Research Paper

Career exploration of high school students: a pilot study in Vietnam

Thuy Ngo Thanh[1]
Phan Van Nhan[2]

[1]*(Psychological and Pedagogical Sciences Department, Vietnam National Institution of Educational Sciences-VNIES)*
[2]*(Research Division of Educational Policies and Strategies, Vietnam National Institution of Educational Sciences-VNIES)*

ABSTRACTT: *This study aimed to adapt the CES-R (Career Exploration Survey-Revised) [14] to the Vietnamese culture. The questionnaire consisted of twenty-eight questions in three components: Intended-Systematic Exploring, Environmental Exploration, Self-exploring. The sample consisted of 45 students from high school in Hanoi, and they were requested to answer online due to the CoVid-19 pandemic context. The results have shown the skewness value of each item was in the normal distribution. The Cronbach's Alpha of components were 0.907, 0.923 and 0.903, respectively, for the overall questionnaire was 0.911. After measuring Conformity Factor Analysis, the new questionnaire consisted of 20 questions. There were three new components of Individual Experience, Environmental Exploration and Intended-Exploration. Overall findings demonstrated that this questionnaire had high validity and reliability scores. It could be used as a valid and reliable instrument to measure the career exploration behaviour of Vietnam high school students. In furthermore, the new questionnaire could adapt for Vietnam students in larger areas, gender, ethnicity, grade and learning outcomes.*
KEYWORDS: *career exploration, validity, reliability, Confirmatory Factor Analysis.*

I. INTRODUCTION

The rapid development of the Industry 4.0 Revolution has epochal changed the vocational world. It is sustainably transforming many fields of work. Some kinds of jobs have lost while some new ones had been born [16][5][17][[2]. This context has led to many changes in perceptions and judgement in the value of the specific job. People have to develop themselves to appropriate social economy changes with their potential skills, academic competencies, and reality perceived [5]. Career exploration is one of the significant factors in the vocational process. This process required students to gather vocational information, join in social roles, get into new social interactions to enhance their experiences in a particular career they tended to concern about [15][22][25]. Suberman U. has pointed out that career exploration plays an essential role in career choice and vocational orientation, even the success in their lives [7]. It has a significant impact on readiness in career development and the very early first step to prepare relevant skills for their life.

The concept of career exploration referred to "*purposive behaviour and cognitions that afford access to information about occupations, jobs, organizations that were not previously in the stimulus field*" [18]. Career exploration is defined as the process of gathering information relevant to an individual's career, setting up one's career plans, managing the diverse transitions in career life [4]. Flum and Blustein described career exploration as the integration process between individual characteristics and self-determined career development [6]. It means the individual's career process internalizes extrinsic motivations and conducts the embedding of intrinsic motivation in their whole life span [10].

The original theory of career exploration was developed in early 1960 when the researchers realized the critical role in the career process [18]. The initial research based on seeking information to enhance vocational knowledge with the individual's complex process in perception, attitude and behaviour. It has now been considered an essential part of career development and a determining element in career decision-making in recent years. The relationship between career self-efficacy and career exploration is positive [1][11][12][18].

Therefore, it could lead to a change in behaviour occurring due to each student even in the same treatment condition. The structure of career exploration can be defined as the activities such as gathering information and knowledge about job searching, planning, opportunities and career options [21]. According to that, the students had to learn all the necessary competencies and vocational skills and require academic education. Therefore, the findings of our study indicate the career exploration questionnaires can figure out the Vietnamese student's career abilities and competence of interest in want, as well as in the information of interest in learners.

In recent years, parents and their children have concerned much more about proper vocational orientation with the characteristics, potential competency, the directions of interests. They expected that understanding one's abilities could help them quickly determine or focus on careers in running it. Based on the research of Arrington (Hermawan & Farozin, 2018), junior high school students are in the digital age and their career preparation as soon as having better effects on the future of vocational education and their path.

This study used a revised version of the Career Exploration Survey-Revised (CES-R) [14]. It had been developed by Blustein to measure the student's behaviour in identifying the vocational orientation themselves [18] [14]. It involved career-related activities such as talking to the elder person to collect information, opportunities, learning and get more experience with necessary abilities and skills, maybe a vocational degree or academic education in need [3]. This questionnaire examined the validity and reality in the study of Kristen A.Nasta with some original questions [14]. Some news had been added to suit the new social context. The internet had created new ways of exploring career and career opportunities.

Vietnam Ministry of Education and Training admitted the critical role of career exploration in higher education. It promoted that all educational institutions implemented vocational activities in school to enhance students' perception behaviours [13]. Therefore, based on the literature, the study analyses this scale of CES-R in Vietnam under the nCovid-19 pandemic context.

The goal of the present study is to adapt the Career Exploring Scale-Revised [14] to Vietnamese students and examine its validity and reliability. CES-R is an instrument developed to assess the career exploring behaviours construct, presenting the attention of researchers and practitioners in Vietnam with the evaluation and activities in vocational counselling.

II. METHOD

Our study was adapted from the Career Exploration Survey – Revised (CES-R) [14] for examining the suitability of this questionnaire in Vietnam. The validity and reliability of this questionnaire are examined how it could be adopted in Vietnam. According to that, we tried to figure out the career exploration behaviour of Vietnamese students. This survey consists of 28 questions. All were scored on an interval Likert-type scale and measured how career exploration a student had done in the high school year.

We translated all the items in this questionnaire to appropriate for Vietnamese culture. The questionnaire have been checked for grammar and translation from two psychologists. As the first step, a psychologist translated the English version to Vietnamese. The other one reviewed the translation back into English. The complete Vietnamese performance was evaluated for cultural appropriateness by the researchers at the Vietnam National Institute of Educational Science. The items which were confused in concepts or meanings were determined and made necessary modifications. The students at High school, junior high school, and high school Educational Science Experimental reevaluated the updated version. This study developed a CES-R version which was appropriated for Vietnamese high school students.

This questionnaire was conducted at primary school, junior high school, and high school Educational Science Experimental in Hanoi. The participants were 45 high school students in 11 grade. Data was collected online from February 24, 2021, to February 28, 2021, in the social distance-time due to the CoVid-19 pandemic. The questionnaire is structured, and the items are closed type. All the items for the evaluation dimension are rated on a 5-point Likert scale from 1-never to 5-great.

After the data cleaning process, 11 records were removed because of missing data. The final dataset consisted of 34 valid records that were used to analyze. IBM Statistical Package for the Social Sciences (SPSS 22.0) was used to analyze the data. The analysis methods used in this study aim to adjust the suitable scale with the survey objects in Vietnam, including statistical descriptions, reliability analysis, confirmatory factor analysis (CFA). In this study, CFA executed to confirm the original scale's structure in Vietnamese culture. We also used consistency reliability, the item-total correlation data to analyze the valuation of this scale. The instrument's practicality clearly showed that this study lacks a test-retest reliability aspect as the questionnaire administered only once.

III. RESULTS

The reliability and validity of the instrument are presented below according to the evaluation dimensions of CES-R implementation. We used description analysis in SPSS to examine the overall description valuation, such as mean, standard deviation, and Skewness. The results show the reliability of these items in

three dimensions of career exploring behaviour: Intended-Systematic Exploration - ISE (see Table 1), Environment Exploration - E.E. (see Table 2), and Self-Exploration - S.E. (see Table 3). The mean valuation shows how frequently those behaviours happened in their routine or the past. The valuation gets up to five points present the students often conduct that behaviour and inverse the valuation reduces to one point representing that the students never do that. The skewness values showed ISE, E.E. and S.E. valuation in the range of -1 to 1(see Table 1). This analysis meant the distribution of each item in the scale is the normal distribution.

Table 1 showed that students "*sought opportunities to demonstrate work skills*" (M = 3.088, SD = 0.996) higher than "*Tried specific work roles just to see if I liked them*" (M = 3.029, SD = 1.058) in a moderate amount when they explored the internal vocational behaviour. "*Participated in practice interviews*" rarely implemented in vocational exploring (M = 2.471, SD = 1.331). The Skewness of the ISE scale all in the range from -1 to 1 of standard construction.

Table 1
Statistic Description of ISE scale

Intended-Systematic Exploration	Code	N	Range	Min	Max	Mean	Std. Deviation	Skewness
1. Experimented with different career activities	TH1	34	4	1	5	2.735	1.263	0.151
2. Sought opportunities to demonstrate work skills.	TH2	34	4	1	5	3.088	0.996	0.010
3. Tried specific work roles just to see if I liked them	TH3	34	4	1	5	3.029	1.058	0.264
14. Participated in an internship, practicum, fieldwork, or volunteer opportunities in a career field I am interested in	TH14	34	4	1	5	2.735	1.310	0.180
15. Participated in practice interviews.	TH15	34	4	1	5	2.471	1.331	0.599

According to the mean valuation in Table 2, high school students conducted a substantial amount of behaviour in "*Sought information on specific areas of career interest*" (M = 3.618, SD = 1.074) with no much difference in students' opinions. "*Taken coursework related to a career you are interested in*" (M = 3.412, SD = 1.305) had shown that students often did that to explore the suitable career. Students somewhat "*Sent out resumes to employers and/or posted them online*" (M = 2.147, SD = 1.184) when they explore the surrounding environment.

Table 2
Statistic Description of E.E. scale

Environment Exploration	Code	N	Range	Min	Max	Mean	Std. Deviation	Skewness
4. Investigated career possibilities.	TH4	34	4	1	5	2.912	1.138	0.182
5. Went to various career orientation programs.	TH5	34	4	1	5	2.500	1.212	0.325
6. Obtained information on specific jobs or companies.	TH6	34	4	1	5	2.912	1.083	-0.120
7. Gathered information on job trends, salaries, and general job opportunities in my career area.	TH7	34	4	1	5	3.353	1.152	-0.249
8. Sought information on specific areas of career interest.	TH8	34	4	1	5	3.618	1.074	-0.403
16. Sought career advice from a teacher or Academic Advisor.	TH16	34	4	1	5	3.177	1.381	-0.263
17. T Been to the Career Resource Center on campus to obtain career guidance and/or explore	TH17	34	4	1	5	2.294	1.315	0.691
18. Done online searches to obtain career information	TH18	34	4	1	5	3.088	1.215	-0.286
19. Sent out resumes to employers and/or posted them online	TH19	34	3	1	4	2.147	1.184	0.397
20. Attended job fairs or interviewed with employers on campus	TH20	34	4	1	5	2.294	1.292	0.666
21. Written and/or sent out letters of inquiry, or telephoned potential employers to make employment contacts	TH21	34	3	1	4	2.059	1.099	0.605
22. Spoke to family, friends, or community about career advice	TH22	34	4	1	5	3.382	1.129	-0.159

23. Gathered information regarding additional education or training needed for your career.	TH23	34	4	1	5	3.206	1.149	0.081
24. Taken coursework related to a career you are interested in	TH24	34	4	1	5	3.412	1.305	-0.316

Self-exploration is one of the most important components in the vocational process, represented in Table 3 with an average mean of all items equal to 3.5. Students "*thought about what career would be best for me*" frequently (M = 3.853, SD = 1.077) higher than "*thought about how my major fits my career goals*" (M = 3.735, SD = 1.109)

Table 3
Description of S.E. scale

Self-Exploration	Code	N	Range	Min	Max	Mean	Std. Deviation	Skewness
9. Reflected on how my past integrates with my future career.	TT9	34	4	1	5	3.647	1.070	-0.487
10. Focused on my thoughts on me as a person in relation to my career.	TT10	34	3	2	5	3.706	0.906	-0.141
11. Contemplated my past in relation to my career.	TT11	34	3	2	5	3.618	0.985	-0.147
12. Been retrospective in thinking about my career.	TT12	34	4	1	5	3.235	0.955	-0.284
13. Understood a new relevance of past behavior for my future career.	TT13	34	4	1	5	3.471	1.022	-0.368
25. Took career tests to analyze and assess your interests, abilities and/or values.	TH25	34	4	1	5	3.294	1.315	-0.074
26. Thought about what career would be best for me	TH26	34	3	2	5	3.853	1.077	-0.310
27. Thought about how my major fits with my career goals..	TH27	34	3	2	5	3.735	1.109	-0.286
28. Established career plans for the future.	TH28	34	4	1	5	3.353	1.098	-0.185

Input three dimensions of the evaluation in Cronbach Alpha analysis to examine the reliability of each scale. Table 4 showed the overall results, consisting of three constructs (ISE, E.E. and S.E.) and each item included. Cronbach's Alpha for the first construct – ISE scale - was 0.907, for the second construct – E.E. scale- was 0.923, and for the third scale – S.E. scale – is 0.903 as the value of Cronbach's Alpha has to above 0.8 for the items to be acceptable for research purposes.

Table 4
Cronbach's Alpha of ISE, E.E. and S.E.

Scales	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Intended-Systematic Exploration (ISE) (Cronbach's alpha = 0.907)					
TH1	11.324	16.044	0.850	0.741	0.868
TH2	10.971	19.908	0.601	0.455	0.918
TH3	11.029	18.332	0.749	0.613	0.892
TH14	11.324	16.044	0.808	0.756	0.878
TH15	11.588	15.583	0.845	0.792	0.869
Environment Exploration (EE) (Cronbach's alpha = 0.923)					
TH4	37.441	122.193	0.692	0.805	0.917
TH5	37.853	120.250	0.721	0.859	0.915
TH6	37.441	124.921	0.611	0.689	0.919
TH7	37.000	124.424	0.590	0.746	0.920
TH8	36.735	129.170	0.434	0.852	0.924
TH16	37.177	118.089	0.696	0.777	0.916
TH17	38.059	116.966	0.781	0.872	0.913

TH18	37.265	120.746	0.699	0.830	0.916
TH19	38.206	120.532	0.730	0.909	0.915
TH20	38.059	121.209	0.634	0.849	0.919
TH21	38.294	123.184	0.677	0.946	0.917
TH22	36.971	122.090	0.703	0.789	0.916
TH23	37.147	122.614	0.667	0.822	0.917
TH24	36.941	124.542	0.503	0.621	0.923
Self-Exploration (SE) (Cronbach's alpha = 0.903)					
TH9	27.529	46.196	0.430	0.647	0.912
TH10	26.882	44.289	0.690	0.725	0.891
TH11	27.441	45.163	0.659	0.758	0.893
TH12	26.971	43.969	0.689	0.691	0.891
TH13	27.294	43.547	0.798	0.684	0.884
TH25	27.177	42.938	0.581	0.547	0.902
TH26	26.618	42.001	0.825	0.853	0.881
TH27	26.735	41.413	0.843	0.859	0.879
TH28	27.118	44.046	0.647	0.635	0.894

Table 5 demonstrated the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test to examine the suitability of the dataset for factor analysis. Each item was determined to ensure that the variables were particular and intended in the exploring behaviour of high school students. High values (close to 1.0) generally indicate that factor analysis is helpful in the sample. The KMO Measure of Sampling Adequacy valuation (KMO = 0.6, p < 0.001) meant the factor analysis is accepted and suitable for the study.

Table 5
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.60
Bartlett's Test of Sphericity	Approx. Chi-Square	739.187
	df	190
	Sig.	0.000

The total variances explained and rotated components shown in Table 6. It indicated the sum of the eigenvalues equals the number of components. The extracted components, nearly 76% of the variability, could considerably reduce the complexity of the dataset by using these components, with only a 24% loss of information.

Table 6
Total Variance Explained and rotated components

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.784	43.919	43.919	6.743	33.715	33.715
2	4.764	23.818	67.737	6.149	30.745	64.46
3	1.547	7.737	75.474	2.203	11.013	75.474

Table 7 showed the Conformity factor analysis (CFA) to define individual constructs to pretest to evaluate each item of the measurement model and develop the comprehensive questionnaire by arranging the items into three dimensions of CES-R to find suitable with the purposes of study. In CFA, the variables were loading on which factors and which factors correlated. The first component included nine items. The second component consists of nine items, and the third component consists of two items.

Table 7
Conformity factor analysis - CFA

Rotated Component Matrixa			
	Component		
	1	2	3
TH1	0.723		
TH4	0.719		
TH5	0.894		
TH7		0.735	
TH8		0.839	
TH9			0.896
TH10		0.873	
TH11			0.817
TH12		0.748	
TH14	0.750		
TH15	0.783		
TH16		0.694	
TH17	0.902		
TH19	0.910		
TH20	0.893		
TH21	0.923		
TH24		0.828	
TH25		0.721	
TH26		0.863	
TH27		0.795	

Note: Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization.

According to CFA results, three components represented three dimensions of the CES-R questionnaire shown in Table 8, suitable for the Vietnam high school student. The first component which meant for the Self-exploration Questionnaire, namely Individual's Experience (Cronbach's Alpha = 0.825), consists of 2 items: "*Reflected on how my past integrates with my future career*" and "*Focused on my thoughts on me as a person in relation to my career*". The second component (Cronbach's Alpha = 0.934), namely as the original component in CES-R is Environmental Exploration consists of nine items: "*Gathered information on job trends, salaries, and general job opportunities in my career area*", "*Sought information on specific areas of career interest*", "*Focused on my thoughts on me as a person in relation to my career*", "*Been retrospective in thinking about my career*", "*Been retrospective in thinking about my career*", "*Taken coursework related to a career you are interested in*", ". *Took career tests to analyze and assess your interests, abilities and/or values*", "T*hought about what career would be best for me*", "*Thought about how my major fits with my career goals*". The third component which represented for Intended-Systematic Exploration, namely Intended Exploration (Cronbach's Alpha = 0.953), consists of nine items: "*Experimented with different career activities*", "*Investigated career possibilities*", "*Went to various career orientation programs*", "*Participated in an internship, practicum, fieldwork, or volunteer opportunities in a career field I am interested in*", "*Participated in practice interviews*", "*Been to the Career Resource Center on campus to obtain career guidance and/or explore*", "*Sent out resumes to employers and/or posted them online*", "*Attended job fairs or interviewed with employers on campus*", "*Written and/or sent out letters of inquiry, or telephoned potential employers to make employment contacts*". The new questionnaire has already deleted eight items that had low reliability and availability with the sample.

Table 8
The new questionnaire in three dimensions of CES-R for Vietnamese high school students

Scale	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	
Individual Experience (Cronbach's Alpha = 0.825)					
TH9	3.0294	0.939	0.703	0.494	
TH11	2.9412	1.451	0.703	0.494	
Environmental Exploration (Cronbach's Alpha = 0.934)					
TH7	28.1765	58.392	0.675	0.617	0.927
TH8	27.9118	57.356	0.805	0.739	0.92
TH10	27.9412	57.633	0.835	0.784	0.918
TH12	28.0294	59.484	0.678	0.581	0.927
TH16	28.3529	55.75	0.676	0.555	0.929
TH24	28.1176	54.289	0.811	0.804	0.919
TH25	28.2353	56.61	0.67	0.666	0.928
TH26	27.6765	56.832	0.838	0.865	0.918
TH27	27.7941	57.138	0.788	0.799	0.92
Intended Exploration (Cronbach's Alpha = 0.953)					
TH1	19.4118	72.371	0.758	0.769	0.949
TH4	19.2353	75.034	0.706	0.577	0.952
TH5	19.6471	71.447	0.846	0.888	0.945
TH14	19.4118	71.28	0.78	0.922	0.948
TH15	19.6765	70.165	0.821	0.918	0.946
TH17	19.8529	69.523	0.866	0.877	0.944
TH19	20	71.394	0.872	0.931	0.944
TH20	19.8529	71.16	0.799	0.811	0.947
TH21	20.0882	73.234	0.84	0.929	0.946

IV. DISCUSSION

This research examined the reliability and availability of the CES-R scale in Vietnam. The results of this study supported the adaptation of this scale for high school students in Vietnam. These results are consistent with the past research on the CES-R scale, which had shown the availability and reliability in a different culture [14][18][6][3][9][22][7]. The items performed reflected the original scale's procedures and validated the feasibility of the study by examining the reliability with Cronbach's Alpha to ensure acceptance in the Vietnam context [8].

However, the Conformity Factor Analysis implement indicated the appropriation of each item in detail. Therefore, the study explored the new three components represented for the old three in CES-R by arranging the suitable items. The component Individual's Experience replaced for Self-Exploration. This change reasoned for the content of two items. Both two items focused on the experience. Each student had to think carefully to figure out the relevant experience in the past with the future career. These contents were no longer fit with the name of Self-exploration. We named it "Individual's Experience", which contained the original purpose and linear with the internal contents. Environmental Exploration kept the name as the original scale because all item's contents had not much changed. Nine items included four items in origin and five items added, focusing on the individual's willingness to the suitable career that fits their characteristics and purposes. Intended-Systematic Exploration renamed to Intended Exploration due to the nine items concentrating on the person's behaviour on exploring the career positively in many ways.

Otherwise, this study concerned eight deleted items. Although the Cronbach's Alpha is acceptable, the Conformity Factor Analysis shows the suitability of these is unreliable with the sample. Vietnam students have less chance to practice vocational skills in school may lead to reduce the opportunities to explore their competencies in vocational fields [20][26][19]. Their parent's tended to demonstrate an indirect positive

influence on the decision of careers [23][24]. It is reasonable that these items are not suitable for the Vietnamese culture.

Limitations of the study included that the participant sample was primarily with the total amount of 45 high school students. Most of the respondents in 11 grade could not represent all of the high school students in Hanoi or Vietnam. However, the potential drawback of this study was that the results contribute to the career psychology field cause of providing knowledge about career exploration behaviour. The results show that the CES-R scale is possibly adapted in Vietnam. Furthermore, this scale can be used to direct the vocational orientation for Vietnamese high school students. According to this study, the results could compare between areas, genders, parent's job, and learning outcomes.

V. CONCLUSION

In conclusion, this study makes a positive contribution to research and enhances high school student's perception of career exploration behaviour. It is also essential that individuals be assisted in understanding and improving their awareness of vocational development. Effectively exploring career options help students, as well as their parents, in the complex process of career development, planning and preparation. The limitations of this study suggest that future research needs to develop the CES-R version suitable to Vietnamese culture. It might also look at how the influence of the source of career exploration can differ for people based on the development stages. Finally, the new Career Exploration Scale-Revised need to research in Vietnam culture continuously.

REFERENCES

[1]   Albert Bandura. (1978). Self-efficacy: toward a unifying theory of behavioural changes. *Advances in Behaviour Research and Therapy*, *1 (4)*, 139–161. https://doi.org/10.1017/S0003055400259303

[2]   Berichte, A., & Berichte, A. (2016). Industry 4.0 – job-producer or employment-destroyer? *Research report*, Retrieved from https://www.econstor.eu/handle/10419/161710

[3]   Betz, N. E., & Voyten, K. K. (1997). Efficacy and Outcome Expectations Influence Career Exploration and Decidedness. *Career Development Quarterly*, *46*(2), 179–189. https://doi.org/10.1002/j.2161-0045.1997.tb01004.x

[4]   Blustein, D. L. (1997). A context-rich perspective of career exploration across the life roles. *Career Development Quarterly*, *45*(3), 260–274. https://doi.org/10.1002/j.2161-0045.1997.tb00470.x

[5]   Fareri, S., Fantoni, G., Chiarello, F., Coli, E., & Binda, A. (2020). Estimating Industry 4.0 impact on job profiles and skills using text mining. *Computers in Industry*, *118*, 103222. https://doi.org/10.1016/j.compind.2020.103222

[6]   Flum, H., & Blustein, D. L. (2000). Reinvigorating the Study of Vocational Exploration: A Framework for Research. *Journal of Vocational Behavior*, *56*(3), 380–404. https://doi.org/10.1006/jvbe.2000.1721

[7]   Hermawan, R., & Farozin, M. (2018). The role of career exploration in career decision participants. *COUNS-EDU: The International Journal of Counseling and Education*, *3*(4), 126.https://doi.org/10.23916/0020180315640

[8]   In, J. (2017). Introduction of a pilot study. *Korean Journal of Anesthesiology*, *70*(6), 601–605. https://doi.org/10.4097/kjae.2017.70.6.601

[9]   Jepsen, D. A., & Dickson, G. L. (2003). Continuity in life-span career development: Career exploration as a precursor to career establishment. *Career Development Quarterly*, *51*(3), 217–233. https://doi.org/10.1002/j.2161-0045.2003.tb00603.x

[10]   Jiang, Z., Newman, A., Le, H., Presbitero, A., & Zheng, C. (2019). Career exploration: A review and future research agenda. *Journal of Vocational Behavior*, *110*, 338–356. https://doi.org/10.1016/j.jvb.2018.08.008

[11]   Lent, R.W. & Brown, S. D., & Hackett, G. (2017). Social cognitive career theory. *Career Choice and Development*, page 750-754.

[12]   Lent, R., Brown, S. D., & Hackett, G. (1994). Toward a unifying scct and academic interest, choice and performance. In *Journal of Vocational Behavior* (Vol. 45, pp. 79–122).

[13]   Ministry of Education and Training (2018), Quyết định số 552/QĐ-TTg phê duyệt đề án "*Giáo dục hướng nghiệp và định hướng phân luồng học sinh trong giáo dục Phổ thông giai đoạn 2018-2025*". Retrieved from http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?class_id=2&_page=1&mode=detail&document_id=193755

[14]   Nasta, K. A. (2012). *Influence of Career Self-Efficacy Beliefs on Career Exploration Behaviors*. December, 1–52. Retrieved from https://dspace.sunyconnect.suny.edu/bitstream/handle/1951/42318/KristenNastaMastersThesis.pdf

[15]   Shevyakova, A., Arystan, M., & Petrenko, Y. (2021). *Competence development for industry 4.0: Qualiphication requirements and* solutions, March 20,2021. Retrieved from http://doi.org/10.9770/IRD.2021.3.1(7)

[16]   Sima, V., Gheorghe, I. G., Subić, J., & Nancu, D. (2020). Influences of the industry 4.0 revolution on the human capital development and consumer behavior: A systematic review. *Sustainability (Switzerland)*, *12*(10). https://doi.org/10.3390/SU12104035

[17]   Song, D., & Bonk, C. J. (2016). Motivational factors in self-directed informal learning from online learning resources. *Cogent Education*, *3*(1). https://doi.org/10.1080/2331186X.2016.1205838

[18]   Stumpf, S. A., Colarelli, S. M., & Hartman, K. (1983). Development of the Career Exploration Survey (CES). *Journal of Vocational Behavior*, *22*(2), 191–226. https://doi.org/10.1016/0001-8791(83)90028-3

[19]   Tran, T. Q., Tran, A. L., Pham, T. M., & Van Vu, H. (2018). Local governance and occupational choice among young people: First evidence from Vietnam. *Children and Youth Services Review*, *86*(84436), 21–31. https://doi.org/10.1016/j.childyouth.2018.01.019

[20]   Tran, T. T. (2013). Limitation on the development of skills in higher education in Vietnam. *Higher Education*, *65*(5), 631–644. https://doi.org/10.1007/s10734-012-9567-7

[21]   Varekian Keishing, S.Renukadevi (2016), A Review of knowledge management based Career Exploration system in Engineering education, I.J Modern Education and Computer Science, 2016, 1,8-15, DOI: 10.5815/ijmecs.2016.01.02

[22]   Wang, J., Fan, W., Cheung, F. M., Wang, Q., & Li, M. (2019). Personality and Chinese adolescents' career exploration: The mediation effects of self-efficacy and perceived parental support. *Journal of Pacific Rim Psychology*, *13*. https://doi.org/10.1017/prp.2019.16

[23]   Wang, M., & Degol, J. (2013). Motivational pathways to STEM career choices: Using expectancy–value perspective to understand individual and gender differences in STEM fields. *Using Expectancy-Value Perspective to Understand Individual and Gender*

Differences in STEM Fields, *33*(4), 304–340. https://doi.org/10.1016/j.dr.2013.08.001.Motivational

[24]   Ware, N. C., Steckler, N. A., & Leserman, J. (1985). Undergraduate Women: Who Chooses a Science Major? *The Journal of Higher Education*, *56*(1), 73. https://doi.org/10.2307/1981723

[25]   Widayani, A., Astuti, E. S., & Saifi, M. (2020). Competence and readiness of small and medium industries against of industrial revolution 4.0. *IOP Conference Series: Earth and Environmental Science*, *485*(1), 0–7.https://doi.org/10.1088/1755-1315/485/1/012114

[26]   Yao, C. W., & Tuliao, M. D. (2019). Soft skill development for employability: A case study of stem graduate students at a Vietnamese transnational university. *Higher Education, Skills and Work-Based Learning*, *9*(3), 250–263. https://doi.org/10.1108/HESWBL-03-2018-0027