TRAINING MANUAL ON
TVET CURRICULUM DEVELOPMENT
ENSURING 21ST CENTURY SKILLS

PREFACE

This training manual entitled "TVET Curriculum Development-Ensuring 21st Century Skills" is a guiding document to plan, prepare, and implement this program for trainers who are involved in occupational analysis and curriculum development fields. This program is extremely important for those who wish to learn the techniques on how to integrate different components like greening skills, entrepreneurship skills, IR 4.0 etc. in to the TVET curriculum apart from 21st century skills.

It is prepared with the contents collected from different documents and especially designed to support trainers/instructors in practical and easy way to conduct this course.

It is developed in a way that it has step by step process of conducting this course as well as training contents, which makes the target users an easy reference and it handy to carry any place. It is a dynamic document and a trainer/facilitator can modify or amend this manual as per the need of present time and technology & methods enhancement.

It is also important to mention that this manual could be modified because the content should match with current country and TVET institutes' context and realities.

This training manual only does not guarantee the success of the training since the delivery of the contents and management of the activities depend on the implementer of the training program, However, this document can provide clear, concise and informative strategies that were adopted from CPSC's own experience on the subject as well as from my own knowledge and expertise.

As CPSC successfully implemented this course in the past, this is a testament of CPSC's continued commitment to provide a simple, applicable and innovative publication that is targeted to increase the skill and knowledge of its participants. I hope that this manual will be useful to the targeted audience and will fulfill its intended purpose and may you be able to find value and reasons for its use and dissemination.

Best of luck!

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ACKNOWLEDGMENTS

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INTRODUCTION

The There are different names given to 21st Century skills such as employability skills, basic skills, life skills, transferable skills, soft skills, and core skills etc. These are divided into three categories (Applied Educational System, n.d.):

Figure 1: 21st Century Skills. Source: Applied Educational System (n.d.)

1. Learning Skills (the 4 C's) – these skills teach students about the mental processes required to adapt and improve upon a modern work environment

2. Literacy Skills (IMT) – these skills focus on how students can discern facts, publishing outlets, and the technology behind them. There's a strong focus on determining trustworthy sources and factual information to separate it from the misinformation that floods the Internet.

3. Life Skills (FLIPS) – these skills take a look at intangible elements of a student's everyday life. These intangibles focus on both personal and professional qualities.

These skills are intended to help students keep up with the lightning-pace of today's modern markets. Each skill is unique in how it helps students, but they all have one quality in common. The Figure 1 below captures the skills in each category of learning, literacy, and life skills.

FRAMEWORK FOR 21ST CENTURY SKILLS

The framework for 21st Century Learning was designed and developed in collaboration with teachers, education experts, and business leaders to clearly describe and visualize the skills and knowledge learners need for long-term development and success in work, life and citizenship, as well as the support systems necessary for 21st century learning outcomes. It has been used by thousands of educators and hundreds of schools to put 21st century skills at the center of learning (Rex Publishing, 2018).
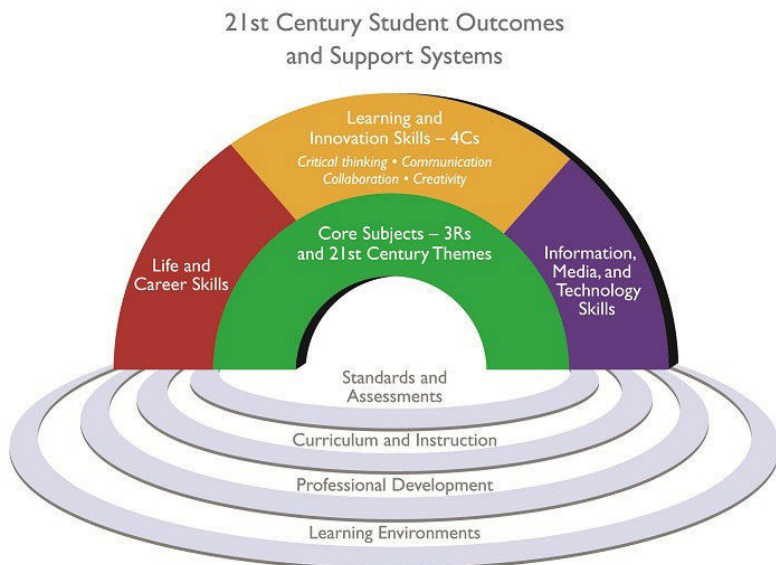
Figure 2. Framework Partnership for 21st Century Skills. Source: Rex Publishing (2018).

21ST CENTURY OUTCOMES

T21st Century Outcomes (represented by the rainbow) are the skills, knowledge and expertise learners should master to secure their success in continuing education, work and life in the 21st century.

CONTENT KNOWLEDGE AND 21ST CENTURY THEMES

The mastery of fundamental subjects and 21st century themes is essential for students in the 21st century. Disciplines include: reading, language, arts, mathematics, economic, science, global awareness, civic literacy, health literacy, and environment literacy.

21ST CENTURY SUPPORT SYSTEMS

These elements are the critical systems necessary to ensure student mastery of 21st century skills. These include standards, assessments, curriculum, instruction, professional development and learning environments. These must be aligned to produce a support system that produces 21st century outcomes for today's students.

OBJECTIVE OF TRAINING MANUAL

This training manual is developed with intention to guide trainers to conduct training about the TVET curriculum development to ensure the mastery and knowledge of 21st century skills. It is envisaged that the trained curriculum developers will be able to ensure 21st century skills in the TVET curriculum.

CONTEXT OF THE TRAINING

In the TVET sector, there is a high demand of experts that will instrumental in integrating cross-cutting issues like 21st century skills, greening skills (Education for Sustainable Development), technopreneurial skills, and Industrial Revolution 4.0 components into the TVET curriculum. There is also the need to revisit the curriculum and revise or review, if necessary.

This training helps to meet the demand for those types of activities. These are extremely important for the TVET students to be able to meet the labor market demand of 21st century workforce and sustain the employment. The curriculum developers, trainers, facilitators, and development professionals from the government/private TVET institutions, and others companies, will be benefited from this training program.

TRAINING PLAN

A training plan is tool to look ahead program implementation and answers the following questions:

- What content will be delivered?
- Who delivers the training?
- When it is going to takes place?
- Will it be face to face or on-line?
- Where will be the training venue?
- What the participants will be doing during the training?
- Will there be any study visits and social activities?

The Training plan encompasses other training elements such as the following:

- Training design
- Goals, objectives
- Intended outputs,
- Training strategies/approaches

The training plan also includes the information on logistical arrangements, day to day training activities, resource persons, training coordinator, course evaluation, participants' evaluation, and certification requirements.

DRAFTING THE TRAINING DESIGN

The training design gives overall looks of the training and it is a foundation for the successful training implementation. It sets the pace of training implementation (e.g. will it be face-to-face instruction? in a classroom, lab or workshop? or on-line course or blended learning approach?).

It is usually based on training plan. It is a guide for a trainer and participants also follow the design. The design helps in resource allocation and time management

in while implementing the program. An example training design is provided in the table below:

Table 1: Sample training design

Training name	TVET Curriculum Development Ensuring 21st Century Skills
Goal	Produce curriculum experts who can integrate 21st Century Skills in to the TVET Curriculum
Objectives	Understand concept of 21st century skills
	Internalize curriculum development processes, methods, elements, and types
	Develop curriculum framework incorporating 21st Century Skills
	Be familiar with ICT & digital technology to develop curricula
Duration	5 days
Target group	TVET professionals, facilitators, trainers, curriculum development specialists
Group size	20/100 participants
Instruction mode	Classroom instruction/ On-line

TRAINING APPROACH

The training approach is based on learning strategies and active participation that all the participants are required to do during the program time.   A participatory approach is applied in the training to make instruction two ways and not only trainer-centered.

The following participatory methods are utilized which are as follows:

- Sharing of experiences, cases and real life incidences
- Working in a team/individual on practical tasks, projects and cases
- Asking open ended questions and using probing techniques
- Encouragement for the reflective learning and sharing
- Mind relaxing games/Energizers/Ice-Breakers

ROLE OF TRAINER/FACILITATOR

A trainer plays a vital role in making the training environment active and participants active and participatory. He/she is responsible to make the training successful and achieve the objectives and learning outcomes of the training. Some major roles of a trainer is provided below:

- Prepare training materials like visuals, assignment sheets, program book, training manual, presentations etc.
- Provide different TVET curriculum examples and cases for learning
- Conduct training in lively manner and make it participatory
- Provide different countries curriculum frameworks
- Provide clear and concise concepts and definitions
- Be a role model in conducting training program
- Conduct final exam and program evaluation
- Prepare program report and propose recommendations for the improvements

METHODS USED IN THE TRAINING

Some of the recommended methods in conducting this training on DACUM workshop facilitation are brainstorming, interactive lecture, group work, simulation, questioning, energizers/icebreakers and others. However, implementers are free to device their own strategies depending on the objectives of the training (Lamichhane, 2018).

BRAINSTORMING

It is a technique to get ideas and information from the group. During training, the trainer can start by asking the participants about their understanding of the basic concepts until concrete ideas are formed. A detailed discussion of the process is shown in figure 2.
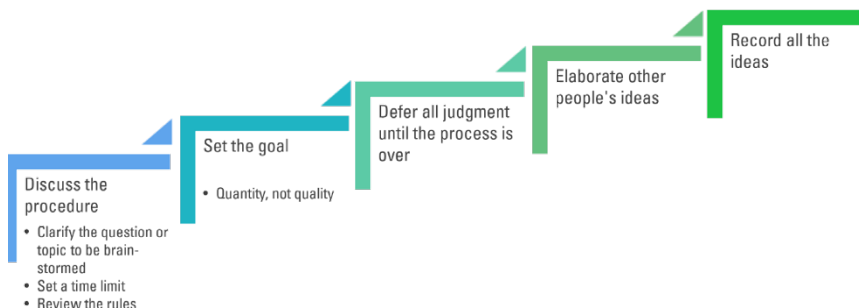
Figure 3: Brainstorming Process. Source: Lamichhane, R. H. (2018).

INTERACTIVE LECTURE

An interactive lecture is an oral and visual presentation intended to present information or teach people about a particular subject. It is useful to apply for knowledge delivery part. In this training interactive lectures are used to convey the following information to the participants and includes the following elements:

1. Background
2. Concepts
3. Elements
4. Examples
5. Critical information
6. Trends
7. Principles
8. Process,
9. Other relevant information on DACUM method.

GROUP/INDIVIDUAL WORK

The best way to explore innovation in learning is through group work. It is an effective method in imparting knowledge, skills and attitudes to a large number of participants. In order to

maximize its benefits, the trainer can explore assigning a project task for two or more participants in one group. They can create an action plan, project proposal development, assessment of project or initiatives, or other possible interventions. As it is a group activity, the trainer has to ensure that the contents of the outputs will be applicable to all trainees (Lamichhane, 2018).

ICE BREAKERS/ENERGIZERS

An ice breaker is an activity, game, or event that is used to physically motivate the participants to listen and participate by warming up the conversation or introduce stretching exercises that are simple but fun. Ice breakers are "any event that requires people to comfortably interact with each other and a trainer is an opportunity to use an ice breaker". (Heathfield, 2017).

The first type of ice breaker is just for fun. When participants know each other, laughter and conversation generated by the ice breaker, warm up the group. When participants are strangers, the ice is broken and participants learn something about each other.

The second type of ice breaker introduces or segues into the topic of the training session or meeting. It might also generate laughter and conversation, but its clear purpose is to open up the topic of the session. An example of this type of ice breaker is asking the group to identify the characteristics of their best team experience to introduce a session on team building. Here are additional formats that you can use.

The third type of ice breaker is an activity based on the purpose of the session. For example, a group of participants can demonstrate the worst or best case of practices in an institute, organization or method.
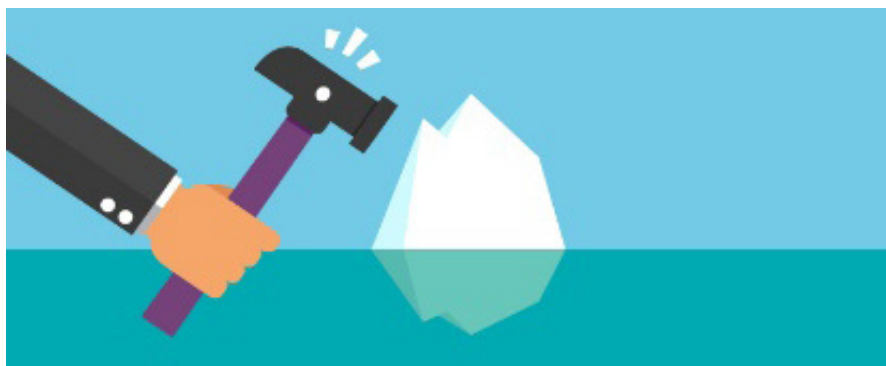
QUESTIONING

Questions are used in the training to provoke thought, retrieve prior learning, involve a participant and check the understanding of the subject matter. In this program, a resource person leads a discussion by using questioning technique. During the training, participants are encouraged to ask the questions during the presentations and after the presentations.

PROJECT WORKS

Project work is an activity that allows the students to apply learned or existing multiple skills and they need to study, do research and find reference materials to complete the project tasks. The Project works progresses under the guidance and monitoring of a resource persons. This training program encompasses four project works and they graded as well.

OTHERS

Based on the context, resource persons can use other methods such as fish bowl, panel discussion, debate, experience sharing, role play, case studies, videos, on-line discussion etc.

PROGRAM BOOK FOR TRAINING

The program book is the first document prepared for the training program at the CPSC. It is known as a training/program plan. This is due to the fact that all the program materials development depends on it. It is an outline of the training program which serves as a guide for the participants, and to those who are involved in the program. It encompasses information on background of program, objectives, intended outputs, program activities, IPO model, schedule, details about the resource persons, and theme papers.

COMPONENTS OF THE PROGRAM BOOK

INTRODUCTION

Technical and Vocational Education and Training (TVET) must properly prepare their students to live and work in the 21st Century. This preparation includes providing students with important skills needed in 21st Century. Thus, this is very important to make the 21st century skills integral part of TVET curricula. TVET must put great efforts to improve the skills of the 21st century to produce graduates of quality TVET program aiming for high employability. The effect of the change of program that often occurs have an impact on students and teachers because of the quality of the produced graduates who cannot meet the current needs of the job market. TVET graduates quality and innovation ecosystems can be achieved through increased technological innovation skills among TVET graduates.

OBJECTIVES OF THE PROGRAM

At the end of the program, the participants will be able to:

- Understand concept of 21st century skills
- Internalize curriculum development processes, methods, elements, and types
- Develop curriculum framework incorporating 21st Century Skills
- Be familiar with ICT & digital technology to develop curricula

TRAINING CONTENTS

The training program covers the following important concepts and chapters:

Theme Paper 1: TVET for the Global Competitiveness: Ensuring 21st Century Skills

This theme paper covers broad concepts like role of TVET in the global competitiveness, challenges of TVET programs, importance of 21st century skills, key components of 21st century skills, and TVET curriculum for 21st century.

Figure 3: Essential skills for 21st century: Source; Lamichhane, R. H. (2020).

Theme Paper 2: Concept of Curriculum and development process

This part covers the definition, types, and elements of curriculum, and conventional & competency-based curriculum development processes.

Curriculum Development Process

Step 1.
Application to the Council to develop Competency Based Curriculum (Attach Training Needs Assessment Report)

Step 2.
Job/Occupation Analysis by Experts selected by Sector Skills Advisory Committee (SSAC)

Step 3.
Verification of Job/Occupation Analysis report by Experts different from those who drafted the report

Step 6.
Packaging of competency based curriculum by accredited curriculum developers from occupational standards

Step 5.
Packaging of Occupational Standards by curriculum development committee from task analysis report

Step 4.
Task Analysis by Experts under the guidance of a curriculum developer

Step 7.
The Council evaluates the draft curriculum against curriculum development guidelines

Step 8.
Sector Skills Advisory Committee presents the draft curriculum to stakeholders for validation.

Step 9.
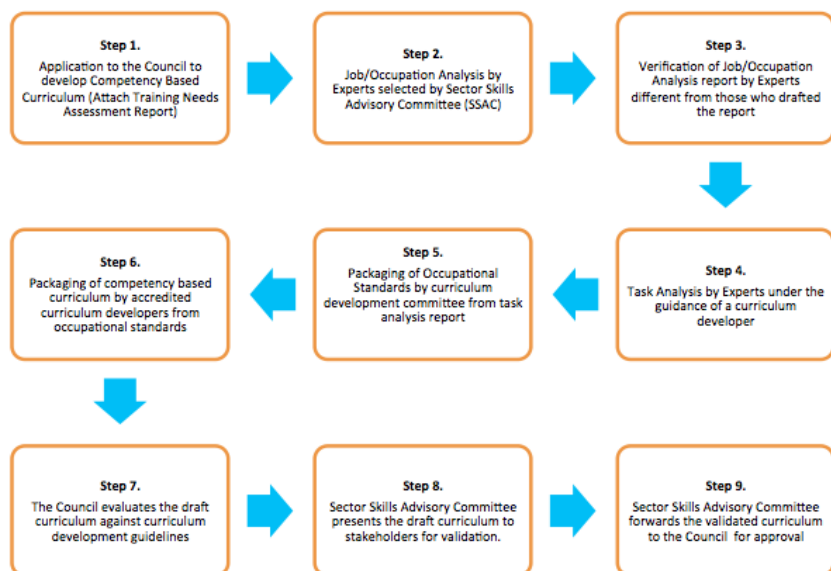Sector Skills Advisory Committee forwards the validated curriculum to the Council for approval

Figure 4: Curriculum development process Source: TVET Curriculum Development Assessment and Certification Council (2016)

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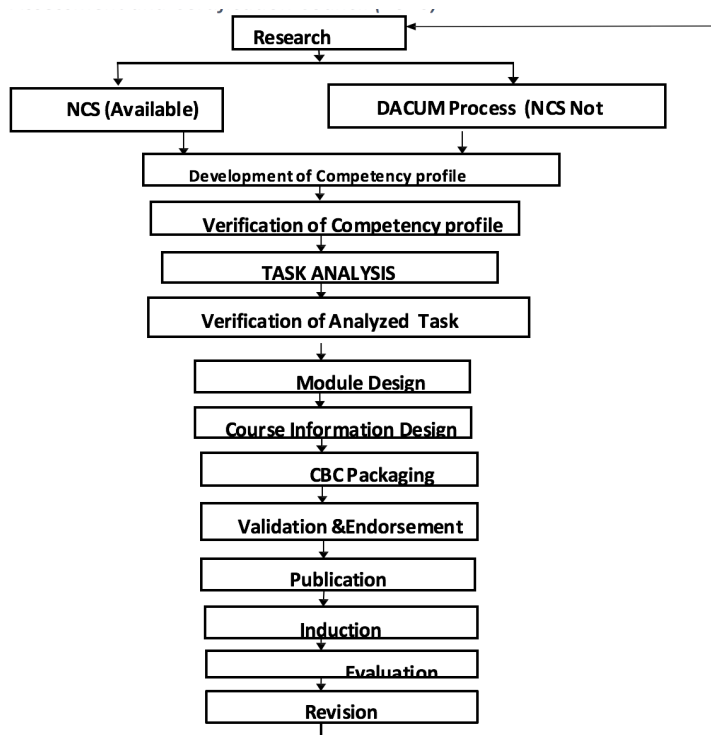
Figure 5: Competency-based curriculum development process. Source: Department of Technical Education, Ministry of Labor and Human Resources, Bhutan (2018).

Theme Paper 3: Effective Methods of Curriculum Development

This theme paper deals with the definitions of curriculum development, methods, models, curriculum planning and structuring, and various methods of curriculum development. Few example models are given below:
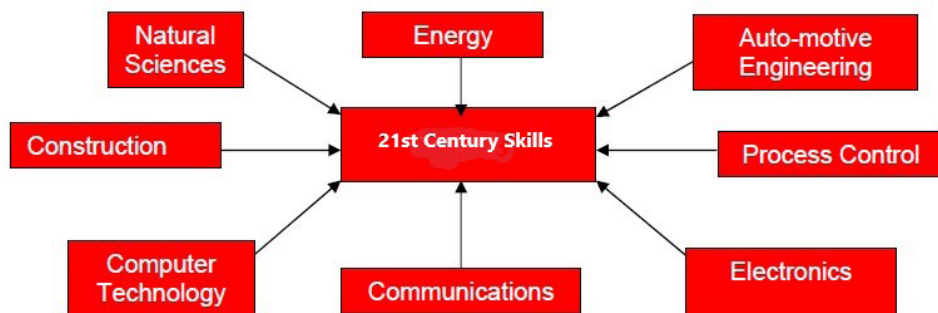
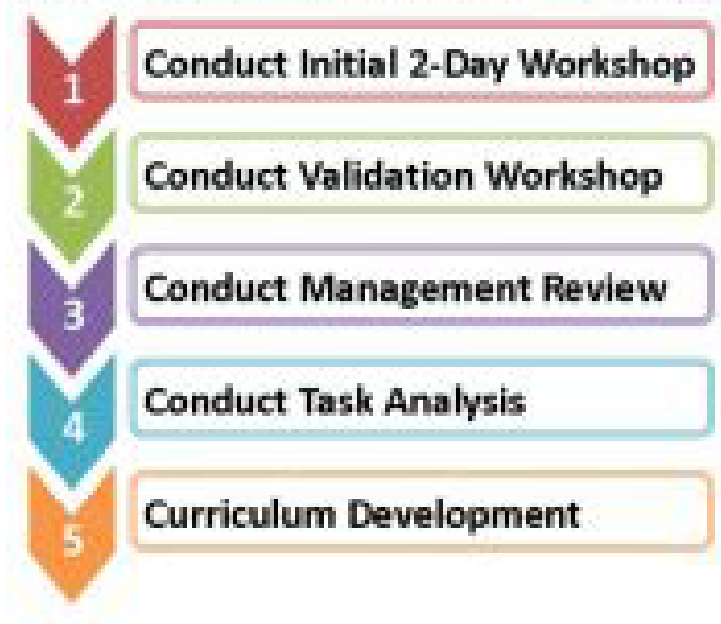Figure 6: Hungerford diffusion model. Source (Majumdar, 2009).

Figure 7: Steps in the DACUM process. Source: Eastern Kentucky University (2009).

Theme Paper 4: Innovations in Curriculum Development

This theme paper deals with course development process, conducting virtual DACUM workshop, and ICT tools to develop on-line courses, and learning management system. Demonstration on developing courses by using mobile apps and Moodle E-learning platform is provided. Participant as a project work have to develop one example course during the training time.
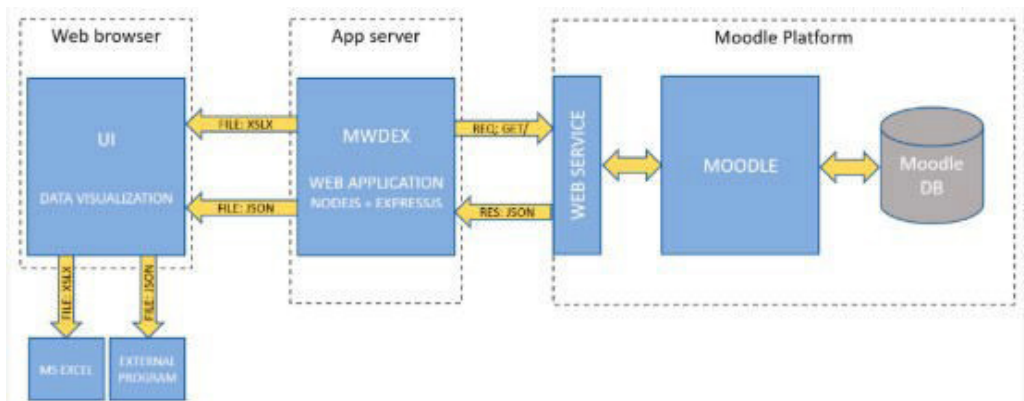

Figure 8: Moodle Process Flowchart. Source: Pelaez, Pradas, Rodriguez-Sedano &Acquila-Natale (2019).

Theme Paper 5: Curriculum Design and Framework incorporating 21st Century Skills

This theme paper provides importance of 21st century skills in TVET, ways to incorporating it into the TVET curricula, and few tips on how those skills can be delivered in the TVET institutions. Example of curriculum framework of different countries are provided to learn about the framework. Techniques on how to deliver and assess 21st century skills are provided with the six countries examples. Participants will be informed the following ways to integrate 21st century skills in the TVET curriculum:

A. 21st century skills across all the technical teaching areas like, mechanical, electrical, electronics, construction, and hotel management

B. 21st century skills as separate module

The curriculum framework is introduced below:
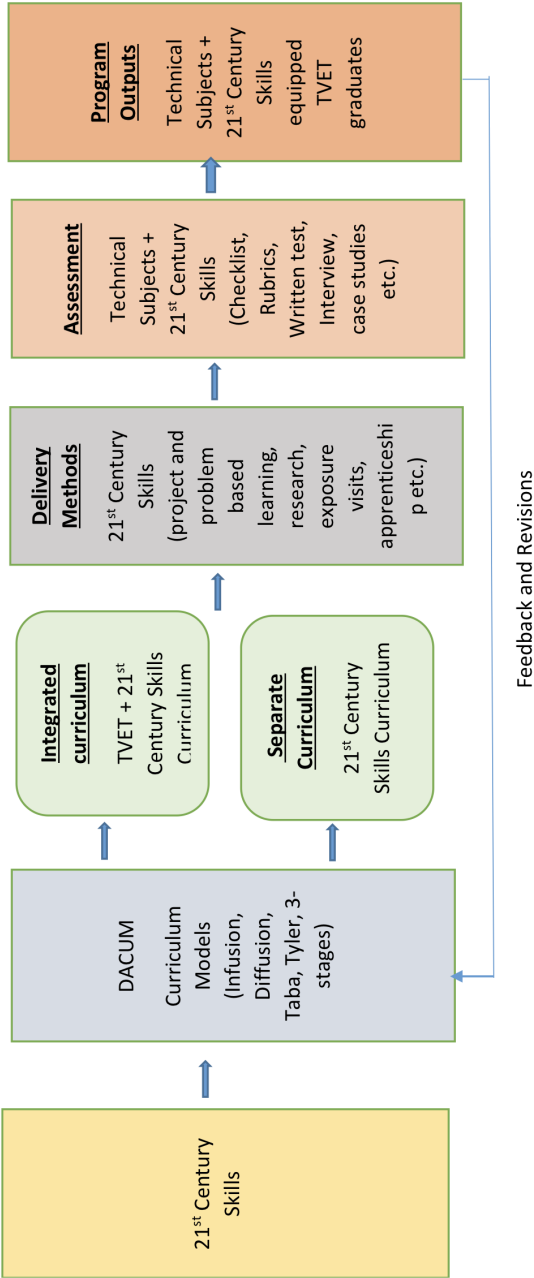

Figure 9: Curriculum Framework to Integrate 21st Century Skills. Source: Norton, R.E. (n.d.)

SCHEDULE OF ACTIVITIES

In order to organize the training program, this is the sample of the 5-day schedule of activities. This may be modified depending on the circumstances.

Table 2: Sample 5-day Schedule of Activities

Day	AM to PM			
Day 1	**Opening Program** Program Management Institute video briefer Program Orientation OnCOURSE Management	**Theme Paper 1** Ensuring 21st Century Skills for the Gloabal Competitiveness and Innovation in the TVET	**Theme Paper 2** Concept of Curriculum and Development Process **Project 1** Develop a Curriculum Structure (format) to be Adopted by TVET Institutions	
Day 2	**Theme Paper 3** Methods of Curriculum Development		**Project 2** Examine Different Methods of Curriculum Development to be Selected for the TVET Program	
Day 3	**Theme Paper 4** Innovations in Curriculum Development		**Project 3** Use ICT to Develop TVET courses	
Day 4	**Theme Paper 5** Curriculum Design and Framework Incorporating 21st Century Skills		**Project 4** Develop a Curriculum Framework Integrating 21st Century Skills	
Day 5	Input on Action Planning to Integrate 21st Century Skills to the Curriculum	Preparation of Action Plan	Presentation of Action Plans Participants' Online Exam	Program Evaluation Closing Ceremony

TRAINING PROGRAM FRAMEWORK

The training program framework depicts the connection of different inputs, activities, and outputs. It normally gives a bird eye view of the program and helps reader understand about the training program. Below, is the training program framework shown as Inputs-Process-Outputs (IPO) model:

Table 3: Sample Training Program Framework Using the Input-Process-Output Process

Inputs	Process	Outputs	Outcomes
• Resources • Resource persons • Curriculum Developers	• Conceptual Inputs (Theme paper 1,2,3,4. & 5) • Project works (PW 1,2,3, $ 4) • Active Participation • Questioning	• Curriculum Framework • Action plan to Integrate 21st Century Skills	21st Century Skills will be integrated in the revised and newly developed TVET Curricula.

TRAINING PERSONNEL MANAGEMENT

Training personnel managements refers to the information about the training coordinator, facilitator, resource person, logistic officer, and expert workers. Their names, designation, address and telephone numbers should be shared with each other so that connection can be made so that questions/queries can be answered and collaboration avenues can be identified.

ANALYSIS OF TRAINING OBJECTIVES FOR RELEVANCY, ALIGNMENT, SEQUENCE, AND EVALUATION

This is an exercise which is not a component of the program book but is essential to be done to make sure that the training program is well-prepared. Here are questions that will aid you in the analysis (Lamichhane, 2018):

1. What sequence should the objectives be achieved? Usually, learning builds on learning. It may be useful to learn certain areas of knowledge and skills before learning new areas.

2. Will the objectives achieve the overall training goal(s)?

3. What are the best learning activities to achieve the objectives?

4. Do the methods match the participants' particular learning styles?

5. Do the methods stretch their styles, too? Are the methods readily accessible? Do the methods take advantage of real-life learning opportunities?

6. Do the activities include ongoing reflections about learning?

7. The learners will benefit from regularly taking time to stand back and inquire about what is going on in the training, what are they learning and what, if anything, should be changed

8. What results, or evidence of learning, will be produced?

9. Who will verify that each of the learning objectives was reached? Ideally, the learning is evaluated by someone who has strong expertise in the areas of knowledge and skills required to achieve the training goals.

10. What costs will be associated with developing and implementing your plan?

11. Think about facilities, technologies, personnel, special expertise, etc. You may want to update the "Budget".

12. How will learners' manage time and stress during the learning?

13. Participants' evaluation can be done both pre and post program. It will help to measure the effectiveness of training programs.

COURSE/PROGRAM EVALUATION

Program evaluation is one of the key activities of the training. It is normally conducted after the training, before certificates of participation are handed out to the participants. It helps to redesign course, scheduling, apply appropriate training methodologies and assign competent resource persons. Training program evaluation can be done on training design, contents, methodologies, resource persons and logistics. A standard format for the evaluation has to be developed by the trainer and adopted by the management before implementation. The sample form is as follows (Lamichhane, 2018).

THE CLOSING PROGRAM

The closing program is conducted at the last day of the training program. It can be conducted in formal or informal setting depending upon the host organization requirement, however it is conducted in an organized and professional manner. It is designed to wrap up the training activities and give due recognition to those who have participated. Special remarks can be given by chief guest and remarks followed by participants' representative, program coordinator and lead trainer. During the closing program, certificates will be distributed as a proof of training participation to those participants who successfully met the training criteria and gained a substantial knowledge on TVET Curriculum Development Ensuring 21st Century Skills.

Table 4: Sample Evaluation form for the Training Program

Training Evaluation Form for Participants Date: Title: (Instructions: Please indicate your level of agreement by √ with the statements listed below :)					
Statement	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1. The objectives of the training were clearly defined.					
2. Participation and interaction were encouraged					
3. The topics covered were relevant to me					
4. The content was sequentially organized and easy to follow					
5. The materials distributed were helpful					
6. The learning of this training will be useful to my work					
7. The training objectives were met					
8. The time allotted for the training					
9. Training environment were comfortable.					
10. Training facilities and materials were adequate					

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Resource Person 1:					
1. The trainer was knowledgeable on training					
2. The trainer has demonstrated accurate					
3. The trainer was well prepared					
4. The trainer was humorous and joyful					
Resource Person 2:					
1. The trainer was knowledgeable on training					
2. The trainer has demonstrated accurate					
3. The trainer was well prepared					
4. The trainer was humorous and joyful					

Overall Impressions:
1. What did you like most about this training?
2. What aspects of the training could be improved?
3. How do you hope to change your practice as a result of this training?
4. What additional trainings would you like to have in the future?
5. Would you like to give additional feedback to resource persons? Please give with their name.
6. Please share other comments or expand on previous responses:

Thank you for your feedback!

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Shared Vision 2023

The Inter-governmental TVET Leader for Sustainable Development

Mission

Transforming TVET towards Sustainable Societies through
Outcome-Based Quality Training, Accreditation, Research
and Image Building for stakeholders