

APPLICATION OF IPA ON BUSINESS RISK MANAGEMENT FOR PRESCHOOLS: RISK IDENTIFICATION AND RANKING

Yi-Gean Chen, National University of Tainan
Jao-Nan Cheng, National University of Tainan

ABSTRACT

The purpose of this study is to find the possible business risks when preschools conduct new business strategies. After evaluating the possibilities and seriousness of each risk, the researcher adopts the method of IPA to analyse and distinguish the types of business risks, Acceptable risks, High risks and significant risks and according to the risk types to provide suitable suggestions to preschools' managers to deal with the risks: Transfer, mitigate, accept or avoid. The main subjects of the questionnaire are all the preschools' principals in Taiwan and the researcher adopts stratified random sampling to draw the samples and finally obtains 511 valid samples. After statistics analysis, the results of this study are as follows: (1) In this study, the researcher combines two risk management models, HHM and RM5, with the results of past studies to develop the risk management measurement for preschools and after analysis of the results of measurement, the researcher finds there are 6 risk dimensions and 24 risk items the principals will meet when they conduct new management strategies. Among all the risk items they will meet", heavier work load for preschool teachers" has the highest chance to occur and "safety of the building elements and components "will cause the most severe consequences; (2) The following risk items must be mitigated when a preschool implements new strategies: Professional capacities and work load of preschool teachers, the ability of the preschool to respond to policy changes and a shortage of human resources. These business risks are the ones that must be dealt with most urgently. According to the results above, the researcher suggests preschool principals adopt suitable risk management strategies to deal with different business risks when they conduct new business strategies.

Keywords: Business Risks, Risk Management, IPA.

INTRODUCTION

Starting from 2000, the fertility rate among young couples in Taiwan has declined drastically from 13.76% to 11.65% and the number of neonates is 292724 in 2000 and 196873 in 2016 (Department of Statistics, Ministry of Education, 2017). As a result of the rapid decrease in the number of young children, preschools have been forced into operational difficulties (Chen, 2016; Cheng & Chen, 2013). Thus, many preschools want to increase their competitiveness by changing their business strategies (Duan & Ma, 2013; Huang, 2008; Tsai, 2007), but worry such changes might lead instead to business risks. What kind of risks might arise if new strategies are implemented, how these risks might affect the business of the preschool and what might preschools do to manage these risks are important issues for preschool operators. It is therefore intended that the results of this study could provide knowledge of the business risks faced by early childhood education institutions to educational researchers in other countries, together with

methods to manage these risks. Given that such studies in the educational field were relatively few in the past although Chen (2016) has developed some index to measure the managerial risks for preschools by Delphi Technique, it is hoped that this study could generate some results concerning this issue. The research findings could make it possible for researchers around the world to understand the business risks of preschools in Taiwan and lead to appropriate suggestions on how these risks could be managed. They could also serve as reference for preschool operators from other countries and help those early childhood education institutions facing the same problems enhance their operational benefits.

This study conducted quantitative data analysis on the basis of a questionnaire, which was developed by combining studies regarding business risks in the business world (Barki et al., 2001; Lai & Lau, 2012; Longstaff et al., 2000; Rice, 2010; Ting et al., 2009; & Yiannaki, 2012) and those concerning the operational practices of preschools (Chen, 2016; Duan & Ma, 2013; Huang, 2008; Tsai, 2007; & Zhu, 2013), with the aim to measure the risk items of preschools. Moreover, by referring to the positioning and ranking method (Lai & Lau, 2012), as specified in the risk management model RFRM (risk filtering, ranking and management model), the risk values were calculated by multiplying the likelihood of a hazard being realized by the severity of its consequences in order to gain an understanding of the extent of the organizational risks faced in the current operational strategies (Lai & Lau, 2012). Finally, in combination with the IPA method (Importance-performance Analysis), the risks were analysed and differentiated as "a risk to be mitigated", "a risk to be shifted", "a risk to be avoided" and "a risk to be accepted", which are intended to be references for preschool operators in terms of risk management.

Given the above, the specific research purposes of this study could be described, as follows:

- (1) Investigate the possible business risks faced by preschool operators in Taiwan during the implementation of new strategies, including the risk items, likelihood of a hazard being realized and the severity of the consequences of the hazard being realized.
- (2) Analyse the management directions of the business risks for preschools in Taiwan, including investigation of the characteristics of different risks (high risk, significant risk and acceptable risk) and the management of these different risks (to be mitigated, to be shifted, to be avoided or to be accepted), thus, constructing referable paths for the management of business risks in preschools.

LITERATURE REVIEW

The researcher collects the studies of business risk management and finds that three theoretical models are applied to be the basis of model construction in many studies. They are HHM model (hierarchical holographic modelling), RM5 model (five risk management model) and RFRM model (risk filtering, ranking and management model). Therefore, this study also applies such three models to be the theoretical frame of preschool risk management. The illustrations about the application of HHM, RM5 and RFRM in this study are as follows.

Business Risk Measures for Preschools

The application of HHM and RM5 HHM (Hierarchical Holographic Modelling) is a risk management model developed by the University of Virginia and has been used in many risk management studies to define the risks of organizations (Schauppner, 2006). HHM is a holistic approach for analysis of an organization's risks, which analyse the features and characteristics of the organization, as well as the different dimensions involved in the system (Haimes et al., 2002; Lai & Lau, 2012). Using HHM to construct the risks faced by enterprises, Lai and Lau (2012)

identified the major categories of risks in the industry as economic, reputation, resources, operations, environmental, market, policy, managerial and financial risks, through which the risks of an organization could be examined in a holistic manner. Ting, Kwok & Tsang (2009) identified the major visions or perspectives of an organization's risks, including societal, technical, political, environmental, geographical, managerial, financial, infrastructure, outreach, etc. According to Longstaff, Chittister, Pethia & Haines (2000), the risks of an organization are comprised of temporal, quality, environment, leadership, acquisition, software implementation, technology risks, etc. Yiannaki (2012) suggested that "enterprise innovation" be included as part of an organization's risk. In addition, by adapting Porter's five forces analysis, Rice (2010) established risk management 5-forces (RM5) for businesses, including internal organization risks, information risks, risk influences, infrastructure and industry risks.

Based on the above research findings of HHM and RM5, the researcher in this study selects several risk items applicable to preschools and combines the two risk management models, HHM and RM5, with the results of past studies in preschool-management field (Chen, 2016; Duan & Ma, 2013; Huang, 2008; Tsai, 2007 & Zhu, 2013) to develop the risk management measurement for preschools and develops them into the measures of business risks in preschools. The first is quality and operational risk (Barki, Rivard & Talbot, 2001; Lai & Lau, 2012; Longstaff et al., 2000; Rice, 2010; Ting et al., 2009 & Yiannaki, 2012), which is related to various factors, such as teaching quality and work load and is mainly used to measure professional capacities, work input, work load relating to the general affairs of the preschool, work load relating to early childhood education, etc.; the second is policy risk (Lai & Lau, 2012; Longstaff et al., 2000; & Ting et al., 2009) which is related to such factors as changes in early childhood education policies and the relationship between the preschool and relevant administrative bodies and is used to measure responses to policy changes, policy awareness, the relationship between relevant administrative bodies, etc.; the third is environmental and managerial risks (Barki et al., 2001; Lai & Lau, 2012; Longstaff et al., 2000; Rice, 2010; Ting et al., 2009; & Yiannaki, 2012), which are related mainly to such factors as environment and facility safety, management and leadership and is used to measure the emergency handling mechanism, safety of building elements and components, leadership style, institutionalized management, etc.; the fourth is financial risk (Lai & Lau, 2012; Longstaff et al., 2000; Ting et al., 2009; & Yiannaki, 2012), which is mainly related to such factors as the financial management of the preschool and used to measure cost overruns, general expenses, increased labour costs, financial constraints, greater liabilities, etc.; the fifth is market risk (Lai & Lau, 2012; Rice, 2010; Ting et al., 2009. & Yiannaki, 2012), which is related mainly to such factors as the challenges and competition from nearby preschools and the image and characteristics of the preschool and is used to measure resistance to new opponents, the performance of opponents lagging behind and highlight advantages, characteristics of early childhood education, etc.; the sixth is resource risk (Lai & Lau, 2012; & Rice, 2010), which is mainly used for various factors, such as recruitment failures, high turnover rate, inability to lay off unsuitable employees, lack of human resources, etc. In this study, empirical data is gathered and analysed to confirm the above dimensions and items of measurement, which could then be used to identify the business risks of a preschool.

Business Risks Rating For Preschools

The application of RFRM many studies in the past applied RFRM on risk assessment and risk ranking (Haines, Kaplan & Lambert, 2002; Haines et al., 2002; Lai & Lau, 2012). Imbeah

& Guikema (2009) point out that RFRM is a suitable method to assess and analyse business risks and to make the decision about the treatment of those risks.

Risk rating refers to the determination of the degree of each possible risk in terms of the "likelihood of occurrence" and "consequence of hazard" (Lai & Lau, 2012; Haines et al., 2002, p.7; Kern, Moser, Hartmann & Moder, 2012.), through which it is possible to identify the aspects of the organization with the greatest risk rating and hence, the risks it should avoid. Providing the tool for risk rating and ranking, RFRM (risk filtering, ranking and management model) has been used in many studies to define the risks of an organization (Haines, Kaplan & Lambert, 2002; Haines et al., 2002; Lai & Lau, 2012.). RFRM is based on the "likelihood" and "consequence" of a hazard being realized and calculates the risk rating of an organization by multiplying these two elements, thus, rating and classifying the organizational risks and the corresponding degrees of the risks (Lai & Lau, 2012). After risk rating, different countermeasures could be taken according to the defined risk levels. As suggested by Lai and Lau (2012), those with a risk rating of 5-16 are significant risks, those with a risk rating of 1-4 are acceptable risks and those with a risk rating of 20-25 are high risks. For each category of risks, corresponding action plans are proposed, as shown in Figure 1.

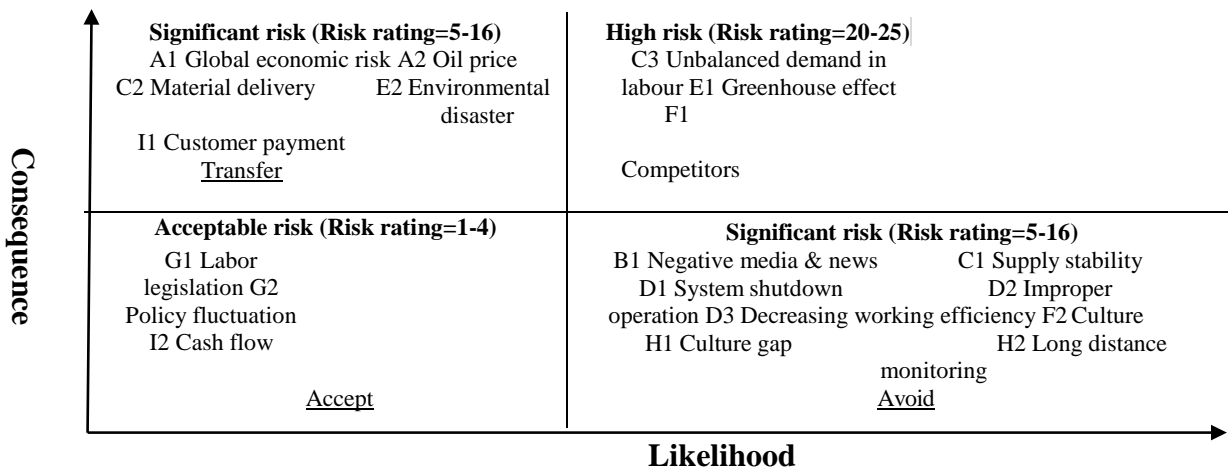


FIGURE 1
RISK ASSESSMENT AND CLASSIFICATION MATRIX

Referring to the risk rating model shown in Figure 1 and combining it with the method of IPA, a risk matrix is constructed in this study. Specifically, IPA works by using the "likelihood of a hazard being realized" as the x-coordinate and the "consequence of a hazard being realized" as the y-coordinate. Accordingly, all the risk items are distributed to the four quadrants of this matrix. The risks allocated to the first quadrant are characterized by "a high likelihood of being realized and high severity", namely, risks that the preschool should "mitigate". The risks allocated to the second quadrant are characterized by "a low likelihood of being realized and high severity", namely, risks that the preschool should "transfer". The risks allocated to the third quadrant are characterized by "a low likelihood of being realized and low severity", namely, risks that are "acceptable" to the preschool. The risks allocated to the first quadrant are characterized by "a high likelihood of being realized and low severity", namely, risks that the preschool should "avoid".

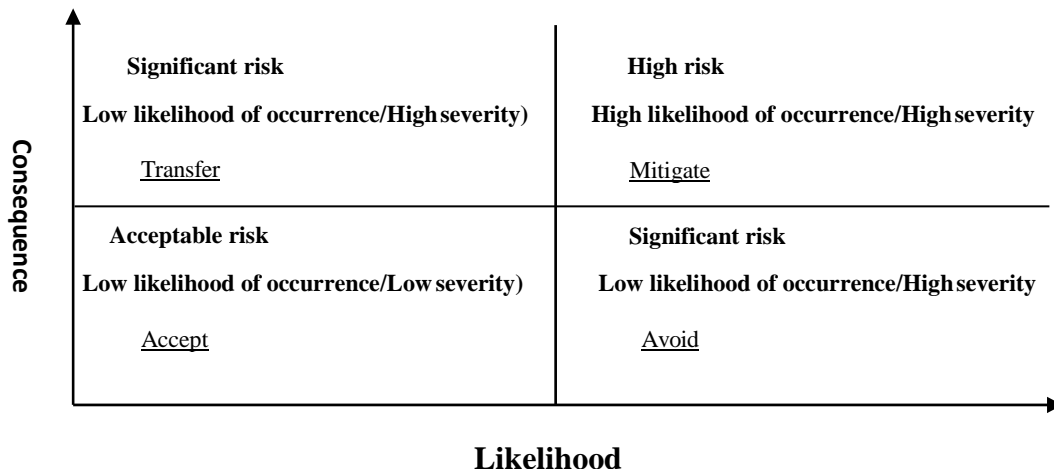


FIGURE 2
RISK ASSESSMENT AND CLASSIFICATION MATRIX IN COMBINATION WITH IPA

According to the above literature review, empirical data are gathered and analyses are conducted for each scenario, as based on the research purposes.

RESEARCH METHOD

Research Subjects and Sampling

In this study, the principals of public and private preschools in Taiwan are chosen as the research subjects. By dividing Taiwan into the four regions of north/central/south/east, the researcher conducts stratified random samplings of equal proportions, as based on the number of preschools in each region. In total, 511 valid samples are collected for data analysis.

Research Tools

Due to the lack of business risk scales in the past¹, this study developed questions for the "preschool business risks questionnaire", as based on the results of the literature review and by referring to relevant studies (Barki et al., 2001; Chen, 2016; Huang, 2008; Lai & Lau, 2012; Long staff et al., 2000; Rice, 2010; Ting et al., 2009; Tsai, 2007; Yiannaki, 2012; & Zhu, 2013) and used it as the measurement tool. Every question in the test was scored according to a Likert Scale of 1 to 5 points. In line with the results of factor analysis, preschool business risks were found to include 24 measurement items in six dimensions (Table 1). The first dimension was financial and included five items: Cost overruns, general expenses, increased labour costs, financial constraints and greater liabilities. The second dimension was related to quality and operations and included four items: Professional capacities, work input, work load relating to the general affairs of the preschool and work load relating to early childhood education. The third dimension was related to environment and management and included four items: Emergency handling mechanism, safety of building elements and components, leadership style and institutionalized management. The fourth dimension was related to resources and included four items: Recruitment failure, high turnover rate, impossibility to lay-off unsuitable employees

and lack of human resources. The fifth dimension was related to the market and included four items: Resistance to new competitors, performance of competitors lagging behind, highlighting advantages and characteristics of early childhood education. The sixth dimension was related to policy and included three items: Policy changes, policy awareness and relationship between relevant administrative bodies. The α reliability is 0.95, the construct validity is 0.64 ~ 0.96 and the scale was satisfactory in terms of both reliability and validity.

Data Analysis

This study uses SPSS22.0 to process and analyse the data. Moreover, in combination with the IPA method (Importance-performance Analysis), a risk matrix is established to determine the risk rating for each risk item. Table 1 lists the various business risk factors for preschools. There are a total of 24 items in this questionnaire. Principal Component Analysis is used to extract the common factors from the 24 items and only factors with an Eigen Value (λ) greater than 1 are chosen (Joseph, Rolph & Ronald, 1987). Oblique Rotations are used to derive six factors, which include Financial Risks (FR), Quality and Operations Risks (QOR), Environment and Management Risks (EMR), Resource Risks (RR), Market Risks (MR) and Policy Risks (PR). After factor analysis, it is determined that the first factor (FR) consists of 5 items, with factor loadings of 0.828 ~ 0.920; the second factor (QOR) consists of 4 items, with factor loadings of 0.683 ~ 0.839; the third factor (EMR) consists of 4 items, with factor loadings of -0.657 ~ -0.891; the fourth factor (RR) consists of 4 items, with factor loadings of -0.803 ~ -0.909; the fifth factor (MR) consists of 4 items, with factor loadings of 0.636 ~ 0.856; and the sixth factor (PR) consists of 3 items, with factor loadings of -0.727 ~ -0.869. Hair, Black, Babin, Anderson and Tatham (1992) indicated that a factor loading higher than 0.6 means that the variable has great contribution to that factor, thus, every variable (item) in this study has great contribution to the factor (dimension). The total variance explained in 6 dimensions is observed to be 79.696%; the first dimension (FR) is 47.577%; the second dimension (QOR) is 11.329%; the third dimension (EMR) is 6.069%; the fourth dimension (RR) is 5.721%; the fifth dimension (MR) is 4.679%; the sixth dimension (PR) is 4.321%. Aksoy and Ö zgan (2016) stated that data is appropriate for scale factor analysis when the KMO (Kaiser-Meyer-Olkin) value is higher than 0.60. Since the KMO value in this study is 0.930, the data set is appropriate for factor analysis. As can from Table 1, questions concerning a total of 24 business risks in 6 dimensions are developed.

Risk dimension Risk item	Financial	Quality and operations	Environment and management	Resource	Market	Policy	Communality
Risk of financial constraints	0.960	0.001	-0.002	-0.005	-0.001	0.031	0.909
Risk of increased monthly labour costs for the preschool	0.901	-0.017	0.060	-0.059	0.049	0.000	0.872
Risk of greater liabilities for the preschool	0.874	-0.015	0.017	-0.094	-0.031	-0.020	0.826
Risk of monthly cost overruns for the preschool	0.843	0.052	-0.092	0.023	0.014	-0.013	0.808
Risk of increased water and electricity costs, rental charges for premises or other general expenses	0.828	-0.008	-0.083	-0.003	0.050	-0.023	0.816

Risk of preschool teachers' being unable to be fully devoted to their work and compromising the quality of early childhood education	0.053	0.839	-0.043	0.119	-0.031	-0.011	0.689
Risk of preschool teachers' having no adequate professional capacities or being unable to fully bring out their professional capacities, thus, compromising the quality of early childhood education	-0.041	0.837	0.045	-0.045	0.104	0.100	0.675
Risk of preschool teachers having to bear a heavier work load because of the general affairs of the preschool	0.020	0.757	0.016	-0.052	-0.025	-0.118	0.677
Risk of creating heavier classroom management load for preschool teachers and greater numbers of child counselling issues	-0.016	0.683	-0.072	-0.112	-0.102	-0.178	0.673
Risk of safety issues relating to the building elements and components of the preschool	0.002	-0.057	-0.891	-0.013	-0.076	-0.097	0.802
Risk of the preschool not establishing or implementing an emergency handling mechanism	-0.001	-0.026	-0.880	-0.012	-0.049	-0.087	0.809
Risk of the principal finding it difficult to win the support of teachers and other employees with his or her leadership style	0.075	0.134	-0.678	-0.042	0.180	0.078	0.742
Risk of the principal having no idea about the preschool's operations, leaving the state of affairs unorganized and being unable to achieve institutionalized management	0.141	0.108	-0.657	-0.019	0.186	0.071	0.744
Risk of preschool teachers being unwilling to retain in their position, namely, the risk of a higher turnover rate and lack of talents	0.079	-0.015	0.058	-0.909	-0.003	-0.028	0.869
Risk of the preschool being unable to recruit adequate numbers of preschool teachers and suffering from the lack of talents	-0.044	-0.047	-0.063	-0.885	0.018	-0.061	0.832
Risk of the preschool being unable to lay off unsuitable employees and suffering from the lack of talents	0.054	0.015	0.009	-0.855	0.018	-0.018	0.817
Risk of a lack of teachers and other employees, namely, inadequate human resources, in the preschool	0.083	0.097	-0.047	-0.803	0.012	0.047	0.810

Risk of the preschool being unable to highlight its advantages	0.066	0.031	-0.030	0.026	0.856	-0.070	0.867
Risk of the preschool being unable to resist new competing preschools	0.141	0.005	0.030	-0.015	0.828	-0.075	0.876
Risk of the preschool lagging behind in performance or performing worse than competing	0.116	-0.058	0.010	-0.009	0.817	-0.168	0.889
Risk of the preschool being unable to highlight the characteristics of its early	-0.156	0.060	-0.195	-0.266	0.636	0.068	0.690
Risk of the management of the preschool finding it difficult to keep up with the changes in early	-0.014	0.007	-0.027	-0.003	0.099	-0.869	0.850
Risk of the management of the preschool being unable to respond to the sudden changes in early childhood education policies and regulations, thus, greatly affecting the development of the preschool	-0.015	0.058	-0.042	-0.082	-0.020	-0.829	0.809
Risk of the preschool having a bad or tense relationships with the governing bodies of preschools	0.087	0.078	-0.058	0.004	0.119	-0.727	0.777
Eigenvalue	11.418	2.719	1.457	1.373	1.123	1.037	---
Variation explained	47.577	11.329	6.069	5.721	4.679	4.321	---
Total variation explained	47.577	58.906	64.975	70.696	75.375	79.696	---
KMO value	0.930	----	----	----	----	----	---

RESEARCH RESULTS

Table 2 lists the risk ratings of preschool business risks, as obtained in combination with the IPA method. According to the statistical data listed in this table, this study offers the following analysis of the management of business risks when new strategies are implemented in Taiwan's preschools by the operators or principals.

Analysis of the Likelihood of Hazard Being Realized

In terms of the 24 risk items and the likelihood of a hazard being realized after the implementation of a new strategy, the one boasting the highest mean of 3.27 is "preschool teachers having to bear a heavier work load because of the general affairs of the preschool"; followed by "creating heavier classroom management load for the preschool teachers and greater numbers of children with counselling issues", with a mean of 3.14. Next is "the management of the preschool being unable to respond to the sudden changes in early childhood education policies and regulations, thus, greatly affecting the development of the preschool", with a mean of 3.12. This means that it is generally agreed among preschool principals that the most possible risk to be triggered by the implementation of new strategies is the increased work load for preschool teachers. On the other hand, the risk item with the lowest mean of 2.64 is "greater liabilities for the preschool". From the above results, it could be seen that the top concern for preschool principals after the implementation of new strategies is not to create greater liabilities for the preschool. Their worst fear and the most probable scenario, is creating heavier work load

for preschool teachers.

Analysis of the Consequence Severity of Hazard Being Realized

In terms of realized consequence severity of the 24 risk items, the one with the highest mean of 3.59 is the "safety of the building elements and components"; followed by "impossibility to lay off unsuitable employees and suffering from a lack of talents", with a mean of 3.55. Next is "preschool teachers being unwilling to retain in their position, namely, the risk of a higher turnover rate and lack of talents", with a mean of 3.52. This means that safety issues relating to building elements and components, which may arise after the implementation of new strategies, will cause the most severe results. On the other hand, labour shortage is the risk item that will impose the greatest influence when new strategies are implemented. Regarding the item with the least severe influence, "inability to bring out its advantages", has a mean of 3.15. This shows that preschool principal's think that, whether or not they are able bring out its advantages will not have huge influence on the operations of the preschool.

Risk Rating Analysis

In this study, risks are rated by multiplying the likelihood of a hazard being realized and its consequence severity. As could be seen from the risk values of the 24 risk items listed in Table 2, the item with the highest risk rating is "preschool teachers having to bear a heavier work load because of the general affairs of the preschool", with a score of 11.15. The one with the lowest risk rating is "greater liabilities for the preschool", with a score of 8.79. This shows that greater work load for preschool teachers constitute the riskiest item for a preschool after the implementation of a new strategy, while greater liabilities for the preschool is the least risky item. The researcher then went on to determine the risk characteristics by combining IPA with the risk assessment and classification conducted in Lai and Lau (2012) and Rice (2010). According to the statistical results, the average score of the 24 risk items, in terms of the "likelihood of being realized" is 2.90, while that in terms of the "consequence severity of being realized" is 3.35. Thus, the origin of the coordinate is set as (2.90, 3.35). Table 2 and Figure 3 list the details regarding the location and characteristics of the various risk items. The risk items in the various quadrants and their characteristics are described, as follows.

There are 7 risks in the first quadrant, namely, "early childhood education quality being compromised by the reduction in the teaching capacities of the preschool teachers or the impossibility to bring out their professional capacities", "heavier work load for preschool teachers because of the general affairs of the preschool", "the development of the preschool being greatly affected by the changes in policies and regulations", "inability to recruit adequate number of preschool teachers and a lack of talents", "preschool teachers being unwilling to retain in their position and the consequent higher turnover rate and lack of talents", "impossibility for the preschool to lay off unsuitable employees and the consequent lack of talents", "the lack of preschool teachers and other human resources in the preschool", respectively. Since the risks in this quadrant are characterized as "high risks to be mitigated", it means that risk items, such as "professional capacities" and "work load" on the level of quality and operations, "responses to policy changes" on the level of policy and all the risk items on the level of resources, including the "inability to recruit talents", "high turnover rate", "impossibility to lay off unsuitable employees" and "labour shortage" are all possible high risks for a preschool during the implementation of new strategies, thus, preschool principals or operators should try to mitigate

them. In other words, as these risks have a high chance of occurring and might result in grave results once they occur, thus, preschool principals should try to reduce their damage to preschool operations when they do occur.

There are 3 risks in the second quadrant, namely, "not establishing or implementing an emergency handling mechanism", "safety issues relating to building elements and components", "leaders having no idea about the preschool's operations, leaving the state of affairs unorganized and un-institutionalized", respectively, all of which are "on the level of environment and management". Since the risks in this quadrant are characterized as "significant risks to be transferred", it means that the three risk items of this level of management, although not having a high chance of occurring when the preschool principal implements new strategies, will have grave results when they do occur. It is therefore necessary for the preschool to transfer these risks through various measures, such as specifying emergency handling procedures, working closely with relevant government institutions and developing a good relationship with them, setting high safety standards for building elements and components, inspecting such elements on a regular basis to ensure they do not occur, establishing various systems for the organization and assigning leaders to implement them, etc.

There are 11 risk items in the third quadrant, namely, "having a tense relationship with the governing bodies of preschools in the county", "the principal finding it difficult to win the support of teachers and other employees with his or her leadership style", "the preschool suffering from cost overruns every month", "the preschool having to pay increased water and electricity costs, rental charges for premises or other general expenses every month", "the preschool having to bear greater labour costs every month", "the preschool suffering from financial constraints", "the preschool having to bear greater liabilities", "the preschool being unable to resist new competing preschools", "the preschool lagging behind in performance or performing worse than competing preschools in the area", "being unable to bring out one's advantages" and "the preschool being unable to highlight the characteristics of its early childhood education to attract parents", respectively. Most of the risks are attributable to either the financial (including cost overruns, general expenses, greater labour costs, financial constraints and increased liabilities) or market level (including resistance with new competitors, lagging behind the competitors in terms of performance, highlighting the advantages and characteristics of early childhood education). Only one item belongs to the policy level, namely, "relationship with administrative bodies", while another one could be attributed to the level of environment and management, namely, "leadership style". As the risks in this quadrant are characterized as being low, in terms of both the likelihood of being realized and consequent severity being realized and hence, "acceptable", which shows that these 11 risks are acceptable when new strategies are implemented in a preschool.

There are 3 risk items in the fourth quadrant, namely, "early childhood education quality being compromised by the preschool teachers' inability to be fully devoted to their teaching", "heavier classroom management load for preschool teachers and greater numbers of children with counselling issues" and "the preschool being unable to keep up with the rapid changes in early childhood education policies and regulations", respectively. The first two items are attributable to the level of quality and operations; while the last one belongs to the level of policy. The risks in this quadrant are characterized as having a high likelihood of being realized, but low consequence severity of being realized and hence, pose "significant risks to be avoided", meaning that the preschools should try to avoid these three risks during the implementation of new strategies.

Table 2
TABLE OF PRESCHOOL BUSINESS RISKS RATINGS

Preschool business risk description	Likelihood of being realized	Consequence severity	Quadrant	Risk rating (Risk assessment score)	Risk characteristics
1. The new business strategy will result in a reduction in the teaching capacities of the preschool teachers or make it difficult for them to bring out their professional capacities, thus, compromising the quality of early childhood education and triggering risk (quality and operations: Professional capacities)	3.11	3.38	1	10.51	High risk(Mitigate)
2. The new business strategy will make the preschool teachers' unable to be fully devoted to their teaching, thus, compromising early childhood education quality and triggering the risk (quality and operations: Work input)	3.06	3.34	4	10.22	Significant risk(Avoid)
3. The new business strategy means a heavier work load for preschool teachers because of the general affairs of the preschool, hence, the risk (quality and operations: Work load relating to the general affairs of the preschool)	3.27	3.41	1	11.15	High risk(Mitigate)
4. The new business strategy means creating heavier classroom management load for preschool teachers and greater number of children with counselling issues, hence, the risk (quality and operations: Work load of the preschool teachers)	3.14	3.32	4	10.42	Significant risk(Avoid)
5. After the new business strategy is implemented, the development of the preschool will be greatly affected when early childhood education policies and regulations are changed (policy: Responses to policy changes)	3.12	3.35	1	10.45	High risk(Mitigate)
6. The new business strategy will cause risks if the preschool could not keep up with the rapid changes in early childhood education policies and regulations (policy: Policy awareness)	3.02	3.24	4	9.78	Significant risk(Avoid)
7. The new business strategy will tighten the relationship between the preschool and its governing bodies, hence, the risk (policy: Relationship with administrative bodies)	2.84	3.19	3	9.06	Acceptable risk
8. The new business strategy will cause risks if the emergency handling mechanism is not established or properly implemented (environment and management: Emergency handling mechanism)	2.77	3.49	2	9.67	Significant risk(Transfer)

9. The new business strategy will cause risks because of the safety issues relating to the building elements and components of the preschool (environment and management: Safety of the building elements and components)	2.66	3.59	2	9.55	Significant risk(Transfer)
10. The new business strategy will cause risks if the principal finds it difficult to win the support of teachers and other employees with his or her leadership style (environment and management: Leadership style)	2.82	3.24	3	9.14	Acceptable risk
11. The new business strategy will cause risks if the principal has no idea about the preschool's operations, thus, leaving the state of affairs unorganized and being unable to achieve institutionalized management (environment and management: Institutionalized management)	2.8	3.38	2	9.46	Significant risk(Transfer)
12. The new business strategy might result in cost overruns for the preschool every month, hence, the risk (financial: Cost overruns)	2.82	3.34	3	9.42	Acceptable risk
13. The new business strategy might result in increases in water and electricity costs, rental charges for premises or other general expenses for the preschool every month, hence, the risk (financial: General expenses)	2.81	3.25	3	9.13	Acceptable risk
14. The new business strategy might result in increased labour costs for the preschool every month, hence, the risk (financial: Labour costs)	2.82	3.3	3	9.31	Acceptable risk
15. The new business strategy might result in financial constraints for the preschool every month, hence, the risk (financial: Financial constraints)	2.77	3.31	3	9.17	Acceptable risk
16. The new business strategy might result in far greater liabilities for the preschool, hence, the risk (financial: Greater liabilities)	2.64	3.33	3	8.79	Acceptable risk
17. The new business strategy will cause risks if the preschool is unable to resist new competing preschools (market: Resistance with new competitors)	2.9	3.21	3	9.31	Acceptable risk
18. The new business strategy will cause risks if the preschool lags behind in performance, as compared to competing preschools, (market: Lag behind competitors in terms of performance)	2.81	3.18	3	8.94	Acceptable risk
19. The new business strategy will make it impossible to bring out the preschool's advantages, hence, the risk (market: Advantages highlighting)	2.84	3.15	3	8.95	Acceptable risk

20. The new business strategy will make the preschool unable to highlight the characteristics of its early childhood education to attract parents, hence, the risk (market: Characteristics of its early childhood)	2.73	3.23	3	8.82	Acceptable risk
21. The new business strategy will cause risks if the preschool could not recruit adequate numbers of preschool teachers and be impossible to be implemented due to the lack of talents (resource: Failure to recruit talents)	2.98	3.51	1	10.46	High risk(Mitigate)
22. The new strategy will make the preschool teachers unwilling to retain their position, resulting in a higher turnover rate and a lack of talents, hence, the risk (resource: High turnover rate)	2.94	3.52	1	10.35	High risk(Mitigate)
23. The new strategy will cause risks if the preschool could not lay off unsuitable preschool teachers, resulting in a lack of talents, hence, the risk (resource: Impossibility to lay off unsuitable employees)	2.99	3.55	1	10.61	High risk(Mitigate)
24. The new strategy will cause risks if there is a labour shortage (resource: Labour shortage)	2.97	3.5	1	10.4	High risk(Mitigate)

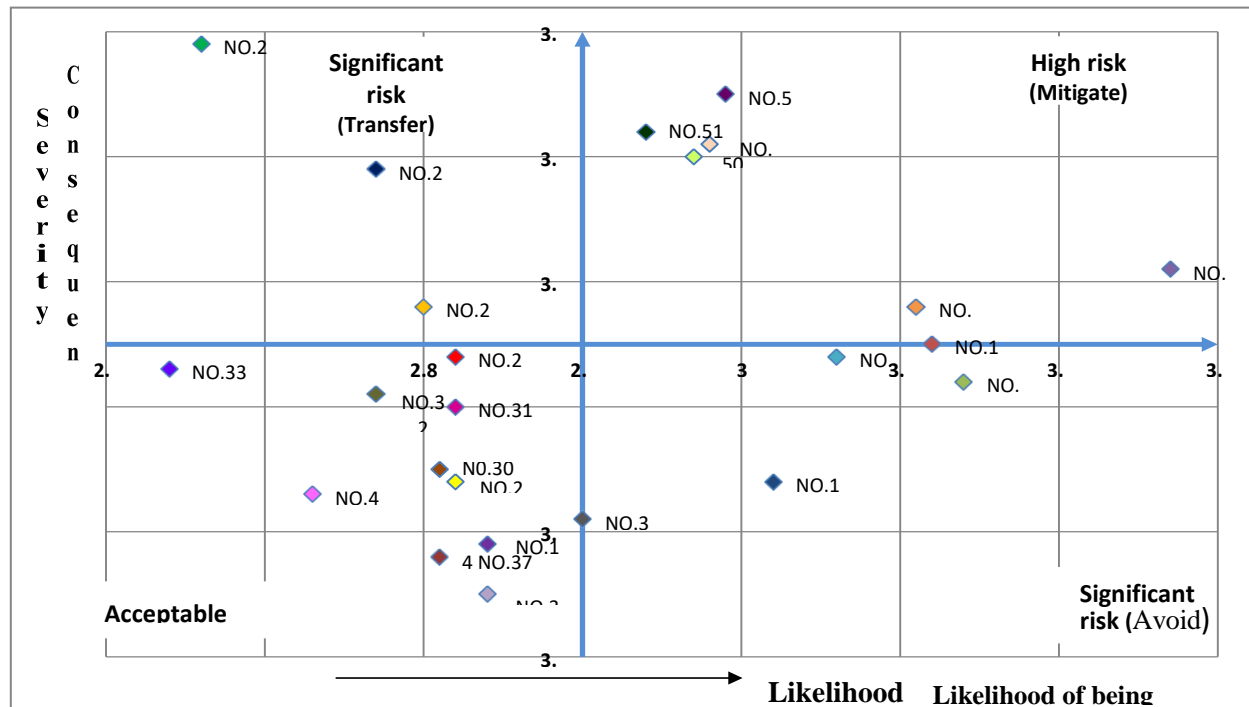


FIGURE 3
RISK ASSESSMENT AND CLASSIFICATION MATRIX

Notes: NO3: Quality and operations (professional capacities); NO4: Quality and operations (work input); NO7:

Quality and operations (work load relating to the general affairs of a preschool); NO8: Quality and operations (work load for the preschool teachers); NO12: Policy (responses to policy changes); NO13: Policy (policy awareness); NO14: Policy (relationship with administrative bodies); NO21: Environment and management (emergency handling mechanism); NO22: Environment and management (safety of building elements and components); NO25: Environment and management (leadership style); NO26: Environment and management (institutionalized management); NO29: Financial (cost overruns); NO30: Financial (general expenses); NO31: Financial (increased labour costs); NO32: Financial (financial constraints); NO33: Financial (greater liabilities); NO36: Market (resistance with new competitors); NO37: Market (performance of competitors lagging behind); NO38: Market (advantages highlighting); NO46: Market (early childhood education characteristics); NO50: Resource (inability to recruit talents); NO51: Resource (high turnover rate); NO52: Resource (inability to lay off unsuitable employees); NO53: Resource (labour shortage).

CONCLUSION

Given the fierce competition between preschools in Taiwan, nearly all operators consider shifting to more effective business strategies for the purpose of sustainable operation and existence. However, such shifts in business strategies might be accompanied by risks, which could only be reduced through risk management. On the basis of relevant risk management theories and research findings and taking the practical operations of preschools into consideration, the researcher in this study develops 24 risk measurement items in six dimensions and collects empirical data for analysis of the profile and characteristics of the business risks, thus, rating the various risks and putting forward suggestions for the management of such risks. The important findings and corresponding suggestions are hereby elaborated, as follows.

First, this study found that, when implementing new strategies, the most probable risks for a preschool are mainly attributable to the level of quality and operations, among which heavier work load for preschool teachers has the highest chance of manifesting itself and includes greater work load relating to the general affairs of the preschool, classroom management load and greater number of children with counselling issues. On the other hand, the least likely risk is greater liabilities for the preschool. This means that it is generally agreed among preschool principals that after new strategies are implemented, it is more likely for the work load of preschool teachers to increase and less likely to result in greater liabilities. This is a thought provoking result for the researcher. As all reforms must depend on teachers for support and implementation (Villegas-Reimers, 2003), this might be the reason why it is generally agreed among preschool principals that, after new strategies are implemented, it is most likely that the work load of preschool teachers will increase. However, the heavier work load for preschool teachers will lead to labour issues (Karsenti & Collin, 2013; Torres, 2016), such as turnovers and resignation, which constitute another research topic of this study, including "failure to recruit talents", "high turnover rate", "impossibility to lay off unsuitable employees", "labour shortage", etc. Therefore, changes in business strategies will surely cause business risks, such as heavier work load for preschool teachers and talent losses. Only by establishing channels for mutual understanding and facilitating preschool teachers to have a deep understanding of the business difficulties of preschools could they address problems and work together for the sustainable operations of the preschool, thus, avoiding the business risk of talent loss.

Secondly, it is agreed among preschool principals that environment and safety issues tend to cause the gravest results when new strategies are implemented. Among the 24 risk items, safety issues relating to the building elements and components of the preschool, in particular, will cause the most severe consequences. The reason for this might be that safety issues relating to building elements and components would often threaten people's security of life. Once such issues arise, the reputation of the organization will be compromised, which might also lead to

significant damages, hence, the extremely severe consequences. In addition, a shortage of human resources constitutes a risk of severe consequences during the implementation of new strategies. Previous analysis suggests that preschool teachers are the most important assets of a preschool (Pandey, 2011), as it has to depend mainly on humans (preschool teachers in particular) to provide services (mainly education and child care). If there is a shortage of human resources, it will be difficult to implement any strategy, hence, the grave consequences. The risk with the least severe consequence is found to be the inability to highlight one's advantages; the most probable reason for this is that most preschools in Taiwan are supervised and evaluated by the government and each one is required to abide by the rules and regulations. In recent years, in terms of quality, after the integration of preschools and day care centres in particular, the government has been urging homogeneous early childhood education in all areas. Under such circumstances, operators of preschools developed a concept: That failure to highlight their advantages would not necessarily lead to severe consequences.

Third, regarding the risk rating of the 24 risk items in combination with IPA, this study found that the following risk items must be mitigated when a preschool implements new strategies: Professional capacities and work load of preschool teachers, the ability of the preschool to respond to policy changes and a shortage of human resources (including failure to recruit talents, high turnover rate, impossibility to lay off unsuitable employees, labour shortage, etc.). These business risks are the ones that must be dealt with most urgently. In addition, the risks that must be transferred are found to include: Not establishing or implementing an emergency handing mechanism, safety issues relating to the building elements and components, the principal having no idea about the preschool's operations, thus, leaving the state of affairs unorganized, etc. Although these risks boast a low likelihood of being realized, if they do arise, severe consequences will follow, thus, they should be addressed immediately. Regarding risks to be avoided, they include early childhood education quality being compromised by the preschool teachers' inability to be fully devoted to their teaching, heavier classroom management load, a greater number of children with counselling issues, the preschool being unable to keep up with the rapid changes in early childhood education policies and regulations, etc. The remaining risk items are all acceptable.

This study points out the business risks faced by preschools in Taiwan and puts forward suggestions for the management of these risks, as based on the IPA results. It is intended that the research findings of this study could give the scholars and researchers of this international symposium some understandings of the business risks currently faced by preschools in Taiwan and offers suggestions for possible management directions.

ENDNOTES

1. Instead of a questionnaire, Chen (2016) developed some index by Delphi Technique to measure the managerial risks for preschools, so we still lack of the scale, "preschool business risks questionnaire".

REFERENCES

- Aksoy, S. & Ö zgan, H. (2016). A reliability and validity study for researching teachers' perceptions related to their psychological capital. *Indian Journal of Positive Psychology*, 7(2), 147-151.
- Barki, H., Rivard, S. & Talbot, J. (2001). An integrative contingency model of software project risk management. *Journal of Management Information Systems*, 17(4), 37-69.
- Chen, Y.G. (2016). IPA analysis on service quality of preschools: Based on PZB Model. *The Journal of Human Resource and Adult Learning (HRAL)*, 12(1), 10-19.
- Cheng, J.N. & Chen, Y.G. (2013). The exploration of the dimensions to the scale of kindergarten's competitiveness

- and kindergartens' efficacy. *Education and Sports Education*, 12, 16-21.
- Department of Statistics, Ministry of Education (2017). Numbers of neonates. Retrieved from: <http://sowf.moi.gov.tw/stat/year/list.htm>
- Duan, H. & Ma, Z. (2013). The development strategies for private preschools to adapt to the transition society of Taiwan. *Journal of Early Childhood Education & Care*, 10, 1-17.
- Haimes, Y.Y., Kaplan, S. & Lambert, J.H. (2002). Risk filtering, ranking and management framework. *Risk Analysis*, 22(2), 383-397.
- Haimes, Y.Y., Lambert, J.H., Kaplan, S., Pikus, I. & Leung, F. (2002). *A risk assessment methodology for critical transportation infrastructure*. Virginia: Virginia Research Transportation Council.
- Hair, J.F., Black, B., Babin, B., Anderson, R.E. & Tatham, R.L. (1992). *Multivariate data analysis (Sixth Edition)*. New York: Macmillan.
- Huang, I. (2008). The content of the ideal brand at infant preschools and the related subjects discussion-infant school sellers and customers' view. *Journal of Early Childhood Education & Care*, 2, 103-117.
- Joseph, F.H., Rolph, E.A. & Ronald, L.T. (1987). *Multivariate data and analysis with reading*. New York: MacMillan Publishing Co.
- Karsenti, T. & Collin, S. (2013). Why are new teachers leaving the profession? Results of a Canada-Wide survey. *Education*, 3(3), 141-149. doi: 10.5923/j.edu.20130303.01
- Kern, D., Moser, R., Hartmann, E. & Moder, M. (2012). Supply risk management : Model development and empirical analysis. *International Journal of Physical Distribution & Logistics Management*, 42(1), 60-82.
- Lai, I.K.W. & Lau, H.C.W. (2012). A hybrid risk management model: A case study of the textile industry. *Journal of Manufacturing Technology Management*, 23(5), 665-680.
- Longstaff, T.A., Chittister, C., Pethia, R. & Haimes, Y.Y. (2000). Are we forgetting the risks of information technology? *Computer*, 33(12), 43-51. doi: 10.1109/2.88 9092
- Pandey, S. (2011). *Professionalization of teacher education in India: A critique of teacher education curriculum reforms and its effectiveness*. Retrieved from: <http://www.icsei.net/icsei2011/Full%20Papers/0007.pdf>
- Rice, J.F. (2010). Adaptation of Porter's five forces model to risk management. *Defence Acquisition Review Journal*, 17(3), 375-388.
- Schauppner, C.T. (2006). *Measuring the immeasurable: Applying hierarchical holographic modelling to developing measures of effectiveness for stability, security, transition and reconstruction operations*. Newport, RI: Naval War College. (ADA463707)
- Ting, J.S., Kwok, S. & Tsang, A. H. (2009). Hybrid risk management methodology: A case study. *International Journal of Engineering Business Management*, 1(1), 25-32.
- Torres, A.C. (2016). Is this work sustainable? Teacher turnover and perceptions of workload in charter management organizations. *Urban Education*, 51(8), 891-914
- Tsai, C. (2007). The case study of innovative management for early childhood education. *Journal of Early Childhood Educare*, 5, 35-58.
- Villegas, R.E. (2003). Teacher professional development: An international review of the literature. Paris: International Institute for Educational Planning. Retrieved from: <http://unesdoc.unesco.org/images/0013/001330/133010e.pdf>
- Yiannaki, S.M. (2012). A systemic risk management model for SMEs under financial crisis. *International Journal of Organizational Analysis*, 20(4), 406-422.
- Zhu, Z. (2013). A study of the willingness of knowledge sharing of preschool workers. *Early Childhood Education*, 311, 20-33.