The Framework of Inclusive Education for Vice Chancellors of Universities Based on the Goals of Sustainable Development through Visual Digital Dashboard

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Abstract

The General Assembly of United Nations Member States had accepted the agenda of 17 Sustainable Development Goals (SDGs) for 2030, focusing on "leaving no one behind". These SDGs clearly include disability and people with disabilities. Disability is directly counted in the goals 4, 8, 10, 11 and 17 of SDGs. It is an immediate appeal for all the countries around the world to act on these SDGs. Vice chancellors/presidents/heads of universities can play a significant role towards inclusion at tertiary level of education for disable students without any gender differences, through the provision of support for the first two goals (4 and 8), as mentioned above. Vice chancellors can help disable students through the delivery of inclusive learning environments, involving the industries to help disable individuals in getting access to the job market and prepare these leaners for future inclusions via innovations in curriculum and immersion of other key stakeholders. This paper offers the framework for vice chancellors to implement these two goals at their universities via visual digital dashboard for effective decision making that is centred on significant key performance indicators (KPIs), sub areas of these KPIs and revision (s) of underperforming policy (policies) and/or procedure (s) linked to these KPIs and sub areas.

Keywords: Disability-Inclusive Education, Effective Decisions, Goals, Inclusive Education, KPIs, Policies and Procedures, Revisions, Sustainable Development, Vice Chancellor, Visual Digital Dashboard

1. Introduction

Education is a practice of transfer knowledge and skills to students. Inclusion in education provides equivalent learning opportunities to all the students (including students with disabilities), where every student is treated fairly within the educational environment. Inclusion refers towards understanding, admitting, and dealing all students at equal levels without any segregation of physical, intellectual, educational, social or emotive abilities or disabilities.

The General Assembly of United Nations Member States had accepted the agenda of 17 Sustainable Development Goals (SDGs) for 2030, concentrating on "leaving no one behind".

These SDGs visibly include disability and persons with disabilities. Disability is directly linked with the goals 4, 8, 10, 11 and 17 of the SDGs. Globally, it is an urgent appeal for all the nations to work towards these SDGs.

Vice chancellors/presidents/heads of universities may contribute substantially towards inclusion at the tertiary level of education for disable students, without gender differences, through the provision of support for the first two goals (4 and 8). Vice chancellors can help special need students (students with disabilities) through the provision of inclusive learning environments, innovations in curriculum, involving parents and other key stakeholders, and contacting industries and experts to help disable individuals in getting access to job market. This paper provides the framework of inclusive education for vice chancellors to implement these two goals at their universities through the help of visual digital dashboard for effective decision making, based on certain KPIs, those are revised via linked policy (policies) or/and linked procedure(s).

Business intelligence (BI) software works on a systematic structure to collect, save and analyze the data of an organization (Grublješič & Jaklič, 2015). Effective decision making depends on appropriate organization of data (Ahmad, 2022). BI software is utilized in diverse areas such as commerce, industry, medical and education; it saves, recalls, organizes, searches and compares the data and offers a dashboard that creates reports, charts, queries and gives many other options for making decisions. Oracle and NetSuite are known companies those are providing comprehensive business solutions for pedagogical organizations.

Nevertheless, available literature reveals that the percentage of success for business intelligence solutions are very little (Goundar, 2021), expensive and need a huge amount of time for its implementation (Salur & Kattar, 2021). In addition, BI systems do not offer needed actions for upcoming necessities those move towards constant advancements (Mrc, 2017; Ahmad, 2022). Artificial intelligence is intelligence based on machines; despite of benefits, it is a known fact that artificial intelligence cannot replace human intelligence. Disability-inclusive education needs constant improvements, revisions and effective decision making for its implementation at the best.

Therefore, solutions are required for the invention of operative and operational developments for the real-world atmospheres of pedagogical institutions, focusing on inclusive education those move towards effective decisions making with focused and organized actions, considering the upcoming needs of institutions, devoid of business intelligence systems.

This paper emphases on the course of effective decision making by the use of an offered framework for disability-inclusive education that is centered on revision(s) of policy (policies) or/and procedures(s), connected with inclusive education, planned to meet the sustainable

development goals, including disability and people with disabilities; focusing on "leaving no one behind", announced by the General Assembly of United Nations Member States. Next sections of this paper are connected to "literature review", "Independent, Dependent and Moderating Variables for the Framework of Inclusive Education", "The Framework of Inclusive Education (for Goals 4 and 8 of UN's General Assembly for Sustainable Development)", "Conclusions", and "References".

2. Literature Review

2.1. General Assembly of United Nations Member States

The General Assembly of United Nations was established in 1945 under the Charter of the United Nations that has a significant role in policymaking, including all of its members; it offers an exclusive forum for multilateral debate and conversations covering complete spectrum of world-wide problems (United Nations, n.d.).

2.2. Sustainable Development Goals by General Assembly of United Nations Member States

The United Nations Member States-accepted agenda for sustainable development goals for 2030 offers a plan for peace and prosperity for the human beings living on earth, keeping in view the existing situations and upcoming needs at global levels. In addition, all the countries around the globe are requested to participate immediately towards elimination of poverty and other deficiencies through effective plans and policies towards the improvement of health and educational facilities and to decrease inequalities ("THE 17 GOALS | Sustainable Development").

2.3. 17 Sustainable Development Goals – "Leaving no one behind"

The General Assembly of United Nations Member States had acknowledged the agenda based on 17 Sustainable Development Goals (SDGs) for 2030, concentrating on "leaving no one behind". These 17 SDGs are shown in figure 1 (SDGs, n.d.).

Figure 1. 17 SDGs of Sustainable Development (SDGs, n.d.)

2.4. Goals 4 and 8 of Sustainable Development by General Assembly of United Nations

Figure 2 shows five SDGs (4, 8, 10, 11 and 17) those visibly comprise disability and persons with disabilities (SDGs, n.d.).

Goal 4 is linked to effective and inclusive learning atmospheres for inclusive education (including people with disabilities), without gender differences and focusing towards lifelong learning (SDGs, n.d.).

Goal 8 is connected to inclusive and sustainable economic growth (including people with disabilities), with equal and decent work opportunities without gender differences (SDGs, n.d.).

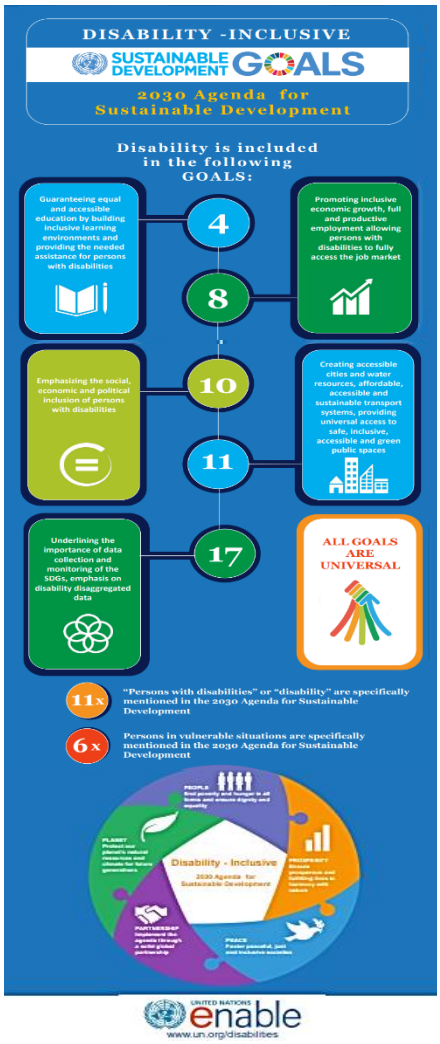


Figure 2. Disability Inclusive – Sustainable Development Goals (Disability-inclusive, n.d.)

2.5. Data and Intelligence

Facts collected for evaluations and conclusions are called data (Zafar, 2021). Well-organized and arranged data is information (Miller, 2000). When the information is properly organized and implicitly retained by a person is known as knowledge; in addition, knowledge is recognised facts gained by experience, involvement, training or workout (Collins, 2012;

Cláudio et al., 2015). Algorithmic arrangements of computer programs that impersonates or imitates human intelligence is called artificial intelligence (Sharma & Bhargav, 2022).

2.6. What is Decision Support and Business Intelligence (BI)?

The idea of business intelligence came from a technology named decision support in 1950 (Heang & Mohan, 2017). Business intelligence supports companies and corporations to analyse and evaluate information that results in effective decision making (Sadiku & Musa 2021; Ghoshal & Kim, 1986). BI permits to store huge amount of information, deal with unstructured and structured data and delivers improved outcomes those lead towards decision making (Grublješič & Jaklič, 2015).

Conversely, Salur and Kattar (2021) stated that the cost of implementation and execution of a business intelligence system is very high and utilizes a huge amount of time. Moreover, data mining and other technological expertise need trainings, and subcontracting to a third party could be required such as the involvement of specialists. 'Gartner' a technological research firm states that successful rate of business intelligence software is between 20% to 30% (Goundar, 2021).

2.7. Business Intelligence Data Dashboard

A business intelligence software data dashboard is used to analyse, evaluate and track the key performance indicators by the executives and administrators of an institution that helps them in making decisions; hence, a power BI dashboard shows substantial decision making particulars (Sahin & Ifenthaler, 2021). Crystal reports, Tableau, Power BI and Jasper reports are famous tools those are used for data visualisation and generates reports for the institutions, resulting in charts, graphs, reports, flow charts and other options through visual digital dashboard (Ahmad, 2022). An isolated set of data which is difficult to fetch, integrate and utilize with other data sources of an institution is known as a data silo (Patel, 2019). These computer based tools can interact with data silos and restructure the data to get connected with diverse data sources; such as Tableau tool could be linked to variety of data sources like MS Excel and comma-separated value files, relational databases like SQL Server, DB2, Oracle, and Google Cloud, Sheets and many other sources (Tableau. n.d.).

2.8. What is a Report?

A computer generated report is comprehensive information illustrated in diverse provisions like graphs, charts or information in tabular form (Pedamkar, n.d.).

2.9. Machine Learning?

A method that utilizes algorithms to analyse and compare the existing information towards upcoming forecasts and projections is called machine learning (Abozraig, Ok & Yildiz, 2022).

2.10. Pedagogical System and its Stakeholders

Key stakeholders of a pedagogical system are staff (teachers and administration), students, policy makers, heads of educational institutions, parents, researchers, alumni, related industries and experts linked to the concerned institutions (Ahmad, 2022).

2.11. Policies and Procedures

A policy is a set of rules and principles for an act sanctioned by an authority that is required to be shadowed by related stakeholders; moreover, it interprets any questions related to stakeholders, what and why they have to do (Peltier, 2004). A procedure is a method or practice that tells how a policy is followed by shadowing steps in a detailed manner (Peltier, 2004). Policies and procedures help towards the delivery of guidelines, steps and ways to complete diverse operations and ensure compliance with indicated laws concerning decision making and reorganisation of internal operations (Peltier, 2004).

If a policy does not deliver projected results of advancement then it is the time to revise the policy or linked procedure(s); this reevaluation comes up with enhanced outcomes that supports in effective decision making (Compliancebridge, 2021).

2.12. What is Disability-Inclusive Education?

Dash (2006) stated that historically educational setups were based on two modes, including: (i). Special needs educational system for students with disabilities. (ii). Educational system for everyone else as a formal classroom based education. The integration drive to combine students with disabilities with traditional classroom based students was started during the second half of twentieth century. The call of recent progression as a global movement is to develop a unified educational system (disability-inclusive education) for all the students regardless of their abilities or disabilities.

Disability-inclusive education is connected with the activities accomplished in formal pedagogical organizations including usual and special need students within the similar atmosphere those enhance the collaboration and communication of these students (Moran & Abbott, 2002). Inclusive education is a practice that allows students with special needs or disabilities to obtain their education along with formal students within formal classrooms those are reinforced by support services (Deboer, Pijl & Minnaert, 2010). ChatGPT is a human like conversational robotic software that can be used for students of Dyslexia, and learning disabilities as a useful tool (IS2AI, 2023); moreover, it can be used for visually impaired and blind students (Nawaz, 2023). A voice input and read aloud control can be added as extension for voice input and output (Steven, 2023); that can be used for blind students.

2.13. ABC of Inclusion and UDL (Universal Design for Learning)

Briggs (2017) detailed ABC of inclusion as: ‘A’ for acceptance; the educational institution accepts all students to study in a similar classroom, no matter what ability or disability they have. ‘B’ for belonging; a student’s sense of belonging in the educational community is a significant component of inclusion. ‘C’ for community; the entire community

of the educational institution cares for, helps and assists all of its students, regardless of abilities or disabilities and irrespective of gender differences, to empower them to prosper.

Universal design for learning (UDL) provides equivalent openings to all students to be successful that deals with the process of teaching and learning to help the students in accessing the learning contents in a flexible way. It also endeavours to find diverse ways to retain the students motivated; in addition, UDL uses a range of teaching techniques to eliminate any obstacle towards the process of learning (Morin, n.d).

2.14. Key Performance Indicators (KPIs) Essential for a University towards Performance Comparison and Improvement of Performance Ranking at Global Level

Key performance indicators are foundations of decision making. In general, there is a long list of KPIs that is utilized to evaluate the performance of a university; nevertheless, there are following most important KPIs those are vital for performance evaluations (Emery, 2014): i). Achievement of students. ii). Discipline referrals. iii). Percentage of attendance in the classrooms. iv). Students graduation percentage. v). Teachers satisfaction.

The Times Higher Education (THE) annually publishes the rankings of universities in the world. Following are some of the KPIs used by THE (The-methodology, 2022) for the announcement of international rankings of the universities (indicators those can be linked to inclusive education (special needs/disability-inclusive education) are selected and listed here):

Teaching and learning: 1). Staff to student ratio. ii). Number of full time enrolled students. iii). Male to female student ratio. iv). Research: productivity (published papers per researcher). v). Citations per paper. Industry: vi). Information related to industry (such as knowledge transfer). ‘California Institute of Technology’ bagged fourth place (with an overall score of 94.5) according to the World University Ranking of THE for 2021 (The, 2021), and moved two places up to second place (with an overall score of 95.0) in 2022 (The, 2022), using above mentioned KPIs.

The QS world university rankings for Arab and other areas (QS, 2022) consider following KPIs (indicators those can be linked to inclusive education (special needs/disability-inclusive education) are selected and listed here):
i). Citations/paper. ii). Ranking of programs (Academic Reputation). iii). International Research Network.

Some of the helpful KPIs those are considered under common knowledge and required by any university (higher education institution) for performance evaluation and improvement of rankings are taken from the author (Ahmad, 2022), and merged with the KPIs of ‘THE’ and ‘QS world university ranking’, keeping in view inclusive education and listed in figure 5 at the left side, under KPIs: ‘Teaching and Learning’, ‘Research’, ‘Library’, ‘Industries and Experts’,

'Budget', 'Programs', 'Benchmarking', 'Risk Management', 'Parents Feedback', 'Strategic Plan(s)', 'International Collaborations', 'Extra-Curricular Activities', 'Hospital and Health Services', 'Security/Legal Affairs & Rights', 'Internal and External Audits', and 'Housing, Stores, Maintenance, PR, Procurement', sub areas with bulleted items and others. As inclusive education is the inclusion of special need students with normal students, therefore, most of the KPIs and sub areas can also be used for normal students (as applicable according to the need). Moreover, these KPIs and sub areas are aiming at students with disabilities, without any gender differences; to answer the call of United Nations General Assembly, stressing on "leaving no one behind".

3. Independent, Dependent and Moderating Variables for the Framework of Inclusive Education

According to the literature review, figure 3 shows dependent, independent and moderating variables of the framework of inclusive education.

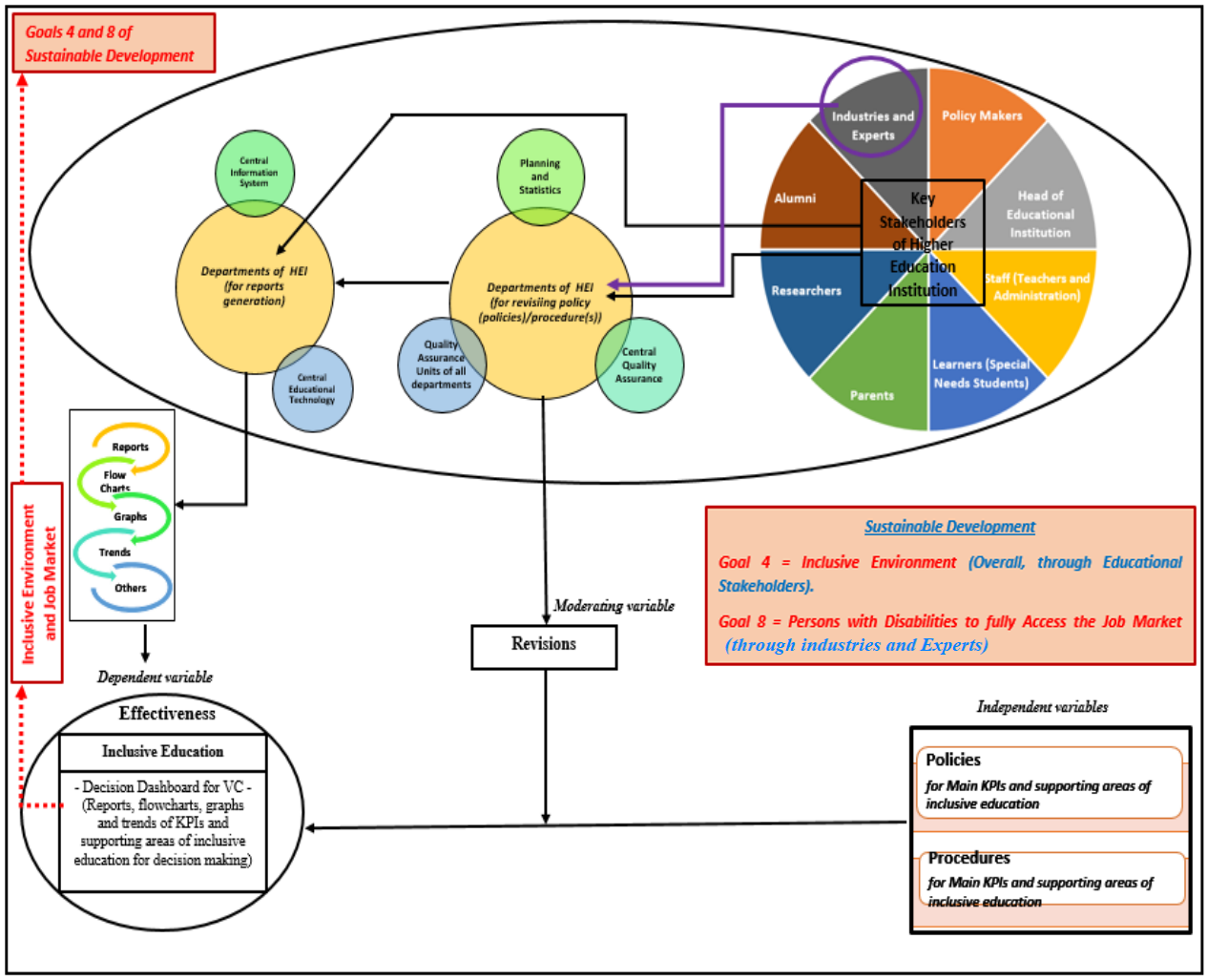


Figure 3. Dependent, independent and moderating variables of disability-inclusive education framework

Figure 3 illustrates that 'effectiveness' of inclusive education is a dependent variable; 'polices' and 'procedures' are independent variables and 'revisions' of policies or procedures is a moderating variable.

4. The Framework of Inclusive Education (for Goals 4 and 8 of UN's General Assembly for Sustainable Development)

The independent, dependent and moderating variables shown in figure 4 illustrates the relationships of these variables within in the framework of disability-inclusive education at the university, keeping in view the two goals (4 and 8) of sustainable development. Therefore, in figure 4, the departments of 'planning and statistics', 'central quality assurance', 'central information system', 'educational technology' (dealing with a LMS), 'industry and experts' (as main key stakeholders) and 'quality assurance units' of all the departments in the university are highlighted with blue color, those play a vital role towards the operation of the framework of inclusive education that is a repeated process of revision(s) for policy (policies) or/and linked procedure(s) towards the assessments of KPIs (figure 5, left side) related to effective decision making for performance enhancements, until expected outcomes are achieved. 'Vice chancellor/head or president of a HEI' and 'policies by PMKRS (policy makers)' are also highlighted in blue color because these are the base of effective decision making. All the other colors with dotted and dashed lines and arrows in figure 4 are used to show inner links among diverse departments of the university. The basic source of this structure is adopted from the researcher Ahmad (2022).

The Framework of Inclusive Education for Vice Chancellors

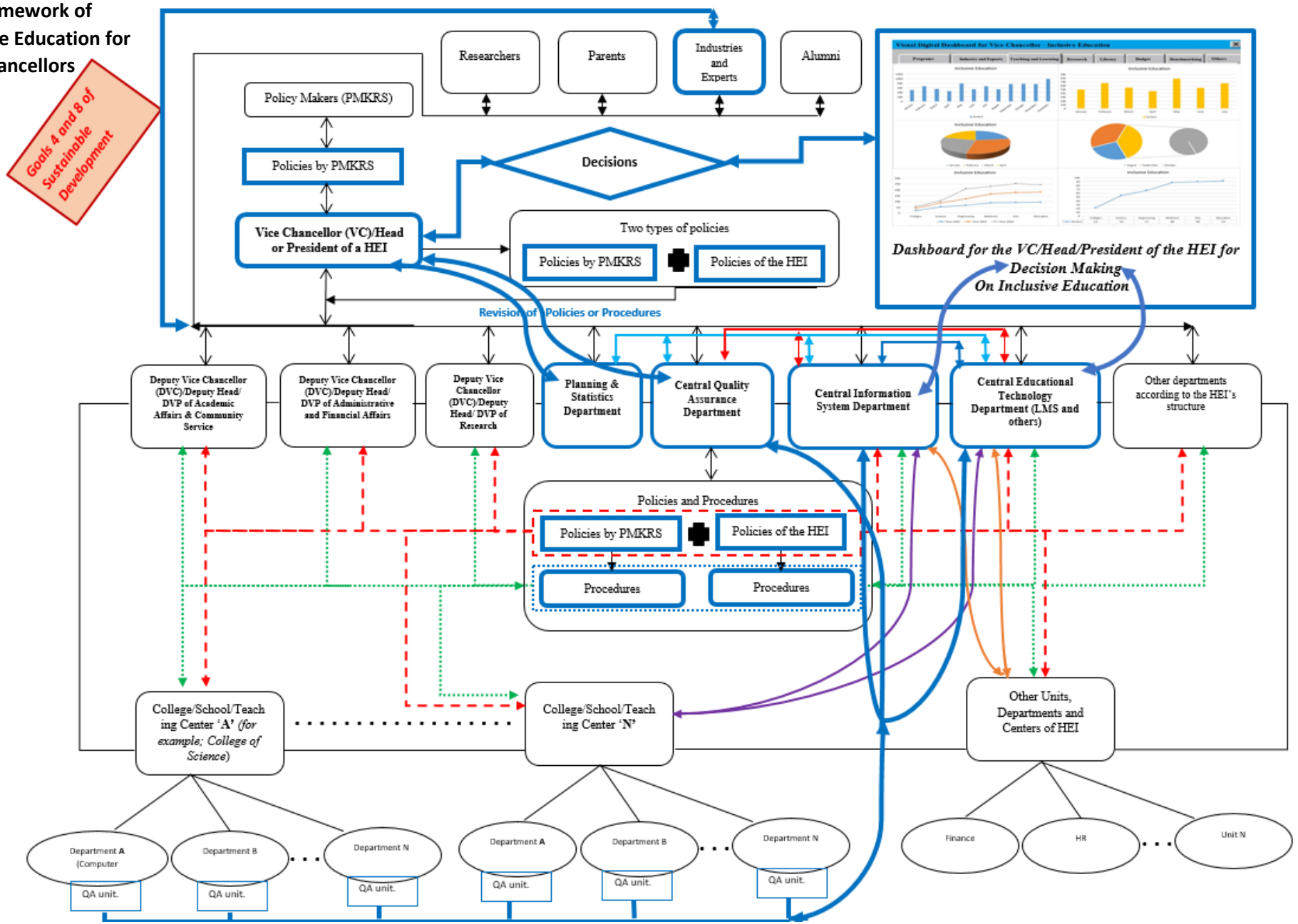


Figure 4. The Framework adopted from Ahmad (2022) and adapted for inclusive education based on goals 4 and 8 of UN's General Assembly for Sustainable Development

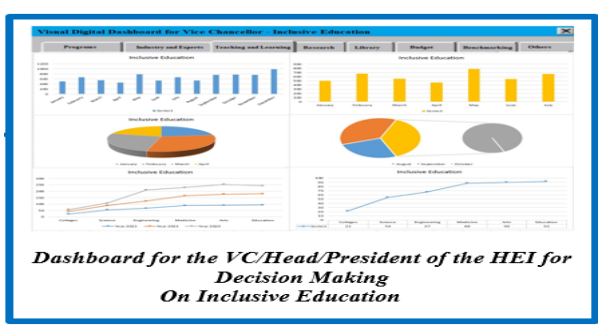
There are many tabs on the framework of inclusive education (figure 4) under the 'Dashboard for the VC/Head/President/ of the HEI for Decision Making on Inclusive Education'. All the tabs have comprehensive details of KPIs at the left side of figure 5, those would produce graphs, charts, trends, comparison tables and other stuff through the offered visual digital dashboard to the vice chancellor for effective decision making.

There are two type of policies used by any university; first type is developed by the policy makers for implementation purposes and second type is developed by the university, itself. Every policy has a procedure or set of procedures. Policy (policies) and procedure(s) could be revised keeping in view the outcomes of KPIs achieved through the visual digital dashboard of decision making, until the expected outcomes get achieved. Vice chancellors can make decisions and send recommendations to the policy makers to revise a policy or request linked stakeholders to revise the policy or/and linked procedure(s) until the required outcome is accomplished for any KPI. The structure of this framework is based on standard names; any university can include the names of its departments and adopt internal structure based on its in-house arrangements.

KPIs for meeting the goals 4 and 8 of sustainable development and performance improvement of the HEI.

Reports, flowcharts, graphs and trends of each department, unit and school/college, industry, stakeholder, linked to the HEI towards disability-inclusive education (related with special need male and female students), including comparisons, historical analysis, percentages, averages, maximum, minimum, count, total, surveys feedback and others for the following KPIs ***(the terms 'special need students' and 'disable students' used in this table have similar meaning and refer to disability-inclusive education; moreover, as disability-inclusive education indicates towards inclusion, therefore, these KPIs (in addition to basic needs) are applicable for both: 'disability-inclusive' and 'formal' university students, as and where required)*****:**

Teaching and Learning for inclusive education (related with special need male and female students)	
▪ Achievement of special need students.	▪ Special need students' retention rates.
▪ Learning classroom attendance percentage.	▪ Special need students' dropout rates.
▪ Percentage of learners' graduation.	▪ Average CGPA of special need graduates.
▪ Satisfaction of instructors.	▪ Accreditation of inclusive educational programs.
▪ Staff to student ratio.	▪ Academic program review and self-evaluation reports on inclusive education.
▪ Number of enrolled students (full time/part time).	▪ Inclusive education plan's implementation
▪ Male and female students' ratio. Overall, equal opportunities for special need male and female students.	▪ Staff satisfaction with offered services on inclusive education by the HEI.
▪ Overall special need students' performance (CGPA) for each department of all the schools/colleges of the HEI.	▪ Staff satisfaction with teaching and learning towards inclusive education.
▪ Overall average CGPA of special need students at the HEI.	▪ Students' satisfaction with offered services on inclusive education by the HEI.
▪ Overall comparisons of CGPA with previous terms/semesters/years.	▪ Students' satisfaction with teaching and learning towards inclusive education.
▪ Augmented reality, virtual reality, mixed reality text to speech and speech to text teaching and learning solutions for special need students.	▪ Inclusive teaching strategies and modified tests and examinations for special needs inclusive instruction.
Research	
▪ Research on inclusive education; problems and solutions by researchers.	▪ Technical reports written by special need students
▪ Papers published in peer reviewed journals by special need students (per department and school/college).	▪ Research projects funded by the university for special need students.
▪ Papers presented at international conferences by special need students.	▪ Research projects funded by external sources for special need students.
▪ Books publication by special need students by each department and school/college.	▪ Comparative analysis of research done by special need students (journal papers, conference presentations, books, book chapters and others) with previous years for each department and each school/college of the HEI.
▪ Book chapters published by special need students.	▪ Community services performed by special need students: research based editorial services, holding of honorary positions, such as journal editors, associate editors and reviewers. Conference session chairs, moderators, memberships of boards and international committees, guest lectures, keynote speakers, patent registrations, letters to editors and others.
Library	
▪ Number of books available, and issued per term/semester/year to special need students.	▪ Papers/books/articles read through digital library by special need students.
▪ Types of books/materials available for special need students, including: audio books, sign language videos, braille books and other resources.	
Industry and Experts	
▪ Feedback from linked industries about their requirements and inclusive employment opportunities	▪ Recommendations from industrial experts on the revisions of inclusive educational programs.



Reports of Main KPIs – Inclusive Education

-Detailed Dashboard on Inclusive Education-
Presented to the Vice Chancellor of the University

(A distinct view of particulars via different tabs for each title of the KPI.)

Dashboard articles are produced by the Central Information System and Central Educational Technology departments of the HEI, with reference to the framework given in figure 4.These departments produce detailed comparisons through tabs for each title of the KPI, and detailed information to the items (given at the left side under each KPI or at the end of the list for main KPIs), as follows: 'Teaching and Learning for inclusive education (related with special need male and female students)', 'Research', 'Library', 'Industry and Experts', 'Budget', 'Programs', 'Benchmarking', 'Risk Management', 'Parents' Feedback', 'Strategic Plan', 'International Collaborations', 'Extra-Curricular Activities', 'Disability Inclusive Infrastructure for Special Need Students', 'Hospital and Medical facilities for special need students', 'Security and Legal Rights Provision to Special Need Students', 'Offered Health Services for Special Need Students', 'Internal Audits and External Audits on Inclusive Education', 'Housing, Accommodation Facilities and others for special need students', plus, 'Any other Report on Inclusive Education towards special needs…as Per the Requirements of the University'.

Reports, graphs, flowcharts, trends, tabular comparisons and other objects could be created from connected data sets of the KPIs or from data silos - through Crystal Reports, Jasper Reports, Tableau, Power BI or any other program.

Future forecasts and estimates can be provided through Azure Machine Learning platform or by any other Machine Learning software.

(including people with disabilities) without gender differences.	
▪ Feedback of Industries about offered educational Programs.	▪ Alumni (special need students) feedback from industries (real-world environments)
Budget	
▪ Budget allocations for inclusive education (special needs).	▪ Budget deficit (special needs).
▪ Budget lapse (special needs).	▪ Budget utilization (special needs).
Programs	
▪ Current and previous rankings of all the programs towards inclusive education (academic reputation): like Preparatory Programs, Arts and Humanities, Engineering, Medicine, Science and others.	▪ Curriculum innovation towards inclusive education focusing on lifelong learning.
Benchmarking	
▪ Local and regional benchmarking on inclusive education (special needs).	▪ International benchmarking on inclusive education (special needs).
Risk Management	
▪ Mitigation plans for issues linked to special need students.	▪ Trainings of staff on inclusive education for special need students.
Parents' Feedback	
▪ Feedback of parents on inclusive education towards special needs.	▪ Parental awareness programs/trainings and their feedback towards special needs.
Strategic Plan(s)	
▪ Status of strategic plan's implementation on inclusive education towards special needs (male and female), at each department and school/college of the HEI.	▪ Number/Percentage of disabled employees at each department and school/college of the HEI.
International Collaborations	
▪ MOUs or agreements signed by the HEI with other organizations on inclusive education towards special needs.	▪ Memberships in international societies, groups or communities of special need students.
Extra-Curricular Activities	
▪ Plans and implementation of extra-curricular activities for special need students.	▪ Events for special needs students; sports activities, competitions, events.
Disability Inclusive Infrastructure for Special Need Students	
Disability inclusive infrastructure for special need students, [based on famous Universal Design for Learning (UDL) approach (to accommodate individual learning dissimilarities) to deal with special needs students as explained by Gronseth and Dalton (2020) and Morin (n.d)], including literature and items from Sandoval (2022), Wintemute, (2022), National association of the deaf. (n.d), Speech and communication aids, (n.d.), All. (n.d.), Hearing aids, amplifiers and accessories (n.d.) as follows: visually impaired students through volunteers to support them in reading materials, notes taking, examinations, provision of auditory software by the university, white canes, smart canes, finger readers, page magnifying lens devices, talking clocks, big vision magnifying glasses, BrailleNote/Notetaker devices, portable text-to-braille converters, text to speech converters, ChatGPT based feasible solutions, web based solutions, LMS solutions; CART (Communication Access Real-time Translation) services for deaf and hard-of-hearing learners, assistive listening/hearing aid devices, signers/sign language interpreters, peer-buddies/trained (training of) peer buddies (paid and volunteers) and rewards and awards for learners and stakeholders. In addition, provision of ramps, rails, special toilets, tactile walkways, inclusive building entrances, car parking, wheel chairs, disability-inclusive roads, wheel chair accessible vans and busses, walking frames, rollators, elbow crutches, sitting arrangements and accessibility in classrooms, libraries, computer laboratories and cafeterias, braille labelled cans and stuff in cafeterias and grocery shops, application of large fonts in classroom presentations, exams, non-verbal communication boards and cards, social awareness strategies (empathy) and any other related facilities required for disability inclusive infrastructure according to the needs of the university.	
Hospital and Medical Facilities for Special Need Students.	
Security and Legal Rights Provision to Special Need Students.	
Offered Health Services for Special Need Students.	
Internal Audits and External Audits on Inclusive Education.	
Housing, Accommodation Facilities, Stores, Maintenance, PR and Procurement support for special need students.	
Any other Report on Inclusive Education towards Special Needs…As Per the Requirements of the University.	

Repeated revision(s) of the policy (policies) or/and procedure(s) or both (if required) based on the outcomes of visual digital dashboard.

-Decision Making on Inclusive Education (Goals 4 and 8 of Sustainable Development)-

Repeated revision(s) of the HEI's policy (policies) or/and procedure(s) on inclusive education related with main KPIs or supporting areas by the 'Central Quality Assurance Department' in combination with 'Planning and Statistics Department', 'Industries and Experts', 'QA Units of all departments' and other stakeholders (if required to improve the performance or advancement towards expected outcomes) of the HEI based on the structure given in figure 4. After revision(s), the next cycle is comparison of outcomes of reviewed policy (policies) or/and procedure(s) or both. The Vice chancellor can send recommendations to the policy makers for the policy revision(s), or ask for further revision(s) of the policy (policies) or/and procedure(s) at the HEI, requesting the staff of related departments (figure 4), if required; it is a repeated process of improvement and decision making through the involvement of all the key stakeholders, including: 'Head of Educational Institution', 'Staff (Teaching and Administrative)', 'Linked Departments', 'Special Needs Students', 'Parents', 'Researchers', 'Policy Makers', 'Industry and Experts', 'Alumni' , until expected outcomes are achieved.

Figure 5. Details of Visual Digital Dashboard for Inclusive Education shown in figure 4

5. Conclusions and Future Work

The practice of education is centered on transfer of knowledge and skills to the students. Disability-inclusive education refers to the inclusion of students with disabilities along with other students in formal classrooms. The General Assembly of United Nations Member States had acknowledged the agenda based on 17 goals of sustainable development for the year 2030 that emphasizes on "leaving no one behind". These SDGs particularly include people with disabilities; and dealing with disability is directly considered in goals: 4, 8, 10, 11 and 17. It has requested all the countries around the world to immediately act on all the SDGs.

Educational institutions of all levels can play an important role towards this call; vice chancellors/presidents/heads of universities can play a substantial role towards the inclusion at tertiary level of education for students with disabilities and contribute to first two goals: 4 and 8. Goal 4 is associated with operational inclusive learning environments via inclusive education that includes students with disabilities, without any gender differences (including male and female students with disabilities) aiming towards lifelong learning strategies. Goal 8 is linked to inclusive and sustainable economic growth (counting persons with disabilities) with parallel and decent working provisions without any gender discrimination.

The success rate of business intelligence software is very low, implementation is time consuming and price is very high; moreover, human involvement and intelligence is required towards successful accomplishments of required outcomes. Therefore, there is a need to solve these issues with successful outcomes; this framework of inclusive education is a solution of these problems.

Vice chancellors can use the offered framework of inclusive education in this paper through visual digital dashboard of decision making to support students with disabilities through inclusive educational environments without any gender discrimination. There is a list of research centered key performance indicators, given at the left side in figure 5 that can be used for visual digital dashboard for vice chancellors to generate reports, flowcharts, displays and trends of every department, unit and school or college, industry and other stakeholders those are connected to the university for supporting the inclusive education. This visual dashboard offers evaluations, historical comparisons, percentages, averages, information about maximum and minimum values, count, total and responded feedback of surveys for the given KPIs. The terminologies of 'special need students' and 'disable students' used in this paper have same meaning and point towards disability-inclusive education; likewise, as disability-inclusive education states about inclusion, consequently, this framework and most of its KPIs

and sub areas can also be used for 'formal' university learners, as applicable according to their necessities. VCs are offered with the visual digital dashboard of decision making by the central information system and central educational technology departments of the university that is based on the revision of policy (policies) or/and linked procedure(s) with any KPI, until the expected outcomes are achieved; the KPI can be compared with previous outcomes and might be compared with national, regional and international benchmarks, whatever is available. A policy is a set of instructions for an action endorsed by an authority that is obligatory to be followed by concerned stakeholders, and a procedure is a way that interprets how a policy is tracked and practiced through different phases or stages. If an outcome of the policy does not provide expected effects then the policy or linked procedure(s) is/are required to be revised, until the estimated outcomes get achieved, and these revisions result in effective decision making. Therefore, the vice chancellors can request revision(s) for the underperforming policy (policies) or/and procedures(s) from a concerned department(s) of the university, or send recommendations to the policy makers to revise the policy (policies).

Following KPIs along with sub areas in bulleted items (given at the left side in figure 5) are required to be considered by the VCs for policy (policies) and/or procedure(s) revision (s), as and when required:

'Teaching and Learning', 'Research', 'Library', 'Industries and Experts', 'Budget', 'Programs', 'Benchmarking', 'Risk Management', 'Parents Feedback', 'Strategic Plan(s)', 'International Collaborations', 'Extra-Curricular Activities', 'Disability Inclusive Infrastructure for Special Need Students', 'Hospital and Health Services', 'Security/Legal Affairs & Rights', 'Internal and External Audits'. Moreover, other areas and sub areas; particularly, (in addition to given KPIs) concentration is required on sub areas of 'disability-inclusive infrastructure for special need students' (for policy (policies) and/or procedure(s) revision (s)) towards the facilitation of visually impaired and blind learners through: volunteers or paid helpers to support reading, taking notes, taking specialized tests and exams and provision of auditory software by the university. In addition, provision of white canes, smart canes, finger readers, page magnifying lens devices, talking clocks, big vision magnifying glasses, Notetaker or BrailleNote devices, handy text-to-braille converters, text to speech converters, ChatGPT based feasible solutions (voice input and output, read aloud solutions), web based solutions and LMS based solutions. Furthermore, provision of Communication Access Real-time Translation (CART) services for deaf and hard-of-hearing, assistive listening devices, signers or interpreters of sign language, peer-buddies, trained (training of) peer-buddy

volunteers and funded individuals. Likewise, rewards and awards for special need learners, volunteers and other stakeholders to increase the motivation are required to be instigated. Moreover, availability of ramps, rails, inclusive toilets, tactile walkways, disability-inclusive entrances to the buildings, inclusive parking lots, wheel chairs, inclusive roads, specialized vans and busses for wheel chair accessibility (easily approachable and accessible wherever required in the university), walking frames, rollators and elbow crutches. Besides, disability-inclusive classrooms, libraries, computer labs, canteens, braille labelled items in canteens, grocery shops, medical stores, usage of large fonts in the lectures and presentations, inclusive assessments, inclusive display boards, non-verbal communication cards and boards, strategies of social awareness towards emotional and cognitive empathy and other related facilities are required to be delivered according to the requirements of inclusive education at the university.

Central quality assurance department, quality assurance units of all the departments (connected with teaching and administrative staff), planning and statistics department, central information system department, central educational technology department, industries and experts and other key stakeholders play a decisive role in the implementation of inclusive education; consequently, the vice chancellor of the HEI makes effective decisions towards disability-inclusive education through visual digital dashboard. Quality assurance units of all the departments along with teaching and administrative staff have to include ABC of inclusive education and universal design for learning towards the successful implementation of disability-inclusive learning environments. Policy makers, heads of educational institutions, instructors, administrative staff, learners, parents, researchers, alumni, linked industries and industrial experts related to the specialization(s) of the university are key stakeholders of an educational system. All the above mentioned departments along with key stakeholders and resources have to contact the linked industries, alumni and experts, those would help in drawing a clear picture of the future requirements for the male and female students with disabilities with reference to the job market; as a result, inclusion will come up with effective and sustainable educational environment at the university, along with inclusive curriculum and constructive future outcomes those will help students with disabilities to get decent jobs in the industry without gender discrimination.

Dear vice chancellors/heads/presidents of universities, what are you waiting for? The framework of disability-inclusive education is in your hands. Use this framework to help the students with disabilities at your universities, improve the overall performance through effective decision making, and answer the call of the General Assembly of United Nations

through accomplishing the goals 4 and 8 of sustainable development; and change this world. As a future work, substantial KPIs along with bulleted items for disability-inclusive education, given at the left side in figure 5 could be developed by the central information system department as software modules for the visual decision dashboard of effective decision making for vice chancellors, working within the given framework.

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