



WELCOME

# colloquium



**Beginning: 11 october2023**

**University of Zurich**

**2023-2024**

**Time: 16:15-17:45**

**Presentation:16:15-17:00**

**Disscusion:17:00-17:45**

**Training method : blended  
learning(Hybrid)**



## **Origin University**

Shahid Beheshti University

## **Host University**

Zurich University, Switzerland

Institute of Education



## Lead Professor

**Roland Reichenbach, Prof. Dr.**

Professor of General Education Studies



Roland Reichenbach has been a Professor of General Educational Studies at the University of Zurich, Switzerland, since 2013. His research focus and main interests are concerned with pedagogical ethics, the philosophy of education, political education as well as processes of negotiation and agreement.



## Guest Visitor

### **Khorasani Abasalt.**

Associate Professor of Higher Education  
and Continuous Education

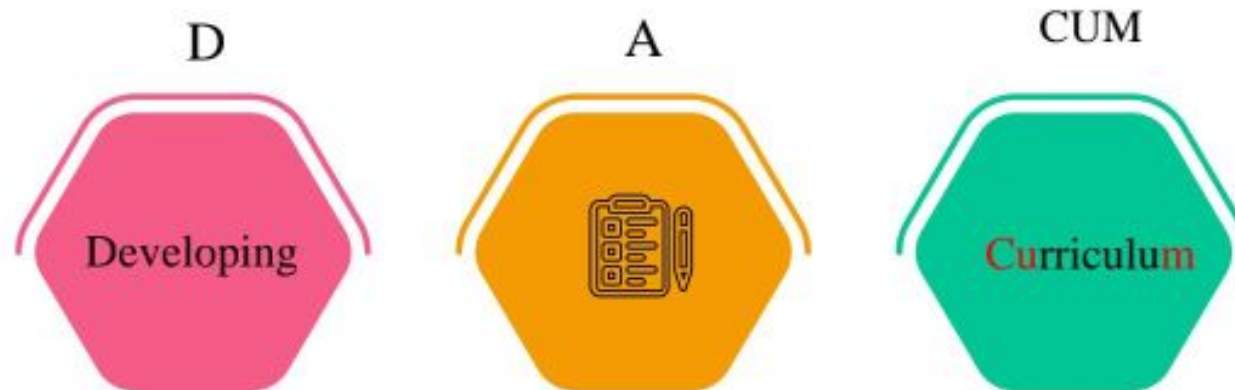


- ❑ Vice Chairman of UNESCO Chair in Management, Planning and Quality Assurance in Higher Education
- ❑ Director of Journal of Human Resource Training and Development
- ❑ Vice President of Higher Education Hub at Shahid Beheshti University
- ❑ Editorial Board Member of Iranian Higher Education Journal
- ❑ Board Trust Member and Founder of the Iranian Higher Education Association
- ❑ President of Iranian Society for Training and Development(NGO)

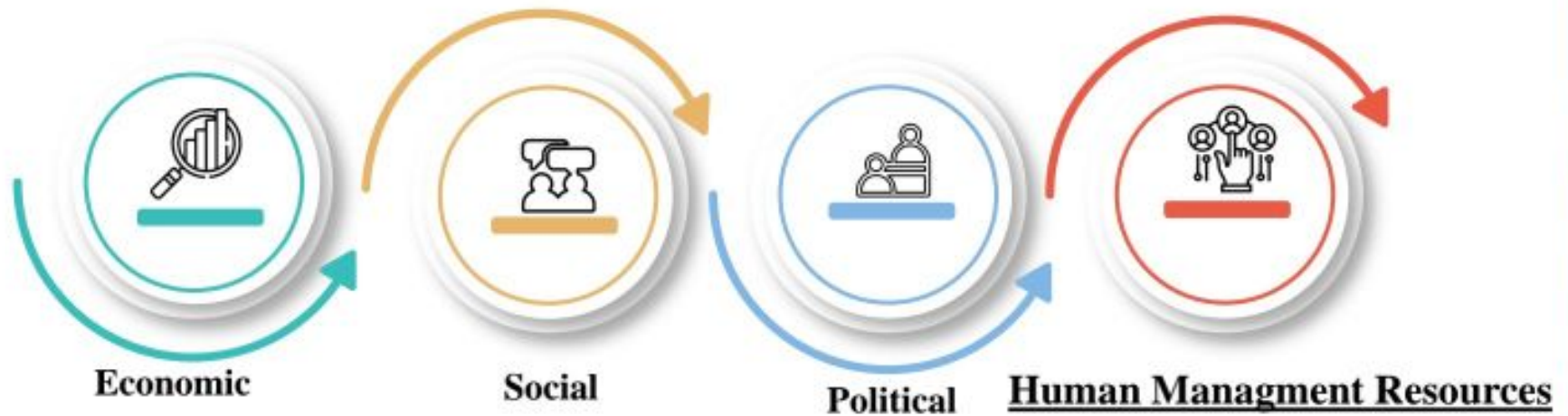


# Application of the DACUM model for universities & higher education institutions

Case study “Lab expertise job”



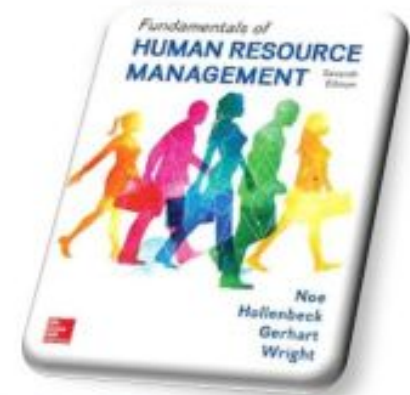
## Iranian Higher Education Main Challenges



## HR Challenges: Theoretical support

We have 19-22 process in HR based on  
Armstrong or Raymond Noe model in HR

**THE GREATEST:**  
Organizational structure



**Raymond Noe**



**Michael Armstrong**





## Considerations of HR aspects in education

- ◇ Recruitment of teachers
- ◇ Cultural context
- ◇ Talent Manager/organizational designer
- ◇ Strategic approach
- ◇ Training and development standards
- ◇ Performance management



# The Greatest HR Challenge

## Organizational structure



Michael  
Armstrong



# Main organizational structure challenges in Iranian educational systems



**Holder exist without position**



**Position without holder**



**High (Overload) Quantity of human resources**



**Low Job fitness**



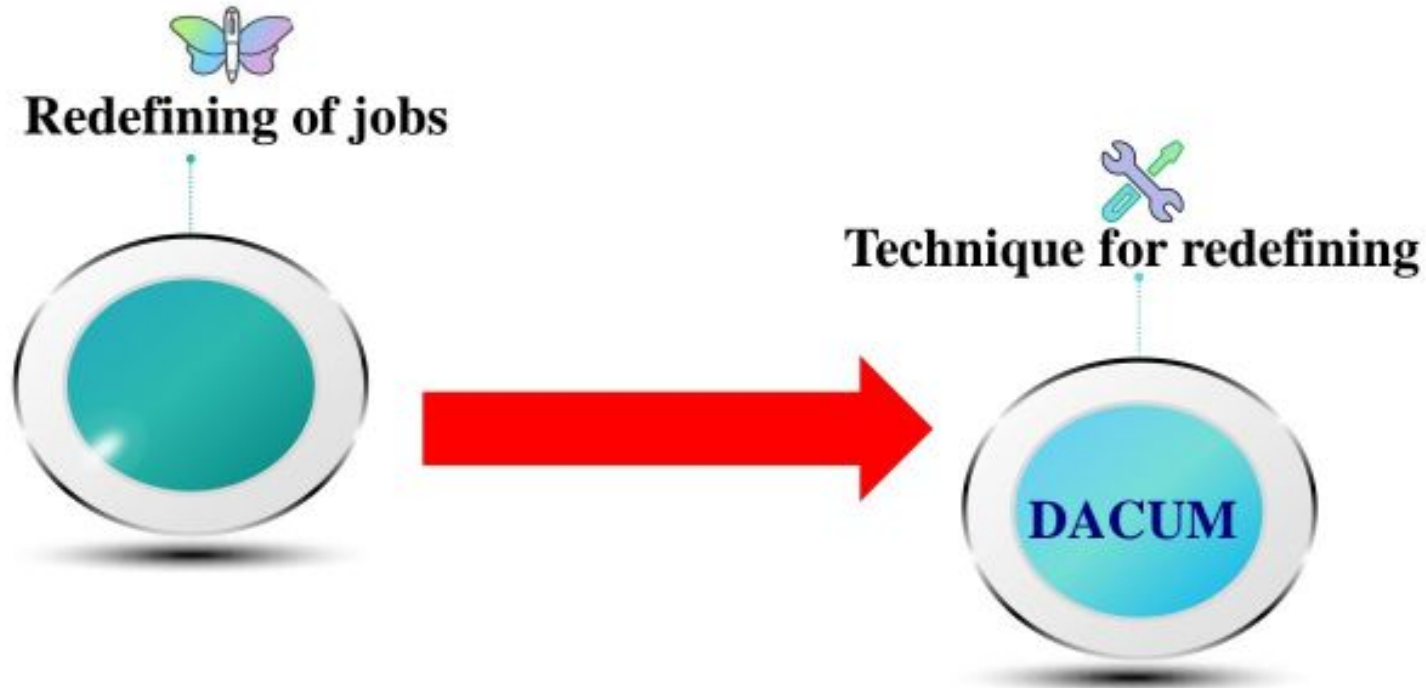
**Low Quality of human resource**



**There is no Balance of human resource**



Some solutions for eliminating of this challenges in organizational structure is



# General Estimation

**Based on research by IRP in 2022**

There are between 900 to 1224 position in public universities.



Dean  
Head of Department  
Named Professor  
Professor  
Reader  
Senior Lecturer  
Lecturer  
PostDoc Research Fellow  
Assistant Lecturer  
PhD Student





Based on research by IRP in 2022

**Lab Technician**



**Is Key job is in universities**





What was our technique?



# Our technique was

DACUM



<https://files.eric.ed.gov/fulltext/ED401483.pdf>



Norton, Robert E.

THE OHIO STATE UNIVERSITY  
CENTER ON EDUCATION AND  
TRAINING FOR EMPLOYMENT

# WHAT IS DACUM?

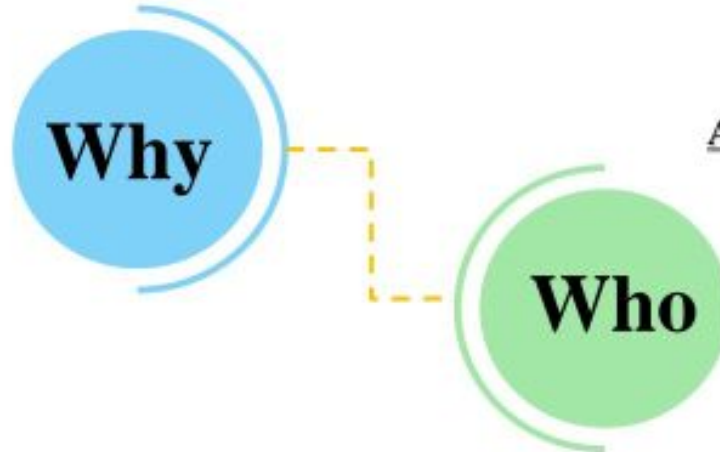
**An acronym for Developing A Curriculum**  
**A process for analysis of :**

- ◆ a job
- ◆ an occupation
- ◆ a process
- ◆ a function



# Who/Why Use DACUM?

- **Effective**
- **Quick**
- **Low Cost**



Academics in different departments & universities

K12 teachers

Policy makers in the area of education

Business & Industry Trainers & Managers



# Who Uses DACUM?

DACUM is used by:

- **Educational agencies** such as state departments of education, community and technical colleges and institutes, proprietary schools/colleges, colleges of education and universities, and secondary schools.

*Educational Agencies*

A list of some of the educational agencies served by the Center on Education and Training for Employment, College of



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AUTHOR	Norton, Robert E.
TITLE	DACUM Handbook. Second Edition. Leadership Training Series No. 67.
INSTITUTION	Ohio State Univ., Columbus. Center on Education and Training for Employment.

Education, The Ohio State University (hereinafter referred to as CETE) follows.



# Philosophy

- **Expert workers can describe and define their job more accurately than anyone else.**
- **An effective way to define a job is to precisely identify the tasks that expert workers perform.**
- **In order to perform tasks, certain knowledge, skills, tools and worker behaviors are required.**

# Key Terms





# Duty

**DUTY**

**Describes a large area of work in performance terms**

**Serves as a title for a cluster of related tasks**

**Is a general, not specific, statement of work that is performed**

**Is a meaningful, stand alone statement without reference to a job**

**Usually 6 to 12 duties per job**





# Task

**Smallest unit of work with a useful outcome**

**Outcome is a product, service or decision**

**Is an assignable unit of work**

**Has a definite beginning and ending point**

**Can be observed and measured**

**Can be performed independent of other task**

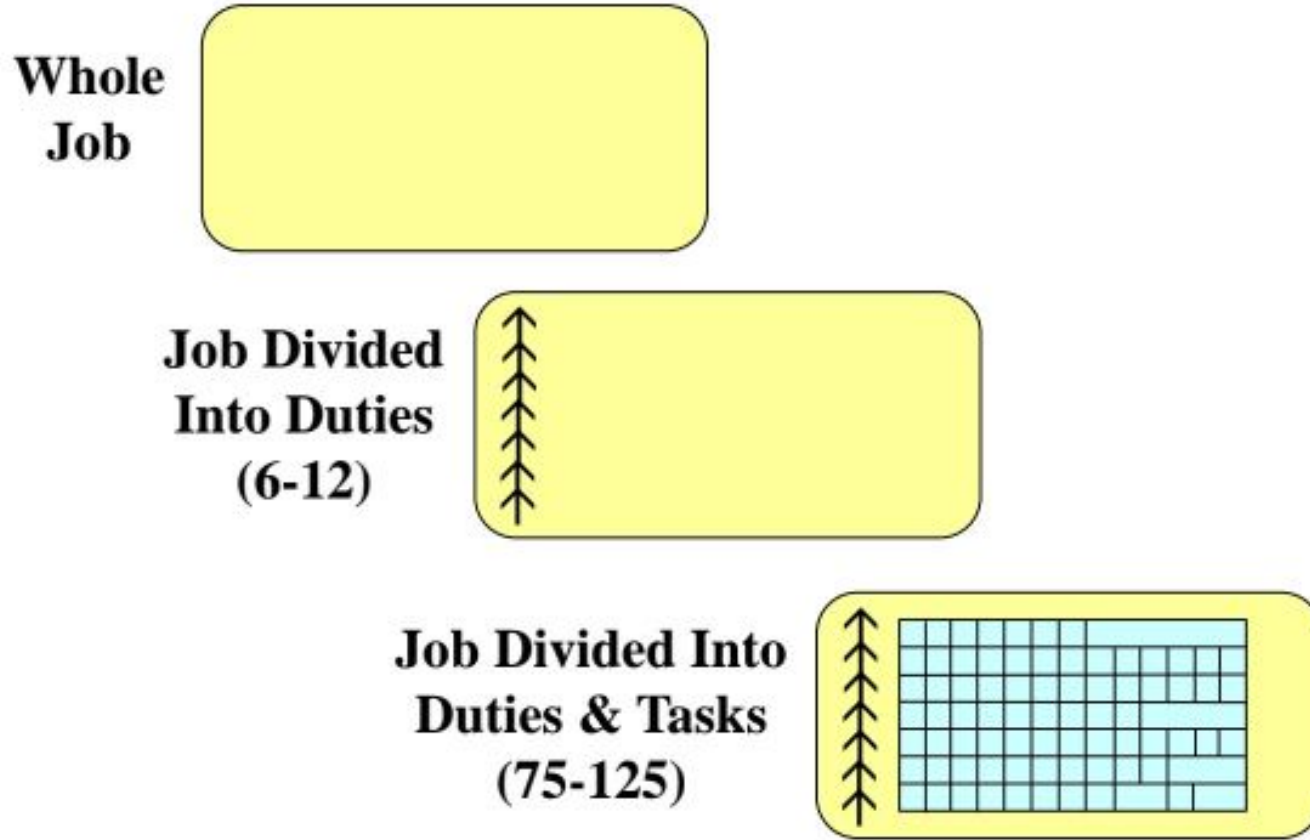
**Consists of two or more steps**

**Usually 6 to 20 tasks per duty**





# Duty & Task Relationships





# Step

- Activities required to perform the task.**
- Is the detail of procedures.**
- Always two or more steps per task.**
- The DACUM panel does NOT identify steps.**
- Curriculum developers will develop the steps.**



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# Task Statement Criteria

**Stated in performance, DOING, terms**

**Has a SINGLE action verb**

**Includes an OBJECT that receives the action**

**Contains one or more qualifiers**

**Is “Crystal” clear**

**Is a stand alone statement, not dependent on the duty or other tasks for meaning**

**Avoids references to tools, equipment and knowledge**



# Components of Task Statements

## Qualifier

Words or phrases used to modify, describe, clarify the statement.

## Verb

The verb is in the first person, singular, active voice.

## Object

The object is the thing acted upon by the worker.

# Example #1

**Job** Homeowner  
**Duty** Maintain the yard  
**Task** Mow the lawn  
**Step** Start the mower





## Example #2

<b>Job</b>	<b>Homemaker</b>
<b>Duty</b>	<b>Prepare meals</b>
<b>Task</b>	<b>Bake Cookies</b>
<b>Step</b>	<b>Mix ingredients</b>



# Example #3

**Job** Academic Member  
**Duty** Teaching  
**Task** Developing of lesson plan  
**Step** writing of behavioral objectives



**Lesson Plan**

Date	Grade level
Teacher	Subject
Objectives	
Materials	Assess
Procedures	
Evaluation	

**BEHAVIORAL OBJECTIVES**  
A behavioral objective is a clear, specific, and measurable statement of what a learner is expected to achieve at the end of a unit of work.

**PURPOSE**  
Behavioral objectives are important because they:

1. Provide a clear focus for instruction.
2. Help learners understand what is expected of them.
3. Create benchmarks to measure attainment.

**HOW TO WRITE**

- **Use Bloom's Taxonomy Verbs:**  
A taxonomy of cognitive skills, from low-level to high-level cognitive abilities. Use Bloom's verbs to formulate your objectives.
- **Use SOLO Taxonomy Verbs:**  
An alternative taxonomy describing observable behavior, scaling in complexity, rather than cognitive skills.

HELPINGPROFESSION.COM

<https://www.onetonline.org/link/details/25-1125.00><https://www.onetonline.org/link/details/25-1125.00>



- ☐ **Trainer**
- ☐ **Observer**
- ☐ **Recorder**
- ☐ **Expert workers**





# DACUM Workshop Outcomes

- **Precisely stated job duties and task**
- **Lists of:**
  - General knowledge and skills**
  - Worker behaviors**
  - Tools, equipment, supplies and materials**
  - Future trends/concerns**
  - Acronyms (optional)**





## **DACUM Standards**



**All duty and task statements contain a single verb, an object and one or more qualifiers.**

**The same task appears only once.**

**Duties and tasks are logically sequenced.**

**There are 6 to 12 duties per job and 6 or more tasks in each duty.**

**Lists of knowledge, behaviors, tools and trends are developed.**

**A majority of the committee represents expert workers.**



- **Rank and seniority are left at the door**
- **Everyone participates equally**
- **Share ideas freely**
- **Hitchhike on each other's ideas**
- **One person speaks at a time**
- **Keep on track**



# Workshop Ground Rules

- Offer constructive suggestions rather than criticism.
- Consider and reconsider all task and duty statements carefully.
- Don't use references.
- Observers cannot participate.
- **HAVE FUN!**





## **CASE STUDY:**

**A sample of designing an  
educational program based on job  
analysis using the DACUM method**



job title:

**Laboratory technician/senior technician**



[illegible]



		DUETY#3: Quality Control According to the Instructions S = ./56																								
MT	MST	Time					Frequency					Importance					Difficulty (level of learning)					SUB TASK  ( Activity)	TASK	Row		
		5	4	3	2	1	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1					
3.7	2.75				*					*		*								*		Checking the cleanliness of devices, containers and sampling tools	Process quality control	1		
	3.75		*						*			*							*			Examining the obtained solutions				
	3.25			*					*			*							*			Examining the chemical mediators of the experiments				
	4.5		*					*				*						*				Examining the temperature and conditions required for experiments				
	4.75	*						*				*						*				Controlling the way experiments are conducted				
39																										

DUETY:												
Categories of learning	Domains of learning			Traits & Attitudes	Competency & skill type			Skill & competency level			activities	TASK
	Psychomotor	Affective	Cognitive		Technical skills	Conceptual Skills	Human Skills	Skill	Ability	Knowing		

## The title of the general task DUETY3: quality control according to the instructions

categories  of learning	Domains of learning			Traits & Attitudes	Competency & skill type			Skill & competency level			activities	TASK
	Psychomotor	Affective	Cognitive		Technical skills	Conceptual Skills	Human Skills	Skill	Ability	Knowing		
Knowledge			*	Knowing the principles and standards of laboratory equipment	*			Getting to know the standards of sampling devices and tools			D3T1S1	T1
Knowledge/application			*	Identification of chemical solutions and their process	*			Ability to investigate chemical solutions			D3T1S2	
Knowledge/application			*	Identification of chemical mediators and their process	*			The ability to examine the chemical mediators of experiments			D3T1S3	
Practice and mastery	*			Identifying and applying the principles and guidelines of experiments	*			Skill in checking temperature and conditions required for experiments			D3T1S4	
Comprehension/evaluation			*	Identifying and controlling the correct process of experiments	*			Skill in controlling the way experiments are conducted			D3T1S5	

			Domains of Learning		Traits & Attitudes	Competency & Skill type			Related Knowledge, ability & skills				
Learning classification	Psychomotor	Emotional	Cognitive	Technical		Perceptive	Manual	Skill & Competency level			SUBTASK	TASK	
								skills	ability	Knowledge			
Knowledge and Applications			I	Familiarity with equipment and its usage in experiments	I			Proficiency in preparing supplies and equipment			D1 T1 S1	T1	
Practice and Mastery	I			Understanding the principles and techniques of solubilization	I			Proficiency in creating solutions to meet standard requirements			D1 T1 S2		
Practice and Mastery			I	Familiarity with methods of chemical addition	I			Familiarity with adding necessary chemicals			D1 T1 S3		
Practice and Mastery	I			Understanding the principles of device setup and reading the standard sample		1		Proficiency in setting up the device and reading the standard sample			D1 T1 S4		
Practice and Mastery	I			Understanding the method and executing calculations	I			Ability to perform accurate calculations			D1 T1 S5		
Practice and Mastery	I			Familiarity with the principles of preparing supplies and equipment	I			Proficiency in preparing supplies and equipment			D1 T1 S1	T2	
Practice and Mastery	I			Identification and analysis of methods for standard solution preparation	I			Proficiency in creating solutions according to the standard			D1 T1 S2		
Knowledge and Applications			I	Understanding the principles and standard methods of device calibration and sample reading		1		Familiarity with setting up the device and reading the standard sample			D1 T1 S3		
Knowledge and Applications			I	Understanding how to perform calculations	I			Understanding how to perform calculations			D1 T1 S4		
Knowledge and Applications			I	Knowing how to prepare weights		1		Familiarity with preparing the necessary weights			D1 T1 S1	T3	
Practice and Mastery	I			Analysis of principles and methods for standard calibration	I			Proficiency in calibrating devices following the provided instructions			D1 T1 S2		



## Duty :Calibration and checking of devices and equipment

Tools & Equipment	Education Method				Education Necessity			Education Content	Traits & Attitudes	Code
	RT	OJT	JA	CT	SUP	IMP	CRI			
			ü	ü		I		Familiarity with laboratory tools and equipment	Knowing the equipment and use of equipment in the laboratory	D1 T1 S1
	ü	ü				I		Understanding the principles and methods of solubilization	Identifying the principles and methods of solubilization	D1 T1 S2
	ü	ü					I	Knowledge of calibration methods and chemical addition techniques	Knowing the methods of adding chemicals	D1 T1 S3
	ü			ü			I	Identifying the principles and standard methods for adjusting devices and reading samples	Identifying the principles and standard methods of device adjustment and sample reading	D1 T1 S4
				ü		I		Understanding the method and performing calculations	Identify the method and make the calculation	D1 T1 S5
		ü		ü	I			Familiarity with the principles and procedures for preparing supplies and equipment	Identifying the principles and preparing supplies and equipment	D1 T1 S1
		ü		ü		I		Identification and analysis of standard solution methods	Identification and analysis of standard solution methods	D1 T1 S2
	ü			ü			I	Understanding the principles and standard methods for adjusting devices and reading samples	Knowing the principles and standard methods of device adjustment and sample reading	D1 T1 S3
				ü		I		Ability to perform calculations	Knowing how to perform calculations	D1 T1 S4
		ü		ü	I			Knowledge of weight preparation techniques	Knowing how to prepare weights	D1 T1 S1
		ü		ü			I	Analysis of standard calibration methods	Analysis of standard calibration methods	D1 T1 S2
The design of Tools & Equipment has not been completed due to the absence of some participants in the VALIDATION meeting and differences in the tools,										



## The Title of the General Task of DUETY#3: quality control and compliance with standards

Tools & Equipment	Education method				Education Necessity			Education Content	Traits & Attitudes	Cod
	RT	OJT	JA	CT	SUP	IMP	CRI			
				*	*			Laboratory tools and equipment	Knowing the principles and standards of laboratory equipment	
		*		*		*		Solving principles and methods	Identification of chemical solutions and their process	
		*		*		*		Characteristics and application of chemical mediators	Identification of chemical mediators and their process	
	*			*		*		Optimal laboratory instructions	Identifying and applying the principles and guidelines of experiments	
44	*			*		*		Optimal laboratory principles and rules	Identifying and controlling the correct process of experiments	



## The title of educational modules: quality control of processes

### Behavioral goals:

- 
- 
- 

### Educational content:

- Laboratory tools and equipment
- Principles of solution methods
- Characteristics and Application of chemical mediators
- Test Instructions
- Optimal laboratory principles and rules

### Course prerequisites:

Necessity of training: SUP ☐ IMP ☒ CRI ☐

## Educational technology



(Educational method) :RT ☐ OJT ☒ JA ☒ CT ☒

Materials, Space and Educational Aids: Educational Booklet, MS PowerPoint, Laboratory Equipment

Course type: General ☐ Specialized ☒ Theory ☒ Practical ☒

Participant conditions (Course Level): Manager ☐ Senior expert ☐ Expert ☒ Technician ☒

Learning area: cognitive/psychomotor

Class: knowledge, application/understanding and evaluation/practice and mastery

Course instructor:

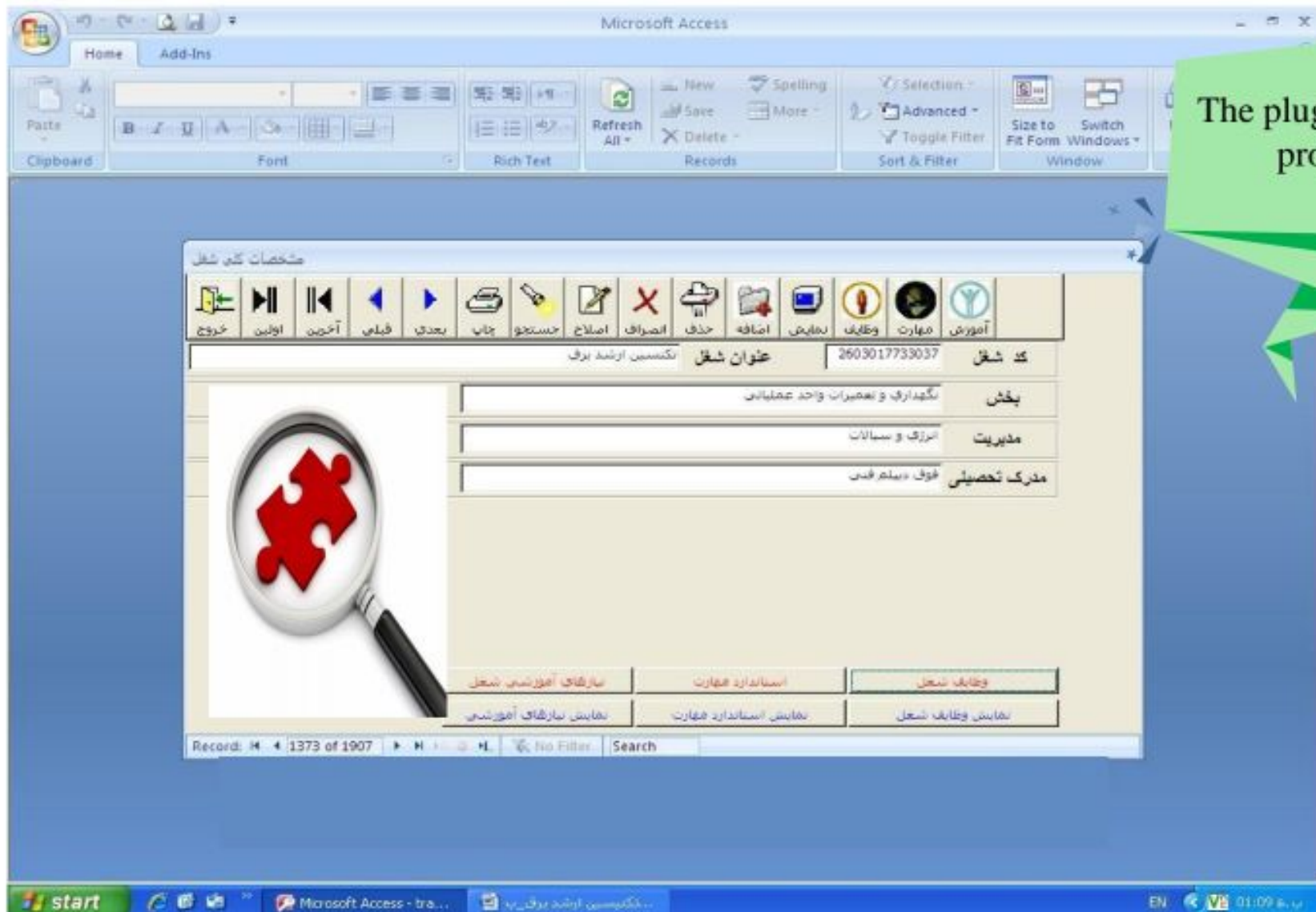
Time:

Effectiveness measurement method: survey ☐ pre-test/post-test ☒ effect on performance ☐ results ☒

## Reasons for developing web-based software and plugins

- **Quick tracking possibility**
- **Shorten the process time**
- **Reduction of verbal services**
- **Review instead of renewal**
- **Increasing work speed and reducing costs**

## An example of the project process





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Home Add-Ins

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وظایف شغل

خروج اولین آخرین قبلی بعدی چاپ جستجو اصلاح انصراف حذف اضافه نمایش پرسشگری شغل سابقه

کد شغل 2603017733037

عنوان شغل تکمیل ارساد برقی

امتیاز	مدت زمان			سطح یادگیری			فراوانی و تکرار			ضرورت و اهمیت			Duty	code
	3	2	1	3	2	1	3	2	1	3	2	1		
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	1- تعمیر و نگهداری از کلبه جهازات برقی فشار قوی	6231
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	2- تعمیر و نگهداری از سیستم برقی فشار متوسط	6232
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	3- تعمیر و نگهداری از سیستم برقی فشار متوسط	6233
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	4- تعمیر و نگهداری از سیستم برقی دستگاه	6234
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	5- تعمیر و نگهداری از سیستم برقی ایستگاه بهیاز	6235
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	6- سفارشات خرید قطعات بدگی برقی واحد و کدیگ آنها	6236
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	7- سفارشات ساخت قطعات	6237
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	8- اجرای کلبه حکم کارهای برقی روئین ، اضطراری	6238

Task

No Filter Search



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وظایف شغل

وظایف شغل

خروج از فرم

بازگشت به فرم قبلی

بازگشت به فرم بعدی

چاپ

جستجو

اصلاح

حذف

افزافه

نمایش

پرستاشی

شغل

سابقه

تکمیل ازشد برق

کد شغل 2603017733037

عنوان وظیفه 6231

1- تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مستقر در ایستگاه برق

Duty Task

تعمیر و نگهداری از پست های پست ها

تعمیر و نگهداری از دیزل ژنراتورهای پست ها

تعمیر و نگهداری از ایرکابین های پست ها

تعمیر و نگهداری از سیستم های برق تاورها

نگهداری از پست های برق و اتاق کنترل

تعمیر و نگهداری از تجهیزات تابلوهای پست ها و اتاق کنترل

تعمیر و نگهداری از کلیه کابین های پست ها

Activity

Record: 1 of 7

Task

Record: 1 of 8

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Clipboard

Font

Rich Text

Refresh All

New Save Delete

Records

Spelling More

Selection Advanced Toggle Filter

Sort & Filter

Size to Fit Form Switch Windows

Window

Replace Go To Select Find

Find

Activity

خروج از فرم خروجی آخرین قبلی بعدی چاپ جستجو اصلاح انصراف حذف اضافه نمایش پرسشنامه شغل سابقه

تکسین ارتشد برق	2603017733037	کد شغل
1-تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مستقر در ایستگاه برق	6231	عنوان وظیفه
تعمیر و نگهداری از ترانس های پست ها	8355	عنوان TASK

Task	Activity
تعمیر و نگهداری از ترانس های پست ها	- بازدید و چک کردن ترانس و اتاف ترانس از نظر تعمیرات .
تعمیر و نگهداری از ترانس های پست ها	- بازدید از روعن ، سیمکاز ، بوتینگ ها و جعبه مقاومت NGR .
تعمیر و نگهداری از ترانس های پست ها	- تعمیر و تعویض قطعات ترانس ها و باتوشاف آنها .

Record: 1 of 3

No Filter Search

Task

Record: 1 of 3

No Filter Search



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Paste

Clipboard

Font

Rich Text

Records

Sort & Filter

Window

Find

استاندارد مهارت

خروج اولین آخرین قبلی بعدی چاپ جستجو اصلاح انصراف حذف اضافه نمایش پرستنی شغل سابقه

کد شغل 2603017733037

عنوان شغل تکسین ارشد برق

توانمندیهای استاندارد مهارت شغل

آشنایی	توانایی	تسلط	
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	تعمیر و تعویض کتبه الکترو موتورها و نگهداری از کتبه قطعات تابلوهای پمپا آب
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	کدینگ قطعات برقی واحد
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	اجرای حکم کارهای برق روئین ، ایمنی ، انصراف و 55
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	آشنایی با اصول دیجیتال
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	اصول الکترونیک و الکترونیک صنعتی
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	سرویس و نگهداری تجهیزات ابزار دقیق
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	توانایی عیب یابی و تعمیر و سرویس و نگهداری شبکه مخابراتی و نصب سیستم های تلفن و اینترنت
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	توانایی انجام اصلاحات و توسعه در مدارهای فرمان و کنترل

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## Results of this project



**reducing of Job replacement from %21to 15.5%**



**increasing Job satisfaction from %65to 73.3%**



**increasing Job fitness from %46 to 63%**



**Change Quality work life of human resource from 33 to 42%**



**Balance of human resource from 41% to 68%**







University of  
Zurich<sup>UZH</sup>



Shahid Beheshti  
University

**University of Zurich**



**Shahid Beheshti University**



Thanks for your time