) think this is the right purpose. There are 41/100 students (accounting for 41%) are still wondering this purpose and there are 29/100 students (accounting for 29%) think that this is the wrong purpose of teaching methods in education from the impact of the 4.0 industrial revolution. It is clear that there are many students who still do not understand the purpose of teaching method in education from the impacts of 4.0 industrial revolution, they only see the forehead things but not really deeply understand the innovation of teaching method in education from the impact of the 4.0 industrial revolution is partly due to the policy of education reform or not?

Fourthly, the purpose of teaching methods in education from the impact of the 4.0 industrial revolution is to: "Meet the teaching requirements during the 4.0 industrial revolution, interdisciplinary integration teaching of STEM". There are 42/100 students (accounting for 42%) that this is the right purpose. There are 33/100 students (accounting for 33%) are wondering this purpose and there are 25 students (accounting for 25%) think this purpose is not correct. It is clear that the innovation of teaching methods must meet the teaching requirements in the 4.0 period. When the 4.0 industrial revolution affects education, then there is a need for a breakthrough in education. It means that there must be innovations in the method to help learners understand in the best way. more positive in the method to help learners understand the best way.
Lastly, the purpose of teaching in education from the impacts of the 4.0 industrial revolution, the purpose of teaching in education from the impact of the 4.0 industrial revolution is to: "Get achievements for the school". There are 27/100 students (accounting for 31%) that this is the right purpose. There are 26/100 students (accounting for 47%) wondering this purpose. There are 47/100 students (accounting for 47%) that this purpose is not correct.is to: "Get achievements for the school". There are 27/100 students (accounting for 31%) that this is the right purpose. There are 26/100 students (accounting for 47%) wondering this purpose. There are 47/100 students (accounting for 47%) that this purpose is not correct.

Thus, the investigation results indicate that the majority of Preschool Education students have a good understanding of the purpose of teaching methods in education from the impact of the results and the role of STEM education in changing those. In addition, there are still many students who do not really understand the purpose of teaching methods, because this is a very important aspect influenced by 4.0 industrial revolution and STEM education. If students do not define the purpose of teaching methods, of course, what they do will not be effective, especially for students of education universities and colleges. Therefore, in order to understand the purposes of teaching methods in education from the impacts of the 4.0 industrial revolution, and STEM education each of them must study carefully to understand the effects of 4.0 industrial revolution on education in general and learn about teaching methods in particular at that time.

*The trend of innovating teaching methods under the impact of STEM education:

The trend of innovating teaching methods in STEM education from the impacts of the 4.0 industrial revolution is very important because when they determine the innovation trend, students easily grasp how teachers teach so that they can learn lessons more easily. That requires students need to be aware of the new trend of teaching methods. In order to understand students' awareness of the trend of teaching methods before the impact of 4.0 industrial revolution STEM education, I conducted a survey of students of University and College of Education with the question "What trends do teachers often innovate teaching methods, according to you? With three levels as follows: "Regular", "Sometimes", "Never". And the results are:

Table 5. The trend of teaching method innovation under the impact of STEM education from the impacts of the 4.0 industrial revolution

| No. | Environment                             | Trend                  | University of Education | College of Education | Total       |
|-----|-----------------------------------------|------------------------|-------------------------|----------------------|-------------|
|     |                                         |                        | Regular | Sometimes | Never | Regular | Sometimes | Never | Regular | Sometimes | Never |             |
| 1   | Technology of teaching activities       |                        | 21/42   | 19/38     | 10/20  | 19/38   | 22/44     | 9/18   | 40/40   | 41/41     | 19/19 |
| 2   | Positive teaching activities           |                        | 25/50   | 23/46     | 2/4    | 26/52   | 20/40     | 4/8    | 51/51   | 43/43     | 6/6  |
| 3   | Interdisciplinary integration in teaching activities |                        | 27/54   | 19/38     | 4/8    | 24/48   | 20/40     | 6/12   | 51/51   | 39/39     | 10/10 |
| 4   | Develop scientific research skills    |                        | 20/40   | 19/38     | 11/22  | 19/38   | 19/38     | 12/18  | 39/39   | 38/38     | 23/23 |
Table 5 shows that: In general, Preschool Education students are aware of the trends of teaching methods in education from the impacts of the 4.0 industrial revolution such as: industrializing teaching activities, positive teaching activities, combining traditional teaching methods with modern ones, and intensifying scientific research activities.

40/100 students (accounting for 40%) think that teachers have regularly innovated their teaching methods in the direction of industrializing teaching activities. It means that, in the process of teaching, teachers have applied information technology, letting them students access to internet resources ... so that students can easily grasp and have more extensive lessons. It can be seen that students of the University of Education and College of Education are aware of this trend at the level of regular assessment. Besides, there are 19/100 students (accounting for 19%) think that teachers have never used this trend, showing the small number of students who are not aware of this trend. It is possible that students did not focus their minds in the lessons or they have not realized that their teachers had not yet innovated their teaching methods in the direction of industrialization.

There are 51/100 students (accounting for 51%) supposing that teachers have regularly renovated teaching methods towards positive teaching activities. They mean fostering the positive and self-discipline of students. In this trend, 26/50 students of College of Education (accounting for 52%) agree with this trend. Most of them think that teachers have used the trend of positive teaching activities, however at different levels. Specifically, students believe that the number of teachers who sometimes use this trend account for 43%, seeing a quite large number to realize that the trend that teachers have used, of which students of University of Education and College of Education have no difference in their votes.

According to the trend of interdisciplinary integration in teaching activities, 51 students in University of Education and College of Education (accounting for 51%) agree with this trend that teachers use regularly. Only more than half of the students thought that this was a tendency to be used regularly, 39 students (accounting for 39%) said that with this trend, teachers use at the average level and 10% of students said that this trend had never been used in the teaching process. During the survey, I also had time to observe teaching methods of teachers and found that they have been using the tendency to combine traditional teaching methods and modern teaching methods interdisciplinary integration in teaching activities very often. Thus, it shows that students have not fully focused on the teacher's ways of teaching and thus, give an awareness of this tendency at an average level. Related to the trend of developing scientific research skills for learners, 39 students agreed that there should be a focus on fostering scientific research skills for students - one of the most important conditions when they integrate the modern world.

When raising extensive interview questions on this issue to lecturers of Thai Nguyen University of Education, we received many replies that teachers have been very active in applying these trends to change teaching methods for students to have the best performance, helping them develop more comprehensively. However, there are still difficulties in the application of trends to innovate teaching methods before the impacts of STEM education, including difficulties in facilities, heavy amount of knowledge, etc. They are also the reasons why teachers have difficulties in applying teaching methods of STEM education, and it is also one of the bases for me to make recommendations to the teachers so that they would better perform trends and help students become more aware of this issue.

4. Conclusion
The survey results show that many students at the University of Education and College of Education have been aware of the importance and impacts of the 4.0 industrial revolution on education in general and the changes in educational goals, contents, methods, forms from the impacts of the 4.0 industrial revolution and the role of STEM education in teaching. However, the perception of this problem between students of University of Education and College of Education is different, showing that students at University of Education are better aware of the issue than those of College of Education.

However, there are still some students who are not really aware of the changes in the goals, content, methods and forms of education from the impacts of the 4.0 industrial revolution and the role
of STEM education in teaching. It seems like that they have not paid much attention to this issue, which that makes students' awareness is still at moderate and low levels. The impact of the 4.0 industrial revolution on education and the role of STEM education in teaching is very important. It is from this research result that embolden us to continue to have extensive researchs on influenced factors to make recommendations for Preschool Education students to raise their awareness of the 4.0 industrial revolution's impacts and the role of STEM education in teaching should be given with much attention.

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