Science education at Islamic university: vision and distinction

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Abstract. The Indonesian National Qualification Framework Curriculum or often called the KKNI curriculum has forced all universities in Indonesia to equate curriculum content according to national standards, not least the science education curriculum at the Islamic University. This paper wants to describe the characteristics of curriculum and science learning in one of Islamic University in Indonesia. The research method used is descriptive qualitative through stages of science education curriculum analysis, interview with representatives of curriculum development team and Focus Group Discussion (FGD). The results of this study are: (1) there are differences of science content in science education curriculum at Islamic University, either with the similar program or with pure science program in the public university. (2) Islamic content as an indicator of the achievement of the university's vision and differentiator should not be expressed in a special course, but rather incorporated in the existing courses with the appropriate integration model. (3) The profile of learning achievement of science education students at Islamic University is expressed in three complementary coordinate axes, namely content, pedagogical and Islamic values. This difference in learning achievement affects lecturing activities from planning, implementation to assessment.

1. Introduction

Distinction for a university is a necessity. Through that distinction, one university can be distinguished from the others, both in programs, distinctiveness and excellence. On large campuses in the world, the distinction is very inherent and easily identified [1] In the context of Islamic universities in Indonesia, a distinction must still be built and promoted. One of them is the tag line of scientific integration, general science and the science of religion (Islam). It is not strange if there are a lot of studies, research and reviews about the model of scientific integration at Islamic universities in Indonesia. UIN Malang promotes its "tree of knowledge" model, UIN Yogyakarta promotes its "spider web" model and UIN Bandung promotes its "wheel" model, better known as the tag line "Wahyu Guides Science" [2].

The existence of a scientific integration model at the Islamic University in Indonesia is actually showing the university's distinction so that education customers are presented with alternative choices in choosing a university [3]. Especially for religion-based universities, higher education does indeed have an impact on the religious beliefs of its students [4]. Given the importance of religion in the lives of so many students, it is time for institutions to consider and take responsibility, one of them through scientific integration [5].
Even though distinction is a necessity, higher education standards cannot be ignored. The quality is always number one. Quality is measured in terms of meeting the standards of higher education (Quality in fact) or measured through customer satisfaction (quality in perception) [6]. Creating a quality campus starts from the determination of a strong vision that is inspired and carried out by all civitas, from the leader to the staff and employees at the lowest level. There is awareness from all parties that "Quality is everybody business" [7].

The minimum quality that must be possessed by every campus in Indonesia is the fulfillment of higher education standards accredited by BAN PT, from university accreditation, faculty to study programs, including science education at the Islamic University. One of the contents of the national standard is the fulfillment of the curriculum. Through the issuance of Presidential Regulation No.8 of 2012 concerning the Indonesian National Qualifications Framework (KKNI), the science education curriculum at the Islamic University must be revised and adapted to the IQF without reducing the vision and distinction of the university. Through descriptive analysis, this paper wants to reveal how the profile of the development of a science education curriculum at an Islamic university in Indonesia.

2. Methods
The research method used is descriptive qualitative. The first step taken is the curriculum analysis of physics education, chemical education and biology education courses. This curriculum analysis aims to obtain the composition of the courses to support the achievement of learning outcomes and graduate profiles. The distribution of courses in each study program will be grouped into four major parts, namely content knowledge, pedagogical knowledge, Islamic knowledge, and others.

The second step is interviewing the head of the study program in each department and / or curriculum development team in each department. This is done to confirm the results of the document analysis. Some important questions raised are: (1) profile of graduates (2) learning outcome (3) process of determining courses (4) elective courses presented and (4) composition of course groups.

The third step is the Focus Group Discussion (FGD) of fellow researchers to analyze findings and process and analyze field data and make interpretations. The FGD results are presented in a detailed and comprehensive narrative accompanied by supporting evidence.

3. Results and Discussion

3.1. Comparison of Pure Science, Science Education in General University, and Science Education Study Programs at Islamic Universities
Table 1 below shows some differences in the composition of the pure science curriculum at public universities, science education study programs at public universities and science education study programs at Islamic universities.

| Pure Science | Science Education at General University | Science Education at Islamic University |
|--------------|----------------------------------------|----------------------------------------|
| • Content Knowledge (Physics, Chemistry, Biology) | • Content knowledge (Physics, Chemistry, Biology) | • Content knowledge (Physics, Chemistry, Biology) |
| • Pedagogical knowledge (Curriculum and Science Learning, Learning strategy, assessment and evaluation, educational psychology, cognitive development of students etc) | • Pedagogical knowledge (Curriculum and Science Learning, Learning strategy, assessment and evaluation, educational psychology, cognitive development of students etc) | • Pedagogical knowledge (Curriculum and Science Learning, Learning strategy, assessment and evaluation, educational psychology, cognitive development of students etc) |
| • Islamic Knowledge (Aqeedah/faith, ibadah/worship and akhlaq (Islamic ethic) etc) | • Islamic Knowledge (Aqeedah/faith, ibadah/worship and akhlaq (Islamic ethic) etc) | • Islamic Knowledge (Aqeedah/faith, ibadah/worship and akhlaq (Islamic ethic) etc) |
Pure science held by public universities is projected to produce graduates who are competent in the field of pure science with a SSi (B.Sc) degree. Course composition is dominated by science content material. For physics study programs, we will get to know a number of major subjects such as basic physics, mechanics, electricity and magnetism, thermodynamics, statistical physics, waves and optics, modern physics, quantum physics, core physics and other advanced courses according to the concentration taken. For chemistry study programs, we will recognize major subjects such as general chemistry, organic chemistry, inorganic chemistry, analytical chemistry, spectrometry, biochemical analysis etc. For our biology study program we will analyse Fundamental Biology, Animal Anatomy & Physiology, Genetics, Plant Structure & Development, Cell & Molecular Biology, Ecology etc.

Science education in public universities is projected to become a teacher candidate with the title S.Pd (B.Ed). The old curriculum ensures that students who have passed S1 can automatically become teachers because they are provided with IV certificate. In the new regulation, graduates of science education only have a bachelor's degree without an IV certificate. To become professional teachers, they must take the Professional Education Program (PEP) program even though they already have pedagogical knowledge such as curriculum and science learning, learning strategies, assessment and evaluation etc.

Unlike the B.Ed program in public universities, B.Ed programs at Islamic universities add special subjects about Islamic knowledge such as courses on Islamic Aqadah, al-Quran and al-hadith, Fiqh, Arabic etc. This course is prepared to equip prospective teachers to be able to integrate science learning with Islamic religious values in Islamic schools.

3.2. Learning approaches
In addition to differences in course content, differences in objectives, achievement of learning outcomes and graduate profiles, differences in study programs will also appear in the selection of learning approaches. For pure science, lectures will be focused so that students master the course content that will equip students' expertise both as scientists, researchers or experts. For science education, lectures will be focused on mastering content and pedagogy. In the world of education known as Pedagogical Content Knowledge [8]. For students of science education study programs, besides they must master content knowledge, they also have to understand how to teach the content to their students (pedagogical knowledge). The two abilities composition was combined by Shulman as a pedagogical content knowledge. Figure 2 below shows the different focus of the course and the learning approach that was delivered.

![Figure 1. Pure Science Learning.](image1.png)

![Figure 2. Science Education Learning.](image2.png)

3.3. Science Learning at Islamic University: A hypothetical model
In addition to mastering content and pedagogy, students who take the department of science education in Islamic universities are also equipped with Islamic knowledge that is spread with quite a lot of subjects. In theory, science lectures at Islamic universities and the study of science in Islamic schools should use a new approach to approaching. We refer to the model as Islamic, Pedagogical, Content Knowledge which is shown in Figure 3.
3.4. Pendulum Phenomenon and Implementation of KKNI

The Indonesian National Qualifications Framework (KKNI) is a competency qualification framework that can juxtapose, equalize and integrate between the fields of education and the field of job training and work experience in order to provide recognition of work competencies in accordance with work structures in various sectors [9]. KKNI has made 9 qualification levels both through formal education channels and through job training channels. Undergraduate or DIV bachelor level is categorized at level 6, while teachers are placed at the professional level (level 7).

To become a professional science teacher, the input of graduates of S1 or DIV does not have to be the essence of an educational study program (B.Ed program). However, it can also be followed by graduates of pure science study programs (B.Sc. Programs). There are several policies that are still debatable, especially related to the choice of curriculum types. So far, the educational study program in Indonesia still uses a concurrent teacher training approach, all educational courses are given together with content subjects [10]. When participating in PPG, it is believed that there is repetition of the same material, although it can also be tricked from the level of depth or type of bill. For BSc program graduates, the PEP program can be considered as a consecutive teacher training, they get professional teacher education courses after they complete the content course.

Before the KKNI, there were some assumptions that the mastery of subject matter by graduates of science education with pure science was different. If this assumption is correct, then the answer is reasonable because at the same time, students in science education must master two fields at once (content and pedagogy) while at the same time, students in pure science departments only focus on content. Students or graduates of science education can find tri phenomena related to their competencies. We call this the pendulum phenomenon. There are students who are very content masters but weak in the field of pedagogy (oblique to the right pendulum), there are students who are very pedagogic, but weak in content (pendulum to the left) and there are students who are competent in both fields (balanced pendulum). But the position and conditions of students and graduates are not always in the same conditions. Over time and demands, all three conditions can be experienced. Training and self-development have a very decisive role.

Through the KKNI, each university, department and study program, both pure science and science education must improve and revise the curriculum according to the KKNI and the demands of work in the field. The role and function of study program associations is expected to guarantee minimum standards for learning outcomes at the same qualification level.
3.5. Curriculum of Science Education in Islamic Universities: A case study in West Java

As revealed in the introduction, every Islamic university in Indonesia must have a vision and distinction being promoted. However, that vision and distinction must also be compromised by the standards of higher education in Indonesia, one of which is curriculum standards. Figure 5 below shows an overview of the science education curriculum at one of the Islamic tertiary institutions in West Java which is expressed in the distribution of course groups.

Based on Figure 5 above, the percentage of science subject content presented is at an average of 53.56%, pedagogical content is 30.51%, Islamic knowledge is 9.3% and the rest are general courses of 6.63%. Based on the agreement of one study program association it was stated that the percentage of content subjects was recommended to meet 70%. With a large number of credits (156 credits)> the number of standard credits (144), it is certain that it is impossible to add more courses. The most probable solution is through the integration of courses and approach to integrative learning, one of which is polyculture strategy [11].
4. Conclusion
The typology of science education in Islamic universities is very different in both curriculum content and learning approaches. There is a vision of scientific integration that compromises between religion and general science. This difference is the difference offered by the university for its users. However, the minimum standards for learning at the same level cannot be far from other public universities. The consequences of adding Islamic knowledge in the composition of the course have an impact on the number of SCs taken. Therefore we need an integrated model of the right subject that is able to combine two or more different disciplines.

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Acknowledgments
The researcher thanked the Research Center of UIN Sunan Gunung Djati Bandung for facilitating the research and publication of this paper.