Decrease and Conquer Strategy Application in Education

Alternatives Education Systems and Teaching Strategies that use Decrease and Conquer

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***Abstract*—Algorithm strategies are widely applicable. Decrease and conquer is an algorithm strategy that reduce problem into smaller problems and then conquer it to get the entire problem solution. Decrease and conquer strategy could be applied in education, in education system as well as teaching strategies. Education is an important aspect in human lives. Each children deserves a good education. A student could have good education if there is good education system with suitable teaching strategy. Indonesia's education system applies divide and conquer strategy for elementary and secondary school, and combination of divide and conquer and decrease and conquer in high school and university. Besides Indonesia's education system, there are some other alternatives for education system that uses decrease and conquer: Students Choose Subjects System and Personalities-Based System. For teaching strategies that using decrease and conquer, this paper explains 2 strategies: differentiated instruction through learning station and group learning.**

Keywords—decrease and conquer; education; education system; teaching strategies.

I. INTRODUCTION

Education is one of the most important aspect in human lives in this modern era. Formal education, from elementary to high school, gives children base knowledge in many subjects, including ethical and citizenship education. On the other hand, college and university education gives student knowledge that could support them when they need to survive in the real life world. Education produces leaders with rational thinking ability and knowledge, which is so important especially for developing country like Indonesia.

As developing country, Indonesia has to keep up with the world modernization. Therefore, education system in Indonesia develops over time, from traditional to modern techniques, one curriculum to another. The curriculum in Indonesia is developed by curriculum development team in Education Ministry. On July 15th, 2017, the team officially launched Curriculum 2013, which has some differences with the older one, Curriculum KTSP (2006), in some aspects. One of the differences is that Curriculum 2013 has consideration for soft skills in the graduation standard and it has specialization subjects which applied from the first grade of high school.

Basically, we could say that education in Indonesia, as well as many other countries in the world, has applied 'Divide and Conquer Strategy', where subjects that students must learn are divided into many sections that student must conquer one by one.

Talking about education, teaching strategy is one thing that we should consider about. Teaching strategy is approaches that teachers use to teach their students. There are many teaching strategies that a teacher could apply in teaching, such as cooperative learning, inquiry-based instruction, and differentiated instruction. Some of this teaching strategies are actually applying algorithm strategies, like decrease and conquer.

Decrease and Conquer is one of popular algorithm strategies. It is a strategy that divide a problem into smaller problems, and solve it. Therefore, not like divide and conquer strategy that need to solve all smaller problems to solve the bigger one, decrease and conquer only solving one of the problems to solve the entire problem.

In short, this paper would analyze how we could apply decrease and conquer strategy in some aspect in education, such as teaching strategies and education system itself.

II. THEORETICAL FRAMEWORK

A. Algorithm Strategies

Algorithm strategies are approaches to solve problems. It also possible to have a combination of some different strategies to solve one certain problem. Here are some algorithm strategies that people usually use:

- Brute force. This is an algorithm that literally try all possible solutions, and then choose one best solution. This algorithm is considered as expensive in its execution.
- Greedy. This algorithm focus on getting local best/optimum solution by choosing the best from choices available at one time, without considering any consequences, and hoping that it will lead to get the global optimum.

- Divide and conquer. This algorithm has three phases, dividing, conquering, and combining. What it does in the dividing phase is keep dividing the problem into smaller problems until it small enough to be conquered. After that, in the conquering phase, we conquer all the small problems, and then in the combining phase, we combine all small problems' solution to get the initial problems' solution.
- Decrease and conquer. (would be explained more detail in other part of this document)
- Breadth First Search. This algorithm involves graph. The graph could be exist before the algorithm start but it also could be created while the algorithm is processing. The algorithm starts from a root node, then creates/ searches to all of its child nodes. After creates all child node, the algorithm would create child nodes from the first child nodes, and so on until it found the proper solution for the problem.
- Depth First Search. As well as Breadth First Search, Depth First Search also involves graph. The different is in the algorithm process. Depth First Search would create a child node from the root, and create another child node for that child node, and so on until the node is a leave node (does not has any child node). After reaching the leave node, the algorithm would backtrack to parent node and check if it could have another child node. If it could, the algorithm would create child node until find leave node, but if not it would keep backtracking. The process would be repeated as long as the algorithm does not find the solution yet.
- Branch and Bound. This algorithm is by far the most widely used tool for solving large scale NP-hard combinatorial optimization problems. B&B is an algorithm strategy that has to be applied specifically for each problem that want to be solved, with choices and vary application. Even then, principles for the design of efficient Branch and Bound algorithms have emerged over the years. Branch and bound is similar with DFS algorithm in term of making graph for each problem and how tracing it. Therefore, branch and bound does not trace until the leaves. It uses boundary function to bind the search. The boundary function is used to avoid searching in the out-of-bound nodes or nodes that is obviously not the solution for the problem. Boundary function that is usually optimized by combining with the value of the current best solution enables the algorithm to search parts of the solution space that possible to be solution only implicitly.

B. Education in General

Why education is important? Education affect many aspects of one's life. Education gives basic knowledge to young children, including reading, writing, and basic mathematic. Not only knowledge, education also gives ethical and moral values and builds one's character, which should build them to be a good citizen in their future. Education gives learning environment to both hard skills and soft skills, such as leadership and communication skills, which is important especially for developing countries like Indonesia.

According to Oxford Dictionary, education is the process of receiving or giving systematic instruction, especially at a school or university. While informal education emphasizes in improving skills without standardized curriculum, formal education is education that has standardized system and rules. The formal system is usually called education system.

System itself means a set of connected things that operate together. Therefore, we could say that education system is a set of connected things in education process that operate together with the aim to achieve education purposes.

C. Education System in Some Countries

In the 1970s, Finland changes its education strategy into comprehensive schools for all student. This system makes sure that all students have a common education experience, with highly qualified teachers and supports for struggling students. Today in Finland, students start school with one year of pre-primary education, followed by nine years at a comprehensive school. Finland also develops curriculum, from the core, framework, and how much time allocated for each course. In class, Finland education focus more in creativity and learning by doing strategy. Teachers are asked to be creative and innovative in their personalized teaching and also have to give individual attention to their students.

In Spain, the government rules that children should attend primary school from age 6-12, which divided into cycles. Spain primary school focuses on personalized tailored class depending on the children level. It has purpose to give a common, solid basic education in culture, oral expression, reading, writing and math. After primary school, students could go to Spanish Middle School and after that to Spanish High School (Spanish Baccalaureate) or vocational training. In Spanish High School, there are specializations that students could choose from 4 concentrations: Arts divided into image and design; performing arts, music and dance; Science and technology; Humanities and social sciences.

In Indonesia, children have to get formal education for 9 years, which included primary school and secondary school. The curriculum is created by curriculum development team in Education Ministry of Indonesia, which lastly, on July 15th 2017 had launched the newest version of curriculum: Curriculum 2013. In Curriculum 2013, soft skills are considered as one of graduation standard besides of hard skills. It also focuses more on activeness of students in class. After secondary school, students are supported to go to high school, which they could choose to be in science or social science or language program. After that, Curriculum 2013 gives another choices to students at their first grade to get preferred additional subject besides their mandatory subjects based on their program.

D. Teaching Strategies

Teaching strategies are ways that teachers use to approach and teach their students. Here are some teaching strategies that could be used by teachers to handle a class:

- Cooperative learning. This teaching strategy gives students the opportunity to work with others and see different points of view. When studying together, students are hoped to have better self-confidence and there is research that said: students work more effectively in a group then by themselves. Each student is responsible for one another's learning. Students are also learning that all of the team member has equal role to give important contribution within a team. Students are exposed to and use many skills throughout this strategy: communication, problem-solving skills, cognition, and also critical thinking. All of those skills are essential for a successful academic career.

- Inquiry-based instruction. Inquiry-based learning focuses on involving students in the learning process so the students would not learning something they do not familiar with. They will have a deeper understanding of what they are learning. In inquiry-based learning strategies, students are engaged by asking questions, investigating, exploring, and reporting what they see or what they feel. This process would make students have a deeper understanding of the content that they are learning, and when that happened, student should be able to apply the knowledge of what they learnt in many kind of situations. Problem-solving skill is one of the most important skills in this 21st century, which requires students to give solution for complex problems, and the inquiry-based learning strategy is a great tool to give students this skill.

- Differentiated instruction. This teaching strategy approaches each student by accommodating to their specified learning styles. According to Howard Gardner's Multiple Intelligence Theory, every person has a unique mind, and therefore each person learns and understands information differently. By giving different instructions, or using different approaches to each student, teachers would be able to fulfill all students need. There is a helpful strategy to differentiate instruction, called learning stations. Teachers could set up stations with a task in each. Therefore, in a station, there are more than one levels or styles in a same task, so students would be able to complete the same task, but at the level and style that is specifically designed for them.

- Graphic organizer. Graphic organizers focus on visual. This strategy is simple and effective to help students brainstorm and organize their thoughts and ideas in a visual presentation. This strategy tries to help students to organize information so it would be easier for them to comprehend. Graphic organizers are flexible. They could be used for any lesson, such as structural writing, brainstorming about ideas, planning a class event, problem-solving, or decision-making. The Venn diagram, concept map, KWL chart, and T-Chart are the most popular graphic organizer that teachers usually use in class and recommend to their students.

- Utilizing technology in the classroom. This strategy is a great alternative way to empower students to stay connected and learn technologies in this modern era. Students are usually more interested and motivated to learn lesson that involving technologies in it. Because they think the lesson is interesting, they would not mind to learn it in a long time. There are many ways that teachers could try to utilize technology in their classroom, such as: creating web-based lessons or web-based quiz, multimedia presentations using videos, animations, or some type of graphics like images or gifs, utilizing tablets or iPads, taking class on a virtual field trip, participating in an online research project, or even creating a class website. These technology approaches would give positive impact to the learning process, where students would not be bored and would want to learn more.

Every student is unique. Each student learns in their own way. Therefore, every classroom is unique too. Besides, teachers are unique as well, each teacher has his/her own style in teaching. Unique classrooms need unique teaching techniques and strategies, so not all strategies or techniques would be effective if applied in a class. Teachers have to be diligent to do some trials-and-error, trying teaching strategies to find the most suitable one for their class. In the end, their work would pay off when they finally know what approach is the most effective one. It is also not impossible that teachers use combination of teaching techniques and strategies in their class.

Now, we should look Indonesia itself. Indonesia is still developing education that equally distributed from Sabang to Merauke, which means there is still a gap between teaching methods in cities and rural areas. In rural areas, teachers are usually still using traditional tools like blackboard chalks, and nature-provided items to teach, while in cities, nowadays, teachers are using presentation, marker, whiteboard, and other modern props. In rural areas, there are only few students in a class, therefore teachers could use differentiated instruction strategy because they could know each students personalities and learning way more precisely than a city classrooms that packed of about 30 to 50 students in a class. Besides, in cities, such as Jakarta and Bandung, teachers could be more creative by using graphic and technology utilization in their class.

E. Students' Learning Style

Students are unique. Each of them has their own learning style that is developed during time. A learning style refers to the way in which a child gets information best. According to Neil Fleming There are three main types of learning styles (VAK):

- Visual: Visual Learner Students understand and learn best when information is presented to them visually. Graph, diagrams, and images give benefit to them. Seeing information helps these students visualize concepts of subjects they are learning.

- Auditory: Auditory Learner Students understand and learn best when information is presented to them in an auditory manner. Traditional teaching that use lecture-style, where teachers explain subjects to students using their voice gives benefit to these students. Videos are also helpful. Hearing information helps auditory learner internalize concepts taught.

- Kinesthetic: Kinesthetic Learner Students understand and learn best when information is presented to them kinesthetically. Action of playing, conducting experiments are some of techniques that helps these students. Using their hands or bodies helps these students to experience the concepts of subjects taught.

F. Decrease and Conquer Strategy

Basically, decrease and conquer strategy is an algorithm strategy that reduces a problem into smaller problems but then only solving one of the smaller problems to solve the entire problem. This strategy is different with divide and conquer, which have to solve all smaller problems and then combine all the solutions to get the real solution.

Decrease and conquer strategy has two phases: decrease phase and conquer phase. In decrease phase, the algorithm reduces the problem into smaller problems, and in the conquer phase, the algorithm conquer one of the smaller problems recursively. There is no combine phase in decrease and conquer strategy.

There are three different variance of decrease and conquer strategies:

- Decrease by constant. This variance reduces a problem into smaller problems using a constant that is fixed in all iterations. Usually, the constant is 1. Example program for this algorithm is selection sort.
- Decrease by a constant factor. This variance of decrease and conquer uses constant factor to reduce a problem into smaller ones. The constant factor is usually 2 and it is fixed in all iterations. Binary search is one example of this algorithm.
- Decrease by a variable size. As the name implies, this variance uses variable when reducing a problem into smaller problems, which means the reducing constant is not fixed in all iterations. Selection problem is example problem that could be solved using this strategy.

III. Application of Decrease and Conquer Algorithm in Education

In Indonesia, and mostly other countries in the world, uses divide and conquer in their education system, where it comes to defining curriculum for elementary schools. How could we know this? Then why do they use divide and conquer? Is it the best approach? Therefore, when it comes to teaching strategy, there are lots of teaching strategies that could be applied to classes, considering their uniqueness, the teacher and the class itself. Is there any teaching strategy that actually using decrease and conquer strategy? How could it affect the effectiveness of the teaching-learning process? We would find the answers of those questions one by one.

A. Analysis about Divide and Conquer Education System

As stated above, many countries are using divide and conquer when it comes to education system for elementary/ preliminary schools. For example, Indonesia's curriculum. In Indonesia, curriculum is specified for each grade of elementary and secondary schools. We could conclude that the system is using divide and conquer because actually the subjects are not really changing from elementary to secondary school. Based on Indonesia's 2013 Curriculum, the core subjects that are tested in National Examination are only Mathematic, language, and Natural Sciences. Beside those that got tested in National Examination, there are also subjects like Social Sciences, Pancasila and Civic Education, Religion and Manner Education, Local Contents (Cultural Art and Workshops, Physical Education and Health Sciences) and some optional subjects like Local Language. The different is just in the division of the subjects when they are learnt by students.

- Elementary School

In elementary school, there are 6 grades. The mandatory language education is only Bahasa, which means English and local language are optional. Therefore, most elementary school in Indonesia has both that optional language subjects, where the local language depends on where the school is located. For example, in Central Java the local language is Javanese. Pancasila and civic education, Cultural Art and Workshops, and Physical Education and Health Sciences are also considered as mandatory subjects. In the newest curriculum (2013), elementary school students learn mandatory subjects thematically, using a comprehensive dictates that has included mandatory subjects. So there are no specified dictate for mathematic, Bahasa, and other subjects, but all of it is packed in themes in a dictate for each theme. Natural science are still packed in one subject, included chemistry, physics, and biology, and all blended in the themes, as well as social sciences. Therefore, there are separated dictates for Religion and Manner Education due to religion diversity in Indonesia.

In one semester there are about four to five dictates The students learn in themes, for example for the first grades, there are themes: "My Self", "My Hobbies", "My Activities", "My Family", "My Experiences", "Clean, Healthy, and Beautiful Environment", "Things, Animals, and Plants around me", and "Natural Events". In "My Experiences" theme, there are 4 subthemes: "Childhood Experience", "Experience with Friends", "School Experience", and "Memorable Experience". In "Childhood Experience" subtheme, students learn about numbers (mathematic), national symbol (Pancasila and Civic education), musical elements (Cultural Art and Workshops), dominant moves (Physical Education and Health Sciences), and communication (Bahasa). In one subthemes, there are 5-6 lessons.

Looking at this, we could say that the government uses divide and conquer in this elementary school curriculum, by dividing subjects into grades, then themes, subthemes, and finally each subthemes into lessons. After that in the conquering phase, students should learn one lesson at one time, and the combining phase is mid-semester tests and final exams, where students are got tested for all themes in one period.

- Secondary School

In secondary school, there are 3 grades with mandatory subjects similar to the elementary school subjects, except for Cultural Art and Workshops and language. In secondary school, English becomes one of the mandatory subjects and Cultural Art and Workshops subject is divided into two different subjects: Cultural Arts (Fine / Music / Dance / Theatrical) and Workshop and Entrepreneurship (Engineering / Crafts / Cultivation / Processing).

Different with elementary school, in secondary school there are separated dictates for each subjects. Natural science still packed in one dictate (no specialization), as well as social sciences. In every dictates, there are some chapters. Special for natural science, in first grade of secondary school, each chapter learns one specific specialization (either chemistry, physics, or biology). Therefore, for the second and third grades, natural science are generalized into "Integrated Natural Science", where in each chapter includes more than one specialization, such as physics and biology, and even all three of them. Each chapter has special theme, for example "Motion of Objects and Living Things in the Environment" theme (includes motion concept (physic) and motion system in human, animal, plants (biology)).

From this arrangement, we could also conclude that it uses divide and conquer strategy. In the dividing phase, they divide subjects based on the level (grades). After that, the division continue to chapters, and subchapters. In the conquering phase, here comes the teaching-learning process where teachers teach their student to 'conquer' the subchapters one by one. After all subchapters are learnt, the student goes to combining phase in mid-term test and final exam where they have to answer questions from all subchapters to know if they really understand the entire subject or not.

B. Decrease and Conquer Alternatives in Education System

1) Indonesia's High School System

In Indonesia's high school, students are given choices of specializations: Mathematics and Natural Science, Social Science, and Language Science. For all specializations, there are still some mandatory subjects: Religion and Manner Education, Pancasila and Civic Education, Mathematic, Bahasa, English, History of Indonesia, Arts Culture (Fine/Music/Dance/Theatrical), Physical Education and Health Sciences, and Workshop and Entrepreneurship (Engineering/Crafts/Cultivation/Processing). In Natural Science specialization, there are subjects: Specialized Mathematics, Physics, Biology, and Chemistry. In Social Science specialization, there are subjects: World history, Geography, Economics, and Sociology. In Language Science specialization, there are subjects: Specialized Bahasa, English Language and Literature, Foreign language, and Anthropology. In every subjects, there are chapters and subchapters.

From facts stated above, we could conclude that it uses combination of decrease and conquer and divide and conquer strategy. First, it divides the lessons based on their level into 3 grades. After that, it uses decrease and conquer. Here are the decrease and conquer algorithm in pseudo-code:

```
struct Subjects = {Title: String,
                   Category: String}
procedure HSEdu(input HS: Array of Subjects,
                      input i, j: integer,
                      input        StdCategory:
String)
//i and j are initialized as 0
Declaration:
Algorithm:
if(HS[i].Category!=StdCategory)  and  (i  ==  j)
then
    i++
    j++
    HSEdu(HS,i,j,StdCategory)
else
    if (HS[i].Category == StdCategory) then
        j++
        HSEdu(HS,i,j,StdCategory)
   else
        Learn(HS, i, j) //Conquering phase
   endif
endif


procedure Learn (input HS: Array of Subjects
                 input i, j: integer)
//Students learn Subjects between index i and j
```

Students only need to study subjects in their chosen specialization plus mandatory subjects. After this decrease and conquer system, the curriculum back to divide and conquer by dividing the chosen subjects into chapters and subchapters. Students conquer subchapters in their specialized subjects and mandatory subjects one by one, and then the combining phase comes in final exam.

2) University Education

Before entering university, student should choose a major that they want to be specialized about. After be accepted in university, students will only learn courses that is designed special for the major their chosen before. This system is obviously using decrease and conquer strategy, because students do not need to learn all courses of all majors to finish their university education.

3) Students Choose Subjects System

Considering the uniqueness of each student, there is a way of thinking that students should choose subjects that they want to learn and teachers that they like. A survey held by stageoflife.com shows that students who like their classes usually get higher grades. Students who like classes get 32%

higher grades than students who don't. Students that do not like their class usually has hard days learning something that they do not like or learning from someone they do not like (could be caused by teacher's teaching style that does not fit students. learning style).

This way of thinking uses decrease and conquer, where students only need to learn their preferred subjects to finish education in certain level.

Therefore, there are point-of-views that this approach could not applied in elementary and secondary school. This is because in elementary and secondary school, students are learning basic knowledge that would be useful in their daily life as an educated person. If elementary students could choose their own subjects, there are possibilities - such as students do not learn mathematic at all because they do not like it - which is not hoped to be happened.

This approach could be used if it comes to additional subjects. So, students still have to learn all mandatory subjects, but there are additional subjects that they could choose to learn more about. Additional subjects that could be taught in elementary and secondary school in example: debating, speech, foreign languages, communication strategies, specific sports and arts, programming, robotic, basic of any kind of engineering, advanced version of mandatory subjects, and many other interesting subject.

4) Personality-Based Education

When we talk about students, we know that each student has unique personality. These personalities could be used to determine what subjects that are suitable for a student. There are many ways to know students personalities, such as using MBTI Test, interest and talent test, or any other psychological tests. Not only based on the tests, student personal preference is also important to be considered.

This approach has same issue with "Choosing Subject" approach, which is could not be applied for mandatory subjects. Students need to learn mandatory subjects, whether they like it or not. Therefore, when it comes to additional and not-mandatory subjects, this approach could be useful.

For example, students are tested using MBTI test and a student is identified as INTP type. An INTP person is fit to work as business analyst, corporate strategist, data analysts, mechanical, electrical, software engineer, technical writer, and journalist. Here, the student's preference has a big role. For example the same student with the last example is interested with robots. It shows that the student most likely interested to be a mechanical or electrical engineer. Then, he/ she should take robotics as his/her additional subject.

With MBTI or other personality test data (plus student preferences), we could have a list of preferred subjects. With that list and list of additional subjects that a school has, here is the pseudo-code of this system:

```
procedure PBEducation(input PBE: Array of String,
                      input i, j: integer,
                      input PS: Array of String,
                      output CS: Array of String)
//PBE is an array containing additional subjects
//PS is an array containing preferred subjects
//from personality test and student preferences
//CS is an array containing the chosen subjects
//I, j is initialized as 0
Declaration:
Algorithm:
If (i > PBE.length()) then
    Learn(CS) //conquering phase
else
    if (PS.contains(PBE[i])) then
        CS[j] = PBE[i]
        j++
        i++
    else
        i++
    endif
    PBEducation(PBE,i,j,PS,CS)
endif

procedure Learn (input HS: Array of String)
//Students learn Subjects in HS
```

C. Decrease and Conquer Alternatives in Teaching Strategies

There are many teaching strategies that could be applied by a teacher, depending on the teacher's teaching style and also the class' learning style. Teaching strategies has developed from traditional ones, to modern ones. Here are some application of decrease and conquer strategy in teaching strategy.

1) Differentiated Instruction Strategy

This approach is most likely used in Finland, where teachers have to know their student well, to design personalized way to learn for their students.

Differentiated Instruction Strategy uses decrease and conquer strategy. It is actually considering that every student is unique, has unique mind and learn and understand lessons differently. This strategy gives different instructions, or using different approaches to each student. This strategy makes sure teachers are able to fulfill all students need.

Learning stations is one applied technique that apply this strategy. In this technique, each student would solve problem only using their preferred methods or suitable level or both. To support good learning stations, teachers have to understand knowledge levels of their students that they want to improve. For example there are 4 stations: Mathematic, Bahasa, English, and Natural Science. Students are asked to choose their preferred first one, and then go to the station. In each station, teachers have prepared video (for audio-visual learner), audio (for auditory learner), book/ presentation slides (for visual learner), and games or

experiments (for kinesthetic learner) that are actually teaching the subjects. Students should choose their preferred way to get the knowledge. The stations could also implemented one by one (one station = one lesson hour).

This technique could also use students' level to differentiate what students should learn. Knowing students' ability level is required for this type. Student should only learn in their own speed and understanding level, and try to improve it.

This teaching strategy could be done if teachers have enough resources and teachers are highly asked to be creative and diligent in making different approaches.

If teachers have enough resources, it is also possible having learning stations that are specified based on students' level and learning style. Here is a pseudo-code of that approach example:

```
LEVEL = {LOW, LOW-MIDDLE, MIDDLE, MIDDLE-HIGH, HIGH}
STYLES = {VISUAL, AUDITORY, KINESTHETIC}
struct Media = {Subject: String,
                Level: LEVELS
                Style: STYLES}
Procedure Differentiated(input Med: Array of Media,
                         Input Subj: Array of String,
                         input i, j: integer,
                         input L: LEVELS,
                         input S: STYLES,
                         output Used: Array of Media)
//i and j are initialized as 0
//Med is an array containing all available medias
//Subj is an array of subjects that want to be learnt
//Used is an array of media that a student will use
//L is a student level & S is his/her learning style

Declaration:
Algorithm:
If (i > Med.length()) then
    LearnUsing(Used) //Conquering phase
else
    if (Med[i].Level == L) and
       (Med[i].Style == S) and
       (Subj.contains(Med[i])) then
          Used[j] = Med[i]
          i++
          j++
   else
          i++
   endif
   Differentiated(Med, Subj, i,j,L,S,Used)
endif

procedure LearnUsing (input Medias: Array of Media)
//Students learn using Medias elements
```

2) Group Learning

Besides of reducing learning materials based on student's level and/or learning style, teachers could also apply decrease and conquer strategy using group learning. Group learning strategy is when teacher divides the class into several groups of student. This is the dividing/ reducing phase. After that, each group should learn about one subtheme or subchapter and then present it in front of the class. This could be considered as conquering phase, because the presentation could be used as scoring aspect for the theme/subject (finishing one presentation for one subtheme means the student has finished the whole theme).

This strategy is pure decrease and conquer when we talk about a theme/chapter/subject. Therefore, it is not actually the pure decrease and conquer if we talk about the whole semester. It is also involved divide and conquer, because in the end of semester, students would still tested for the whole themes/chapters/subjects, not only the subthemes/subchapters that they presented.

IV. Conclusion

Each student is a unique personality with unique learning style, and each of them deserves good education. It is not recommended to force students learn what they do not like (outside the mandatory subjects). Therefore, teachers and education professionals should find the most suitable system and teaching strategies that would fulfill all students need. Decrease and conquer is one algorithm strategy that could be applied in education system and teaching strategies, that focus more on specialization than generalization.

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PERNYATAAN

Dengan ini saya menyatakan bahwa makalah yang saya tulis ini adalah tulisan saya sendiri, bukan saduran, atau terjemahan dari makalah orang lain, dan bukan plagiasi.

Bandung, 8 Mei 2018

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