Guidance For Higher Education To Provide The Necessary Soft Skills To Meet The Needs of Industrial Era 4.0 Using AHP And Fuzzy-AHP

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- Industry 4.0 and changes
- Industry 4.0 in education – technological-based expertise
- Soft skill rather than hard skill
- Few studies on soft-skills
- Very limited references on this issue using AHP and Fuzzy AHP
- Objectives of the study: what skills graduates of higher education should posses to thrive in industry 4.0

Literature Review

- Industry 4.0 and the integration of intelligent machine, human actors, physical objects, manufacturing lines and process into every organization level to create systematic technical data in near real-time
- Disruption to the workplace and workforce
- Require new skills and competence and eliminate old professions and skills
- The development of technology has grown faster than schools are able to recognize and implement necessary training and education

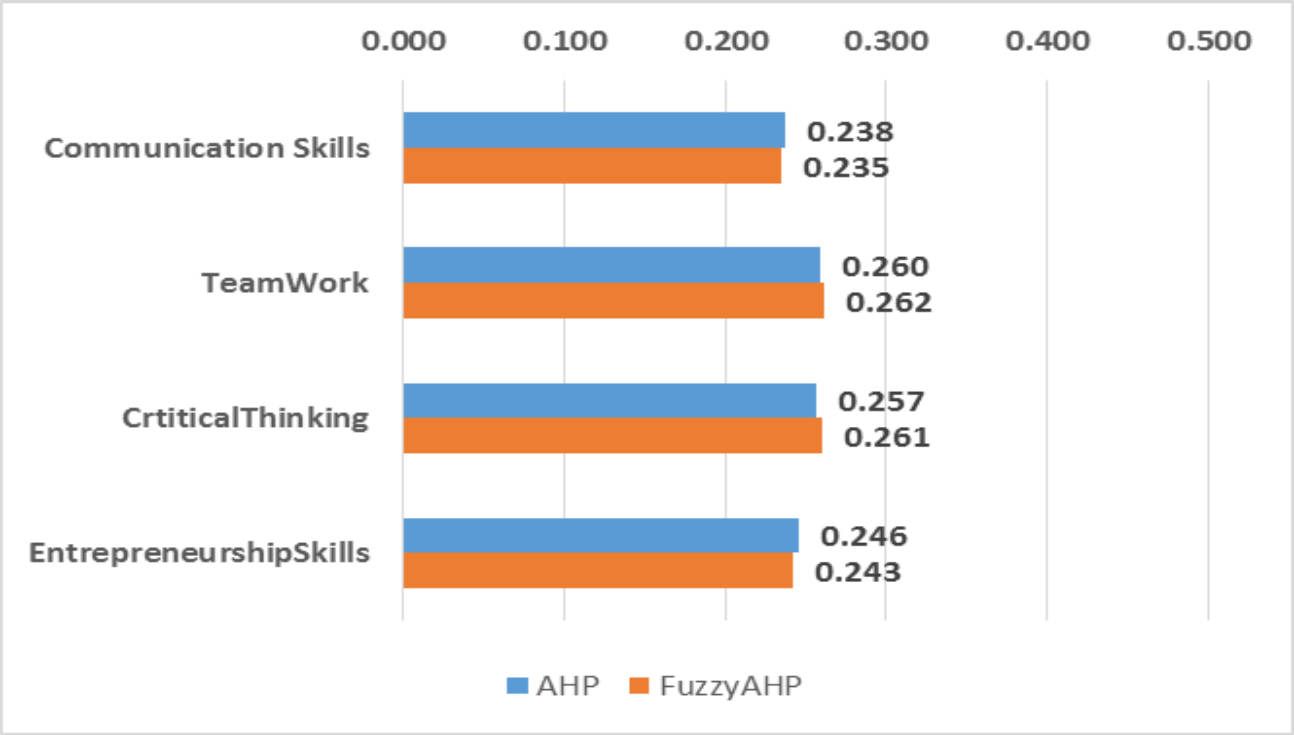
- The importance of soft skills
- Soft skills influence people a person’s ability to learn
- Soft skills:
  - Communication skills
  - Ability to collaborate with others
  - Complex problem solving
  - Emotional intelligence
  - creativity

- Industry 4.0 and education
  - Introducing problem solving and collaboration
  - Knowing and learning via direct experience
  - Learn from errors

Methodology

- Data gathering through questionnaire
  - AHP form: pair-wise matrix of comparison
- Respondents: 24 lecturers
- Data analysis: AHP – Fuzzy AHP
  - Triangular fuzzy numbers
- Steps
  - Determine the value of Fuzzy synthetic extent
  - The degree of possibility
  - Level of probability
  - The normalized weight vectors

Results



The comparison analysis results of the AHP and the Fuzzy-AHP for Criteria

Criteria/Sub Criteria		Local Weight		Global Weight		LocalPriority		GlobalPriority	
		AHP	F-AHP	AHP	F-AHP	AHP	F-AHP	AHP	F-AHP
Communication Skills	C1	0.238	0.235			4	4		
TeamWork	C2	0.260	0.262			1	1		
CrtiticalThinking	C3	0.257	0.261			2	2		
EntrepreneurshipSkills	C4	0.246	0.243			3	3		
	Sum	1.000	1.000						
Communication Skills Sub Criteria									
Fluent in English	SC1.1	0.386	0.458	0.092	0.107	1	1	5	4
WritingSkills	SC1.2	0.231	0.124	0.055	0.029	3	3	12	12
Expressing/PresentingIdea	SC1.3	0.383	0.419	0.091	0.098	2	2	6	6
	Sum	1.000	1.000	0.238	0.235				
Team Work Sub Criteria									
AbleToWorkUnderPressure	SC2.1	0.250	0.182	0.065	0.048	3	3	11	10
AbleToWorkWithPepoleFromAllLevel	SC2.2	0.381	0.439	0.099	0.115	1	1	3	3
Inter&IntraPersonalSkills	SC2.3	0.369	0.379	0.096	0.099	2	2	4	5
	Sum	1.000	1.000	0.260	0.262				
Critical Thinking Sub Criteria									
ProblemSolvingSkill	SC2.1	0.322	0.349	0.083	0.091	2	2	7	7
Creative&InnovativeThinking	SC3.2	0.396	0.450	0.102	0.117	1	1	2	2
GoodDecisionMaking	SC3.3	0.281	0.201	0.072	0.052	3	3	9	9
	Sum	1.000	1.000	0.257	0.261				
Entrepreneurship Skills Sub Criteria									
AchievementOrientation	SC4.1	0.305	0.262	0.075	0.063	2	2	8	8
Integrity	SC4.2	0.428	0.567	0.105	0.138	1	1	1	1
CustomerOriented	SC4.3	0.267	0.172	0.066	0.042	3	3	10	11
	Sum	1.000	1.000	0.246	0.243				

Conclusion

- Industry 4.0 requires soft skills
- The ability to work in teams especially with people at all levels is the most important for graduate studengs
- The difference between AHP and Fuzzy AHP is not significant. AHP is enough provided the respondents are experts
- The ability to cooperate with people at all levels will help graduates to compete in industry 4.0 and to prevent unemployment
- Further research that must be made is how to design higher education that emphasizes team work and collaboration with people at all levels, both curricular and extra-curricular.