## RESEARCH SKILLS AND ACADEMIC LITERACY

Q5	Questions	TRANSVERSAL COMPETENCE OF UNIVERSITY
	-	STUDENTS OF ENGINEERING
1	What is the	- to determine whether students have acquired transversal
	research/telling	competences, and to what extent.
	question or	• To analyze the level of development of the
	questions?	dimensions that shape the transversal competences
		of engineering students and to verify whether there
		is any difference in the level of development of
		such competences related to gender, study
		program and year of study.
		• To study the relationships between the difference
		dimensions analysed, in order to determine how
		much they contribute to the development of
		transversal competences.
2	What are the key	Transversal Competences in Higher Education: Competences
	concepts?	classified into two types [technical or specific competences and
		generic or transversal competences]. DeSeCo Project(Rychen &
		Salganik, 2001) explains that competences can be divided into
		three categories [ Use tools interactively, interact in
		heterogeneous groups, Act autonomously].
		Transversal Competence of Engineering students:
		Students are considered to have acquired transversal competence(
		social skills, leadership, language, management or ICT skills)
		through their academic qualification. However, adequate
		attention is not given to these competences because they mostly
		involve several courses.
		The focus of this study would be on the evaluation process with
		the intention of obtaining a reliable tool to assess students
		progress in developing these types of competences.
2	What mathada ara	This research is based on an ampirical study, analyzing
3	what methods are	angineering students' percentions in the University Center of
	useu :	Marida at the University of Extremadura Southwest Spain
		The data used are mainly from primary sources
		Data Collection Instrument:
		- Data was collected using questionnaire (originally
		designed by Solanes Nunez and Rodriguez(2008))
		- The questionnaire was validated in Solanes Nunez and
		Rodriguez(2008) study where reliability and internal
		consistency of the instrument was 0.02 distributed in size
		factors that explained 53 15% of the variance
		- In the current work internal consistency (measured by
		Cronbach's alpha increased to 0.968 distributed in nine
		factors explaining 74.109% of the total variance.

		Sample:
		Sample size $= 102$ , the questionnaires were administered through
		a web based system (Moodle learning platform). All responses
		were valid.
		Statistical analysis:
		- Carried out a descriptive analysis of the variables (mean
		& variance)
		- Used ANOVA to test the significance of differences in
		scores for gender, study program and year of study.
		- Adopted the Principal component analysis.
		- Synthesis of full information with the minimum loss
		criterion of explanatory power.
		- Used the t-test to test the significance from the differences
		in scores observed (individual variables).
4	What answers are	Initial Analysis: To analyze the dimension that shape the
	presented?	transversal competences.
	1	- Descriptive analysis of each variable (mean & standard
		deviation)
		- Mean range is between 2.96 points to 4.04 points.
		- On this basis, students assess transversal competences
		positively, valuing all, except the skill to use University
		resources optimally.
		Analysis of variance:
		- Fisher's value as an index of discriminating power. The
		effect of significance, $\alpha = 0.05$
		- Levene's test was used to test for homogeneity of
		variances.
		Principal Component Analysis:
		- The sample was treated as a normal distribution because
		both Kaiser-Meyer-Olkin test (KMO)(0.785) and Barlett's
		test of sphericity (p=0.000) showed that the data were
		appropriate for this type of analysis and the Cronbach's
		alpha (0.968) indicated good internal consistency.
		- The Kaiser criterion was used based on the eigen value to
		choose the resulting factors which determined the
		extraction of 9 factors appropriate.
		- These factors explained 74.109% of the total variance
		after varimax rotation, and may be identified with
		different transversal competences.
		- There is a statistically significant difference between the
		global average and the mean of the main components 3
		(social skills). On the other hand, the main components
		1(management skills), 4 (Communication and leadership
		skills and motivation) and 7 (creativity, analytical skills
		and efficiency) are below the average with lower
		significance.

5	What is the	This research provide an important contribution to literature on
	contribution of this	transversal competences in engineering students.
	work?	

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Q5	Questions	Teamwork development across the curriculum for chemical
		engineering students in Hong Kong: Processes, outcomes and
		lessons learned.
	What is the	Objective: to examine how Chinese learners work and interact.
	research/telling	Research Questions:
	question or	- Can the teamwork skills of students be improved by
	questions?	systematic intervention and in what ways?
		- What are the special characteristics of Chinese learners in a
		team environment?
		Hypothesis:
		- Systematic intervention enhances students' awareness of
		teamwork.
		- Systematic intervention facilitates students to construct
		more accurate conception of teamwork.
	What are the key	Teamwork defined: a small number of people committed to a
	concepts?	common purpose and approach for which they hold themselves
		mutually accountable.
		Teamwork models and Framework:
		- The teamwork development initiatives in CBME at
		HKUST are part of a teaching development project.
		- The primary aim of the project is to develop students'
		teamwork skills systematically trough explicit instruction,
		opportunities to practice and formative feedback
		throughout the three-year undergraduate curriculum.
	What methods are	Data for analysis and evaluation were obtained from four primary
	used?	sources (Pre- and post-tests of students' knowledge of effective
		teamwork, longitudinal qualitative and quantitative data derived
		from self-assessment, faculty assessment of student performance,
		focus group interviews.
		- Self-assessment on team and peers (susceptibility test was
		adopted to explore the possible levels of dysfunctions in
		the team.
		- Faculty assessment (teams are rated by instructed on a
		Focus group Interviews (somi structured with a list of
		- rocus group microrews (semi-suructured with a list of guiding questions)
		Bonulation size:
1		

	72 undergraduate students majoring in Chemical engineering,
	Chemical and Environmental Engineering, and Chemical and Bio-
	product Engineering.
What answers are	- 68 out of 72 students completed the pre-test and amongst
presented?	them 34 completed the post-test(this was due to the fact
presented.	that the second sampling was done at a time when student
	did not need to attend class)
	- The pre-test generated 13 categories showing 459 pairs of
	relationship with the 17- original responses
	- Wilcovon signed Rank test was conducted to test the
	median difference in paired data. The result indicated that
	'division of labour' was significantly mentioned less in the
	nost test than in the pre-test $(7-2.45, p<0.05, r=0.30)$
	On the other hand, 'conflict resolution', 'knowing each
	- On the other hand, conflict resolution, knowing each other' and 'monitoring foodback and evaluation' ware
	significantly montioned more in the post test then in the
	significantly mentioned more in the post-test than in the
	One emerging estagery was the 'informed decision
	- One energing category was the informed decision making' appearing four times in the past test
	Solf assassment on team and paora
	(course work) The result of the team suscentibility test
	- (course work) The result of the team susceptionity test
	showed that trust and communent were the areas of
	bish ratings to questions related to these to items in all
	three nounds of accessment
	(final year project EVD) Nine out of 18 project teems
	- (Inial year project – FTF) Nine out of 18 project teams
	were randomly selected to complete the assessment
	fublics. On average, students gave lower scores to
	Example association to be accounted by the second to be accounted
	Faculty assessment.
	- 24 laboratory learns were rated by instructors on six
	dimensions. The results snowed that team members deal
	with contracts constructively received the lowest average
	rating. On the other hand, consensus within teams (i.e.
	team members agree on the team's goals ) received the
	mgnest average rating.
	- FYP supervisors ratings did not exhibit significant
	anterence among the five elements except for high
	commitment.
	Focus group interview:
	- 12 students participated in the focus group interviews after
	the laboratory courses and 11 attended the interviews at the
	end of the whole project.
	- Participants reflected that their teamwork awareness was
	raised because of the teamwork training and the explicit
	instructions on teamwork.

What is the	The study adds to literature on Team building across curriculum of
contribution of this	Chemical Engineering students by depicting how students
work?	perveived and undertook teamwork tasks in Hong Kong Chinese
	contexts. The study also claims that enhanced awareness of
	teamwork concept is demonstrated through a three-year systematic
	teamwork development project. This an extension of other works
	(Daniels et al., 2010; Hirsch and McKenna, 2008; Oakley et al.,
	2007;Tien et al., 2002; Tonso, 2006) in the Chinese context
	specifically in Hong Kong.

INTRODUCTION	Transversal competences refers to a set of competences related to
250 WORDS	attitudes and values and, procedures. These competences can be
	transferred from one specific professional field to another. Acquiring
	transversal competencies provides students with the basic knowledge,
	abilities and qualities required to translate competences into suitable
	behavior for organizational purposes.
	This review analyses two popular articles on Transversal Competences
	mainly related to leadership skills, teamwork and problem solving.
	The first article "Transversal Competences of University Students of
	Engineering" was authored by Hernandez-Linares et al., in June, 2014.
	The second article is "Teamwork development across the curriculum
	for chemical engineering students in Hong Kong: Processes, outcomes
	and lessons learned" authored by Zou and Ko in 2012.
	The main focus of this review will be on how each article defined the
	research problem context, research question and hypotheses,
	theoretical framework, methodology, research results and major
	findings paying attention to the similarities and differences between the
	two studies.
	Hernandez-Linares et al., (2014) research uses a tool to measure the
	information from ampirical study conducted on a sample of 102
	angineering students from the University of Center of Marida
	Hernandez Linares et al. (2014) argues that transversal competences
	are developed in different subjects throughout the study program
	making it difficult to be measured. Thus, it is essential to establish
	making it difficult to be incastical. Thus, it is essential to establish mechanisms to measure students' progress in competence acquisition
	and identify areas not addressed before. This forms the basis for their
	research
	On the other hand, Zou and Ko (2012) study reported on a three-year
	project aimed at developing students' teamwork skills systematically
	through explicit instruction, opportunities to practice, and formative
	feedback across the curriculum. Zou and Ko (2012) is of the view that
	current engineering education in China still focuses primarily on the
	transmission of technical knowledge while the development of

	professional skills is largely overlooked (Tu, 2006; cited in Zou and Ko, 2012). The study also points out that engineering educators worldwide are continually interested in how Chinese engineering students perform in a team due to the fact that China produces about 8 times more graduate engineers than the U.S. (Gereffi et al., 2008; cited in Zou and Ko (2012).
COMPARATIVE	
REVIEW 1500	
WORDS	
REFLECTIVE	
SUMMARY 250	
WORDS	

## Theme

## Objectives

## **Research Questions & Hypothesis**