

# Evaluation of Standardization Education Program Product At the National Standardization Agency

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## ABSTRACT

The implementation of standardization education found problems, namely: (1) Socialization and implementation were not quite successful in the higher education environment, (2) Various strategies that were carried out so that standardization education could be massive, structured, and systematically implemented in formal and non-formal education had not been successful. The focus of this research is on the evaluation of Standardization Education Program Product. The approach used in this research was descriptive qualitative. Data collection was carried out by the researchers as a key instrument. The data collection techniques were done by: (1) in-depth interviews; (2) observation; and (3) documentation study. In general, the results of standardization education are in accordance with the 2014-2019 NSA Strategic Plan. However, the evaluation carried out related to standardization education has not yet reached the analysis of the results and benefits (outcome) of standardization education for university graduates. Therefore it is necessary to conduct national research and survey with graduated college student respondents from standardization subject so that the results of standardization education in aspects of results and benefits of the achievements can be mapped and further improved.

## Keywords

product implementation program, standardization education

## Introduction

The National Standardization Agency (NSA) is a non-ministerial state agency with the main task of developing and fostering standardization activities in Indonesia, including metrology, standards, testing, and quality. In carrying out its duties, NSA is guided by Law Number 20 of 2014 concerning Standardization and Conformity Assessment (Ministry of Defense, n.d.). Under the law, NSA has the duties and responsibilities in the sector of standardization and conformity assessment, particularly in the activities of organizing human resource competency enhancement in the sector of standardization and conformity assessment. In line with this, NSA seeks to develop standardization education at various levels of formal education including university level and non-formal education through various courses and training activities.

To carry out its duties and functions, the NSA Standardization of Education and Socialization Center is assisted by 2 sectors consisting of: (a) Standardization Education and Training; and (b) Socialization of Standardization. Education and socialization center of Standardization prepared the Strategic Plan of the education and socialization center of Standardization of 2015-2019 which contained the vision, mission,

objectives, strategic objectives, policy direction, performance targets as the main reference in planning and implementing activities carried out by the education and socialization center within 5 (five) years from 2015 to 2019. This Strategic Plan was prepared with reference to the mandate of Law Number 20 of 2014 concerning Standardization and Conformity Assessment, the Strategic Plan of the NSA (Ministry of Defense, n.d.) and the Strategic Plan of the Deputy for Standardization of Information and Socialization of NSA 2015-2019 (National Standardization Agency, 2015)

To realize the goals of standardization and conformity assessment, the education and socialization center of NSA carried out various activities to support standardization activities in Indonesia. In improving the human resource competence in the sector of standardization, NSA was highly committed to fostering public interest, increasing knowledge of standardization, through formal and non-formal education, including: 1). Disseminating Standardization Education in Higher Education, 2) Organizing training for stakeholders, 3) Introducing Standardization in Secondary Schools, and 4) Fostering children's interest in standardization from the early age.

The problems faced in increasing the standard culture include: (1) Lack of knowledge and

understanding of stakeholders on the importance of standardization; (2) Lack of consistent application of Indonesian National Standards (INS) as a reference for the requirements for the procurement of government goods and services; (3) Lack of awareness of businessmen to voluntarily apply INS which contains additional quality requirements desired by consumers in the national market; (4) Lack of consumer awareness to choose products marked with SNI to ensure safety, security and health as well as preserving the environment; (5) Lack of public participation in standardization activities; (6) Availability of resources which was not proportional to the demands of standardization education and socialization throughout Indonesia (Suliantoro et al., 2014).

Based on the observation results at NSA, it was found that several efforts had been done to improve the implementation of standardization education. One of the efforts done within the scope of cooperation between NSA and Universities, including 1) Education, training and promotion on standardization, 2) Expert participation in standardization activities, 3) Research on standardization and dissemination of the results, 4) Development of laboratory competences, and 5) Exchange of information about standardization.

Based on the background description above, the limitation of this research is to examine the evaluation of implementation product of the standardization education program at the National Standardization Agency for the strategic plan period of 2014-2019.

### Program Evaluation

Program evaluation is a series of activities carried out on purpose to see the level of program success. There are several definitions of the program itself. In the dictionary: (a) program is a plan, and (b) program is an activity that is carried out carefully. Conducting program evaluation is an activity that is intended to determine the success level of the planned activities (Arikunto, 2007). In the book of Suharsimi Arikunto and Cepi Safruddin Abdul Jabar (Arikunto & Jabar, 2009), according to Tyler (1950) program evaluation is a process to determine whether educational goals have been realized, and according to Cronbach (1963) and Stufflebeam

(1971) program evaluation is an effort to provide information to be conveyed to decision-makers. Based on the opinions above, it can be said that program evaluation is a process of collecting scientific data or information which results can be used as a consideration for the decision-makers in determining policy alternatives.

According to Endang Mulyatiningsih (Mulyatiningsih, 2011), program evaluation is carried out with the aims of: a) showing the program's contribution to the achievement of organizational goals. The results of this evaluation are important for developing the same program elsewhere; b). making decisions about the sustainability of a program, whether the program needs to be continued, improved, or stopped.

Given the description above, it can be said that program evaluation is evaluative research. Basically, evaluative research is intended to determine the end of policy existence, in order to determine recommendations on the past policy, which in the end is to determine the next policy.

### CIPP Evaluation Model

The model used in this research is a decision-making model developed by Stufflebeam known as the CIPP Evaluation Model. CIPP stands for Context, Input, Process, and Product. In the book of Applied Research by Mulyatiningsih (Mulyatiningsih, 2011, pp. 126–132), it is said that CIPP evaluation is known as formative evaluation with the aim of making decisions and improving programs.

The CIPP evaluation model proposed by Stufflebeam & Shinkfield (1985) is an evaluation approach oriented to decision-makers (a decision-oriented evaluation approach structured) to provide assistance to administrators or decision-making leaders. Stufflebeam argues that the results of the evaluation will provide alternative solutions to the problems for decision-makers. This CIPP evaluation model consists of 4 components which are described as follows:

#### a. Context

The main orientation of context evaluation is to identify the background of the need to make changes or the emergence of a program of several subjects involved in decision making. The context

components in this research include policy foundation, policy direction, and strategy.

#### b. Input

Input evaluation is carried out to identify and assess the capabilities of the material, equipment, human, and cost resources to implement the selected program. The input components in this research include human resources, curriculum relevance, and the use of information and communication technology.

#### c. Process

Process evaluation aims to identify or predict obstacles in the implementation of activities or program implementation. Evaluation is carried out by recording or documenting every incident in the implementation of activities, monitoring activities that have the potential to hinder and cause unexpected difficulties, finding special information that is outside the plan; assess and explain the actual process. During the evaluation process, evaluators are required to interact with the program implementing staff continuously. The process components in this research include socialization, learning, cooperation, distribution of resources, monitoring, evaluation, reporting, and follow-up.

#### d. Product

Product evaluation is an assessment carried out in order to see the achievement/success of a program in achieving predetermined goals. It is at this evaluation stage that an evaluator can determine or provide recommendations to the evaluated person whether a program can be continued, developed/modified, or even stopped. The main purpose of product evaluation is to measure, interpret and decide the result that has been achieved by the program, namely whether it meets the needs according to the expected objectives or not. The product components in this research include the results obtained during the process of educational activities, namely the achievement and benefit of standardization education.

According to Eko Putro Widoyoko (Eko, 2015) the CIPP evaluation model is more comprehensive than other evaluation models, because the objects of evaluation are not only the results but also context, input, process, and results. Apart from these advantages, on the other hand, this

evaluation model also has limitations, such as the application of this model in the classroom learning programs has a low level of implementation if there is no modification.

Evaluation research aims to produce data and information that can be used to make decisions: improvement, sustainability, expansion, and termination of programs that have been implemented (Kantun, 2017). According to Suharsimi Arikunto and Cepi Safruddin Abdul Jabar (Arikunto & Safruddin Abdul Jabar, 2009, p. 22) there are four possible policies based on the results of implementing a decision program, namely: a. Stopping the program, because it is considered that the program has no benefit, or cannot be implemented as expected, b. Revising the program, because there are parts that are not in accordance with expectation (there are some errors but only slightly), c. Continuing the program, because the implementation of the program shows that everything has gone according to expectations and provided useful results, d. Disseminating the program (implementing the program in other places or repeating the program at a later time), because the program is successful, and it would be very good if it is implemented again at another place and time. The decision-making process is carried out by comparing the findings or facts contained in the evaluation components with predetermined standards or criteria.

The advantage of the CIPP model is that it provides a comprehensive evaluation format to understand program activities from the emergence of the program ideas to the results achieved after the program is implemented (Hakan & Seval, 2011). The CIPP model is used because the model is considered suitable for the learning process of standardization education, which is expected to obtain results according to the program objectives as well as other decisions related to the standardization education (Warju, 2016).

### Methodology

The method used in this research is a qualitative method with a descriptive approach. The fundamental target of this research is to study the implementation of the standardization education program, which can also be used as a consideration for decision making on sustainability and/or the next formulation of

standardization education programs at the National Standardization Agency (NSA). Therefore, the researchers visited the research location directly to collect some data needed in this study, through observation, interview, document review, and participating in a number of activities, as well as distributing questionnaires.

### Research design

Research design is a framework for the process of carrying out research and plan to capture and utilize data so that information can be obtained accurately (Jilcha Sileyew, 2020). According to Rowley in Wirawan (Wirawan, 2012), the research design is a logic that connects the data to be collected and the conclusions that must be drawn towards the questions from the research. Another way to view a research design is to view it in an integrated manner as a plan of action to obtain answers to the questions until conclusions. The research design must ensure that there is a clear view of what needs to be achieved (Wirawan, 2012, p. 147).

To design this research, the researcher first examined the formulation of the relationship between the implementation of strategic management and the NSA standardization education program. Based on this concept, researchers collected various information related to the results of the implementation of NSA standardization education including achievements and benefits of standardization education.

### Data Collection Methods and Data Sources

By looking at the type variations of data collected in each evaluation component, it shows that program evaluation using CIPP requires combining several types of data collection methods and tools. The type of program evaluation data uses more qualitative data and how to obtain it does not require complicated measuring tools. Data can be obtained from program proposal documents, program plan documents, resource documents involved in program implementation, and document results that the program has achieved. Other supporting information can be obtained through interviews. Subjects and sources of research data are automatically taken from the subjects involved in program implementation. Therefore, the informants selected in this study were

representatives of 10 internal NSA stakeholders consisting of 1) Head of Education and Socialization Center Standardization 2) Head of Education and Training Sector at the Education and Socialization Center for Standardization, 3) Head of Mechanics, Electronics and Construction at the Standard Formulation Center, 4) Head of the Sub Division of Education and Training Systems and Evaluation at the Education and Socialization Center for Standardization 5) Head of Standardization Socialization System and Evaluation Sub-Division at Education and Socialization Center for Standardization, 6) Head of Standardization Professional Development Sub-Division at Education and Socialization Center for Standardization, 7) Head of Community Participation Sub-Division at Education and Socialization Center for Standardization, 8) Head of Promotion Sub-Division at Education and Socialization Center for Standardization, 9) First "Widyaiswara" at the Education and Socialization Center for NSA Standardization, and 10) Administrative Staff.

### Instrument Arrangement

In qualitative research, the research instruments or tools are the researchers themselves. Therefore, the researchers as instruments must also be "validated" to what extent the qualitative researchers are ready to carry out research that then go to the field. Validation of researchers as instruments includes validation of understanding qualitative research methods, mastery of the field being studied, the readiness of researchers to enter research objects, both academically and logistically. Those who do the validation are the researchers themselves, through self-evaluation, how far their understanding of qualitative methods is, mastery of theory and insight into the field being studied, as well as readiness and provision to enter the field. Researchers as human instruments function to determine the focus of research, select informants as data sources, collect data, assess data quality, analyze data, interpret data and make conclusions on their findings (Sugiyono, 2015).

### Instrument Grid

The instrument grid is designed and formulated according to the components and aspects evaluated in this research, namely those aspects

that have been determined according to the model chosen by the researchers.

**Tabel 3.1 Research Instrument Grid**

Components	Sub Focus	Research Abstract	Item No	Item Total
Product	Results of standardization education	Standardization education achievements	10	2
		Standardization education benefits	11	

After compiling the instrument grid as described in table 3.1 above, the next step is preparing research instruments by referring to the grid that has been formulated and adjusted to the program plans contained in the standardization education. The thing that concerns researchers in the preparation of this instrument is to avoid any questions deviation from the indicators studied.

### Instrument Validity

A valid instrument means that the instrument can be used to measure what should be measured and can display what should be displayed. According to Sugiyono (Sugiyono, 2015) a valid instrument must have internal and external validity as described follows:

1. The instrument's internal validity is rational validity. If the instrument is built with theories that are relevant to what will be measured, and are up to date, then the instrument has high internal validity. The Instrument has internal or rational validity if the existing criteria in the instrument rationally (theoretically) reflect what is being measured. So the criteria are in that instrument.
2. The instrument's external validity is empirical validity. The instrument that has external validity is an instrument that when used everywhere for measurement will produce valid data. The instrument will have external validity if the criteria in the instrument are compiled based on existing empirical facts or matched with the same or similar instruments which validity and reliability have been tested.

### Data and Data Analysis Techniques

#### Data

The data in this study consisted of two types of data, namely primary and secondary data. Primary data is a source of research data obtained directly from the original source in the form of interviews, polls from individuals, and the observation results of a research object. Secondary data is a source of

research data obtained through intermediary media or indirectly in the form of books, guides, guidelines, and archives (Syafnidawati, 2020). The collection of the two types of data above is carried out using certain techniques.

#### Data collection technique

Data collection in qualitative research can be done in various settings, multiple sources, and various ways. In terms of data collection methods or techniques, data collection techniques can be done by observation, interview, questionnaire, documentation, and a combination of the four techniques (triangulation). However, in general, there are four types of data collection techniques, namely; observation, interview, documentation, and combination/triangulation (Sugiyono, 2015).

Based on the description above, the data collection techniques used in this study were observation, interview and document review, questionnaires, and triangulation techniques.

#### Data Collection Procedure

The data collection procedure in qualitative research involves four types of strategies, namely qualitative observation, qualitative interviews, qualitative documents, as well as audio and visual materials (J.W. Creswell & Fawaid, 2010). By referring to the above opinion, the data collection procedure in this study was carried out using four strategies including: observation; interview; documentation; checklist.

#### Data analysis technique

In this research, the data analysis technique used was the qualitative data analysis technique from Miles and Huberman which included data reduction, data presentation, and conclusion drawing. There are six steps in the process of analyzing and interpreting qualitative data, namely; (1) Preparing and organizing the data for analysis, (2) Exploring and coding the data, (3) Coding to build description and themes, (4) Representing and reporting qualitative findings,

(5) Interpreting the findings, (6) Validating the accuracy of the findings (John W. Creswell, 2015).

According to Miles, Huberman, & Rohidi (M. Miles et al., 2007, pp. 19–20), there are three main points of qualitative data analysis activities namely data reduction, data presentation, and conclusion drawing/verification, as something that is intertwined before, during, and after data collection in parallel form, to build general insights called analysis. In this view, these three types of analytical activities and data collection activities themselves are cyclical and interactive processes. The researchers must be ready to move between the four "axes" of the coil during the data collection, then move back and forth among reduction, presentation, and drawing/verification activities during the remainder of the research time. Data coding, for example (data reduction), leads to new ideas to be included in a matrix (data presentation). Data recording requires further data reduction. Once the matrix is filled, an initial conclusion can be drawn, but that leads to a decision (for example) to add more columns to the matrix to be able to test the conclusion.

Data analysis used in this study was in accordance with the analysis process proposed by Creswell and combined with Miles and Huberman's model (M. B. Miles & Huberman, 1984) by using the following steps: 1) Data Reduction; 2) Data Presentation (Data Display); 3) Conclusion Drawing /Verification.

## Research Result and Discussion

### Result of Standardization Education

Each Government agency has the obligation to prepare a Performance Report at the end of the budget period. This has been regulated in Presidential Regulation Number 29 of 2014 concerning the Performance Accountability System of Government Agencies and Minister Regulation of State Apparatus Empowerment and Bureaucratic Reform no. 53 of 2014 concerning Technical Guidelines for Performance Agreements, Performance Reporting, and Procedures for Reviewing Agency Performance Reports. The performance report is an annual performance report containing the accountability of an agency's performance in achieving the agency's strategic goals/objectives. The

Performance Report Preparation is also an obligation of the Human Resource Development (HRD) Sector for Standardization and Conformity Assessment as one of the work units within the National Standardization Agency which is arranged in stages.

The performance of the HRD Sector for Standardization and Conformity Assessment contributed particularly to the performance of Research Center and HRD sector at Standardization and Conformity Assessment and as a whole to National Standardization Agency. Therefore, the preparation of the Performance Report in the Human Resource Development Sector for Standardization and Conformity Assessment is input in the preparation of the Performance Report of the Research Center and Human Resource Development for Standardization and Conformity Assessment 2019.

The purpose of preparing a Performance Report in the Human Resource Development Sector for Standardization and Conformity Assessment is a form of accountability to the public for the implementation of programs/activities as well as performance accountability in order to achieve the vision and mission of the Research Center and Development of HRD, with the following objectives: a) Giving information to the person who gives mandate about measurable performance that has been and should have been achieved; b) As a continuous improvement effort for government agencies to improve their performance. The evaluation result carried out will be used as the basis for the preparation of several recommendations to become input in determining future policies and strategies in order to improve the work unit's performance.

The Policy of Standardization and Harmonization Development of the Higher Education Curriculum, as conveyed by Rina Indiastuti, Secretary of the Director-General of Learning and Student Affairs, Ministry of Research, Technology and Higher Education in Jakarta on September 12, 2017, includes the Higher Education Human Resource Competitiveness Program, namely: in facing industry 4.0 challenges and rapid changes in economic and social conditions in the 21st century, it requires higher education graduates who are competitive,

namely having strong knowledge, skills, and personal character; b) The education process must be of high quality and relevant. Quality is built to achieve conformity between the implementation of higher education and higher education standards consisting of Higher Education National Standard and Standards set by universities (regulation of the minister of research, technology and higher education number 62 of 2016 concerning quality assurance system of higher education). Relevance is built to achieve conformity to needs; c) Law number 12 of 2012 concerning higher education, regulation of the minister of research, technology and higher education number 44 of 2015 article 54 concerning National Standards for Higher Education in the form of national education standards, national research standards, community service national standards where higher education can set higher education Standards (exceeding national standards); it means that there is a space for innovation and academic autonomy in education and teaching creations so that graduates are able to respond to the needs of national and international employment opportunities. The quality and competitiveness guarantee of higher education such as through accreditation and recognition of graduate users. Competencies and qualifications of graduates in the form of national or international certification based on Presidential Regulation number 12 of 2012 concerning the Indonesian National Qualification Framework.

Based on the HRD Sector Performance Report compiled by the Head of HRD and Conformity Assessment, Kristiati Andriani, ST, MM in January 2020, it was stated that Standardization and Conformity Assessment was a manifestation of accountability for the performance of achieving the vision and mission of the Center of HRD Research and Development in the 2019 Fiscal Year. The Performance Report of the HRD for Standardization and Conformity Assessment of 2019 is the fifth year Performance Report for the 2015-2019 National Medium Term Development Plan. The preparation of Performance Reports in the HRD for Standardization and Conformity Assessment referred to Government Regulation Number 8 of 2006 concerning Financial Report and Government Agency Performance, Government Regulation Number 29 of 2014

concerning Government Agency Performance Accountability Systems, Regulation of the Minister of Empowerment of State Apparatus and Bureaucratic Reform Number 53 of 2014 regarding Technical Guidelines for Performance Agreements, Performance Report, and Review Procedures on Performance Reports of Government Agencies, as well as the 2015-2019 National Standardization Agency Strategic Plan.

In 2019, the HRD Division of Standardization and Conformity Assessment as a part of the Human Resource Research and Development Center is determined to carry out Bureaucratic Reform, in which strengthening performance is one of the target areas of change to provide sufficient confidence that programs are running as targeted. In addition, the HRD Division of Standardization and Conformity Assessment also made changes in targets in order to harmonize the changes in NSA's strategic goals for the 2015-2019 period.

The Performance Report for the HRD of Standardization and Conformity Assessment for 2019 is expected to be a source of information in making decisions to improve the performance of the HRD of Standardization and Conformity Assessment in the future, through the implementation of programs and activities more optimally.

The Performance Agreement in the HRD Sector of Standardization and Conformity Assessment in 2019 has determined 2 (two) targets with 8 (eight) Performance Indicators. The targets and performance indicators are the manifestations of the implementation of the National Standardization Agency Management Support Program and the Implementation of Other Technical Duties which are mandated to the Division of HRD of Standardization and Conformity Assessment.

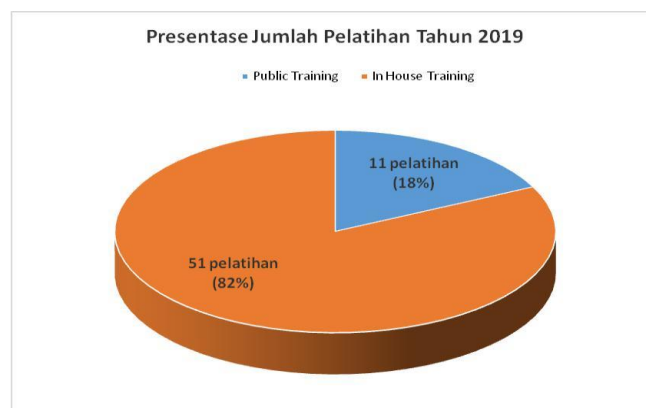
The following describes the achievements of the performance agreement in the HRD Sector for Standardization and Conformity Assessment in 2019 according to the target of increasing performance of HRD management, consisting of one indicator, namely: the number of human resources implementing Standardization and Conformity Assessment training services (instructors, assistant instructors, and secretariats) which follow building capacity. To support these performance indicators, the HRD sector of

Standardization and Conformity Assessment has carried out building capacity activities which were attended by calibration instructors and assistant instructors. The achievement of this performance indicator has reached 100% because the number of participants who took part in this activity has met the expected target. This activity is very useful for calibration instructors because it can minimize the gap in the ability and mastery of teaching methods between the special instructor in calibration and the standardization instructor.

Meanwhile, the performance indicators to measure the realization of the target of developing a standard culture through increasing the competence of human resource of Conformity Assessment Standardization (CSA) consist of 7 (seven) performance indicators, namely the number of human resources who attend CSA service training, the number of human resources who attend CSA training services with a minimum predicate of "good", number of tertiary institutions implementing education materials (accumulation), number of development materials of HRD for CSA developed, number of certificates issued through e-learning (accumulation), number of stakeholders registering e-learning (accumulation), and number of NSA Internal Human Resources participating in the improvement of the CSA competency. The performance achievement for this performance indicator is an average of 209.83%. Followings are the details of the achievement of the target performance indicators.

1) Performance indicators of the number of human resources participating in CSA training services

To support the performance indicators of the number of human resources participating in CSA training services, the CSA HRD Sector has implemented standardization training services which can be seen in the image below:



**Figure 4.1 Percentage of Total Trainings in 2019**

Based on the data above, in 2019 there were 11 public training carried out or 18%, while in-house training was carried out 51 times or 82% of the total number of training in 2019. The number of participants public training in 2019 was 229 people or around 17.52% while in-house training was 1,078 people or 82.48% of the total participants in 2019. Overall in 2019, the number of human resources participating in the CSA training was 1,307 people. The performance achievement for this indicator is 108.92%, which has exceeded the set target of 1,200 people.

In relation to the trend of holding standardization training from 2015 to 2019, the trend of organizing in-house training tended to increase until 2018. This showed that stakeholder awareness of the importance of knowledge and understanding of standards and conformity assessment increased. Meanwhile, in 2019, the implementation of in-house training decreased slightly by 15% when compared to the number of in-house training in 2018. Meanwhile, public training in 2019 increased by 57.14% from 2018. The decrease in the total number of training held in 2019 was due to the fact that the demand for special training (application) in 2019 was more than the demand for similar training in 2018, in which the cost of providing special training (application) was more expensive when compared to general training, causing the target of receiving Non-Tax State Revenue to be achieved faster with less training.

2) Performance indicators of the number of human resources who participated in the CSA training service with a minimum predicate of "good"



For the performance target of fostering a standard culture through increasing the competence of human resources in CSA, performance indicators are used, namely the number of human resources who attend CSA training services with a minimum predicate of "good". Predicate classification based on value ranges can be seen in the table below:

**Tabel 4.1 Predicate Classification**

Value Range	Predicate
85 – 100	Very good
70 – 84	Good
45 – 69	Enough
0 – 44	Less

**Table 4.2: Realization of performance in improving HR competencies of the CSA Division in 2019**

No	Category	Public (persons)	IHT (persons)	Total (persons)	Total of Performance Achievement
1	Very good	64	311	375	29%
2	Good	136	481	617	47.6%
3	Enough	28	243	271	20.9%
4	Less	2	25	27	2.1%
5	Doesn't meet The criteria	-	5	5	0.4%

Based on the table above, it can be seen that the total number of human resources who participated in CSA training services in 2019 with a minimum predicate of "good" was 992 people or 77% of the total participants (1,295 people). The performance achievement for this indicator which obtained a minimum passing score of "good" was 110.22%.

This value has exceeded the performance target set for 2019, which was 900 people. This shows that the training held by the HRD sector of Standardization and Conformity Assessment can increase the understanding and knowledge of training participants regarding Standardization and Comformity Assesment. In addition, the realization of this performance is the result of monitoring and evaluation as well as continuous improvement carried out in a planned and periodic manner related to training materials and instructors, so it is hoped that the quality of the learning process will always be improved.

3) Performance indicators of the number of tertiary institutions that applies CSA education materials (accumulation).

To support the performance indicator of "number of tertiary institutions implementing CSA (accumulation) education subjects", in 2019 the

The HRD sector for Standardization and Conformity Assessment conducted 62 times in-house training and public training in 2019. Overall, this training has been able to improve the competence or understanding of training participants in accordance with the training materials/topics being implemented. The following is a table that shows the performance realization of increasing HR competencies in the CSA division in 2019.

HRD sector of Standardization and Conformity Assessment organized CSA education ToT / Workshop activities and used CSA e-learning in 9 universities. While the target and performance realization of the number of tertiary institutions implementing CSA (accumulated) education subjects in 2018 was 19 universities), while the target of universities implementing CSA education subjects (accumulated) in 2019 was 21 universities. Therefore, the NSA had to collaborate with 2 universities to achieve these targets. But the reality, in 2019 the number of universities implementing CSA education subjects was 3 universities. As of December 2019, the NSA has collaborated with 66 universities throughout Indonesia, in which 22 of them were identified as having implemented standardization education subjects at the undergraduate level and 4 universities having implemented it at the post graduate level. The 2019 performance achievement for this indicator is 150%.

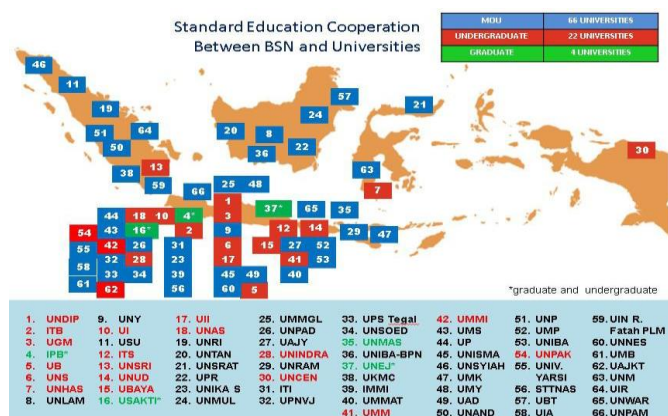


Figure 4.2 Picture of standardization education cooperation in tertiary institutions

4) Performance Indicators: Number of development materials of CSA HR developed

In 2019, a target was set to develop 10 new training materials. This performance indicator is 100% realized with the development of 10 new training materials, namely:

Table 4.12 Training Materials developed in 2019

No.	Training Materials Developed in 2019
1.	Understanding SNI ISO 19011: 2018
2.	Validation of microbiological Testing Methods
3.	Measurement and Calibration of Weights and Analytical Weights
4.	Thermocouple Thermometer Calibration and Measurement
5.	Measurement and Calibration of Voltage, Current, Resistance, Time & Frequency
6.	Measurement Uncertainty
7.	Measurement and Calibration of Mass Force (Pressure Gauge and Test Gauge)
8.	Understanding of Indonesian National Standards (INS) ISO / IEC 17021-2: 2016
9.	Reference book "Occupational Health and Safety Management System" Based on SNI ISO 45001: 2018
10.	Content of e-learning CSA "Implementation of SNI ISO / IEC 17025: 2017"

The development of 10 new training materials in 2019 has been well realized. These activities were supported by instructors and experts in accordance with the field of material being developed. For the coming year, the target number of material development will depend on the analysis carried out, which is sourced from training need analysis,

based on requests from users of the education and training that is delivered through the training evaluation survey or any revisions related to standards.

5) Performance Indicator: Number of certificates issued via e-learning

The fifth performance indicator of the performance target of developing a standardized culture through increasing HR competency in the CSA is the number of certificates issued through e-learning (accumulation). The results of data processing from the CSA e-learning system through the [elearning.bsn.go.id](http://elearning.bsn.go.id) website, showed that CSA E-learning users until 2019 consisted of lecturers, teachers, industry, government, college students, and students. Meanwhile, the highest composition of users was college students with 76% or 2,711 students, followed by industry with 14% or 513 people. This shows that the promotion of standardization through the CSA e-learning system carried out in universities ran well so it could make students realize the importance of understanding standards and be very enthusiastic about using the CSA e-learning website.

6) Performance Indicator: number of stakeholders who signed up for e-learning

Based on the achievement data in 2018, there were 1,626 registrants, while the target of registrants to be achieved in 2019 was 2,626 people. Therefore, the HRD of Standardization and Conformity Assessment had to increase the number of e-learning registrants by 1,000 people in order to achieve the 2019 target. However, in reality, in 2019 the number of e-learning applicants reached 1,971 people. The accumulated number of e-learning registrants was 3,597 people by the end of 2019. The 2019 performance achievement for this indicator reached 197.10%.

This data shows good development in relation to the MoU between NSA and university in standardization education, because after various standardization training/workshops and socialization of CSA e-learning that was carried out as a follow-up to the MoU, now the academic community awareness of the importance of CSA is getting higher and the understanding and knowledge of CSA e-learning users about CSA is increasing.

7) Performance Indicator: The number of NSA Internal HR who participates in the improvement of CSA competence.

To support the performance indicator "The number of NSA Internal HR who participates in the improvement of the CSA competency", in 2019 the HRD Division of Standardization and Conformity Assessment held 11 (eleven) training activities to increase the competence of CSA HR. The total internal human resources of NSA following the improvement of CSA competencies in 2019 reached 306 people. So, the performance achievement for this indicator reached 347.73%, because the target to be achieved was 88 people. For the coming year, the HRD sector of Standardization and Conformity Assessment will identify the needs of CSA training for state civil apparatus of National Standardization Agency in a more comprehensive manner to be able to fulfill the appropriate competency development in each work unit.

### Discussion

Until 2014, the performance indicators of the Standardization Education and Socialization Center were: (1) The number of participants in standardization education (lecturers/teachers and students/college students) reached 5,055 people; (2) The number of participants in standardization training (instructors and participants) reached 1,131 people; (3) The number of society who participated in standardization and conformity assessment activities reached 16,961 people; (4) The number of increased participation of members of the Standardization Society up to 2014 reached 4,151 people; (5) The number of Indonesian National Standardization Award participants in 2014 reached 159 participants, decreased from the previous year which reached 180 participants, while (6) the Customer Satisfaction Index for Standardization Education and Training Services in 2014 reached 79.39. Based on these results, the majority of the performance indicators of the Standardization Center for Education and Socialization in 2010-2014 exceeded the predetermined targets. The number of standardization education participants (lecturers/teachers and college students/students) has experienced a significant increase in achievement compared to the previous year, this is surely inseparable from the efforts of

standardization education learning in 11 universities that have been teaching standardization education. Standardization education abroad has also penetrated universities, for example, UNECE (United Nations Economic Commission for Europe). UNECE collaborates with many universities in standardization education. In providing educational guidelines on standardization, UNECE prepares a "standardization education model program" which covers the main topics that university graduates must master in order to have a general understanding of standards and standards-related issues from the perspective of business authorities or regulators. In Europe, according to a survey conducted by Helmut Schmidt University, the learning related to standardization varies greatly from university to university, and ranges from standardization governance, standardization strategic aspects, IT standards, and e-business applications (United Nations, 2018). Likewise, with standardization socialization activities that are regularly carried out by National Standardization Agency to education world (colleges and vocational high schools), both actively visiting these formal educational institutions, and receiving visits from educational institutions to obtain more in-depth information about standardization and conformity assessment. Apart from that, the development of the e-learning system as a form of independent learning in standardization and conformity assessment greatly contributed to the increased number of educational participation achievement because with e-learning, training institutions and educational institutions have the means to solve learning process problems, and have the accessibility to educational technology which is considered important in the dissemination of knowledge about standardization to the standardization education participants, and interaction between instructors and students can be done online (Romi, 2017). One of the achievement aims done by Education and Socialization Center is to increase public perceptions of standardization. Perception is a view that emerges, that is accepted by individuals through their five senses of the surrounding environment so that it creates a cognitive process that provides an interpretation of an object that is concerned (Herri et al., 2014). According to the research result conducted by Febrian Isharyadi,

Ari Wibobo, and Suminto (2017), shows the public's perceptions of Indonesian National Standard (INS) marked products in four cities (Denpasar, Banjarmasin, Mataram, and Manado), especially in terms of security, safety, health, and the environment have largely been good (73.74%), but this still needs to be improved because there is still 26 percent of research respondents who have other perceptions of products marked with INS. Thus, in order to increase public perception of products marked with INS, the government can carry out standardization education from an early age so that public understanding of products marked with INS will be better (Isharyadi et al., 2018). To increase the public perception, several things are needed such as a continuous and sustainable promotion, education and public awareness program, development of standardization education from schools to universities, making curricula of standardization training, increasing community participation, and encouraging the involvement of training institutions in educating and fostering standardization experts (BSN, 2017). On an ongoing basis, the percentage of education and training institutions networks that implement standardization education was 40% in 2018 (Peraturan BSN NOMOR 24 TAHUN 2019, n.d.)

### Recommendation

Although the results of standardization education in the aspects of the outcomes and benefits of standardization education according to the 2014-2019 Strategic Plan have been achieved, but currently the evaluation carried out related to standardization education has not yet reached the analysis of the results and benefits (outcomes) of standardization education for college graduates. Regarding the fulfillment of the Strategic Plan for the realization of a national quality culture, National Standardization Agency has conducted a national survey related to the national quality culture, but the respondents were the public, in which there may be college students and lecturers by sampling. However, a special survey with respondents of graduated students from standardization courses has not been carried out. Therefore it is necessary to conduct national research and surveys with the respondents of graduated students from standardization courses so that the results of standardization education in

aspects of the results and benefits of the achievements can be mapped and further improved.

### Conclusion

Based on the research results on the implementation evaluation of the standardization education program at the National Standardization Agency (NSA) as well as the discussion, can be drawn the following conclusions: in general, the results of standardization education in the aspects of the outcomes and benefits of standardization education in all standardization education targets according to the 2014-2019 NSA Strategic Plan have been achieved. From testimonials in several universities, it is found out that some companies currently also require an understanding of standardization. Therefore, several universities use the NSA e-learning diploma supplement to prove that their graduates have understood standardization.

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