BRITISH COUNCIL

Global Partnerships

Policy Brief

Disability Inclusion Partnerships grant

2023/2024

REPUBLIK INDONESIA
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Kewarganegaraan	:	Indonesia
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Nama	:	**SITI NURLAELA, Anoraga Jatayu dkk**
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Kewarganegaraan	:	Indonesia
Jenis Ciptaan	:	**Karya Tulis Lainnya**
Judul Ciptaan	:	**Policy Brief – Going Global Partnerships Grant 2023: UK – ID Disability Inclusion Partnerships - Designing a Multiscale Support System for Digital Education to Improve Higher Education Access for People with Disabilities (PWDs) at Institut Teknologi Sepuluh Nopember (ITS)**
Tanggal dan tempat diumumkan untuk pertama kali di wilayah Indonesia atau di luar wilayah Indonesia	:	31 Agustus 2025, di Kota Surabaya
Jangka waktu pelindungan	:	Berlaku selama hidup Pencipta dan terus berlangsung selama 70 (tujuh puluh) tahun setelah Pencipta meninggal dunia, terhitung mulai tanggal 1 Januari tahun berikutnya.
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Project details

Project title	Designing a Multiscale Support System for Digital Education to Improve Higher Education Access for People with Disabilities (PwDs) at Institut Teknologi Sepuluh Nopember (ITS)
Activity start date	1 December 2023 Revised Start Date of the Contract between ITS and the University of the West of England (UWE, UK): 11th November 2024 End Contract Date: 31 Agustus 2025
Total value of grant (please include both the value from British grant and any other or in-kind/matched funding separately)	£29,773.36
Project purpose (use the exact wording from the approved Project Application Form)	This grant would enable ITS to provide best practice and national standards in developing an inclusive digital education system in the future, while also aligning with global standards for serving people with disabilities (PwDs), striving for world-class university status, inspired by examples like UWE. For Department of Urban and Regional Planning (DURP), improving student admissions for case study of DURP Bachelor degree to vulnerable groups like PwDs means open up the opportunity of DURP as an example of a department with a more inclusive policy that could be scaled up to other study programs in ITS. DURP could also provide best practice and national standards in developing MBKM programs involving PwDs. The grant will create opportunities for the UK partner to share accessibility policies and practices in improving accessibility for PwDs, as well as learn from Indonesia's unique challenges in institutional settings and social arrangements. Together, we will co-develop guidelines tailored to local contexts, focusing on

	understanding barriers for PwDs in higher education and improving its support systems.

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EXECUTIVE SUMMARY

Ensuring equitable access to higher education is a cornerstone of a modern, world-class university. For Institut Teknologi Sepuluh Nopember (ITS), the commitment to inclusivity in student admissions is not a peripheral concern but a fundamental component of its institutional identity and strategic mission. This policy brief is a direct outcome of the UKID Disability Inclusion Partnerships grant project, titled "Designing a Multiscale Support System for Digital Education to Improve Higher Education Access for People with Disabilities (PwDs) at ITS". This initiative grounds the imperative for reform within a recognized, funded, and strategic institutional effort to align with global standards of accessibility and equity. This research seeks to understand the problem space by identifying the needs and barriers faced by current students with disabilities in entering degree programs, succeeding during their studies, and establishing connections with industry. Institutional support was also examined by investigating existing policies and practices, including admission and learning processes.

The research is conducted based on the need to embrace people with disabilities in accessing higher education, using the advantages of ITS which already has a digital education system consisting of 41 applications which include the learning process, student intra-curricular and extracurricular activities, employee management, etc. International research consistently shows that students with visual impairments (VI) face more severe and complex challenges in accessing higher education through digital systems than students with other types of disabilities. These challenges stem from systemic design flaws, lack of inclusive practices, and insufficient institutional support. Therefore, the objectives of the research included:

- Paving the way for access to campus life for persons with disabilities, from low vision to total blindness, is supported by the readiness of ITS's institutional capacity for student admission.
- Paving the way for a disability-inclusive digital environment at ITS, by developing a digital support system in myITS Classroom. This includes adjustments to the curriculum and course structure, learning methods and evaluation, and the preparation of teaching materials embedded in the system to ensure inclusivity in the learning process.
- Paving the institutional support system whereas the Regulation support system for university-industry linkage (student output) in ITS could be available.

Scope of the study includes key activities such as:

- Gap analysis and evaluation. Needs and barriers of PwDs among visual impairment students were identified. Existing system in the student input, process, and output were evaluated.
- Audit and upgraded the current digital education system and curriculum, student admission, and student output requirement were upgraded.

- System improvement, including transfer technology from the UWE experience, to provide recommendations to the ITS Rector for future VI students accommodation spefically and PwDs students in general.

Refer to the precedence, during the COVID-19 pandemic, the shift to online education disproportionately affected students with visual impairments (Pargavi N.and Abirami, 2024). While digital learning empowered some groups (e.g., students with mobility impairments), it posed greater challenges for visually impaired students due to inaccessible platforms and lack of adapted instructional materials (ibid). On the other hand, ITS in its long-term planning document has declared the long-term development direction to develop a more creative, flexible and IT-based learning system where online learning becomes one of the strategic learning media (RENIP 2021 2045 or Rencana Induk Jangka Panjang - the ITS Long Term Plan Document 2021 - 2045). This research views the development of digital education at ITS, initiated through platforms such as myITSClassroom and myITSAdmission, as a strategic advantage that can be directed toward building a more disability-inclusive system. The digital education system integrated within the myITS platform comprises various applications; however, these are not yet equipped with features that support disability inclusion.

The partnership with UWE was established based on UWE's standards and practices in implementing disability inclusion in digital technology. A blueprint for inclusive curriculum design and teaching/learning methods, integrated into myITSClassroom as brought as an example of inclusive practice. It also includes recommendations for an inclusive admission system, inclusive student–industry linkage support and strengthened institutional support for the enrollment of students with visual impairments.

Data were collected through interviews, Google Forms questionnaires, and workshops or focus group discussions involving both students and teachers. A total of 33 online/offline workshops[1] engaged around 20 persons with disabilities (PwDs), including high school and university students, teachers, potential graduates, representatives from Bappenas, ITS management and campus leaders, lecturers, curriculum and teaching teams, and PwDs from the employment sector. These diverse participants contributed valuable perspectives and validation throughout the research. Best practices were reviewed, assessed, and benchmarked against universities that already provide higher education services to PwDs.

The outputs of this research are dedicated to providing recommendations, including upgrades to the myITS application, blueprints for curriculum structure and learning materials examples tailored to VI students, inclusive admission policies, and other

[1] https://docs.google.com/spreadsheets/d/1E0n3ab0LqbM14DXLNCFxtJWfCPCwdkR_/edit?gid=535920376#gid=535920376

institutional supports. All research outputs are accessible via the website: **https://www.its.ac.id/pwk/academics/its-inclusive-education-program**

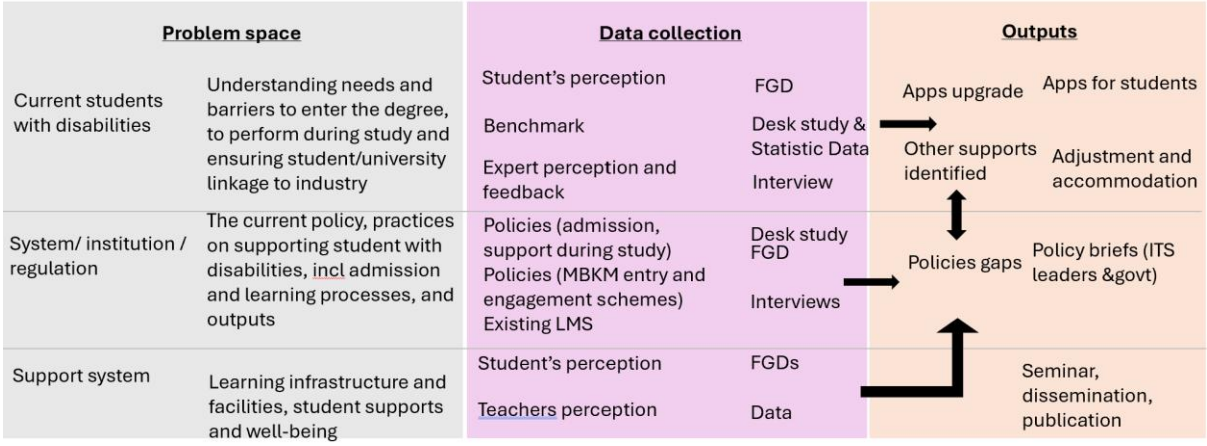


Figure 1 Framework of Research Methodology

The structure of this policy brief consisted of:

(1) A review of regulations, particularly those concerning accommodations for persons with disabilities (PwDs) in Indonesian higher education. The legal framework clearly establishes national standards and institutional responsibilities to ensure equitable access and inclusive practices across both curricular and non-curricular components. Given this, ITS must shift from questioning whether accommodations to PwDs should be provided to focusing on how they can be systematically and gradually implemented;

(2). Gaps and Needs analysis, including barriers in admission, learning processes, teaching and learning methods, assessment and evaluation methods, and student-industrial linkages barriers. Needs analysis performed to identify minimum accommodation services to alleviate those barriers;

(3) The ITS case studies propose a simple method to analyze the readiness level of undergraduate programs in achieving Expected Learning Outcomes (ELOs) in relation to the visual dependency of prospective visually impaired (VI) students, based on a sample of six programs across various faculties. Results among samples showed that System and Industrial Engineering program had the highest percentage of courses categorized as "difficult" (61%), followed by Marine Engineering (48%), and Biology (40%). Among the sampled programs, Business Management had the highest percentage of courses in the "possible" category (50%), followed by Urban and Regional Planning (34%). When combining the percentages of courses in the "possible" and "conditional" categories, Business Management ranked highest (93%), followed by Urban and Regional Planning (67%) and Development Studies (59%);

(4). The digital education development review examined available technologies and benchmarked them against practices at UWE. It provides recommendations on a

range of assistive technologies based on user-friendliness, ease of use, and cost-efficiency for application in ITS.

(5). Findings and Policy recommendations for milestones in student inputs, processes, and outputs.

The brief concludes with a list of actions and future research directions as a continuation of this pilot study, aimed at ensuring the sustainability and realization of ITS's commitment to implementing inclusive education through collaborative efforts in the near future.

Results from each milestone are summarize as follows. We recommend ITS to:

Milestones 1: Student input

1. Formalize and empower a central Disability Service Unit (ULD) as the foundational pillar of its inclusion strategy
2. Design a dedicated "Seleksi Mandiri Disabilitas" (Independent Selection for Disabilities) pathway, utilizing holistic and expert-led assessment methods.
3. Undertake a comprehensive overhaul of its digital accessibility and launch proactive outreach programs to ensure informational equity.
4. Conduct a phased, pilot-based rollout of these new systems, beginning with high-readiness study programs, to ensure a successful and sustainable university-wide adoption.

Milestones 2: Student processes

1. Map graduate profiles and learning outcomes to the needs of visually impaired students (and other disability types) as part of a readiness assessment for study programs, ensuring alignment with the Indonesian National Qualification Framework (KKNI) Level VI and supporting the development of critical thinking and decision-making skills.
2. Conduct a systematic review to evaluate curriculum and course content for visual dependency, based on the barriers and needs of visually impaired students.
3. Adapt teaching and assessment methods using accessible formats, such as digital resources compatible with assistive technologies like screen readers, Braille for printed text, audio materials, and tactile tools.
4. Standardize student-centered learning approaches, such as case-based and problem-based learning, to enhance engagement and understanding for VI students.

5. Scale up inclusive teaching materials and technologies, especially in programs already equipped to support VI learners.
6. Promote and integrate disability-focused research into institutional agendas to advance inclusive education practices.

Milestones 3: Student output

1. Equip students with knowledge and confidence to navigate assistive technology provision in the workplace. This includes ongoing training as they transition into employment, focusing on how to advocate for the use of assistive technologies and understand the laws that protect their rights.
2. Other Training and capacity building on Communication, understanding of work culture, awareness, equal treatment.
3. Provide a Careers Hubs integrate with disability services unit to help all secondary schools and colleges implement high quality careers guidance to help young people make more informed decisions around their future choices, including working experience for PwDs.
4. Ensure the website such as ITS Student Connect that facilitates internship to be accessible for PwDs.
5. Networking with companies and ensure private company awareness and capabilities to accommodate people with disabilities
6. Provide appropriate accommodation for students with disabilities in higher education during their internship period
7. The administrative requirement applied to PwDs and non-PwDs from users will be the same. The university could issue a letter of statement that the graduate are PwDs. This will help users understand there already adjustment in the graduate competencies,

Apart from the recommendations developed during research activities, the research team would also extend the recommendations to ensure the sustainability of this effort to embrace people with disabilities in accessing higher education. We recommend ITS to:

1. Restructure the Disability Services Unit under the Rector or Vice Rector as the ideal organizational model, integrating it with the Academic Development and Admission Division, Healthcare Unit, and Student Career Center. This integration aims to ensure functionality and compliance with national standards, encompassing academic counselling, mentorship programs, mental health support, capacity building and awareness, as well as accessible learning and teaching tools, facilities, and infrastructure.

2. Assess the feasibility of study programs that can accommodate students with disabilities and actively promote relevant programs in higher education to these students.
3. Promote and integrate disability-focused research into institutional agendas to advance inclusive education practices. This includes enhancing the competence of academic staff to address the needs of persons with disabilities (PwDs).
4. Plan, monitor, and evaluate the provision of reasonable accommodations for PwDs at ITS.
5. Raise awareness and regularly disseminate information about disabilities and inclusive education systems to all university members.
6. To ensure sustainable inclusive education, continued university budget support is essential. A shared vision for inclusive education at ITS should be established and integrated into the university's medium and long-term planning and programs.

Implementing these recommendations will align ITS with national law, enhance its institutional reputation, and affirm its commitment to cultivating excellence from the broadest possible pool of talent.

Surabaya, 29th of September 2025

Authors.

Introduction

This research was initiated by the need to embrace People with Disabilities (hereafter be cited as PwDs) in attaining higher education, especially by using the advantages of ITS University that already has an established digital education system. The system is expected to become more-disability-included in its development in the future.

Ensuring the wellbeing of PwDs is challenging. Social exclusion due to limited technology access among PwDs become barriers for them in assessing higher degree education (Fernandez, et. al., 2022). As many as 17% of people with disabilities are not enrolled in school (Fitryanah, 2025). There are 6,321 higher education institutions across the country, yet only 274 institutions[2], or 4%, are registered as providing access and accepting students with disabilities. Only 34% of those number of higher education institution admit VIS (Ministry of Higher Education, Science and Technology, 2024). From total 71 higher education institution[3] that admit various types of PwDs, 5 higher education institutions are located in East Java Province. Only 3 higher education institutions in East Java admit VIS, namely Airlangga University, Universitas Negeri Surabaya, and Universitas Negeri Malang. In those higher education institutions, social science is the most and least potential fields of study for VIS (see data in more detailed in *box 1*). Therefore, digitalization in education that is disability-inclusive would be a vast support that would improve **PwDs access to a quality education (SDG no. 4**).

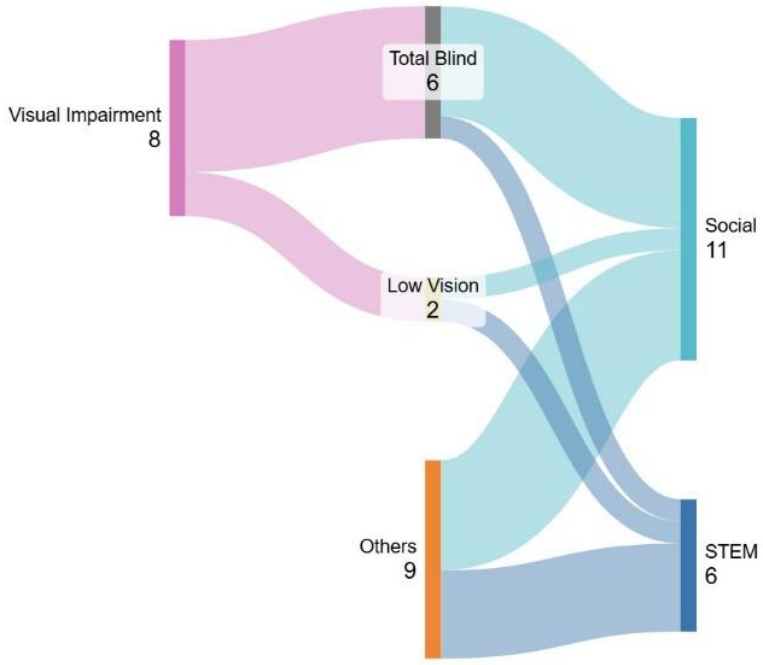
Objective of the research includes:

- Paving the way for access to campus life for persons with disabilities, from low vision to total blindness, is supported by the readiness of ITS's institutional capacity for student admission.
- Paving the way for a disability-inclusive digital environment at ITS, by developing a digital support system in myITS Classroom. This includes adjustments to the curriculum and course structure, learning methods and evaluation, and the preparation of teaching materials embedded in the system to ensure inclusivity in the learning process.
- Paving the institutional support system whereas the Regulation support system for university-industry linkage (student output) in ITS could be available.

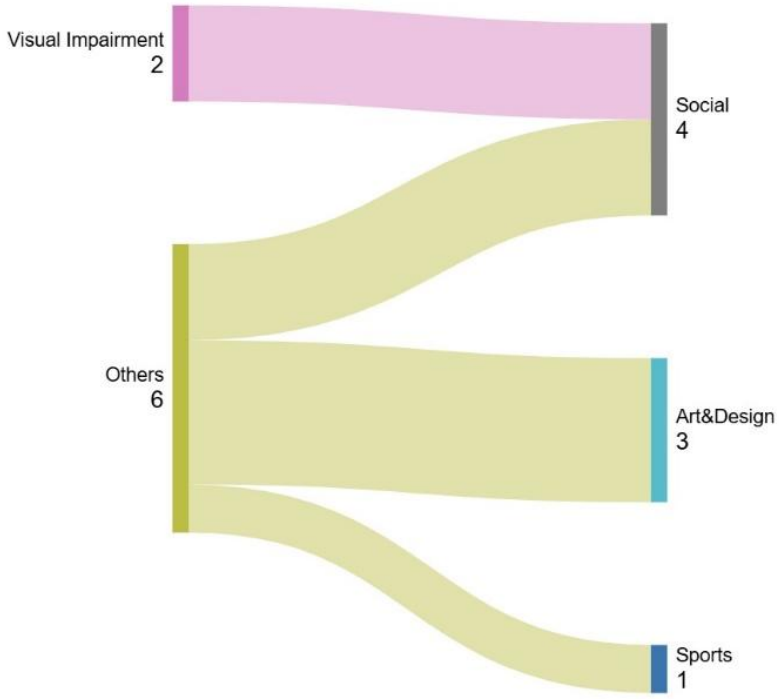
[2] https://ptinklusif.kemdiktisaintek.go.id/s/5/sebaran-mahasiswa-disabilitas

[3] https://ptinklusif.kemdiktisaintek.go.id/s/5/sebaran-mahasiswa-disabilitas

Box 1. University Mapping in East Java Province for Students with Disabilities

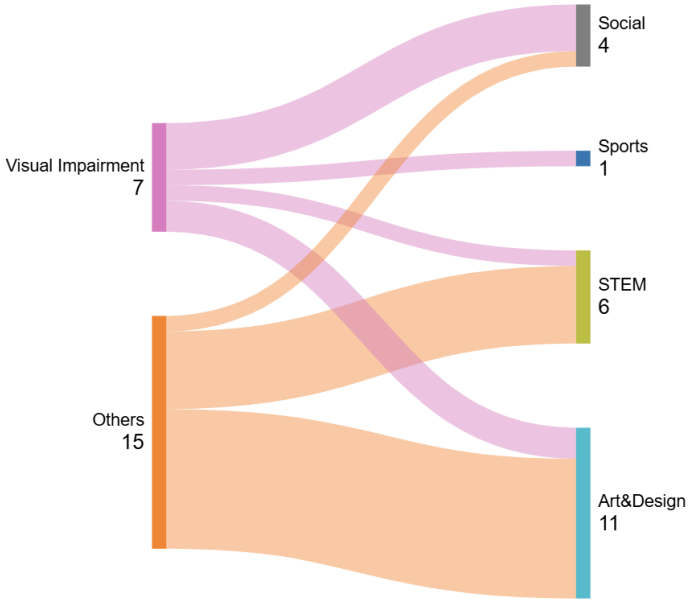


Sankey Diagram of Study Program Number Admit VIS in Airlangga University, Surabaya



Sankey Diagram of Study Program Number Admit VIS in Universitas Negeri Malang

Box 1. University Mapping in East Java Province for Students with Disabilities (continue)



Sankey Diagram of Study Program Number Admit VIS in Universitas Negeri Surabaya

Description:

Social science is the most potential fields of study for VIS. However, the use of assistive technology and providing assistance allows students to learn STEM, sports, and Art&design.

Data source: https://ptinklusif.kemdiktisaintek.go.id/s/5/sebaran-mahasiswa-disabilitas

Scope of the study includes key activities such as:

- **Gap analysis and evaluation**. Needs and barriers of PwDs among visual impairment students were identified. Existing system in the student input, process, and output were evaluated.
- **Audit and upgraded** the current digital education system and curriculum, student admission, and student output requirement were upgraded.
- **System improvement**, including transfer technology from the UWE experience, to provide recommendations to the ITS Rector for future VI students accommodation spefically and PwDs students in general.

In designing the research methodology and implementing the study, the team collaborated with the Dean of the Faculty of Civil, Planning, and Geo Engineering at

ITS, as well as the Head of the Urban and Regional Planning Department and academic staff from DURP at ITS. In particular, we worked closely with YPAB (Yayasan Pendidikan Anak Buta), involving both teachers and alumni. Together, we identified senior high school and university students to serve as research samples. These samples were proportionally selected based on gender, age, and type of visual impairment, ranging from low vision to total blindness.

The research also involved collaboration with the Directorate of Poverty Reduction and Community Empowerment, Bappenas (Indonesia's National Development Planning Board). Bappenas provided valuable input on current internship policies and practices and facilitated the formulation of a Memorandum of Understanding (MoU) with ITS and cooperation agreement with Faculty of Civil Engineering, Planning and Geosciences ITS. This agreement enables future participation of students with disabilities in Bappenas programs. As the lead agency for planning and implementing the National Action Plan for PwDs, Bappenas plays a key role in improving accessibility to education.

Within ITS, Internal Collaboration at ITS and the research team have been developed. The research team worked with DPTSI (Directorate of Technology and Information System Development) to evaluate and upgrade the ITS website and the myITS platform, ensuring better accessibility for visually impaired users. The Directorate of Education (Dirpendik), through the Student Admission Office, contributed expert input during workshops and interviews. They provided insights into the current admission system and identified potential challenges for future admissions of visually impaired students. This office is also a key recipient of the policy recommendations produced by the research.

Further support came from the Division of Academic Affairs, through Vice Rector I and the Directorate of Academic Development and Learning Innovation (DirPAIP). These units oversee the quality of education, research, and community service at ITS. They also reviewed the research outputs and ensured that the policy brief submitted to the ITS Rector includes provisions for inclusive education services for students with disabilities.

In the context of enhancing the accessibility of digital education for people with disabilities (PwDs), the visual impairment student are the most least advantageous groups among other types of PwDs. A comprehensive scoping review by Kerdar et al. (2024) found that many digital platforms, including websites, apps, and educational tools, are primarily designed for sighted users. These platforms often lack alternative text for images, keyboard navigation, and compatibility with screen readers, making them inaccessible to visually impaired users (Hamideh Kerdar et al., 2024). Compared

to other types of disabilities, students with visual impairments encounter distinct challenges in digital learning environments ((Emore, n.d)[4], (Sayed & Cenk, 2023) :

- Difficulty accessing visual materials such as PDFs, slides, and diagrams.
- Incompatibility of digital resources with assistive technologies like screen readers.
- Limited institutional support and inconsistent accommodations.
- Lack of alternative formats (e.g., Braille, audio) for assessments and instructional content.

These barriers are not as prevalent for students with other disabilities, such as mobility impairments, who often benefit more directly from digital learning environments (Pargavi N.and Abirami, 2024).

This research views the development of digital education at ITS, initiated through platforms such as myITSClassroom and myITSAdmission, as a strategic advantage that can be directed toward building a more disability-inclusive system. The outcomes or indirect benefits from the research included (1) Improving PwDs access and opportunities in entering the higher education system in bachelor program; (2) acquire PwDs capacity in self-help processes throughout their lives, to impact on well-being and quality of life; (3) increasing awareness of people in all groups of the campus community, specifically to support PwDs and behave more inclusive in daily life and social life; and (4) toward a better and more inclusive higher education system in ITS.

Opening access opportunities for people with special needs and disabilities does not necessarily reduce the seat allotment allocated to other parties that have been allocated as per business as usual and also does not reduce the facilities and benefits that already provide.

Regulation Review

The Government of Indonesia has provided protection for people with disabilities as stipulated in some laws and regulations such as Act (Undang undang) Number 12 of 2012 concerning Higher Education. However, it is unclear how this act is supported in more detailed regulations or instruments that are practical at the university level, including through technology support. Act Number 20 of 2003 mandates equal education for all citizens in Indonesia without discrimination, enforced by government regulations like PP 70/2019 (Planning, Implementation, and Evaluation of the Respect, Protection, and Fulfilment of the Rights of Persons with Disabilities) and East Java Province Government Regulation Number 3 of 2013. These laws stress the importance of education access for persons with disabilities (PwDs), and local government supports, however implementation in universities is still lacking in their higher education setting since the area beyond authority of local government. Several

[4] Addressing Visual Impairment in Higher Education: Integrating Instructional Design and Digital Resources – The ALT Text

universities such as UIN Kalijaga, UMY, and Brawijaya University, have initiated inclusive education efforts. However, none of these initiatives focus on digital education for PwDs, highlighting a gap in inclusive education methods.

Based on a study by BAPPENAS (2022), Indonesia's Inclusivity Index ranks 125th, below the Philippines, Vietnam, Singapore, and Thailand. Education for persons with disabilities has also been regulated by laws issued since 2003, namely Law No. 20 of 2003 on Sisdiknas or national education system, and Law No. 8 of 2016: Persons with Disabilities. It is stated that special education is intended for students who face difficulties in the learning process due to physical, emotional, mental, or social disorders, and/or who have potential intelligence and special talents. The Ministry of Education of the Republic of Indonesia has since shifted the paradigm of education for persons with disabilities to an inclusive education paradigm. Inclusive education (mainstreaming) provides opportunities for all students with disabilities and those with potential intelligence and/or special talents to participate in education or learning in the same environment as general students. This is regulated in Minister of National Education Regulation No. 70 of 2009 Concerning Inclusive Education for Students with Disabilities and/or Gifted Potential. This regulation stipulates that:

- Inclusive education is an educational service system that accommodates all students, including those with physical, emotional, mental, intellectual, and/or social disabilities.
- Students with gifted potential and/or special talents are also included within the scope of inclusive education.
- Regular educational institutions may implement inclusive education by modifying the curriculum, teaching methods, and assessment systems according to the needs of the students (this will also apply for higher education).

Specifically, there is a regulation that was also developed by the Minister of Education and Culture Regulation No. 157 of 2014 Concerning: Curriculum for Special Education that allows modified regular curriculum or a special curriculum tailored to the barriers and potential of the students. This regulation governs:

- The curriculum for students with disabilities or special needs, both in special education institutions and regular schools.
- The types of disabilities covered, include: visual impairment, hearing impairment, intellectual disabilities, autism, and others.
- The curriculum may consist of a modified regular curriculum or a special curriculum tailored to the barriers and potential of the students.
- The curriculum includes special needs programs and independence programs as integral components.

Nevertheless, the accommodation of persons with disabilities (PwDs) in higher education must still refer to Presidential Regulation No. 8 of 2012 concerning the Indonesian National Qualifications Framework (KKNI) and Minister of Education and

Culture Regulation No. 3 of 2020 concerning National Higher Education Standards (SNPT). These legal references are essential as a strong foundation for study programs in Indonesia as quality assurance to formulate standard criteria for theses, final projects, and dissertations, and serve as juridical references for anyone who validates or disqualifies research conducted by undergraduate, postgraduate, or doctoral students in Indonesia. According to Presidential Regulation No. 8 of 2012, the qualifications for undergraduate graduates are regulated at KKNI Level 6.

As part of quality assurance and a form of positive discrimination, the government continues to provide guidance and support for inclusive education, including through the Minister of Research, Technology, and Higher Education Regulation No. 46 of 2017: Special Education and Special Service Education in Higher Education and Government Regulation No. 13 of 2020 regarding Decent Accommodation for Students with Disabilities. Furthermore, in 2023, government enacted Minister of Education, Culture, Research, and Technology Regulation No. 48 of 2023, which mandates that every higher education institution must facilitate the establishment of a Disability Services Unit (ULD or Unit Layanan Disabilitas), either by creating a new unit or strengthening existing functions. According to data from PD Dikti (2025), among more than 4,200 universities and higher education institutions in Indonesia, only 114 (less than three percent) have established a Disability Services Unit (ULD), and 249 have admitted students with disabilities, totalling approximately 3,582 students with disabilities enrolled in higher education. Despite these initiatives, there remains a significant gap in digital education services for persons with disabilities (PwDs), particularly in STEM fields, highlighting the need for more inclusive education methods in STEM-focused universities.

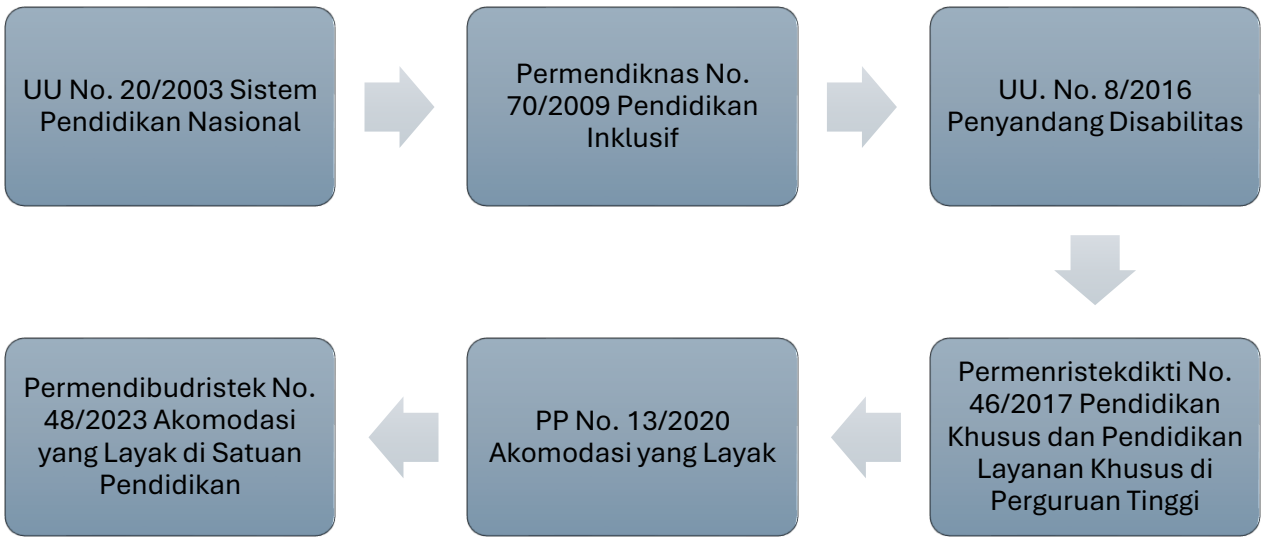


Figure 2 The Inclusive Education Policy of Indonesia (Direktorat Pembelajaran dan Kemahasiswaan, Kemendiktisaintek, 2025)

Gaps and Needs Analysis

ITS already has an established digital education system that is equipped with user-friendly apps, consisting of 41 applications for all teaching/learning purposes, student intra-curricular and extracurricular activities, etc. Among those apps (figure 2), myITSClassroom is a daily learning management system. However, this system is not yet equipped with features that are disability inclusive. Partnership with UWE that already has the standards and implements disability inclusive in digital technology would help in technology transfer for ITS.

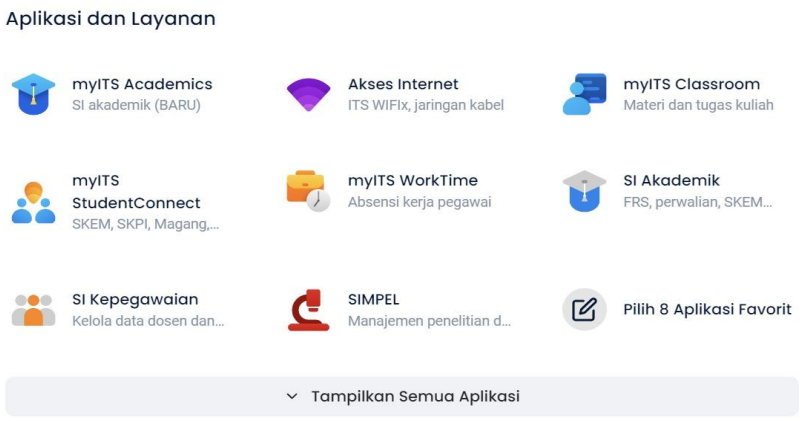


Figure 3 Illustration of the digital education system in ITS

The Equality Act 2010 in the UK says that organisations should have accessible content from the start. The support system towards disability inclusion digital education should be integrated with basic university policies. A multiscale approach is offered in this research to integrate student input-digital learning/teaching process-student output to pave the way in welcoming PwDs to campus life and after their graduation (figure 3). Community campuses should have awareness about the rights of PwDs to education and embrace them. Partnership with the UK university would provide a great support in strengthening capacity building to build awareness and create supportive policies according to UK-best practices.

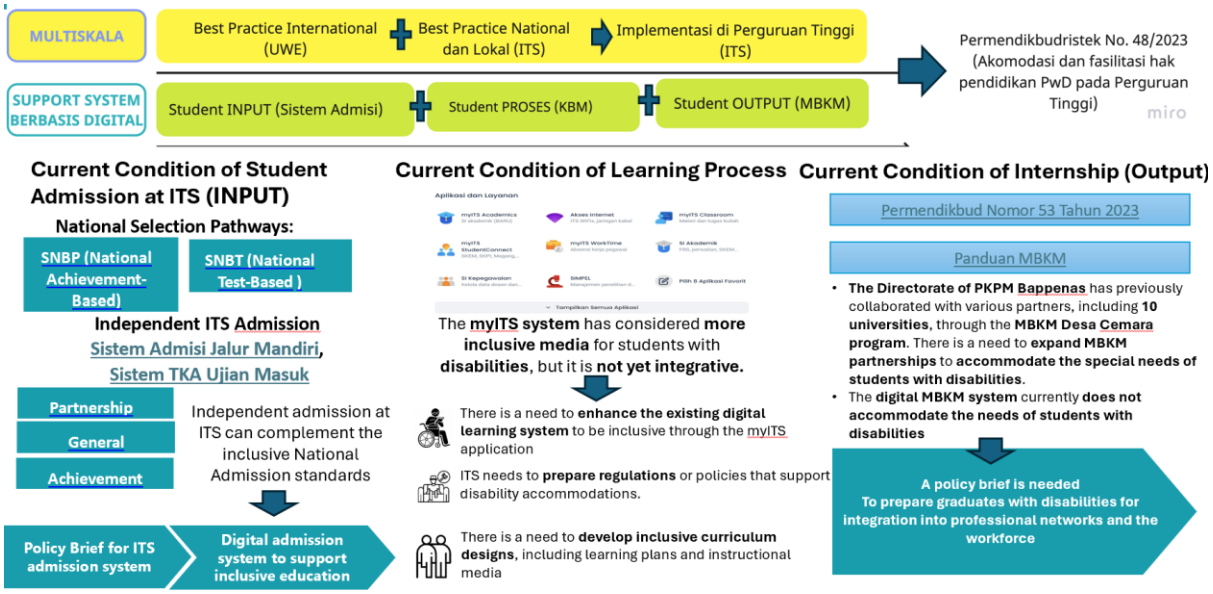


Figure 4 A multiscale approach to integrate student input-digital learning/teaching process-student output to pave the way in welcoming PwDs in ITS

This research aims to create a support system for digital education at ITS University. The scope of the project includes disability inclusion student admission, building LMS (Learning Management System) attached in the upgraded disability inclusion version of student learning/teaching processes in myITSClassroom, providing a better access to PwDs (future) graduates to industry by exercising disability inclusion MBKM program. Disability inclusion support systems would cater to various disability types, mainly vision impaired, from low vision to total blindness.

The problem spaces identified PwDs as a vulnerable group that often face disadvantages including poverty and a higher unemployment rate due to lower education attainment. Data showed that the average years of education of a person without a disability is 6.5 years. For someone with a disability is 2.8 to 4.4 years (Monash University and Australian Government, 2017). Therefore, the outcomes of the project expected to prepare ITS in having a sufficient support system for PwDs enrollment in the near future, as such these PwDs could extend their education experience to build capability of **lifelong education (SDG No.4).**

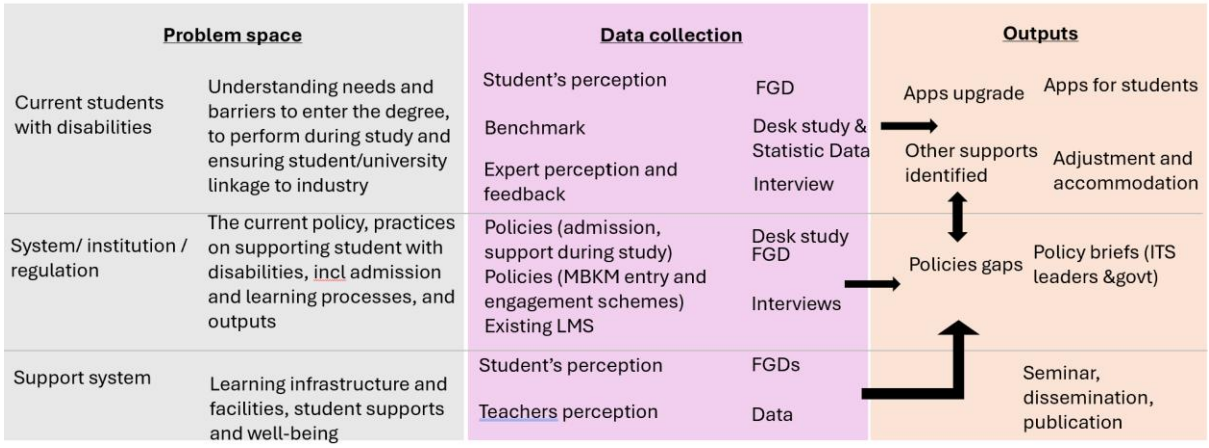


Figure 5 Research Methodology: the Inputs-processes-outputs of research framework

During the barriers and needs identification workshops, several key challenges were identified across student admissions, learning processes, and industry linkages.

Admissions Barriers

Students with disabilities (PwDs) face challenges as early as secondary school, where they often lack access to information and support for university admission. Schools rarely provide adequate preparation or specialized guidance. Students reported limited access to information, including inaccessible university websites (e.g., incompatible with screen readers, overly complex content), and unresponsive contact points such as hotlines or social media.

At the university level, only a few institutions offer special admission systems for PwDs. Outreach to promote inclusive programs is minimal, and many universities show limited commitment to fulfilling the mandated quota for students with disabilities (less than 10%). There is also no comprehensive mapping of accessible study programs or standardized guidelines for inclusive education. Needs included:

- Establish dedicated disability service units.
- Implement inclusive admission systems.
- Improve website accessibility and simplify information.
- Provide accessible contact channels for PwDs.
- Conduct outreach programs targeting students with disabilities.

Learning Process Barriers

Visually impaired (VI) students face both technological and non-technological barriers. Non-technological challenges include limited support services, financial constraints in acquiring assistive technologies, and inaccessible physical environments. Technological barriers include inaccessible online learning platforms, inadequate assistive tools, and difficulties with visual demonstrations or hands-on courses.

In STEM and social science subjects, students struggle with reading and interpreting complex materials such as math problems, tables, figures, maps, and 3D models. These challenges are compounded by untrained teachers and unsuitable classroom settings. Needs included:

- Provide assistive technologies (e.g., tactile maps, 3D printed materials, math software).
- Train teachers in inclusive teaching methods.
- Adjust classroom settings to support collaborative and peer-assisted learning.

Teaching and Learning Methods Barriers

Students face difficulties due to untrained lecturers, limited access to learning materials, and challenges in preparing reports and presentations (e.g., inserting

graphs, tables, maps). Participation in fieldwork, tutorials, and simulations is also limited. Needs included:

- Offer capacity-building programs for lecturers.
- Encourage peer volunteer support.
- Provide assistive tools and software for digital learning materials.
- Adapt classroom environments for inclusive simulations and role plays.

Evaluation Methods Barriers

Students encounter barriers during assessments, including time constraints, inaccessible formats, difficulties with reading and typing, and unsuitable classroom settings. Needs included:

- Allow time extensions for quizzes, exams, and assignments.
- Ensure materials are accessible and compatible with screen readers.
- Avoid multiple-choice formats when possible.
- Provide dedicated exam rooms and group-based assessments with volunteer support.

Student-Industrial Linkages Barriers

During the workshops, several barriers were identified that hinder effective linkages between students with visual impairments (VI) and industry opportunities. Many VI students reported a lack of accessible information about job vacancies. Additionally, limited proficiency in essential software tools—often due to their disability—further restricts their employability. Compounding this issue is the absence of enforcement mechanisms for companies that fail to meet employment quotas for persons with disabilities (PwDs).

A significant barrier is the limited awareness and preparedness of companies to accommodate PwDs. Many employers lack the knowledge, facilities, and inclusive practices necessary to support these individuals. Furthermore, the range of job fields accessible to VI students remains narrow, limiting their career options. Needs to address these challenges include:

- Establishing career support services, such as dedicated career centers or hubs, to provide guidance and job placement assistance for students with disabilities.
- Enhancing graduate qualifications by ensuring students gain proficiency in essential skills, including Microsoft Office, programming languages, English communication, soft skills, and vocational competencies.
- Improving employer compliance with disability employment regulations by raising awareness and building capacity within private companies to accommodate PwDs.

- Ensuring accessible recruitment processes, such as providing online application forms in accessible formats (not image-based), and conducting objective, inclusive interviews.
- Creating inclusive work environments by offering training and capacity-building programs, providing assistive technologies, and fostering understanding of inclusive workplace culture.

Institut Teknologi Sepuluh Nopember case study

ITS in its long-term planning document has declared the long-term development direction to develop a more creative, flexible and IT-based learning system where online learning becomes one of the strategic learning media (RENIP 2021 2045 or Rencana Induk Jangka Panjang - the ITS Long Term Plan Document 2021 - 2045). This research viewed the development of digital education in ITS (initiated with myITSClassroom and myITS Presensi in this project) as one advantage that could be directed towards a more-disability-inclusion system. Since the development of annual focus in 2021 toward “Excellence Digital Environment”, ITS has paved its way for digitalization in education. Currently, there are 7 apps for teaching and learning only, and 34 apps for other needs that are integrated in the big data application of myITS. Thus, this research would enable ITS to provide best practice and national standards in developing an inclusive digital education system in the future, while also aligning with international standards for serving PwDs, striving for world-class university status, inspired by examples like UWE.

In the context of enhancing accessibility to higher education by leveraging the digital strengths of the system for people with disabilities (PwDs), students with visual impairments are among the most disadvantaged groups compared to other types of PwDs. Therefore, prioritizing research that targets visually impaired (VI) students addresses some of the most pressing challenges ITS faces in developing future inclusive education. To that end, this reseach investigates the extent to which ITS, as one of the STEM universities in Indonesia, is able to provide access for persons with visual impairments (PwDs). A comprehensive evaluation is presented, covering graduate learning outcomes and their adjustments, as well as implications for curriculum structure and course learning outcomes.

The comprehensive pilot study targetted DURP Department Urban and Regional Planning program. DURP ITS is one of the departments in ITS with around 620 active students, around 170 annual new student enrolment, and a total of 1479 graduates (as of 2023). Subjects taught in DURP are mainly in the field of public domain and are very relevant to the public policy for enhancing the quality of life of all members of the society equally. Thus, graduates from DURP are important as future leaders who will

shape future public policy in Indonesia. Additional discussions extend to other study programs, including examples from various faculties at ITS. These examples examine the suitability of VI students in achieving the expected graduate learning outcomes and assess how well the curriculum structure aligns with the barriers faced by VI students.

The expected learning outcomes (ELOs) of university graduates are increasingly recognized as central to higher education policy, curriculum design, and quality assurance worldwide. These outcomes are typically defined as statements of what a learner knows, understands, and is able to do after completing a learning process (Harris & Clayton, 2019). Interviewed on graduate students' ELOs were conducted to these samples of undergraduate programs at ITS.

A simple method to combine the assessment of the visual dependency level of each ELO statement with the weighted value of the relevant Course Learning Outcomes (CLOs)5. The results were obtained by multiplying both scores, producing a ranked list of courses from high to low. A high score indicates that the course has low visual dependency, and its CLOs are likely achievable by VI (visually impaired) students without significant adjustments; conversely, a low score suggests higher visual dependency and greater challenges for VI students.

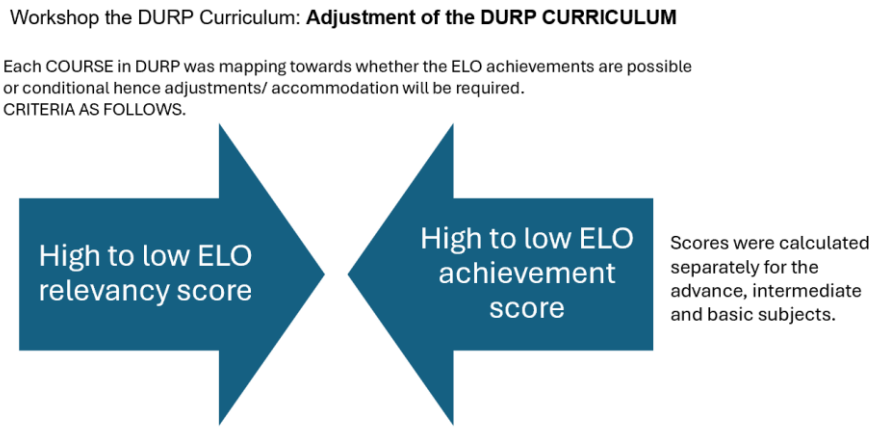
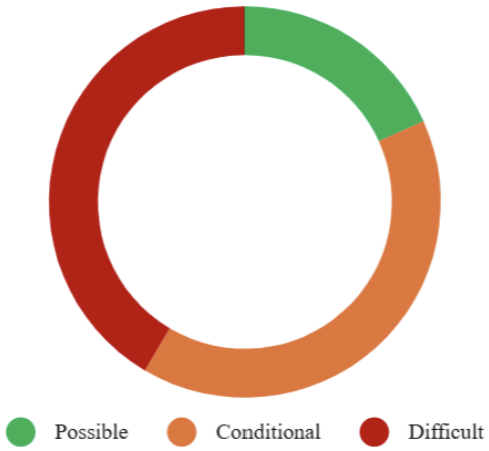


Figure 6 Method for subject mapping towards ELOs achievement

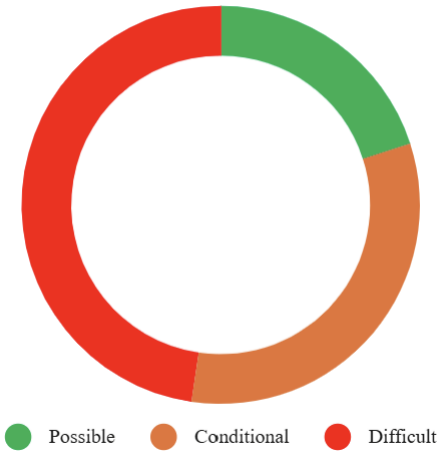
Execution of this method was conducted via workshops with the DURP faculty member for URP undergraduate program, and via interviewed and questionnaire surveys for other remaining 6 programs. A secondary data on how the courses structure in each curriculum support the relevancy ELO measured by data relevancy score from each courses to each ELOs retrieved from database in myITSAcademics platform. The results from this investigation showed in figure 7.

[5] Bobot CPMK terhadap CPL 7 Prodi - Google Sheets

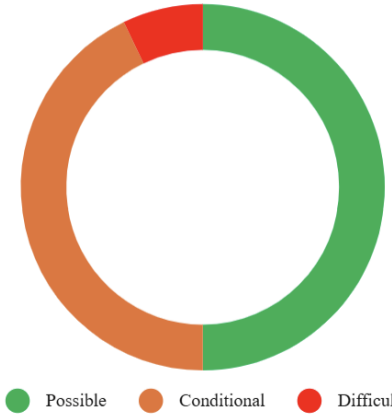


Biology program, total courses: 159

(P: 18%, C:40%, D: 42%)

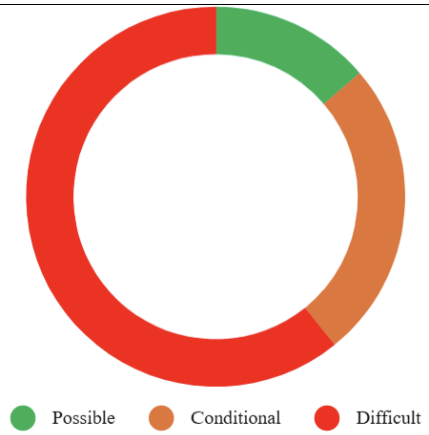


Marine engineering program, total courses: 65 (P: 20%, C:32%, D: 48%)



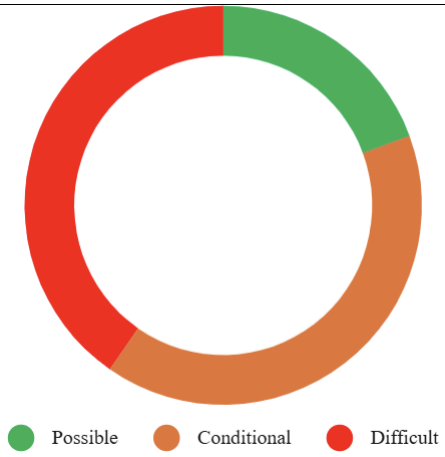
Business management program, total courses: 70

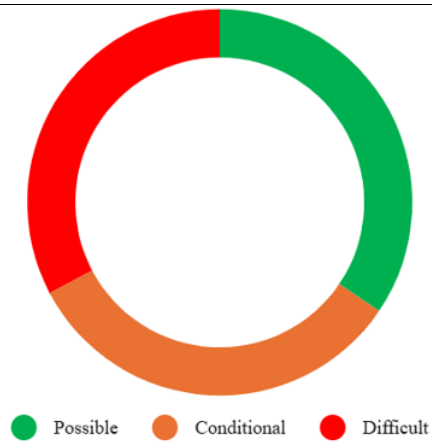
(P: 50%, C:43%, D: 7%)



Systems and Industrial Engineering program, total courses: 51

(P: 14%, C:25%, D: 61%)





Development study program, total courses: 62 (P: 19%, C:40%, D: 40%)	DURP program, total courses: 58 (P: 34%, C:33%, D: 33%)

Figure 7 Mapping the courses in the sampled undergraduate program in ITS based on the level of visual dependency in course learning outcomes for VI (visually impaired) students

The survey results showed that System and Industrial Engineering program had the highest percentage of courses categorized as “difficult” (61%), followed by Marine Engineering (48%), and Biology (40%). Among the sampled programs, Business Management had the highest percentage of courses in the “possible” category (50%), followed by Urban and Regional Planning (34%). When combining the percentages of courses in the “possible” and “conditional” categories, Business Management ranked highest (93%), followed by Urban and Regional Planning (67%) and Development Studies (59%).

Findings from the workshops and surveys led to the following recommendations for mapping undergraduate programs at ITS that show the highest possible achievement of expected learning outcomes of graduates, hence the adjustment to the needs and barriers of visually impaired (VI) students will be made possible, as follows:

1. The Business Management undergraduate program represents the Faculty of the Faculty of Creative Design and Digital Business.
2. The Urban and Regional Planning undergraduate program represents the Faculty of Civil, Planning, and Geo Engineering.
3. The Development Studies undergraduate program represents the Faculty of the Faculty of Creative Design and Digital Business.

Digital Education Development at the Institut Teknologi Sepuluh Nopember

ITS is committed to inclusive education, in line with national regulations such as UU No. 8/2016 on People with Disabilities and PP No. 13/2020 on Decent Accommodation for Students with Disabilities. However, many digital systems (portals, e-learning platforms, and internship management systems) are still not fully accessible for blind and low-vision students. International best practices emphasize the importance of assistive technology in bridging this gap. Therefore, ITS can enhance inclusivity by formally adopting free solutions such as NVDA and UserWay.

The inclusive digital education development in ITS carried out through qualitative data that collected through literature review, questionnaire, simulations pre-test, and post-test. The analysis methods that used in this research is gap analysis based on triangulation (benchmark studies, simulations, and literature review). There are three workshops conducted to simulate the uses of assistive technology. First, workshop IT

simulation before upgrade on 21 April 2025, and second and third are workshop IT simulation after upgrade system on 17 June 2025 and 5 July 2025.

Some workshops with persons with disabilities (PwDs) identified several applications that they already use as day-to-day learning tools to support their studies. The evaluation of the utilization of these applications is described as follows:

Use of NVDA (NonVisual Desktop Access):

- Most participants are already familiar with NVDA as their primary screen reader.
- NVDA is commonly installed on laptops, though some also use it on mobile devices (albeit with limitations).
- It is used to access and transmit text-based information, such as reading documents, emails, and web content.

Alternatives and Supporting Devices:

- Some participants use JAWS (Job Access With Speech) as an alternative, especially due to its more accurate detection of web elements like links or URLs compared to NVDA.
- Certain participants use special devices for braille output, allowing for more tactile access.

The workshops also reviewed and compared web and desktop assistance based. The comparison is described in table 1.

Table 1 Reviewed based on users' experiences with desktop-based and web-based assistive tools

Desktop Based assistance	Positive review	Negative review
NVDA (NonVisual Desktop Access)	The free version is sufficient to meet the needs of users with low vision or total blindness. ITS web applications (Classroom, ITS Website) are generally accessible with assistive tools.	Some content with image elements on ITS web applications still needs descriptive text.
JAWS (Job Access With Speech)	A paid application with premium support.	Requires a paid license to access standard features that are already available in NVDA (open source).

Desktop Based assistance	Positive review	Negative review
Web based assistance	Positive review	Negative review
UserWay (Free version)	Helpful for users with low vision due to available features.	Lacks features to support users who are totally blind.
UserWay (Paid version)	Offers additional disability profile features.	“Page structure” feature does not function properly. Text-to-speech feature overlaps with NVDA functionality. High cost for websites with heavy traffic.

NVDA is the most efficient choice in terms of features and cost, as it is free and compatible with many web applications. JAWS excels in premium features but is less efficient due to licensing requirements. Userway is suitable for web integration, but the paid version is relatively expensive and has overlapping functions with screen readers like NVDA. A combination of NVDA for desktop use and Userway Free for web can be a cost-effective solution with sufficient functionality, while continuing to improve the compatibility of ITS web content with these tools.

The use of assistive technology also reviewed during student-industry linkage session workshops, and findings showed that Students with visual impairments report difficulties accessing job vacancy information, internship guidelines, and academic portals due to non-inclusive website design. Many course materials and digital forms are image-based or poorly labelled, making them inaccessible without a screen reader. While ITS has strong collaboration with Bappenas on disability inclusion, digital accessibility has not yet been standardized across platforms.

In conclusion, the gap analysis in assistive technology utilization among PwDs with visual impairment are as follows:

- Screen Reader Usage: Most visually impaired students use NVDA as their primary screen reader on laptops, with limited use on mobile devices. Some also use JAWS for more accurate web element detection. Specialized Braille devices are used by some participants for tactile access.
- NVDA Features: Add-ons enhance NVDA’s functionality, enabling tasks such as reading PowerPoint presentations, automatic time reading, and voice customization.

- Web Accessibility Considerations: Developers must ensure that ITS web pages and digital platforms are structured for screen reader compatibility, including clear headings, alt text for images, labeled forms, and logical navigation.
- Mobile Accessibility: On Android, students use TalkBack; on Apple devices, VoiceOver is used. Some also rely on Jieshuo Screen Reader for Android due to its flexible features.
- While ITS collaborates with Bappenas on disability inclusion, digital accessibility has not yet been standardized across platforms

Integrating NVDA and UserWay in ITS systems provides a cost-effective, practical, and immediate step toward fulfilling ITS's commitment to inclusivity. By leveraging free assistive technologies, ITS can ensure blind and low-vision students have equal access to learning, internship opportunities, and digital resources, strengthening its role as an inclusive higher education institution. Policy recommendations for Digital Education Development at the Institut Teknologi Sepuluh Nopember included:

1. Institutionalize Assistive Technology
   - Adopt NVDA as the official free screen reader for ITS students with blindness.
   - Integrate UserWay free widget across ITS portals, MyITS Student Connect, and faculty websites.
2. Capacity Building and Training
   - Provide regular training for students with visual impairments on using NVDA effectively.
   - Train IT staff and lecturers to design accessible documents, websites, and forms compatible with NVDA and UserWay.
3. Establish Disability Service Support
   - Create a Disability Service Unit responsible for ensuring continuous accessibility upgrades.
   - Offer consultation, technical support, and workshops for students and staff.
4. Monitoring and Evaluation
   - Conduct periodic accessibility audits of ITS systems.
   - Collaborate with student disability organizations to gather feedback and improve implementation.

As pilot case studies developed in this policy brief, the myITSClassroom assigned a pilot case study for the Transport System course thaught in the Undergraduate program in Urban and Regional Planning. The visual interface of the myITSClassroom platform consisted of fiture for inclusive access that help VI Students, such as:

1. UserWays attached to the webpages
2. NVDA equippted the student owned learning process
3. The learning materials provided in digital form, and further, provided in a format of Audio-ebook that conveniently complement the student learning processes.

The concept of Audio e-book is autonomously converted digital files into audio-ebook, provided in the MyITSClassroom pilot study.

Policy Recommendations: Student Input

The national landscape for university admissions in Indonesia includes several pathways, such as the Seleksi Nasional Berbasis Prestasi (SNBP) and Seleksi Nasional Berbasis Tes (SNBT). While these systems have made strides toward accommodating applicants with disabilities, true inclusivity demands proactive institutional commitment that extends beyond national minimums. This is particularly true for a specialized institution like ITS, where the unique demands of a STEM-heavy curriculum require a thoughtful and tailored approach to admission and support. The challenges of unpreparedness and a perceived low institutional commitment have historically hindered the direct implementation of national inclusion mandates, making a clear, actionable policy framework essential.

This brief uses the Department of Urban and Regional Planning (DURP) as an initial case study, with the explicit goal of developing a scalable model of inclusive policy that can be adapted and implemented across other study programs at ITS. By addressing the existing barriers and leveraging best practices, ITS can transform its admission process from a potential obstacle into an inclusive gateway, thereby enriching its student body and solidifying its position as a leading and equitable institution of higher learning.

This study uses a qualitative approach with descriptive data. Data collection techniques are mainly obtained from interview and workshops, document analysis, and comparative/benchmarking studies with other university. Interviews are mainly done in-between units of ITS itself. Documents analysis are compiled from national policy regarding student admission, also local/ITS admission system. Lastly, the comparative/benchmarking studies are done with three universities: Universitas Al-Azhar Indonesia, Universitas Pamulang, and Universitas Negeri Surabaya; where all of them having Disability Learning Center and specific admission system for students with disabilities.

There were 7 discussion sessions and online survey that have been conducted, namely:

1. FGD Student Admission (17 July 2024, online);
2. FGD Student Barriers and Needs (24-26 July 2024, online);
3. Benchmarking to Al Azhar University Jakarta (1 session in 9 May 2025, Jakarta);
4. Benchmarking to Universitas Pamulang (1 session 12 June 2025, online);
5. Benchmarking to Universitas Negeri Surabaya (1 session 13 June 2025, Surabaya);
6. Faculty Level Workshop on Mapping and Disability Type for Studies and Admission (4 August 2025, Surabaya).

7. University Level Workshop on Mapping and Disability Type for Studies and Admission (25 August 2025, Surabaya).

Key findings reveal a robust legal framework in Indonesia that unequivocally requires higher education institutions to provide affirmative and inclusive admission processes. However, prospective students with disabilities, particularly those with visual impairments, face profound informational and digital barriers that prevent them from even initiating the application process at ITS. Concurrently, benchmarking studies of pioneering Indonesian universities, such as Universitas Negeri Surabaya (UNESA) and Universitas Pamulang (UNPAM), demonstrate that successful, structured models for inclusive admission are not only viable but highly effective, even within diverse academic contexts. These models offer proven solutions to the specific challenges ITS perceives in accommodating PwDs within its demanding STEM-focused programs.

Based on this evidence, this brief puts forth four core policy recommendations designed to be implemented sequentially. First, ITS must formalize and empower a central Disability Service Unit (ULD) as the foundational pillar of its inclusion strategy. Second, a dedicated "Seleksi Mandiri Disabilitas" (Independent Selection for Disabilities) pathway must be designed, utilizing holistic and expert-led assessment methods. Third, ITS must undertake a comprehensive overhaul of its digital accessibility and launch proactive outreach programs to ensure informational equity. Finally, a phased, pilot-based rollout of these new systems, beginning with high-readiness study programs, is recommended to ensure a successful and sustainable university-wide adoption. Implementing these recommendations will align ITS with national law, enhance its institutional reputation, and affirm its commitment to cultivating excellence from the broadest possible pool of talent.

Detailed of findings described as follows:

Findings 1. The National Mandate for Inclusive Higher Education

The obligation for ITS to create an inclusive admission system is not merely a recommendation but a clear and detailed legal requirement under Indonesian law. A review of key government regulations reveals a robust and prescriptive framework that moves the institutional imperative from a question of *if* accommodation should be provided to a matter of *how* it must be implemented. This legal foundation establishes a non-negotiable basis for the policy recommendations that follow.

The regulatory environment is comprehensive. The **Regulation of the Minister of Education, Culture, Research, and Technology (Permendikbudristek) No. 53 of 2023** on Higher Education Quality Assurance explicitly mandates an "inclusive" learning atmosphere and requires that admission principles consider the special needs of students with disabilities. Article 38 of this regulation goes further, obligating universities to provide the necessary infrastructure and student services for PwDs, to be managed by a dedicated "special unit". This is reinforced by **Permendikbudristek No. 48 of 2022**, which governs new student

admissions and explicitly requires all state universities to provide access for PwDs across all admission pathways: SNBP, SNBT, and *Seleksi Mandiri* (Independent Selection).

The cornerstone of this framework is **Government Regulation (PP) No. 13 of 2020** concerning Decent Accommodation for Students with Disabilities. This regulation is highly specific, detailing the forms of accommodation required for students with various disabilities. For the admissions process, it mandates the "provision of affirmation of entrance selection" and requires flexibility in evaluation methods, moving beyond a one-size-fits-all standardized testing model. These detailed requirements, supported by the foundational rights established in **Law No. 8 of 2016** on People with Disability, indicate that a passive, non-discriminatory stance is legally insufficient. Institutions like ITS are required to take active, affirmative steps to ensure access.

The existence of these prescriptive laws creates a significant institutional risk—both legal and reputational—if not addressed proactively. The current disconnect between this strong national mandate and the institutional reality at ITS, which has been characterized by "unpreparedness and low commitment," highlights a critical implementation gap. The problem is not an absence of rules, but the lack of a clear institutional roadmap for compliance and execution. This policy brief is designed to serve as that roadmap, providing a structured pathway to bridge the gap between legal obligation and institutional practice.

Table 2 Summary of National Regulations and Direct Implications for ITS Admission Policy

No.	Regulation	Key Provision	Direct Implication for ITS
1	Permendikbudristek No. 53 tahun 2023	Article 14: Learning process must be inclusive. Article 36: Admission must be inclusive, considering special needs. Article 38: Universities must provide services and infrastructure for PwDs via a "special unit."	ITS is legally required to establish a formal Disability Service Unit (ULD) and ensure its admission principles are actively inclusive, not merely passive or neutral.
2	Permendikbudristek No. 48/2022	Universities are required to provide access for PwDs to participate in all admission pathways (SNBP, SNBT, and *Seleksi Mandiri*).	The ITS *Seleksi Mandiri* pathway cannot be designed in a way that implicitly or explicitly excludes PwDs. ITS must ensure its independent process is as accessible as the national selections.
3	PP 13/2020	Mandates "Decent Accommodation," including "affirmation of entrance selection" and "flexibility in competency evaluation and assessment" based on the type of disability.	ITS's *Seleksi Mandiri* must be redesigned to include flexible and alternative assessment methods. A sole reliance on standardized tests for PwD applicants is non-compliant with this regulation.
4	UU No.8/2016	Establishes the fundamental right to education and non-	All institutional policies, including admissions, must be aligned with the

	discrimination for all Persons with Disabilities in Indonesia.	foundational principle of ensuring equal educational rights for PwD applicants.

Findings 2. Best Practices from Indonesian Universities: Proven Models for Success

The perceived challenges of implementing an inclusive admission system, particularly within a STEM-focused university, can be effectively mitigated by adopting proven models from peer institutions in Indonesia. Benchmarking visits to Universitas Al Azhar Indonesia (UAI), Universitas Pamulang (UNPAM), and Universitas Negeri Surabaya (UNESA) have identified a spectrum of best practices that demonstrate a clear pathway from foundational commitment to comprehensive implementation. These examples provide ITS with a blueprint for success, de-risking the process of reform.

Universitas Negeri Surabaya (UNESA) stands out as a "pioneering institution" in disability inclusion. Supported by a strong legal framework, UNESA offers a special admission track for PwDs through both national and independent routes. Critically, its selection process is not a simple administrative procedure; it is conducted by a dedicated team of "experts in special needs education and psychology." This expert-led assessment ensures a proper alignment between a student's abilities and the specific demands of their chosen academic program. Beyond admissions, UNESA provides robust, ongoing support through its comprehensive "Disability Innovation Center," which offers both academic and non-academic services.

Universitas Pamulang (UNPAM) offers another structured and effective model. Its Disability Services Institution is "directly involved in verification during admission," integrating expert oversight at a critical early stage. The admission process for PwD candidates is multi-faceted, including standardized tests, interviews, and the requirement of medical certification. Post-admission, students are supported through a volunteer "buddy" system, dedicated consultation facilities, and the provision of assistive technologies tailored to individual needs. At a more foundational level,

Universitas Al Azhar Indonesia (UAI), while not yet having a special admission track, has demonstrated institutional commitment by investing in physical and digital accessibility and providing psychological support services for students.

A comparative analysis of these institutions reveals a crucial pattern: the single most important factor for success is the establishment of a formal, empowered Disability Service Unit (ULD) that is integrated *directly* into the admission process, rather than serving merely as a post-acceptance support office. The active role of these units at UNESA and UNPAM during verification and assessment appears to be causally linked to their success. This insight provides

a direct solution to ITS's core concern regarding the suitability of PwD candidates for demanding STEM programs. The UNESA model, in particular, does not ignore rigorous program requirements; instead, it employs expert assessment to ensure a responsible and appropriate match. This shifts the paradigm from a rigid "can/cannot admit" binary to a more nuanced and effective question of "how do we assess for success in this specific context?" This approach is directly transferable to ITS and offers a proven method for navigating the complexities of its engineering and science-based curriculum.

Table 3 Comparative Analysis of Inclusive Admission Models

Feature	Universitas Al Azhar Indonesia (UAI)	Universitas Pamulang (UNPAM)	Universitas Negeri Surabaya (UNESA)
Special Admission Track	No, Unstructured with guidance	Yes, Structured process	Yes, special track via national and independent routes
Role of Disability Service Unit (ULD)	Provides support services post-admission	Directly involved in verification during admission	Expert team conducts selection and ensures program alignment
Assessment Methods	Standard admission process	Standardized tests, interviews, medical certification	Holistic assessment by experts in special needs education and psychology
Key Support Mechanism	Physical/digital accessibility, psychological support	Volunteer "buddy" system, consultation facilities, assistive technology	Comprehensive "Disability Innovation Center" for academic and non-academic support, continuous staff training

Findings 3. The Current Admission Landscape: National Systems and ITS-Specific Gaps

An analysis of the current admission landscape reveals that while national systems are evolving to be more inclusive, significant gaps persist at the institutional level, particularly at ITS. These gaps are most acutely felt by prospective students with disabilities, whose lived experiences highlight critical failures in information equity and institutional support.

The national admission pathways have made tangible progress. The **SNBT** guidebook, for instance, now explicitly states that the system can accommodate students with visual and physical disabilities. The support mechanisms include modified test formats, the use of screen readers to access test materials, and the provision of assigned helpers from the organizing committee to assist with logistics and navigation.

Figure 1 SNBT Selection Criteria Overview

The **SNBP**, being based on academic records, follows the same procedure for all students, with any necessary screening or needs assessment occurring after an offer of admission is made.

Figure 2 SNBP Selection Criteria Overview

However, the primary challenge lies within the *Seleksi Mandiri* (Independent Selection) pathway, where institutional readiness varies dramatically. At ITS, the prevalence of engineering programs with strict industry and safety standards has led to a "major difficulty" and institutional hesitation in determining how to facilitate the admission of students with disabilities, especially those with visual impairments. This has resulted in a system that lacks a clear, accessible, and supportive pathway for PwD applicants.

Figure 3 ITS Admission Main Page

The most compelling evidence of this systemic failure comes from a Focus Group Discussion (FGD) with prospective and current university students who are totally blind. Their experiences reveal that the primary barrier to entry is not their disability itself, but a profound and systemic failure of information equity. The very first step of the application journey—accessing basic information—is fundamentally broken. Participants reported that university websites, including admissions portals, are frequently not optimized for screen readers, forcing them to rely on others to learn about study programs, tuition fees, and application schedules. This creates a significant barrier to independent inquiry and decision-making.

This initial obstacle is compounded by a "guidance vacuum." Students reported a lack of structured outreach from universities to special needs schools (SLBs) and inadequate preparation from their schools on how to navigate the complex university application process as a person with a disability. This systemic neglect places an enormous and inequitable burden of navigation and self-advocacy on PwD applicants and their families. While their non-disabled peers often benefit from structured guidance, PwD students are largely left to navigate a complex and inaccessible system on their own. This reality is not only a practical barrier but also a violation of the principle of equal opportunity mandated by national law, transforming a technical issue of website design into a profound ethical and equity issue that institutional leadership must address. Any reform at ITS must therefore begins by fixing this broken digital and informational gateway.

Findings 4. Needs and Barriers People with Disability in Accessing Existing Student Admission System

Based on the findings from a Focus Group Discussion (FGD) aimed at understanding the needs and barriers faced by students with disabilities, particularly those who are blind, in the context of university admissions in Indonesia. The participants of this discussion included high school seniors and university students who are totally blind. There are some valuable insights into the challenges they face and the areas that require improvement to ensure a more inclusive and accessible higher education admission system.

Experiences in Obtaining Admission Information

Participants highlighted several challenges in obtaining information about university admissions. Although information dissemination through schools and social media platforms such as Facebook and TikTok is beneficial, significant issues remain with the accessibility of university websites. Many students rely on assistance from others to navigate these websites due to their lack of optimization for screen readers. This lack of accessibility creates a significant barrier for visually impaired students seeking essential admission information independently.

Information Needed on University Websites

Participants identified critical information that should be readily accessible on university websites. This includes detailed information about study programs, tuition fees, admission schedules for various pathways (such as UTBK and SBMPTN), and contact details for support personnel. They emphasized the need for these websites to be fully optimized for accessibility tools, such as screen readers, to ensure that visually impaired students can easily access all necessary information without external assistance.

Experiences in University Admission Processes

The university admission process presents several challenges for students with disabilities. Many students have reported a lack of guidance and support from their schools, especially special needs schools (SLBs), in navigating the university admission process. This has resulted in some students missing critical registration deadlines for admission pathways like UTBK. Additionally, there is a lack of structured outreach and support from universities to special needs schools, which further exacerbates these challenges.

Despite these barriers, some students have successfully navigated the admission process with the help of friends or through the disability-specific admission pathways offered by certain universities. However, these experiences highlight the need for more comprehensive and consistent support systems to help students with disabilities transition from high school to university.

Preparation and Guidance for Higher Education

Participants reported a significant lack of preparation and guidance from their schools regarding how to apply to universities and succeed in higher education as students with disabilities. There are no specialized programs or resources to help these students understand the admission process or provide tips on how to integrate and succeed academically and socially in a university environment. This lack of guidance leaves many students feeling unprepared and uncertain about their future academic endeavors.

Key Barriers Identified

The FGD highlighted several key barriers faced by students with disabilities in university admissions:

1. **Accessibility of Information**: University websites are often not fully accessible to students with disabilities, making it difficult for them to obtain necessary admission information independently.
2. **Lack of Outreach and Support**: There is a significant need for universities to conduct comprehensive outreach programs to special needs schools, providing clear guidance and support throughout the admission process.
3. **Inadequate Preparation and Guidance**: Many students with disabilities do not receive adequate preparation or guidance from their schools on how to navigate the university admission process or succeed in higher education.
4. **Inconsistent Implementation of Inclusive Policies**: Although regulations mandating the inclusion of students with disabilities exist, their implementation is inconsistent across universities. Some institutions are proactive in providing support, while others lack the necessary commitment and resources.

Proposed Policy Recommendations for Milestone Student Input

Translating the preceding evidence and analysis into action requires a set of concrete, sequenced, and achievable policy recommendations. The following four proposals are designed to systematically build an inclusive admission system at ITS, addressing foundational structures, strategic processes, and the critical need for informational equity.

1. Foundational Step: Formalize and Empower the Disability Service Unit (ULD)

   ITS must immediately proceed with the formal establishment of a university-level Disability Service Unit (ULD). While plans exist for this unit to be overseen by the Biro Umum Keamanan dan Kesehatan, Keselamatan kerja dan Lingkungan (BUK4L), it is crucial to recognize that BUK4L's primary mandate is focused on general security, occupational safety, and environmental management. This focus means the existing structure is not inherently equipped to address the nuanced academic and social support needs of students with disabilities.

Therefore, this policy recommends the formation of a dedicated subunit within BUK4L with a clear and exclusive focus on student disability services. This subunit cannot be a symbolic entity; it must be adequately resourced with a dedicated budget and staffed by qualified professionals with expertise in special needs education, assistive technology, and disability law. This structural clarification is the cornerstone of all subsequent reforms. The best practices observed at UNESA and UNPAM conclusively demonstrate that an empowered and integrated ULD is the central pillar of a successful inclusive system. Furthermore, national regulations, specifically Permendikbudristek No. 53 of 2023 on quality assurance and no. 48 of 2023 on Decent Accomodation in Education Institution , legally mandate the existence of such a specialized unit to manage services for students with disabilities. Crucially, this new subunit's mandate must extend beyond post-admission support and could serve as an embryo toward a more ideal structure. It must be explicitly granted a formal and active role within the student admission process itself, making it a key partner to the Directorate of Education. Its responsibilities should include verifying disability documentation, conducting comprehensive needs assessments for applicants, and coordinating all necessary accommodations with the admissions committee.

2. Strategic Design: Develop a Dedicated "Seleksi Mandiri Disabilitas" Pathway

   ITS should design and implement a special admission track within its Seleksi Mandiri framework, specifically for applicants with disabilities. This pathway must move beyond traditional metrics and employ a holistic assessment model that can accurately gauge an applicant's potential to succeed in a rigorous academic environment.

   A single, standardized testing model is often an inadequate and inequitable tool for assessing the capabilities of PwD candidates. The justification for this specialized pathway is rooted in the success of the UNESA model, which utilizes a multi-disciplinary team of experts to ensure a careful and responsible alignment between a student's abilities and the specific requirements of an academic program. This approach provides a direct and proven solution to ITS's valid concerns about maintaining academic standards and safety in its STEM programs. This "Seleksi Mandiri Disabilitas" would allow for a range of alternative assessment methods, such as the review of portfolios, structured interviews designed to evaluate problem-solving and critical thinking skills, and a thorough evaluation of prior academic and extracurricular achievements. This ensures a fairer, more accurate, and more comprehensive measure of a candidate's true potential.

3. Digital and Informational Equity: Overhauling Accessibility and Outreach

   ITS must mandate and fund an immediate and comprehensive audit of all its public-facing websites and admission portals, particularly www.its.ac.id/admission, to ensure full compliance with international accessibility standards, such as the Web Content Accessibility Guidelines (WCAG) 2.1. The planned accessibility upgrades to the myITSAdmission platform, identified as a key project activity, should be prioritized, finalized, and deployed without delay.

   This recommendation is a non-negotiable prerequisite for any meaningful inclusion policy. The findings from the FGD with visually impaired students unequivocally identified inaccessible information as the first and most significant barrier they face, creating a fundamental inequity before an application can even be contemplated. In parallel with these technical upgrades, ITS must design and launch a structured and sustained outreach program that proactively targets the alumni from special needs schools (SLBs) enrolled in a reguler high school (SMU), disability advocacy organizations, and community centers. This program should provide clear, accessible information about admission pathways, available support services at ITS, and scholarship opportunities. Such proactive engagement is essential to bridge the current information gap and directly address the "guidance vacuum" reported by students, signaling a genuine and tangible institutional commitment to inclusion.

4. Phased Implementation: A Pilot-Based Approach to University-Wide Adoption

   To ensure a successful and sustainable transition, the new inclusive admission system should be implemented through a phased, pilot-based approach rather than a simultaneous, university-wide launch. This process should leverage the crucial groundwork already completed by the project team in mapping the readiness of six undergraduate study programs (including Urban and Regional Planning, Bussiness Management, and others) to accommodate students with visual impairments.

The "Seleksi Mandiri Disabilitas" should be launched as a pilot project for the upcoming admission cycle, initially limited to the two or three programs identified as having the highest level of readiness. This strategy is pragmatic and mitigates risk. A pilot allows ITS to test and refine its new admission processes, the operational functions of the ULD, and the efficacy of its support systems on a manageable scale. This approach will build essential institutional capacity and generate internal success stories, which can effectively counter the narrative of "low commitment" and institutional hesitation. By starting with programs where success is most probable, ITS

can create a proven, data-driven model that can then be scaled confidently and effectively across all other faculties in subsequent years.

Policy Recommendations: Student Processes

The Education Sector is believed to open up opportunities for vulnerable groups to be able to enhance wellbeing. Increasing the capacity and knowledge of these groups could enhance their awareness of lifelong education that thrive livelihood and quality of life. However, PwDs are suffered from social exclusion due to limited technology become barriers for them in assessing higher degree education. While while assistive technologies (AT) significantly enhance inclusion and accessibility, barriers persist due to inadequate teacher training, lack of information, and insufficient digital infrastructure (Fernández, et. al., 2022). These limitations prevent many students with disabilities from fully participating in academic life. Moreover, Kimball et al. (2016) emphasized that despite legal frameworks that promote positive discrimination towards PwDs in many countries, students with disabilities continue to face challenges in accessing higher education due to systemic gaps in support services and technological adaptation. These findings highlight the urgent need for institutions to address technological inequities as a core component of inclusive education. (Fernández, et. al., 2022, Kimball et al., 2016).

The quality of education in terms of learning process and experience will be dependent upon the method of learning, the study plan, the assessment process, and the supporting technology. To effectively accommodate visually impaired students in higher education, adjustments in curriculum design, teaching methods, evaluation strategies, and assistive technology are essential. Mulloy et al. (2014) demonstrated that assistive technologies; such as screen readers, tactile graphics, and audio-based learning tools; can significantly improve academic outcomes for VI students when integrated into instructional design. Furthermore, López Flores & González Lara (2022) emphasized that inclusive education must go beyond access, requiring tailored pedagogical approaches that consider the sensory and cognitive needs of VI learners. These adjustments ensure that learning outcomes are not only achievable but equitable, aligning with international and national standards for inclusive education and the principles of universal design for learning.

This brief uses the Department of Urban and Regional Planning (DURP) as an initial case study for curriculum design, study plan adjustment, and learning method innovation. The goal is to develop a scalable inclusive policy model that can be adapted and implemented across other study programs at ITS.

Data collection was conducted through interactive discussions, interviews, and questionnaire surveys. Nine workshops focused on identifying necessary adjustments in learning methods, evaluation strategies, and competency standards to accommodate persons with disabilities (PwDs) in undergraduate programs, including the integration of assistive technologies and digital support. An additional three

workshops were dedicated to developing upgraded study plans, assignment plans and assessment/evaluation plans for eight pilot courses within DURP. Interviews and questionnaire surveys were conducted to six of head of undergraduate study programs at ITS.

This study identified several critical barriers faced by visually impaired (VI) students in higher education, particularly in the learning process, assessment, and curriculum structure. These include high visual dependency in course materials, limited accessibility in instructional methods, and evaluation formats that do not accommodate the needs of VI students. Additionally, the lack of systematic curriculum adjustments and inclusive learning environments contributes to unequal learning experiences. The need for legal and regulatory alignment was also highlighted, emphasizing the importance of maintaining national quality assurance standards (KKNI Level VI) while adapting learning outcomes to meet the diverse needs of students with disabilities.

In response to these barriers, the research recommends a comprehensive approach to inclusive education. This includes curriculum redesign based on legal frameworks and ministerial regulations, mapping learning outcomes to ensure alignment with VI students' competencies and adjusting instructional and evaluation methods. Effective strategies include providing Braille and audio materials, using tactile models for spatial understanding, and extending evaluation time. Case-based and problem-based learning methods were found to be particularly effective for VI students, promoting active participation and deeper understanding. The study also calls for scaling up inclusive teaching practices, investing in assistive technologies, and mainstreaming disability-focused research within ITS to support long-term institutional transformation.

Detailed findings are further described in the following sections.

Findings 1. Legal Foundation for Curriculum Adjustment

There is already a legal framework that justifies curriculum adjustments and their derivatives for accommodation of VI students in higher education in Indonesian education system. Regarding curriculum adjustments, course structure, and teaching and learning processes, the regulation used refers to Government Regulation No. 13 of 2020 regarding Decent Accommodation for Students with Disabilities. The accommodations during the learning process for students with visual impairments are regulated as follows.

Table 4 The regulatory framework outlines regulatory provisions for inclusive education for visually impaired (VI) students

Learning process	Learning material	Evaluation process
The application of accessible page standards in use of technology, applications and equipment technology-based in the registration	Submission of learning materials before learning and teaching begin	Flexibility in competency evaluation and assessment

Learning process	Learning material	Evaluation process
system, administration, teaching and learning process, and evaluation		flexibility in the formulation of graduate competencies and/or stamps
Preparation of embossed plans/mockups that describing the physical environment of the school/campus Educational Institution	Flexibility in the form of learning materials according to needs	Modification of assignment and evaluation for educational content, particularly in sports, fine arts, cinematography, drawing, and similar subjects
Assistance services for environmental orientation physical school/campus Organizing Institution Education	Adjustment of media formats or learning materials as well as accessible learning resources	Adjustment of the method, form of presentation, and time task work and evaluation
Socialization of learning systems including library services on the campus of the institution Education Providers	Modification of learning materials for educational content, particularly in sports, fine arts, cinematography, drawing, and similar subjects	Presentation of the script in Braille format, particularly for manuscripts that use many specialized symbols, such as in math, chemistry, and Arabic language
Adjustment of learning strategies for content especially mathematics, physics, chemistry, and statistics'	Provision of reading resources, information, and services easily accessible library	Modification of the presentation of questions that display Images and charts in the form of embossed images simplified description, image description, or the use of props
Availability of Educators or media tools that can read the writing presented on the board/screen in the learning process in the classroom		Presentation of exam questions in the form of softcopy, which operated and worked with using a talking computer, i.e. a computer equipped with screen reader software
Other forms that can guarantee students with visual disabilities to receive educational services		Reading of exam questions by reading officers
Flexibility in learning processes that can be carried out face-to-face, distance including online, or a combination of face-to-face and distance		Extension of time in the completion of tasks
		Extended time of at least 5o% (fifty percent) of the time specified for implementation of evaluations using the braille or read

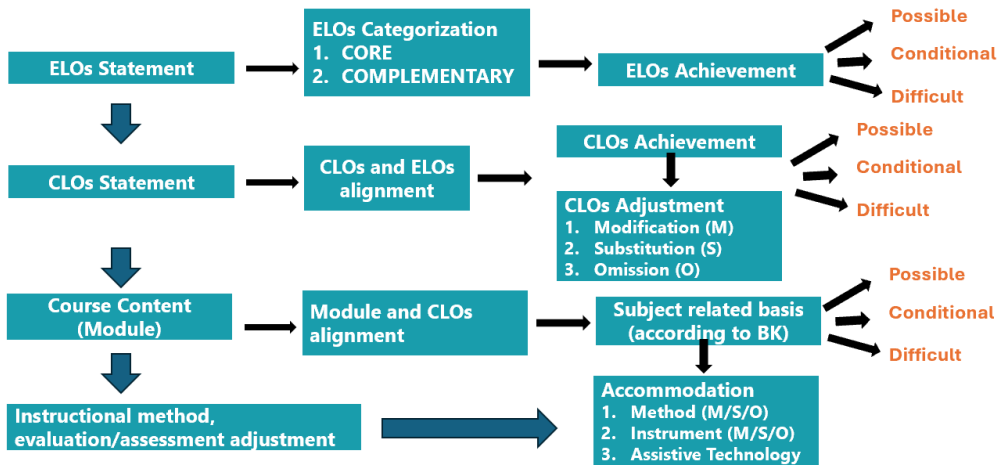
The regulatory framework outlines regulatory provisions for inclusive education for visually impaired (VI) students, undermining for what universities are responsible for in providing inclusive education. ITS must ensure that all

aspects of the academic experience, from enrollment to graduation, are accessible and inclusive for students with visual impairments. This includes:

1. **Accessible Learning Processes**
    - Implement accessible technology standards across registration, administration, teaching, and evaluation systems.
    - Provide orientation services and tactile mockups to help VI students navigate the physical campus environment.
    - Offer flexible learning formats, including face-to-face, online, and hybrid models, tailored to individual needs.
    - Ensure educators and classroom tools support real-time accessibility, such as screen-reading software or verbal descriptions of visual content.
2. **Inclusive Learning Materials**
    - Modify content for subjects with high visual dependency, such as STEM disciplines.
    - Adjust media formats and provide accessible library resources and reading services.
    - Distribute learning materials in advance and in accessible formats (e.g., Braille, audio, simplified visuals).
3. **Adapted Evaluation and Assessment**
    - Provide flexible evaluation methods, including verbal assessments, softcopy exams compatible with screen readers, and Braille scripts for symbol-heavy subjects like math and chemistry.
    - Modify assignments and assessments to accommodate visual barriers, using tactile props or simplified descriptions.
    - Extend evaluation time by at least 50% for VI students and allow alternative formats such as oral exams or reader-assisted assessments.

The legal foundation guidelines, particularly those outlined in PP 13/2020 on Decent Accommodation, highlight the need for a systematic approach to conducting a review of curriculum and course content related to visual dependency and its derivatives. This process leads to findings 2 through 8. The schematic methodology is presented in Box 2**.**

Box 2. A systematic review methodology to evaluate curriculum and course content for visual dependency



Findings 2. A Systematic Analysis to Align Graduate Profiles with the Barriers and Needs of Visually Impaired Students

The graduate profile serves as a foundational framework that guides the formulation of course learning outcomes (CLOs) within academic programs, ensuring alignment with broader educational goals and institutional missions. This alignment is critical in outcome-based education (OBE), where the graduate profile encapsulates the competencies, values, and attributes expected of students upon program completion.

This research conducted such analysis in the Urban and Regional Planning (PWK) program as a pilot study, which can be replicated by other programs at ITS in the future. Based on investigations, a systematic analysis is necessary around **assessing the suitability of graduate professions (graduate profile) for visually impaired (VI) students.** The graduate profile of URP undergraduate program specified as follows in table 5.

Table 5 Graduate Profile of DURP (Bahasa and English)

Profil Lulusan PWK (Bahasa)	Graduate Profile (English)
PL-1 Analis Tata Ruang	PL-1 Spatial Analyst
Lulusan bekerja sebagai analis tata ruang pada sektor pemerintahan terkait dengan bidang perencanaan dan pembangunan	Graduates work as spatial planning analysts in the government sector related to the field of planning and development

Profil Lulusan PWK (Bahasa)	Graduate Profile (English)
PL-2 Perencana Wilayah dan Kota Lulusan Bekerja sebagai perencana wilayah dan kota dalam bidang konsultasi perencanaan wilayah dan kota	PL-2 Regional and Urban Planners Graduates Work as regional and urban planners in the field of urban and regional planning consulting
PL-3 Perencana Infrastruktur dan Transportasi Lulusan bekerja sebagai perencana infrastruktur dan transportasi pada sektor pemerintahan maupun sektor swasta	PL-3 Infrastructure and Transportation Planners Graduates work as infrastructure and transportation planners in the government and private sectors
PL-4 Peneliti/Akademisi Lulusan bekerja sebagai peneliti/akademisi yang melanjutkan studi ke jenjang pendidikan magister	PL-4 Researcher/Academician Graduates work as researchers/academics who continue their studies to the master's level of education

The DURP graduate professions, as explained in Table 5, may include roles such as Planner (PL-2, PL-3), Researcher/Academic (PL-4), and Spatial Analyst (PL-1). However, respondents indicated that graduate users also require prospective employees with skills suited to roles such as Planner Assistant, Facilitator, Advocate, Government Employee, and Researcher; roles that align with the PL-2 and PL-4 categories.

Several workshops discussed adjustments to the graduate profile specifically for visually impaired (VI) graduates, in collaboration with prospective graduate users (employers). It was found that one additional profession that may be more suitable for VI graduates is Social Planner (PL-5), represented by roles such as Facilitator and Advocate in the field of community development. In contrast, the PL-1 profession, such as Spatial Analyst, may not be suitable for VI graduates due to its technical and visual demands. The PL-3 role may still be feasible at the management level, though not at the field level. Table 6 concludes regular URP graduates and VI graduates.

Table 6 Regular Urban and Regional Planning Graduates and VI Graduates

URP graduates (general)	URP VI graduates
PL-1 Spatial Analyst Graduates work as spatial planning analysts in the government sector related to the field of planning and development	Not suitable
PL-2 Regional and Urban Planners Graduates Work as regional and urban planners in the field of urban and regional planning consulting	Most suitable in managerial positions
PL-3 Infrastructure and Transportation Planners	Most suitable in managerial positions

URP graduates (general)	URP VI graduates
Graduates work as infrastructure and transportation planners in the government and private sectors	
PL-4 Researcher/Academician Graduates work as researchers/academics who continue their studies to the master's level of education	Most suitable in managerial positions
PL-5 Social Planners Graduates work as facilitators or advocate that usually involved in participatory planning method, working in Civil Society Organisations (CSOs) or Non-Government Organizations (NGos).	Suitable.

Therefore, findings from the workshops led to the following recommendations for adjusting the graduate profile:

- The profession most suitable for VI graduates is Social Researcher, which will be added as a new category: PL-5 – Social Planner.
- While planner professions are generally suitable for roles such as urban/regional planner and infrastructure/transportation planner, VI graduates are more suited to management or managerial roles rather than field-based positions.
- VI graduates are currently unable to meet the technical requirements for roles such as Spatial Analyst (PL-1), unless future technological advancements make such roles more accessible.

Findings 3. A Systematic Curriculum Adjustment to Address the Barriers and Needs of Visually Impaired Students

A specific ministerial regulation provides direction for inclusive education, indicating the need for a systematic analysis to adjust the curriculum based on the barriers and needs of visually impaired (VI) students. This must be done while maintaining the quality assurance standards for undergraduate graduates as outlined by Ministry of Higher Education, Science, and Technology (Kementerian Pendidikan Tinggi, Sains, dan Teknologi) such as the Minister of Education and Culture Regulation No. 157 of 2014 Concerning: Curriculum for Special Education that allows modified regular curriculum or a special curriculum tailored to the barriers and potential of the students. This regulation governs the curriculum for students with disabilities or special needs, both in special education institutions and regular schools. The curriculum may consist of a modified regular curriculum or a special curriculum tailored to the barriers

and potential of the students. The curriculum includes special needs programs and independence programs as integral components.

This research conducted such analysis in the Urban and Regional Planning (PWK) program as a pilot study, which can be replicated by other programs at ITS in the future. Based on investigations, a systematic analysis is necessary around **assessing the suitability of visually impaired (VI) students in achieving the expected graduate learning outcomes (ELO or CPL).**

The expected learning outcomes (ELOs) of university graduates are increasingly recognized as central to higher education policy, curriculum design, and quality assurance worldwide. These outcomes are typically defined as statements of what a learner knows, understands, and is able to do after completing a learning process (Harris & Clayton, 2019).

The ELOs of DURP undergraduate program have already been formulated (table 7), with the multifaceted roles of the ELOs, which influence not only educational practices but also the employability and lifelong learning capacities of graduates. The graduate profile guides the formulation of the Expected Learning Outcomes (ELOs). Inputs from stakeholders, national standards, and benchmarking against other universities offering similar programs; along with alignment to the university's scientific vision; serve as essential components in the development and evaluation of the ELOs.

This research also evaluates the extent to which the VI (visual impairment) students can achieve these ELOs.

Table 7 the Expected Learning Outcomes of DURP Graduates

ELO	THE EXPECTED LEARNING OUTCOMES (ELOs)
ELO 1	Able to demonstrate the attitudes and character that reflect devotion to the One Almighty God, ethics and integrity, noble manners, sensitivity and concern towards social and environmental issues, appreciation for cultural diversity and pluralism, upholding the rule of law, prioritizing the interests of the nation and the broader society
ELO 2	Able to study and utilize the knowledge and technology in order to apply it to the fields of urban and regional planning, and able to choose the appropiate decisions from the result of individual or group projects in the form of final project reports or other learning activities whose outcomes equivalent to a final assignment, through logical, critical, systematic, and innovative thinking
ELO 3	Able to manage self-learning and continuous self-development as a lifelong learner, to compete on both national and international levels, in order to make a real contribution through a framework to solving the problem by implementing information and communication technology and considering the sustainability principles as well as understanding technology-based entrepreneurship
ELO 4	Able to understand theoretical concepts of urban and regional planning across various aspects, including urban studies, regional studies, coastal studies, spatial science, planning

ELO	THE EXPECTED LEARNING OUTCOMES (ELOs)
	science, data science, built environment design, infrastructure and transportation systems, environmental management, social systems, economics, management studies, and research/projects
ELO 5	Able to understand the spsatial and non-spatial planning methods in decision-making within the field of urban and regional planning
ELO 6	Able to comprehend qualitative, quantitative, and spatial modeling (geographic information system) techniques and processes in urban and regional planning, as well as presentation skills
ELO 7	Able to apply planning formulation techniques and developt an alternative spatial models through qualitative and quantitative approaches in the form of scenarios for spatial pattern and structure of urban, regional, and coastal areas
ELO 8	Able to analyze the potential and issue of both spatial and non-spatial contexts in urban, regional, and coastal areas through an analysis of interrelations between spatial and non-spatial aspects
ELO 9	Able to formulate planning concepts and direction plans through the study of strategic issues within the context of urban, regional, and coastal ares with an understanding of planning issues through observations and utilization of physical/spatial, social, economic, and environmental data
ELO 10	Able to formulate a spatial plans and evaluations that are creative, innovative, sustainable, and responsive to public interests whose results are reviewed on the principles and theories of planning and also able to communicate through visual, verbal, and in writing in the way that can be accounted academically
ELO 11	Able to demonstrate the necessary professional skills to be effective and successful in the workforce, including the ability to work well in multidisciplinary teams, behave excellence, have a strong leadership, synergy, and other potentials to achieve optimal outcomes, as well as the ability to communicate in the effective ways and upholds ethics, norms, and values in planning practice and professionalism

During the validation process of the ELOs with graduates' user, a terminology was introduced to categorize the ELOs into core and complementary components. This classification helps identify which ELOs are essential and cannot be compromised. Consequently, any adjustments to learning methods or course learning outcomes should be limited for those ELOs considered core to the program. These results were also validated by the curriculum team through questionnaire. There were varied responses between graduates' user and the DURP curriculum team. As part of the strategy to accommodate or provide affirmative policies for VI (visually impaired) students who will study in DURP, the research team suggested that core competencies with high visual dependency could be treated as complementary specifically for VI graduates in the future. However, the graduation certificate for VI students should clearly state that the ELOs categorized as complementary indicate that the students were not fully capable of achieving them due to adjustments made during their

studies: whether in learning methods, types of assignments, or assignment formats (e.g., placing more weight on group work for VI students). This suggestion was proposed based on discussions during workshops with both graduates' user and the DURP curriculum team (table 8). For example, participants concluded that "*ELOs 5, 6, 7, 8, and 10 need to be particularly prioritized during learning processes adjustements, as they require software utilization and place greater emphasis on team-based assessment than individual assessment*".

Table 8 Recommendations for ELOs Adjusted for VI Students and Made Transparent in Their Graduation Certificate

ELOs	#ELO	Graduates' user perspective	DURP curriculum team perspective	Recommendation for VI students
Attitude Sikap	1	CORE	Complementary	CORE
Attitude Sikap	2	CORE	Complementary	CORE
Attitude Sikap	3	COMPLEMENTARY	Complementary	CORE
Knowledge Pengetahuan	4	CORE	CORE	CORE
Specific Knowledge Pengetahuan Khusus	5	Complementary	CORE, highly visual	Complementary
Specific Knowledge Pengetahuan Khusus	6	CORE	CORE, highly visual	Complementary
Specific Skill Keterampilan Khusus	7	COMPLEMENTARY	CORE, highly visual	Complementary
Specific Skill Keterampilan Khusus	8	CORE	CORE	CORE
Specific Skill Keterampilan Khusus	9	CORE	CORE	CORE
Specific Skill Keterampilan Khusus	10	CORE	CORE, highly visual	Complementary
Specific Skill Keterampilan Khusus	11	Complementary	CORE	CORE

These adjustments will have implications for the types of courses that primarily support the achievement of those ELOs. We refer to these ELOs as belonging to the "difficult category," and any courses that follow or are

aligned with them will also be considered part of the “difficult category” within the undergraduate curriculum structure. Table 9 describes the categorization of ELOs into “possible,” “conditional,” and “difficult” categories. Accommodating students with visual impairments (VI) will require efforts and facilities from the university and the entire campus community to address the barriers, particularly those associated with the “conditional” and “difficult” ELO categories.

Table 9 Categorization of ELOs Against the Potential Achievement of Visually Impaired Students

ELOs of DURP Undergraduate Program	ELOs Categorization
#ELOs 1, 2, 3, 4, and 11	**Possible with adaptation**, such as providing all learning materials in digital formats and assistive technology.
#ELOs 5, 6, 7, 8, and 10	**Conditional to difficult,** In the process of learning specialized skills related to analytical methods and software utilization, students with disabilities do not face significant obstacles, as long as they are supported by assistive technology, provided with data that facilitates analysis, and allowed to work as team members. However, they may encounter difficulties in achieving certain competencies that are assessed individually. Additionally, students with disabilities may face challenges and require assistance or volunteer support when conducting primary surveys.

Findings from the workshops led to the following recommendations for the ELOs of the VI students:

- The undergraduate program for visually impaired (VI) students should retain the existing eleven Expected Learning Outcomes (ELOs) without removing or adding any statements. However, recognizing that some ELOs may be difficult for VI students to achieve independently, these outcomes can be categorized as complementary, indicating that they may not be fully attainable at the individual skill level. Therefore, competency adjustments should be made at the Course Learning Outcomes (CLOs) level rather than at the ELO level. This approach allows for a more detailed understanding of which modules and courses require additional support and adjustments, based on their alignment with the achievement of each ELO.

- The undergraduate program should retain the A to F grading standards for both visually impaired (VI) and regular students. However, for VI students, the grading process should reference adjusted Course Learning Outcomes (CLOs) to ensure fair and meaningful assessment. Additionally, the weighting between group-based and individual-based evaluations may be modified to better accommodate VI students. For

instance, during curriculum workshops, it was found that certain CLOs, particularly those involving software use, spatial mapping, and quantitative analysis, can be challenging for blind or low-vision students to achieve independently. In such cases, support from volunteers or peer groups is essential. Courses that emphasize these skill-based competencies may adopt a higher proportion of group assessments and a lower proportion of individual assessments specifically for VI students.

- ELO #11 focuses on teamwork and collaboration across disciplines, a critical skill in professional and academic settings. For visually impaired students, this learning outcome can be strategically integrated into courses that use Project-Based Learning (PBL) and Case-Based Learning (CBL), especially in subjects with high visual dependency such as spatial analysis, design, and quantitative modeling. In practice, this means that courses with visually intensive content should intentionally structure group activities where VI students can contribute meaningfully through roles that align with their strengths—such as conceptual thinking, verbal analysis, or strategic planning. By embedding ELO #11 into these collaborative formats, the university ensures that VI students are not only included but empowered to participate in team-based learning environments. This approach also supports equitable achievement of learning outcomes without compromising academic standards. In the DURP undergraduate program, this strategy should be applied to intermediate and advanced-level courses where teamwork is essential and visual barriers are more pronounced. Faculty should be encouraged to design group tasks that allow flexible role distribution and provide assistive tools or peer support to facilitate full participation by VI students.

Findings 4. Mapping Course Structures Against Learning Outcomes Achievement for Visually Impaired Students

Expected Learning Outcomes (ELOs) define the main competencies that students are expected to achieve by the end of their undergraduate program. These outcomes are broad and program-level, encompassing knowledge, skills, and attitudes aligned with national qualification frameworks (e.g., KKNI Level VI in Indonesia).

Course structure, on the other hand, refers to how individual courses are designed and organized to contribute to the achievement of these ELOs. Each course has its own Course Learning Outcomes (CLOs), which are more specific and measurable. CLOs are mapped to one or more ELOs, meaning that the successful completion of a course contributes directly to fulfilling the program's ELOs.

In the context of VI students, this link becomes critical. If an ELO involves competencies that are highly dependent on visual skills (e.g., spatial analysis, interpreting maps or diagrams), then the courses mapped to that ELO must be carefully evaluated. The visual dependency of CLOs within those courses determines whether VI students can realistically achieve the ELO without significant adjustments.

Therefore, by analyzing the alignment between ELOs and CLOs, and assessing the visual dependency of each course, this research identify (appendix 1):

- Which courses are accessible to VI students,
- Which require moderate support or adaptation,
- And which need substantial redesign or assistive technologies or adjustment/substitution of CLOs.

This approach ensures that curriculum adjustments are targeted, evidence-based, and aligned with quality assurance standards, allowing VI students to achieve the same program-level competencies as their peers.

This research conducted such an analysis within the Urban and Regional Planning (PWK) program as a pilot study, which can be replicated by other programs at ITS. The investigation revealed that a systematic approach is needed to assess how well the course structure aligns with the specific challenges faced by VI students. This includes evaluating the visual dependency of each ELO and the weight of related CLOs to identify which courses require additional support or adjustment.

A simple method to combine the assessment of the visual dependency level of each ELO statement with the weighted value of the relevant Course Learning Outcomes (CLOs)6. The results were obtained by multiplying both scores, producing a ranked list of courses from high to low. A high score indicates that the course has low visual dependency, and its CLOs are likely achievable by VI (visually impaired) students without significant adjustments; conversely, a low score suggests higher visual dependency and greater challenges for VI students. Assuming no further technological advancements in learning tools to support students with visual impairments (VI), the analysis suggests that VI students in the DURP undergraduate program would be able to:

- Complete approximately 34% of the curriculum without difficulty (“possible category”)
- Achieve sufficient competency in another 33% with substantial effort (“conditional category”), and
- Face significant challenges in the remaining 33% (categorized as “difficult”), which would require adjustments, such as affirmative policies from faculty members and high support from team teaching for these courses.

[6] Bobot CPMK terhadap CPL 7 Prodi - Google Sheets

Adjustments to course types, particularly for difficult and conditional categories, must be discussed and agreed upon. This includes optimizing learning methods, omitting or substituting course learning outcomes (CLOs) for specific courses, and utilizing available assistive technologies.

Findings 5. Modification, substitution, or omission of course learning outcomes should be based on an evaluation of module content and visual barriers to mastery.

As the mapping and adjustment of Expected Learning Outcomes (ELOs) directly influence Course Learning Outcomes (CLOs), it is essential to analyze the course and module structure to determine its suitability for addressing the barriers faced by visually impaired (VI) students. This analysis assumes no significant technological advancements are available, such as specialized software to assist VI students in reading or creating maps.

ITS adopts Outcome-Based Education (OBE) as its framework for ensuring the quality of educational processes. Within OBE, ELOs provide a structured approach to articulating what students are expected to know, understand, and be able to do upon completing a program (Havnes & Prøitz, 2016). These outcomes guide instructional strategies, assessment methods, and student engagement, fostering deeper learning and skill acquisition. ELOs are embedded within CLOs and the course study plan (Rencana Pembelajaran Semester or RPS). To fully realize the potential of OBE, CLOs must be systematically aligned with program-level ELOs, ensuring curriculum coherence and supporting broader educational goals (Wijngaards-de Meij & Merx, 2018).

This research conducted such an analysis within the Urban and Regional Planning (PWK) program as a pilot study, which can be replicated by other programs at ITS. The findings revealed that a systematic approach is needed to assess how well the module structure (course content) aligns with the specific challenges faced by VI students.

During the curriculum evaluation of the PWK program, a curriculum mapping process was used to formulate learning trajectories. This process helps both educators and students understand how specific course components contribute to overarching competencies. Adjustments were made to the CLOs of selected courses based on a consensus regarding the refinement of ELO statements, which were categorized into core and complementary outcomes. Complementary outcomes indicate that certain courses are highly relevant to these ELOs and therefore require adjustments to address the barriers and needs of VI students. The CLOs, known in Bahasa as Capaian Pembelajaran Mata Kuliah (CPMK), are further broken down into sub-

CPMKs, which represent weekly target achievements based on the course materials or modules being taught.

This research developed adjustment for eight pilot courses, listed as follows:

1. Transportation System (Sistem Transportasi)
2. Regional Planning (Perencanaan Wilayah)
3. Regional Planning Practice (Praktek Perencanaan Wilayah)
4. Community Development (Pengembangan Masyarakat)
5. Planning Information System (Sistem Informasi Perencanaan)
6. Transportation Planning Practice (Praktek Perencanaan Transportasi)
7. Urban Design Practice (Praktek Perancangan Kota)
8. Urban Design (Perancangan Kota)

All these courses were adjusted in terms of their study plan (Rencana Pembelajaran Semester or RPS), assignment plan (Rencana Tugas Mahasiswa or RTM), and evaluation plan (Rencana Assessment dan Evaluasi or RAE). However, the Transportation System course was analyzed as a full pilot case, where adjustments were made not only to the components mentioned above, but also to the modules and learning materials, which were designed to be accessible and friendly for visually impaired (VI) students.

Table 10 describes the examples of adjustment made at the course learning outcomes for the Transportation System Course

Table 10 Adjustment (in blue text) of Course Learning Outcomes (CPMK and Sub-CPMK) in the Transportation System Course to Accommodate Visually Impaired (VI) Students (Bahasa)

CPMK		sub-CPMK
CPMK – 1	Mahasiswa mampu menerapkan konsep sistem transportasi dalam memahami permasalahan-permasalahan transportasi kota/wilayah/pesisir	Sub-CPMK 1: Mahasiswa mampu memahami konsep-konsep/teoritik, definisi danprinsip dasar dalam sistem transportasi.
		Sub-CPMK 2: Mahasiswa mampu memahami pendekatan sistem sebagaisuatu kerangka sistematis untuk memecahkan permasalahan transportasi
CPMK – 2	Mahasiswa mampu menjelaskan peranan sistem transportasi dengan perspektif *LUTI* dalam membentuk struktur ruang dan kaitannya dengan pola ruang.	Sub-CPMK 3: Mahasiswa mampu memahami karakteristik sistem transportasi dan keterkaitannya dengan tata ruang
		Sub-CPMK 4: Mahasiswa mampu menerapkan standards-standards yang berlaku dalam memahami keterkaitan antar-komponen dalam sub-sistem transportasi
CPMK – 3	Mahasiswa mampu mengaplikasikan kerangka framework LUTI dalam memahami kebijakan transportasi	Sub-CPMK 5: Mahasiswa mampu memahami berbagai framework LUTI dan contoh-contoh penerapannya

CPMK		sub-CPMK
		Sub-CPMK 6: Mahasiswa mampu mengaplikasikan framework LUTI dalam memahami kebijakan transportasi
CPMK – 3	Mahasiswa mampu memahami pemetaan konsep aplikasi LUTI dalam mengidentifikasi kebijakan transportasi	Sub-CPMK 5: Mahasiswa mampu memahami berbagai framework LUTI dan contoh-contoh penerapannya
		Sub-CPMK 6: Mahasiswa mampu melakukan pemetaan berbagai contoh pendekatan LUTI dalam memahami kebijakan transportasi
CPMK - 4	Mahasiswa mampu mengevaluasi TOD sebagai salah satu solusi sistem transportasi berbasis LUTI	Sub-CPMK 7: Teridentifikasinya kebijakan LUTI yang efektif dalam intervensi urban form untuk mendukung penerapan sistem transit
		Sub-CPMK 8: Teridentifikasinya karakteristik dan tata kelola kawasan berorientasi sistem transit
		Sub-CPMK 9: Teridentifikasinya kasus kawasan TOD yang dievaluasi terhadap standard dan efektivitas LUTI
CPMK – 4	Mahasiswa mampu memahami elemen perbedaan Kawasan TOD dan non-TOD dan respon LUTI keduanya dalam menyelesaikan masalah transportasi	Sub-CPMK 7: Teridentifikasinya kebijakan LUTI yang efektif dalam intervensi urban form untuk mendukung penerapan sistem transit
		Sub-CPMK 8: Teridentifikasinya karakteristik dan tata kelola kawasan berorientasi sistem transit
		Sub-CPMK 9: Teridentifikasinya benchmark kasus kawasan TOD yang dikomparasi terhadap kawasan non TOD (TAD, dll) dan dikaitkan dengan efektivitas LUTI
CPMK – 5	Mahasiswa mampu mengevaluasi kinerja sistem transportasi melalui pengukuran mobilitas/ aksesibilitas sistem transportasi	Sub-CPMK 10: Teridentifikasinya konsep dan indikator mobilitas/aksesibilitas
		Sub-CPMK 11: Teridentifikasinya metode pengukuran mobilitas/aksesibilitas
		Sub-CPMK 12: Teridentifikasinya aplikasi pengukuran mobilitas pada website/ platform, maupun contoh kasus lapangan
		Sub-CPMK 13: Teridentifikasinya kebutuhan data dan kelengkapan data baik primer maupun sekunder untuk pengukuran mobilitas

CPMK		sub-CPMK
CPMK – 5	Mahasiswa mampu memahami elemen-elemen pengukuran mobilitas/aksesibilitas, pengaruh elemen masing masing terhadap kualitas atau derajat mobilitas/aksesibilitas	Sub-CPMK – 10 : Teridentifikasinya konsep mobilitas/aksesibilitas dan komponen-komponen pada indikator mobilitas/aksesibilitas
		Sub-CPMK 11: Teridentifikasinya bagaimana cara kerja komponen mobilitas berpengaruh pada kualitas atau derajat mobilitas yang diukur
		Sub-CPMK 12: Teridentifikasinya aplikasi pengukuran mobilitas pada website/ platform, maupun contoh best practice
		Sub-CPMK 13: Teridentifikasinya kebutuhan data dan kelengkapan data baik primer maupun sekunder untuk pengukuran mobilitas
CPMK – 6	Mahasiswa mampu menerapkan teamwork dalam pembelajaran berbasis kolaboratif (collaborative learning)	

Findings 6. Instructional Method Adjustments

Government Regulation No. 13 of 2020 regarding Decent Accommodation for Students with Disabilities also directs that instructional methods must be adjusted to accommodate students with disabilities. After mapping course learning outcomes with high visual dependency, instructional methods were adapted to ensure learning outcomes are met. In the pilot study for the Transportation Systems course, the following adjustments were made:

- Providing detailed explanations for content involving images, schematic illustrations, tables, and maps that are not readable by screen readers.
- Supplementing textbooks and presentation materials with Braille versions for printed formats.
- Providing audio book versions for digital materials.
- Creating 3D mock-up tools, such as tactile models of Transit-Oriented Development (TOD) areas, complete with Braille labels and legends to explain spatial characteristics. This approach can be replicated for other visually rich content using non-visual sensory aids.

Future development in technologies to support alternative learning approaches for software-based skills (e.g., mathematical, spatial, and analytical software) is essential. Current assistive technologies may not support skill mastery at the "create" level but are feasible for "analyze," "evaluate," and "understanding or descriptive" levels.

Findings 7. Evaluation and Assessment Method Adjustments

Government Regulation No. 13 of 2020 regarding Decent Accommodation for Students with Disabilities also mandates adjustments to evaluation methods for students with disabilities. Evaluation is not just a grading mechanism—it is a reflection of access, equity, and dignity in learning. Regulation No. 13/2020 outlines two key mandates:

Accessible Formats for Cognitive Evaluation. The evaluation formats should be accessible to VI students. This includes:

- Verbal assessments, which allow students to express understanding orally, especially when written formats are inaccessible.
- Digital written tests compatible with screen readers, ensuring that VI students can navigate and respond to questions independently.
- Simplified multiple-choice questions, designed with clear language and structure to avoid confusion caused by complex visual layouts.
    - **Example**: In the transportation system course, instead of asking students to interpret an accessibility map visually, the evaluation could present a verbal scenario describing spatial relationships and ask students to analyze or respond based on auditory cue. Multiple-choice questions are answered by writing down the selected option instead of marking it.

Extended Time for Evaluations. The regulation mandates a minimum of 50% additional time for VI students during exams and assignments. This compensates for the time needed to navigate assistive technologies, interpret non-visual content, and process information through alternative formats. A student using a screen reader may take longer to read and understand a math problem involving tables or graphs. Providing extended time ensures they are not penalized for the format of delivery but evaluated based on their actual understanding and skills.

Findings 8. Promotion of Case-Based and Problem-Based Learning

Case-Based Learning (CBL) and Problem-Based Learning (PBL) are student-centered pedagogical approaches that encourage active learning through real-world scenarios and collaborative problem-solving.

Case-based and problem-based learning methods are effective for VI students. These approaches involve interactive discussions, presentations, teamwork, and student-centered learning using accessible digital materials. Deep discussions and case analysis help all students, including VI students, actively participate and achieve

course learning outcomes. These methods should be promoted and standardized in course delivery. Attributes for effective implementation are outlined in the Rubric or Rencana Tugas (exp. The transportation systenm course) module. While model examples have been developed in this research, they have not yet been tested or evaluated directly with PwDs. However, during workshops, sampled VI students acknowledged this method as the most effective, especially for understanding complex concepts and creating mind maps.

The advantages of CPL and PBL promotes Interactive and Verbal Engagement. Since VI students often rely heavily on auditory input. CBL/PBL encourages discussion-based learning, which allows VI students to engage deeply through listening and speaking. Example: In the transportation system course, students might analyze a comparative transportation system across cities worldwide case in groups. VI students can contribute by interpreting facts or profile, discussing city transport problems and performance, and proposing arguments, all through verbal interaction.
By using accessible Digital Materials used in CBL/PBL (e.g., case documents, problem scenarios, research articles) can be provided in screen-reader-friendly formats (e.g., accessible PDFs, Word documents, or HTML). Example: A tranpsortation system case study is shared in a format compatible with Audio book or NVDA screen readers, allowing VI students to read and annotate the document independently.

CBL/PBL also promotes teamwork and collaboration. These methods promote peer learning, where VI students can collaborate with sighted peers, enhancing mutual understanding and inclusion.
The method trained VI students with extensive discussion to form their mind mapping and Conceptual Understanding. VI students often struggle with visual representations like diagrams. However, verbal mind mapping or tactile graphics can help them grasp complex concepts with extensive discussion based on literatures, cases, real project, etc.

Proposed Policy Recommendations for Milestone Student Processes

Translating the preceding evidence and analysis into action requires a set of concrete, sequenced, and achievable policy recommendations. The following four proposals are designed to systematically build an inclusive admission system at ITS, addressing foundational structures, strategic processes, and the critical need for informational equity. Policy recommendations for ITS regarding student processes milestones summarized as follows:

1. Map graduate profiles and learning outcomes to the needs of visually impaired students (and other disability types) as part of a readiness assessment for study programs

As part of quality assurance, mapping of program learning outcomes (PLOs) or expected learning outcomes (ELOs) with the barriers and needs of VI students must ensure alignment with the competencies defined in the Indonesian National Qualification Framework (KKNI) Level VI. For example, VI students must still be able to make sound decisions and apply their expertise through the preparation of a final project, developed through innovative, systematic, logical, and critical thinking.

- ELOs related to attitudes and general knowledge under KKNI Level VI can be fully accommodated and achieved by VI students.
- ELOs related to specific skills require more detailed mapping for each discipline, particularly regarding analytical abilities and the types of data needed for independent decision-making and problem-solving. Group-based learning methods can optimize the role of VI students according to their barriers and needs.

2. Quality Assurance: The need for systematic analysis to adjust curriculum and its derivative instruments

A systematic analysis is needed to adjust graduate learning outcomes through course structure evaluation. Two criteria were used:

(1) The relevance of course learning outcomes in supporting undergraduate program competencies.

(2) The level of visual dependency in course content and materials. This study analyzed six programs across various faculties as pilot cases. Findings include:

Based on sampling, recommended programs for VI student inclusion are urban and regional planning and business management.

A systematic analysis is also needed to adjust course learning outcomes by evaluating module content and visual barriers to mastery.

The same regulation also directs that instructional methods must be adjusted to accommodate students with disabilities. After mapping course learning outcomes with high visual dependency, instructional methods were adapted to ensure learning outcomes are met. In the pilot study for the Transportation Systems course, the following adjustments were made:

- Providing detailed explanations for content involving images, schematic illustrations, tables, and maps that are not readable by screen readers.
- Supplementing textbooks and presentation materials with Braille versions for printed formats.

- Providing audio book versions for digital materials.
- Creating 3D mock-up tools, such as tactile models of Transit-Oriented Development (TOD) areas, complete with Braille labels and legends to explain spatial characteristics. This approach can be replicated for other visually rich content using non-visual sensory aids.
- Developing future technologies to support alternative learning approaches for software-based skills (e.g., mathematical, spatial, and analytical software). Current assistive technologies may not support skill mastery at the "create" level but are feasible for "analyze," "evaluate," and "understand" levels.

The regulation also mandates adjustments to evaluation methods for students with disabilities. General guidelines include:

- Cognitive evaluations should use accessible formats, such as verbal assessments, digital written tests, and simplified multiple-choice questions suitable for VI students.
- Extended time for evaluations, with a minimum of 50% additional duration compared to regular students.

3. Standardize PBL/CBL based on Student Center Learning

Case-based and problem-based learning methods are effective for VI students. These approaches involve interactive discussions, presentations, teamwork, and student-centered learning using accessible digital materials. Deep discussions and case analysis help all students, including VI students, actively participate and achieve course learning outcomes. These methods should be promoted and standardized in course delivery. Attributes for effective implementation are outlined in the training module. While model examples have been developed in this research, they have not yet been tested or evaluated directly with PwDs. However, during workshops, sampled VI students acknowledged this method as the most effective, especially for understanding complex concepts and creating mind maps.

4. Scaling Up Inclusive Teaching Materials and Methods

There is a need to scale up inclusive teaching materials and methods, particularly for programs that are more prepared to accept VI students. This includes preparing additional technologies through further research.

5. Promoting Disability Research at ITS for-education development

Disability-related research should be promoted at ITS and integrated into core research agendas within study centers. It should also be mainstreamed by the Directorate of Research and Community Service.

Policy Recommendations: Student Output

Indonesia is lacking way behind other Asian Countries in the inclusive index. Indonesia ranks only 125, below Singapore, Thailand, Philipine, and Vietnam (Bappenas, 2022). Inclusive education has become national priority since the law on inclusive education enacted in Law No. 20/2003. Following with Law No.8/2016 concerning Persons with Disabilities and issued through Regulation of the Minister of National Development Planning/Bappenas Number 3 of 2021, and Ministry of National Development and Planning Regulation/Bappenas Regulation No. 3/2021. Based on this regulation, the National Action Plan (RAN) for people with disabilities was also issued. The employment access directives in the RAN for PwDs focus on the realization of an inclusive economy through the creation of a barrier-free work environment, equal employment opportunities without discrimination, and the empowerment of persons with disabilities to have independence and career advancement.

The internship program as part of the disability inclusion support system plays an important role in empowering and realizing the independence of graduates with disabilities in the future. The learning process at the Impact Campus is one form of education that is very focused on the role of the campus in addressing community issues, accelerating regional development, and transforming the national socio-economic landscape. The Impact Campus internship program is also intended to encourage the achievement of graduate learning outcomes, produce change agents capable of addressing future challenges, and increase the employment absorption rate of higher education graduates in the job market. Learning at the Impact Campus presents challenges and opportunities for students to gain meaningful work experience, expand professional networks, and enhance skills and understanding of the job market ecosystem. Therefore, as a strategic step, this research formulates strategies to facilitate needs and enhance the link and match between the government and higher education institutions.

This research discusses the role of internship implementation (previously accommodated in MBKM and currently changing its approach to Impactful Campus) in encouraging learning outcomes and fulfilling industry needs, as well as the needs of facilities for persons with disabilities in the workplace. So far, there has been a gap between graduates' competencies and industry needs, along with a lack of access for persons with disabilities to industry. The internship activities aim to encourage higher education institutions to act as actors in solving real problems in society. The findings of this research show that the implementation of impactful internships is likely to open access for students with disabilities to build connections and enhance the competencies required by the industry.

This study uses a qualitative approach with descriptive data. Data collection techniques were conducted through interviews to gain an in-depth understanding of the phenomenon. The sampling technique was carried out using purposive sampling

with triangulation. The data from the sample was tested for validity through triangulation, which involves comparing data from various sources, including interview results (from students with disabilities, employers, and individuals with disabilities who have worked), regulations, and theories. The sample selection was conducted considering knowledge and understanding of the issues being researched. The sample respondents who served as sources in this study included representatives from the Directorate of Connectivity and Logistics Infrastructure of Bappenas, the Directorate of Poverty Reduction and Social Welfare of Bappenas, YPAB teachers, students with disabilities from YPAB, disabled students from UNESA, the Head of ITS Quality Assurance Office, the Head of the PWK Laboratory, and lecturers from 6 study programs in ITS.

There were 12 discussion sessions and online survey that have been conducted, namely:

1. Discussion on needs and barrier for PwD to access business and industries (1 session on 7 February 2024 Director of KKN Tematik ITS, 1 session on 12 June 2024 with DoPRSW Bappenas, and 1 session with 8 high school students with visual imparement on19 July 2024);
2. Audiency and Socialization on Internship/Desa Cemara Program (1 session on 24 July 2024 with Bappenas);
3. Discussion on URP ITS Graduate Competency Standards (1 session on 14 July 2025, 1 session on 14 February 2025, and 1 session on 17 June 2025);
4. Workshop Disability-Friendly Teaching/Learning Methods with Assistive Technology (1 session on 22 April 2025);
5. Benchmarking to Al Azhar University Jakarta (1 session in 9 May 2025);
6. Finalization of Draft Memorandum of Understanding (2 sessions: in 14 February and 20 February 2025 with Bappenas);
7. Discussion on Draft Cooperation Agreement between FSTPK ITS and DoPRSW Bappenas (17 July 2025).
8. Online survey with questionnaire to 6 study programs in ITS (25 and 26 August 2025).

Findings 1. Regulation Review

The discussion on access to higher education for persons with disabilities is inseparable from the laws and regulations established by the government, in this case, the relevant ministries. There are several regulations governing higher education for persons with disabilities, namely: regulation on Internship (Table 11), education for persons with disabilities (Table 12), and regulation on infrastructure support for PwDs (Table 13).

Table 11Regulation on Internship

No.	Regulation	Concern
1	Permendikbudristek No. 53 tahun 2023	Penjaminan Mutu Pendidikan Tinggi/ *Higher Education Quality Assurance*
2	Peraturan Menteri Pendidikan, Kebudayaan, Riset dan Teknologi Nomor 3 tahun 2020	National Higher Education Standards
3	Buku Pedoman Merdeka Belajar Kampus Merdeka	

Table 12 Regulation on Education for PwD

No.	Regulation	Concern
1	UU No.8 tahun 2016	People with Disability
2	Regulation of the Minister of National Development Planning / Head of the National Development Planning Agency of the Republic of Indonesia Number 3 of 2021 concerning the Implementation of Government Regulation Number 70 of 2019	Planning, implementing, and evaluating the respect, protection, and fulfillment of the rights of persons with disabilities
3	PP 13 tahun 2020	Decent Accommodation for Students with Disabilities
4	Permendikbudristek No.48 tahun 2023	Appropriate Accommodation for Students with Disabilities in Formal Early Childhood Education Units, Primary Education, Secondary Education, and Higher Education

In addition, there are also regulations that govern the provision of infrastructure for persons with disabilities. The infrastructure needs for persons with disabilities in the workplace refer to the Minister of Public Works and Public Housing Regulation No.

14/2017 concerning Building Facility Requirements. Meanwhile, assistance for persons with disabilities has been regulated in the Minister of Social Regulation No. 16 of 2020 concerning Social Rehabilitation Assistance, through ATENSI services. The provincial government has the task of conducting supervision and training in social rehabilitation programs for persons with disabilities.

Table 13 Regulation on Infrastructure for PwD

Regulation	Concern
Permen PUPR No.14 tahun 2017	Building Facility Requirements
Permen Sosial No. 16 tahun 2020	Social Rehabilitation Assistance
Regulation of the Director General of Social Rehabilitation Number 2 of 2021	Operational Guidelines for Social Rehabilitation Assistance for Persons with Disabilities

Findings 2. Best Practice Review

There are some strategies for PwDs to access workplace that implemented in the UK, namely:

1. Encouraging usage of Assistive Technology: A report by Policy Connect and the UK All-Party Parliamentary Group for Assistive Technology (AT) found that many disabled students “are leaving education without knowledge of work-based AT provision, without skills to use AT in the workplace, and without the confidence to navigate these issues when starting a new job.” Policy Connect recommends Career Service and Disability Services teams work closer together and provide on-going training for students as they transition into the workforce, specifically around how they can advocate for using assistive technology at work and the laws that protect them.
2. Provide a Careers Hubs: Careers Hubs are a central part of the government’s Careers Strategy and Statutory Guidance for School Leaders. The aim is to help all secondary schools and colleges implement high quality careers guidance to help young people make more informed decisions around their future choices. In this career’s hub, the students with disability will be supported with working experience. Studies have shown that work experience develops a number of employability skills including better communication, interpersonal skills, increased confidence and maturity.

Findings 3. Current System Review : Existing Internship System in ITS (Student Connect)

Presently at ITS, there is a digital system in ITS that support the needs of online teaching and learning. One of them is MyITS Student Connect. My ITS Student Connect facilitates student in the MBKM process.

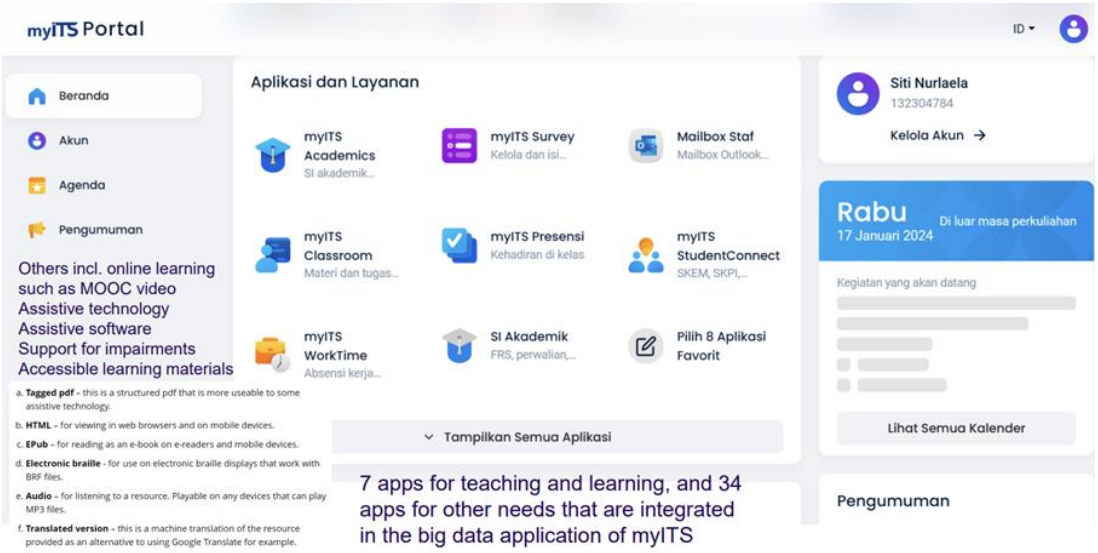


Figure 8 My ITS Portal (Teaching and Learning Digital System in ITS)

The Figure below illustrates the process of Internship in ITS.

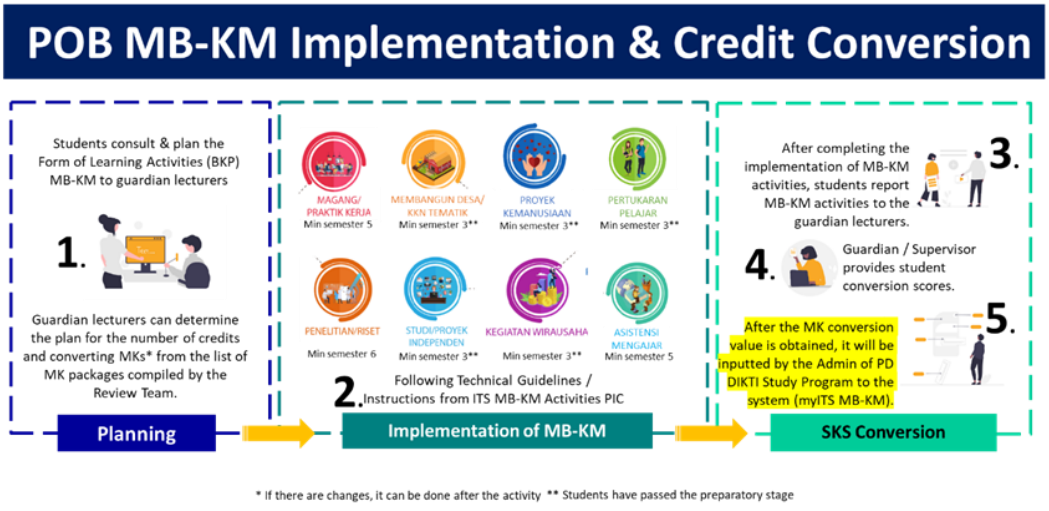


Figure 9 Internship Process

Findings 4. Gap Analysis: Existing conditions for the accessibility of PwDs in the employment

Identification needs and barriers of PwD in access to work opportunity based on several regulations reviewed, discussions with total blind and low

vision workers in Bappenas and low vision lecturer in ITB, and literatures study in order to understand the facility needs for people with disabilities in work environment.

There are 2 conditions for workers with disability:

1. entering the work environment while already having a disability: there should be affirmative action from industries and an inclusive recruitment process.
2. becoming PwD when already working: PwD need to adapt, there should be a disability consultant in the institution (offices/campus) to provide medical and psychological assistance.

*Table 14 **Needs and Barrier of PwD in access to work opportunity***

The Barriers	The Needs
Job Seeker Facilities	
• **There is no information regarding job vacancies for PwD in campuss**	• Provide career center/career hub integrate with disability services unit
Qualification/Graduate Capacity	
• **Lack of software mastery (limitation due to disability condition)**	• Excellent communication skills and technological proficiency (software analysis, AI, etc.) are essential for planners. • Be able to access technology (Microsoft office, Programming languages, English language skills) with assistive technology and training • Attitude • Soft Skills • Vocational skills
Regulation	
• **There are no punishment/sanctions for those who do not comply with the quota** • **Lack of company knowledge to accommodate people with disabilities**	• Improvement private company awareness and capabilities to accommodate people with disabilities
Recruitment Process	
• **Limited fields of work that can be applied for.**	• Easy access to forms (not in the form of images) and online submissions. • Objective interview (equal treatment)
Workplace	
• **Awareness** • **Lack of facilities**	• Training and capacity building • Assistive technology

The Barriers	The Needs
	• Communication, understanding of work culture.

Source: Analysis

There are some highlights of policies are related to PwDs and their access to work:

1. Law No.8/2016 on People with Disability. The law regulates that the central and regional governments, SOEs and BUMDs employ at least two percent of people with disabilities from the number of employees. Meanwhile, private companies are required to employ at least one percent of people with disabilities from the total workforce. There is a sanction for institutions that do not implement the 1% and 2% quotas for people with disabilities as stipulated in Law No. 8/2016 on PwD.The sanctions are administrative and may include: written reprimand, suspension of operational activities, freezing of business license, and revocation of business license. But, in the implementation, there are lack of law enforcement.
2. PP 13/2020 on Decent Accommodation for Students with Disabilities. The Ministry of Education and Culture's initiation, in general, ensures inclusive infrastructure, as well as accompanying human resources so that they are available for people with disabilities in the schools/campus. The derivative of the PP is the Regulation of the Minister of National Development Planning / Head of the National Development Planning Agency of the Republic of Indonesia Number 3 of 2021 concerning the Implementation of Government Regulation Number 70 of 2019. There is a disability service unit at ITS, but in implementing its services it has not been integrated with the career center.

Bappenas Perspective (as Business and Industry/Employer)

1. Bappenas as one of the central government institutions has experience regarding preparing the accommodation for PwDs. Based on the interview with one of the employees in DoPRCE Bappenas that is total blind. Screen readers have been offered from the office. A special system does not yet exist, but the public bureau in Bappenas built an inclusive infrastructure in the office. The recruitment process for expert staff (contractual employee) is quite accessible or disability friendly. But for ASN/government employee, have to follow the procedures of BKN (national civil service agency) and the Ministry of Internal Affairs. Recommendation of formation from the work unit, but at the time of opening, it must comply with BKN and Ministry of Apparatus Empowerment.

In the daily work life, there is no distinction in the opportunity to self-development, but there are indeed limitations that cannot be avoided related to the type of disability. Access meeting materials. DoPRSW special recruitment - there are JBI facilities for the deaf, and regular google forms for the visually impaired.

In the other case, one of the interviewees in Directorate of Connectivity and Logistic Infrastructure Bappenas that is low vision said that considering main duties and functions of the Directorate of Connectivity and Logistic Infrastructure Bappenas (references the Regulation of the Minister of PPN/Head of Bappenas Number 3 of 2022 regarding the organization and work procedures of the Ministry), including:

1. Overall, Mission (Article 131): The Directorate is responsible for coordinating and formulating policies, synchronizing policy implementation, monitoring, evaluating, controlling, and preparing strategic cross-sectoral development initiatives for national development planning in the transportation sector.
2. Specific Tasks (Article 132):
    a. Policy Development: Coordinating and formulating national development planning policies related to themes, targets, policy directions, regulatory frameworks, institutional frameworks, funding frameworks, public service and investment frameworks, and international cooperation in transportation planning.
    b. Policy Implementation: Coordinating, synchronizing, and integrating the implementation of planning policies and budget allocation for national development in land, rail, sea, and air transportation.
    c. Strategic Initiatives: Developing cross-sectoral strategic development initiatives through innovative development models as a basis for application and institutionalization in the plans and budgets of Ministries/Agencies/Regional Governments in land, rail, sea, and air transportation.
    d. Program Acceleration: Coordinating the acceleration of national development program implementation in land, rail, sea, and air transportation.
    e. Monitoring and Evaluation: Monitoring and evaluating the implementation of development programs and activities in land, rail, sea, and air transportation.

The key responsibilities of employees in the Directorate of Connectivity and Logistic Infrastructure Bappenas including:

a. Evaluating, identifying problems, and planning.

b. Calculating funding needs and prioritizing.
c. Assessing proposed activities from ministries, local governments, and other institutions.
d. Developing infrastructure policies
e. Monitoring progress.

The common activities performed in relation to the main tasks include:
a. Creating and calculating sectoral and cross-sectoral development indicators.
b. Conducting gap analysis of infrastructure needs per sector/mode.
c. Analyzing and mapping infrastructure needs by region.
d. Evaluating project feasibility.
e. Communicating information, especially verbally, to stakeholders about planning.
f. Developing alternative infrastructure policies based on technological advancements and demand.

There are at least 5 competencies that need to be developed and honed by graduates of regional and city planning to work at Bappenas, including:
a. Risk Management for Development (Presidential Regulation 39/2023 concerning MPRN): This likely refers to risk management skills related to the National Medium-Term Development Plan.
b. Big Data Analysis Mastery: The ability to analyze large datasets.
c. Infographic Creation: Creating visual representations of information.
d. Public Speaking Skills: Effectively communicating verbally to an audience.
e. AI Utilization Mastery: Leveraging Artificial Intelligence in infrastructure development.

Academic Perspective

1. URP Graduate profile
    a. URP graduate's profile can include roles in: government employees, planner assistant, facilitator, and researcher. Graduates with disabilities are better for social researcher.
    b. For the business and industry sectors, URP graduates need planner certifications. There is a written and interview test for these, but it can be done with the help of a companion.
2. Other Subject Graduate profile (enrichment)
    a. Business management graduate's profile includes roles in marketing, management, entrepreneurship, and bureaucracy. Graduates with disabilities are better suited for managerial roles rather than fieldwork.

For a managerial position, sufficient assistive technology and data should be provide enough. In contrast, technical work requires modifications and assistance. For the business and industry sectors, business management graduates need CWMA and CFA certifications. There is a written test for these, but it can be done with the help of a companion. Business management ITS need to prepare the facilities before admit PwD.

b. Marine Engineering graduate's profile includes roles in academic and researcher. Graduates with disabilities are better suited for academis and researcher. Sufficient assistive technology and data should be provided enough to ensure that graduates with visual impairment can adapt in their work environment.
c. Biology graduate's profile includes quality control, researcher, lecturer, entrepreneur, and surveyor. PwD in visual impairment hard to adapt in this major study because work in laboratory requires normal/full vision.
d. Industrial Engineering graduate's profile includes planner, facilities designer, manager, and analyst. Graduates with disabilities are better suited for managerial roles rather than fieldwork. For a managerial position, sufficient assistive technology and data should be provide enough. In contrast, technical work requires modifications and assistance. Industrial Engineering ITS need to prepare the facilities before admit PwD. Special training for lecturers specifically for visually impaired individuals in the field of STEM, procurement of assistive technology (hardware/software)., development of accessible course materials., provision of student assistants/buddies., financial support for facility modifications., clear guidelines and SOPs from ULD, internship programs/job placement specifically for graduates with disabilities, and also networking with inclusive industries are needed before accepting students with disabilities.
e. Development Study graduate's profile includes planner, government officer, etc. Sufficient assistive technology, data, and assistance should be provided enough to ensure that graduates with visual impairment can adapt in their work environment. Before admit PwD, special training for lecturers in the field of disability for visually impaired students in STEM is required, procurement of special assistive technology (hardware/software), development of accessible course materials, provision of student assistants/buddies, financial support for facility modifications, clear guidelines and SOPs from ULD, internship programs/job placement specifically for graduates with disabilities, and also networking with inclusive industries.

PwDs Perspective

Based on interview with PwDs in senior high school and universities, currently, some universities provide career center to give information about job vacancies. The information also can be accessed in the campus website, and via telegram group, but the information is still not inclusive for people with disabilities. Meanwhile, there is no information regarding job vacancies in senior schools, but at the school there is a teaching system for vocations (such as videography, photographer and script writer) to equip students with skills. Information about job vacancies also spreads effectively from friends to friends and social media (Instagram, TikTok, Facebook). Therefore, networking is very important for job seekers.

In the recruitment process, for people with disabilities, the most important thing is easy access to forms (not in the form of images) and online submissions. However, in job interviews, offline interviews are preferred, because interviews need to look at gestures, readiness and body language. Offline interview also more able to introduce companies that are unfamiliar with PwDs. The aim is to demonstrate skills and abilities in accordance with the CV.

Based on interview with PwDs in senior high school, universities, and alumni, the most important for the workplace to be more inclusive are:
Strengthening from the human resources side, giving an understanding to security to further help its accessibility. The inclusion of understanding has been internalized into every human resource, work culture. Training is part of creating a more inclusive environment.

Assistive technology is very important. There are several limitations/shortcomings for low vision and totally blind, especially images. There are guidelines in the file, website to be compatible. Apps and websites that are difficult to access. Need help from developers. Assistive Technology is more important. The office facilities and layout can be customized according to its needs, based on Ministerial Regulation of PUPR 14/2017.

Communication, understanding of work culture.
The capacity of vacancies for disabled friends accepted is in accordance with the regulations regarding the percentage of people with disabilities in each company/institution.

Training in the workplace related to upgrading and explaining tasks, for example in the world of education, how to teach appropriately, apart from that there are facilities and infrastructure that support people with disabilities, and a comfortable working environment.

The most important thing for university graduates who are Persons with Disabilities to be able to get a job, are:

a. Be able to access technology (Microsoft office, Programming languages, English language skills)
b. Attitude.
c. Soft skills: leadership, communication, how to convey limitations and solutions, potential.
d. Vocational skills: music, massage, videographer, photographer, and scriptwriter, etc.

Employee training for awareness is more effective in respondent's opinion in creating a conducive environment. The Ministry of Manpower has awards for companies that employ people with disabilities after 2021. The law has mandated a quota of 2%-an obligation. In the context of planning and budgeting, there are vocational activities and awards for local government planning for regional development planning inclusive of disabilities.

Findings 5. Skills, Facilities and Administration Process

The profile of graduates in regional and urban planning is including government employees (ASN, P3K), assistant experts, facilitators, private sector employees, state-owned enterprises, and researchers. Graduates in regional and urban planning who are persons with disabilities are more likely to become social researchers. Currently, graduates in regional and urban planning are encouraged to have skill certification. In the certification process, there is a written test, so graduates who are persons with disabilities need to be provided with companions. Recommendations to enhance for PwDs to access business and industries:

1. Communication skills and mastery of technology (software analysis, AI, etc.) are fundamental things that must be possessed by graduates of regional and urban planning.
2. A disability services unit is needed to provide a place for medical and psychological consultation for persons with disabilities in the workplace to make the working world more inclusive.
3. The administrative requirement applied to PwDs and non-PwDs from users will be the same. The university could issue a letter of statement that the graduate are PwDs. This will help users understand there already adjustment in the graduate competencies.

Findings 6. Cooperation between Higher Education Institution and Industries

The cooperation between ITS and Bappenas are written down in a document referred to as a memorandum of understanding (MOU) was signed in NK 04/SES/02/2025 NOMOR: 31/MoU/ITS/2025, February 21st 2025.The cooperation agreement document between the Faculty of Civil Engineering, Planning, and Earth Sciences of ITS and Bappenas was signed in Cooperation Agreement Number 5369/IT2.IX.3/T/KS.00.00/VIII/2025, August 15th 2025.

DoPRSW is a leading coordination for planning, monitoring and implementing of the National Action Plan for PwDs in which one of the strategies is to improve accessibility to education. DoPRSW Bappenas has previously worked together with various partners including with the Bandung Institute of Technology (ITB) and University of Indonesia (UI). The program will contribute to increase inclusivity of the Desa Cemara Internship Program.

Collaboration with universities is a crucial foundation for implementing this program. The involvement of universities opens up significant opportunities to:

1. Produce applied research and policy innovations based on local conditions;
2. Develop collaborative intervention models to accelerate the reduction of extreme poverty;
3. Strengthen the role of academics and students in supporting the formulation of more inclusive and targeted regional development policies;
4. Facilitating the real contribution of higher education to achieving the Sustainable Development Goals (SDGs), particularly SDG 1: No Poverty.

Thus, the Cemara Village Internship Program serves not only as a learning platform for students, but also as a vehicle for synergy between the government and universities in creating good practices in participatory and evidence-based development that are oriented towards community welfare. The Cemara Village program is a collaboration between DoPRSW Bappenas, and 11 universities and 23 Faculties, including:

1. University of Indonesia (FEB and FISIP)
2. IPB University (FEM and FEMA)
3. Padjajaran University (FEB and FISIP)
4. ITB (SAPPK)
5. UPI (FPEB)

6. Trisakti University (FEB and FALTL)
7. Brawijaya University (FEB, FISIP, FT)
8. West Sulawesi University (FE, FISIP, FT)
9. Hasanudin University (FE, FISIP, FT)
10. Respati Indonesia University (FMB, FTI, FP)
11. ITS (FTSPK)

There are three stages for the implementation of this program, namely:

1. Socialization, registration, and announcement.
2. Pre-Departure: workshop and basic planning training (online by zoom)
3. Implementation: validation, data collection, program/policy formulation and program review.

Based on FGD, we identified that PwD will face the challenge in the implementation stage. They need to get support/assistant for completing their task at the implementation stage.

The lack of inclusive facilities/accommodations, consultation service units for persons with disabilities, sensitivity training modules for disabilities that are established as standards, and operational guidelines and standards for employment of persons with disabilities for the public and private sectors are urgently needed and have been outlined in the National Action Plan for Persons with Disabilities.

Related to the digital Internship system, coordination with Bappenas/other partners is required in order to access the platform for the implementation of the Cemara Village internship program and provide companion to help Students with Disabilities.

Proposed Policy Recommendations for Milestone Student Output

There are three strategies to facilitate needs and enhance the link and match between the industries and higher education institutions, namely:

a. Establish an integrated disability service unit (ULD) with admission, academic development division, health services, student center services, career center, and others. ITS must establish a fully resourced Disability Service Unit at the university level, equipped with experts in special needs education, assistive technology, and disability law. This unit should not only provide post-admission support but also play an active role in admissions, verifying disability documentation, conducting needs assessments, and coordinating accommodations with the admissions committee. A strong and empowered ULD will serve as the backbone of all inclusion efforts and is mandated by national regulations. The structure of the Disability Service Unit (ULD) must be

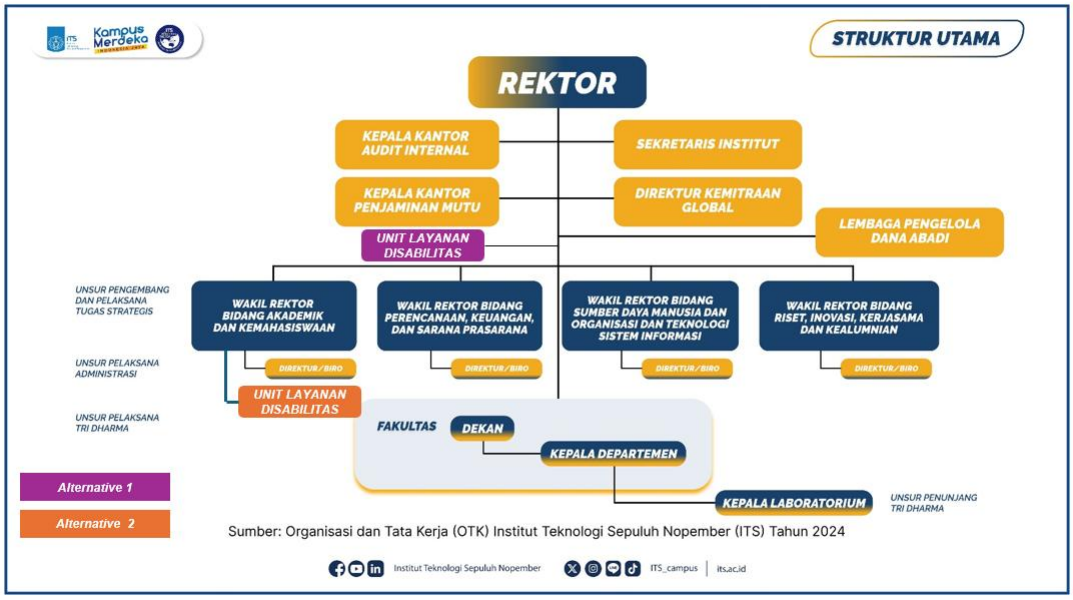
ensured to fulfill its functions as regulated in Law No. 8 of 2016 on Persons with Disabilities.

At the university level, the ULD should be granted formal authorization within the organizational structure, enabling it to carry out programs and activities aimed at:

- Enhancing the capacity of educators and administrative staff
- Coordinating with other campus units to provide services for persons with disabilities (PwDs)
- Monitoring and evaluating reasonable accommodation
- Providing counseling services
- Conducting early detection for students suspected of having disabilities or establishing protocols to prevent undetected cases of PwDs admitted to ITS
- Assisting in the provision of psychiatrists, psychologists, and medical doctors, including integrating medical center services for PwDs
- Disseminating inclusive awareness across the entire campus community

Therefore, the ideal structure of the ULD (Disability Services Unit) at ITS in future stages could be directly managed under the Rector or Vice Rector. This model aligns with best practices observed in several universities, such as UNESA (Universitas Negeri Surabaya) and UAI (Universitas Al Azhar Indonesia), Jakarta. The existing ULD subunit under BUK4L (*Biro Umum Keamanan dan Kesejahteraan, Keselamatan Kerja dan Lingkungan* or General Bureau of Security and Welfare, Occupational Safety and Environmental Affairs) could serve as a foundational embryo, gradually evolving toward its ultimate structure during the transition period. Box 3 displays the ideal structure of ULD management in ITS campus.

b. Internship is one of the media to improve the competence of graduates, both soft skills and Hard skills, to be more ready and relevant to the needs of the times, prepare graduates to be ready to enter society/work environment. The process, quality assurance, and monitoring evaluation based on the guideline. It needs to provide appropriate accommodation for students with disabilities in higher education even when they are in the internship period. The type of accommodations based on the type of disability as regulated. This emphasizes the importance of having an integrated disability service unit with health services, student center services, and others.

Box 3 The ULD should be placed directly under Rector (or Vice Rector 1) with intensive coordination with academic and student affair, and research. Maintaining a holistic but also specific function in handling all the needs of accommodating students with disabilities


c. Provision of inclusive facilities/accommodations, such as:
    1. Disability sensitivity training modules used as standards, guidelines, and operational standards for disability employment in the public and private sectors are necessary and have been included in the National Action Plan for Persons with Disabilities.
    2. Assistive technology and other facilities.
    3. Technical adjustments in the implementation of the Semester Learning Plan (RPS) to make it more inclusive and enhance the connection between industry and higher education. The core competencies demanded by graduates of regional and urban planning are integrity, the ability to study and utilize science and technology in its application to the field of regional and urban planning, understanding of theoretical concepts in regional and urban planning, understanding of the techniques and processes of regional and urban planning, the ability to analyze spatial and non-spatial context potentials and problems, the ability to formulate planning concepts and directions through studies of strategic problems in the context of regions and cities, as well as the ability to prepare plans and evaluate spatial planning.

CONCLUSION

Creating an inclusive education system in a university is not merely a technical adjustment. It is a transformative process that redefines how learning is designed, delivered, and experienced. The challenge lies in the depth and breadth of change required: from the admission system, curriculum redesign/modification and infrastructure adaptation to faculty training and policy reform. It demands a shift in mindset; where diversity is not treated as an exception but embraced as a foundation and a strong commitment to implementing laws and regulations that establish the university's legal obligations. That is why the process of establishing an inclusive education system will be challenging, demanding, and long-term; one that must continue beyond the completion of this research.

Focusing on accommodations for students with visual impairments at ITS, this research presents initial efforts and offers findings and policy recommendations across three key areas:

- Paving the way for access to campus life for persons with disabilities, from low vision to total blindness, is supported by the readiness of ITS's institutional capacity for student admission.
- Paving the way for a disability-inclusive digital environment at ITS, by developing a digital support system in myITS Classroom. This includes adjustments to the curriculum and course structure, learning methods and evaluation, and the preparation of teaching materials embedded in the system to ensure inclusivity in the learning process.
- Paving the institutional support system whereas the Regulation support system for university-industry linkage (student output) in ITS could be available.

To ensure legal legitimacy and sustainability, the next step is the formulation of a Rector's Decree. This decree will serve as an internal legal framework, binding for all academic stakeholders, and will legitimize inclusive academic procedures, curriculum adjustments, assessment systems, graduation standards, and other components that address the barriers and needs of persons with disabilities (PwDs).

Although the journey is long, a step-by-step approach is essential. Five key follow-up actions to this research are recommended:

1. Replicate the research for other types of disabilities to broaden understanding and applicability.
2. Scale up the study to include additional undergraduate programs in ITS (including post-graduate) beyond those surveyed in the current pilot.

3. Prepare comprehensively for undergraduate programs identified as more ready to initiate admissions for students with disabilities especially for visually impaired students.
4. Develop a systematic and effective program and budget plan to begin implementation, supported by operational regulations, monitoring, and evaluation mechanisms.
5. Review the institutional structure of the Disability Services Unit (ULD) to ensure its authority aligns with national standards (Law no. 8 of 2016 on PwDs) and is sufficient to carry out its functions effectively.

The models and instruments produced in this research can serve as replicable and improvable references for future development.

The significance of establishing inclusive education system in ITS is profound. Inclusive education promotes equity, social justice, and lifelong learning. It reflects the ITS's commitment to human rights and its role in shaping a society where everyone could contribute meaningfully with dignity.

We hope to walk the talk in advancing this mission. The research team recognizes that through inclusive research, we can foster empathy, promote social inclusion, and encourage positive discrimination for those who are more vulnerable among us. Therefore, continued research is essential, more research is better, even the more, (across all aspects of support) the better, so that inclusive values can be embedded within the campus community and extended into the broader ITS university culture.

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APPENDICES

Appendix 1 Identified Detailed Course Structure for the URP Undergraduate Program

https://www.dropbox.com/scl/fi/xsc6yp297m96o87bpkhc1/Appendix-1-Identified-Detailed-Course-Structure-for-the-URP-Undergraduate-Program.docx?rlkey=nave69sp4m420dmreun0fyh2f&st=xt7jdhe3&dl=0

Appendix 2 Upgraded Study Plan (RPS), Assessement and Evaluation Plan (RAE) and Assigment Plan (RTM) for selected sample courses in DURP

https://www.dropbox.com/scl/fi/aamat0hdo0n018p4j2n5b/Appendix-1-Upgraded-Study-Plan-Selected-Course_DURP-ITS.docx?rlkey=wwqmyzlmnkuqxv5g474l1r9pj&st=jq6yjoy9&dl=0

Appendix 3 Evaluation of module content and visual barriers to mastery for The Transportation System course

https://www.dropbox.com/scl/fi/67fgo0hlft9wzed4mhpvw/Appendix-3-Evaluation-of-module-content-and-visual-barriers-to-mastery-for-The-Transportation-System-course.docx?rlkey=gs7un7090a2kt8vp7vqa2ssvs&st=cs19jvn7&dl=0

Appendix 4 Inclusion version of the Teaching Materials for sample course at DURP (The Transportation System Course)

Module	Link
Weekly teaching materials	https://drive.google.com/drive/folders/1581uc2MCzIiiCAqFLeTFQFgFEcHWG9C7
PDF of the teaching book	https://www.dropbox.com/scl/fi/orcpejpobi8kd1ykegd52/edit-buku-ajar-penelitian-Revisi-Fixed-10-Feb.docx?rlkey=twf7r78vmx4vwpqkc9tte0i95&st=ndpg4r4y&dl=0

Appendix 5 Inclusion version of the Teaching Materials for sample course at DURP (The Transportation System Course) with Braille translation

https://www.dropbox.com/scl/fi/8kp2xa9wstg4uam1fkt1a/Appendix-5_PPT-of-Transport-System-with-Braille-Translation.pdf?rlkey=nbng6lqe3pmhtppo745k7o2lr&st=1rkoaxmu&dl=0

Appendix 6 Inclusion version of myITSClassroom

https://1drv.ms/v/c/5731631332c30dac/EemhvDqM4BBFpWlvfjnzSPcBn_z6JMsFZg9SsZAuGrLFAA?e=ngsude

Appendix 7 Inclusion version of ITSWebsite

https://1drv.ms/v/c/5731631332c30dac/EVg_40zD6wxJs2V96i9_gVEBMdK_mXXNoeHIZoV5c7hGdg?e=pZgXe9

Appendix 8 Inclusion version of Tactile Tools (3D printing format)

https://drive.google.com/drive/folders/1o3IDotR4WbnAKM1K_jng4lSKug69Ak2w

Appendix 9 Inclusion version of Audio Books

https://1drv.ms/v/c/5731631332c30dac/EemhvDqM4BBFpWlvfjnzSPcBn_z6JMsFZg9SsZAuGrLFAA?e=ngsude

Appendix 10 Manuals of the Inclusion version of myITS platform

- Video Manual myITS Classroom: https://1drv.ms/v/c/5731631332c30dac/EemhvDqM4BBFpWlvfjnzSPcBn_z6JMsFZg9SsZAuGrLFAA?e=ngsude
- Video Manual myITS Website: https://1drv.ms/v/c/5731631332c30dac/EVg_40zD6wxJs2V96i9_gVEBMdK_mXXNoeHIZoV5c7hGdg?e=pZgXe9
- Manual of Userway: https://www.dropbox.com/scl/fi/eydnhdqiy6uyrud1os607/Appendix-10-Manuals-of-the-Inclusion-version-of-myITS-platform.docx?rlkey=bz846hdarudb6d0b5qtqcgs0g&st=p8szd2zh&dl=0

Appendix 11 MoU between FTSPK and Bappenas for the Inclusive Internship Program

https://drive.google.com/file/d/1XVKKH8annp5Be1Z1XDT92ijIpzFy99it/view?usp=drive_link

Appendix 12 Website of Research Outputs

https://www.its.ac.id/pwk/academics/its-inclusive-education-program

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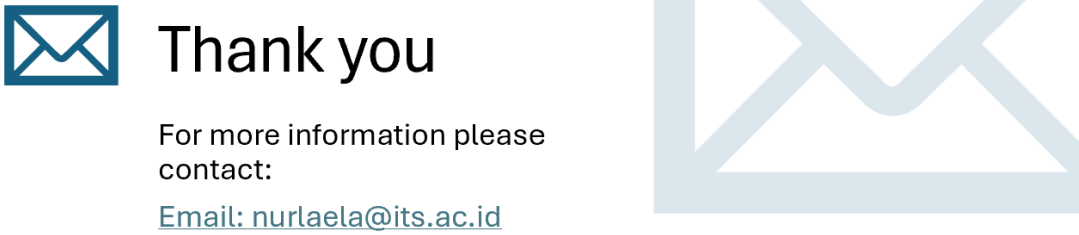

Thank you

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