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Information Technology Capabilities in Nepalese Private School

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Abstract

Purpose: The study highlights the need of Nepalese private schools to develop the capabilities of information communication technology in their organization to acquire, analyze and use of the data. This study aims to examine relationship between IT infrastructure capabilities, IT human resource capabilities and IT capabilities of Nepalese private schools.

Materials and Methods: The research design employed in this study is a combination of qualitative and quantitative approaches. A structured questionnaire survey was used to collect necessary information from four hundred private schools of Bagamati, Gandaki and Lumbini provinces of Nepal who independently involved in this study. Unit of information were principals, coordinators and administrative staff. Structural equation modeling was used to examine the relationship between IT infrastructure, IT human resource and IT capabilities. Descriptive statistics were used to analyze IT infrastructure and challenges faced by Nepalese private schools to exploit their IT capabilities.

Findings: The findings of the study revealed that IT infrastructure capacity and IT human resource capacity have positive relationship with IT capabilities of Nepalese private schools. Nepalese private schools have sufficient IT infrastructure. Majority of Nepalese private schools are poor in IT Human Resource Capability. lack of skilled human resource, high operation cost, delay on repair, ignorance of stakeholders and misuse of IT Infrastructure by their employee are the challenges faced by Nepalese private schools to utilize their IT capabilities.

Implications to Theory, Practice and Policy: Resource base view and enterprises resource planning are the basic theories which governs the information technology. Information technology can enhance the competitiveness of educational institutions and informed decision is a key for success. Technological literacy among the school leaders and user-friendly IT software should be the concern of practitioners. Policy makers should encourage to exploit IT capabilities through training, tax rebate of IT equipment and digitalization on education system.

Keywords: *IT Infrastructure, IT Human Resource, IT Capabilities, Private Schools, Enterprise Resource Planning*

JEL Codes: 033

INTRODUCTION

Information technology (IT) is the life blood of modern organizations and plays vital role in organizational activities (Tayibnapis et al.,2021). Sensing of relevant information in the heap of information collected from internal as well as external sources, transformation of information in ready to use form applying different analytical tools and usages of analyzed information in decision making process by the managers at different levels determines the competitive advantages in dynamic environment (Osakwe et al.,2022). IT capabilities of an organization exchange real time information for informed decision to optimize energy consumption, minimize the waste of input and enhance sustainable organizational processes (Martínez-Peláez et al.,2023). IT operation capabilities of an organization help them to be innovative and able them to create value and distribution of the value to their stakeholders (Kosasi,2024). Adjustment between internal environment and external actors & factors, collection of real time information and their appropriate analysis, to draw insights from data with the help of information technology remains the organization competitive and helps for right & prompt decision. It is the informed decision which leads an organization towards its goals & objectives (Szukits & Móricz,2024). Information technology assists the management of an organization facing the crises in the market, challenges posed by the competitors and changes of the need of the stakeholders (Mgunda,2019). IT capabilities plays significant role on the performance of an organization, flexibility in operation and adjustment in market (Hoa et.al.,2023, Setiawati et.al.,2022). Adaptation of information technology such as internet of things, blockchain, and artificial intelligence (AI) help to reduce wastage of resources used by the organizations and obtain real time information about the attitude of market towards green initiatives (Madkhali & Sithole,2023). The exchange of information regarding the adoption of sustainable development as a long-term objective for the organization, along with market reactions, product modifications, differentiation, and customization according to market demands, is feasible when the organization possesses efficient information technology (Chen et al.,2024).

Functional activities of an organization are to be connected with each other (internal integration) to achieve the common goal of the organization. Proper and coordinated utilization of organizational resources among the department enhance the internal efficiency of the organization which is the source of organizational strength in competitive market. Information technology assist on better coordination among the departments within the organization by sharing the information of one department to another which enhance the performance of both departments (Özşahin et al.,2022). IT infrastructure capabilities refers to the ability of management to exploit the information resource of the organization towards the objectives of the organization. Construction of common platform of information, sharing information within the organization and fact-based decisions among the functional areas of the organization through internal network system is regarded as internal integration of the organization through information technology. Internal integration of functional departments and external integration with stakeholders through internet of things to exchange real time information determines the IT capabilities of an organization. Digital agility is a strategic enabler in the current times that allows organizations to be competitive

and operationally efficient and deliver superior customer experience in this age of high business dynamics and technology-induced business environments (Yuen & Baskaran, 2024).

The total number of schools in Nepal is 35,447 out of which 8,149 are private schools (source: Economy survey of Nepal 2021/2). Nepalese private schools are facing the crises of existing due to the lack of organizational learning, unable to develop the market base strategy, competition with government schools and lack of innovations. Market competition has transformed into speed competition, information competition and knowledge competition, and the scope of competition has also expanded from regions to the world (Yang & Jian, 2020). Real time information is a crucial factor to determine the market trend, differentiation the product and services, customization of the product as per the need of the market. Decisions of the management based on the real time information, proper analysis of collected information and modeling addresses those issues faced by the Nepalese private schools.

Problem Statement

Role of IT team and IT infrastructure in IT capabilities of Nepalese private schools and challenges of fully utilization of information technology by Nepalese private schools are the areas of this study. Global competition among the students, digitalization of school activities, and advancement in information technology forced Nepalese private schools to think about the replacement of traditional school management approach. New research studies say that businesses need to adopt digital technologies and build dynamic IT capabilities and flexible IT skills which is equally applicable in the context of Nepalese private schools. Digital transformation has become the crucial pathway for Nepalese private schools to respond to market changes, enhance comprehensive competitiveness, and achieve sustainable development.

. Nepalese private schools need to strengthen their information technology (IT) capabilities to effectively acquire, analyze, and utilize organizational data for informed decision-making (Momeni et al., 2023). Despite the growing importance of digital technologies in the education sector, Nepal continues to face challenges in ICT infrastructure compared with many other countries, suggesting limited development and research on IT capabilities within Nepalese private schools (Sharma & Kim, 2016). Developing IT capabilities can facilitate the efficient utilization of organizational resources, including human, physical, informational, and technological resources, thereby contributing to institutional sustainability, improved educational quality, and broader socioeconomic development. Furthermore, the adoption of information technology has become essential for private schools regardless of their size or operational characteristics, as it enhances organizational efficiency, competitiveness, and long-term sustainability (Okundaye et al., 2019). Previous studies have also highlighted that IT capability is a critical determinant of organizational performance, profitability, and survival in an increasingly competitive environment (Kgasago et al., 2018). However, empirical evidence examining the relationship between IT capability and organizational performance in the context of Nepalese private schools remains limited. This research gap underscores the need for further investigation into how IT capability influences the performance of private schools in Nepal (Owuori et al., 2020).

LITERATURE REVIEW

Theoretical Review

Resource Base View of an Organization

Organizational resources are the key factors of the organization to achieve its goals. All those tangible and intangible things owned by the organization which are exploited during the course of actions are the resources of an organization. The development of resources by the organization helps it to gain competitive advantages in competitive environment. When efficiency and effectiveness on development & utilization of available resources is achieved the organizational resources are turned into unique, valuable, rare, and costly to imitate. The RBV emphasizes that a firm's long-term success depends on its ability to develop and manage internal resources that are valuable, rare, inimitable, and effectively organized (Schueffel & Stuessi,2025). Internal environment of an organization is regarded either strength or weakness in terms of resources available within the organization. Acquisition and development of resources by an organization is one of the important area of competition among the Nepalese private schools. A school can differentiate it from its competitors in terms uniqueness of resources available with it. Internal strength of a school depends on how the school converts its resources in value creation processes. Those resources which are unique and hard to copy by others enhances school's position in the community (Purba et al.,2023). Human, financial, physical, structural, and informational resources are all types of organizational resources. A school will succeed if it has the most appropriate resources and know how to deploy them more effectively than their competitors (Hoa et al.,2023). Resource base view of an organization is the fundamental principle in the field of IT research.

Enterprise Resource Planning (ERP)

Enterprise resource planning is the internal integration of functional activities of a school through information technology (Rohit and Khan, 2020). Valuable information is collected and generated at different functional centers of the school. unless there is common information sharable platform within the organization activities of various functional areas are unable to produce synergic impact on the performance. ERP helps the school by aggregating and storing information from multiple critical school operations, including student enroll, teaching & learning activities, library, relationship with guardian's, finance & accounting, and human resources (Katuu, 2020). Real time information when uploaded in ERP system data are available at different levels of school management. ERP system contributes on effectiveness of an organization. Research shows that ERP significantly improves organizational performance in various aspects, resulting in significant benefits for the organization (Gandasari and Mukhtaruddin. (2025).

Hypothesis Development

IT Infrastructure and IT Capabilities

IT integrates the activities of different departments and external parties with exchange of real time information through internet of things (Zhang et al.,2016). IT infrastructure consists of computer hardware, software, connecting devices and cables. Hardware includes desktop computers,

laptops, data centers, servers, routers, networking hardware, sensor equipment. IT infrastructure represents the organization's ability to deploy hardware platforms and related software systems (Lu & Ramamurthy, 2006). IT infrastructure indicators include: 1) Hardware device platforms; 2) Software platform; 3) Data management and storage; 3) Network platform; 4) Internet platform; 5) System integration services and consulting; and 6) Operating system platform (Siagian & Ikatrinasari, 2019). Without internet of things, computer hardware and software it is not possible to integrate, coordinate and communicate real time data and exchange of knowledge among the functional areas of the organization and logistics activities. Integration of functional areas through computer networking enables the organization to gain competitive advantages (Ganbold et al.,2020). According to Bharadwaj, (2000) computers, communication technologies, sharable technical platforms and data base are the components of IT infrastructure. IoT is completely reliant on internet connectivity. Therefore, processing the data will be difficult if there is a slow internet connection or no online connectivity. A variety of sensors are used in the data collection procedure. For the purpose of gathering and transmitting data to the cloud, these sensors are linked to IoT gateways (Nofrialdi et al.,2023). If the hardware of the IoT devices is not sufficiently compatible with the IT system, the adoption of IoT for the purpose of corporate intelligence could represent a serious problem for the organization (Michal, 2022). Combination of hardware and software technology enables the organization to develop IT capabilities leading to better decision making and improved organizational performance (Chen et al.,2012). With the existence of adequate information technology infrastructure, it will facilitate and accelerate the process of transferring data and information needed both in making a decision. Appropriate IT infrastructure is the backbone of IT capabilities. Thus, H1.1. IT Infrastructure Capacity has positive impact on IT capabilities of Nepalese private schools.

IT Team and IT Capabilities

Human capital is essential to utilize non-human resources of the organization to achieve efficiency and effectiveness. To mobilize technical resources committed technical manpower is prerequisite in the organization. Committed and loyal IT personnel enable the organization to integrate, organize, and use resources for school needs (Hadikusuma & Siagian, 2022). Human aspect of IT capabilities is represented by IT team. IT personnel are important in supporting the use of technology and resolving school issues (Shehzad et al.,2022). IT team in the organization may be formed as decentralized groups of IT professionals who assist other employee in interacting with IT system at top level, functional level and shop level as an internal source of IT manpower (Foster et.al.,2015). Excellence in a digital work environment depends on employee skills, available infrastructure and technologies (Reuschl et al.,2022). Schools can also hire IT experts as external source of manpower. IT service providers, software suppliers also assist the organization to introduce and implement IT system. IT team should possess both technical skills and behavioral skill as it is responsible to communicate real time information with internal as well as external persons/ parties. Integration of data from multiple sources, analysis of collected data and customization of IT system as the need of the organization, preparation of reports, OLAP utilities demands technical skill (Lior et al.,2016). IT team should also have good understanding of school context, environment and operation mechanism. Integration of IT and school activities,

development of updated applications, working and communicating with functional areas of the school and anticipation of future school needs are the abilities to be posed by IT team (Bharadwaj ,2000). Thus, IT team has positive impact on IT capabilities of Nepalese private schools.

IT Capabilities

Acquisition, deployment, utilization of IT resources for the enhancement of organizational performance is the IT capability of an organization. IT capability consists of IT management, system, and personnel (Kala et al.,2018). IT infrastructure, IT team and integration of business activities through sharing of real time information for right & prompt decision to achieve efficiency and effectiveness in the organization is IT capabilities of an organization (Aslam et al.,2022). IT capabilities enables the firm to monitor its external environment and gives insights to solve the problems created by external actors & factors with informed decisions .IT infrastructure capability, IT human capability and school spanning transforms and develops the school (Li & Jia,2018). Efficient Data management services, network communication services and applications portfolio & services are the IT infrastructure capabilities (Lu & Ramamurthy ,2011). IT team capability is the technical and managerial skills of IT team members. Utilization of IT resources for the achievement of organizational goal refers to IT business spinning capacity. With development of information and communication technology capabilities, their impact on environmental sustainability has become more obvious (Kunkel & Matthess,2020). Transparency in the organizational activities helps to build trust among the stakeholders which is possible through IT capabilities of the organization (Yang et al.,2022). IT capabilities enhance the ability of a firm to quickly respond on differentiation and customization the product/ service to address the changed preferences of the customers. Lu & Ramamurthy (2011) mention that, "IT capability enables a firm's ability to quickly respond to/ capitalize on changes through continuously monitoring and quickly improving product/service to address customers' needs and a firm's ability in its internal business processes to physically and rapidly cope with market or demand changes". The result of interaction of organizational resources and IT assets (IT infrastructure and IT team) is IT capabilities of the organization. Availability of IT infrastructure, IT team and other organizational resources determines the ability of an organization to build IT capabilities. There is cause- and –effect relationship between organization's assets and capabilities. IT capabilities is essential to gain competitive advantages and sustainable development in dynamic environment. IT capabilities has positive impact on firm's performance. Effective and efficient utilization of resources by a school minimize the wastage of scarce natural resources. Protection of natural resource during their consumption leads towards sustainable development.

Research Gaps

Thus, the study aims to bridge the gap of lack of research on role of IT capabilities to achieve sustainable development in Nepalese private schools. The main objective of the study is to examine relationship between IT infrastructure capabilities, IT human resource capabilities and IT capabilities of Nepalese private schools. Nepalese private schools are expected to adopt environmentally responsible practices that balance economic objectives with ecological and social considerations.

Information technology (IT) capabilities which includes hardware, software, IT personnel, ability of internal integration between functional departments, integration with external parties through internet of things, and cloud computing enables the organization to address the situation faced by the organization (Chu et al.,2019). Organization's operational activities are to be supported by sharing the real time information to achieve effectiveness and efficiency ((Hadikusuma & Siagian,2022).

MATERIAL AND METHODS

Survey research design with qualitative and quotative approaches were applied in this study. The population of the study was 4047 private schools of Bagamati, Gandaki and Lumbini provinces of Nepal. According to Economy survey of Nepal 2021/22 there are 2,108 private schools in Bagamati province,643 in Gandaki province and 1,296 in Lumbini province. Purposive sampling method was used. The sample size of the study was calculated by using slovin's formula. Sample size (n) = z2 *p*(1-p) / e^2. Population proportion is estimated at 0.5, 5% margin of error and 95% confidence level were used. n= (1.96)2*0.5*(1-0.5)/ $(0.05)^2$ = 384.16 or 385. The sample size from Bagamati province (2,108/4047*100) is (52percent of 385) 200 schools, Gandaki province (643/4047*100) is (15.88 percent of 385) 62 schools and Lumbini province (1296/4047*100) is (32percent of 385) 123 schools. The composition of study samples represents the private schools of these three provinces of Nepal. Private schools of Bagamati, Gandaki and Lumbini provinces were visited. Principals, coordinators and school administrators were informed about the objectives of the study and oral consent was obtained. The survey instrument of the study was divided among five parts. The first part represents the demographic features of the respondents. The second part has five Likert scale items to measure the IT infrastructure capabilities (Mingwei et.al.,2024), the third part consist of five Likert scale items to measure the IT human capabilities and the fourth part has five Likert scale items to measure the IT capabilities of Nepalese private schools. All the Likert scale items were measured in seven-point scales (1 Strongly Disagree to 7 Strongly Agree). Challenges of full utilization of digital technology were asked to the respondents as open-ended questions. The survey instrument of the study was distributed among Principals, coordinators and school administrators of purposively selected schools. Out of 400, 395 responses were collected. During the preliminary analysis data file was created in MS Excel. Count blank and standard deviation of responses were determined. Blank responses and the responses with standard deviation less than 20 percent were avoided from the study. 10 responses have missing responses and unable to meet the standard deviation criteria were excluded from the study. 385 responses were retained for further analysis. Structural equation modeling was used to test hypothesis. Descriptive statistics were used to analyze IT infrastructure and challenges faced by Nepalese private schools to exploit their IT capabilities.

FINDINGS

Respondents profile

Respondents were asked to provide information regarding their location, level of school, year of experience, position in their school and number of teaching & non-teaching employees. Table 1 summarized the profile of respondents.

Table 1: Respondents Profile

Location	**Frequency**	**Percentage**
Urban	252	65.5
Suburban	133	34.5
Level	Frequency	Percentage
Basic Level	48	12.5
Secondary Level	337	87.5
Experience	Frequency	Percentage
Less than 5 years	147	38.2
6 years to 10 years	145	37.7
Experience more than 10 years	93	24.2
Position	Frequency	Percentage
Principal	234	60.8
Coordinator	133	35.5
Other	18	4.7
Number of Employees	Frequency	Percentage
11 to 20 employees	53	13.8
Employees more than 20	332	86.2

Table 1 revealed that majority of the respondent schools (65.5 percent) are located in urban areas, 87.5 percent schools are running at secondary level, majority of the respondents (60.8 percent) are Principals and majority of schools (86.2 percent) have employees more than 20.

IT Infrastructure

Respondents of Nepalese private schools located at Urban and Suburban areas were asked whether their schools possess computers and equipment's related to IT infrastructure in schools. The frequency of their responses is presented in table 2.

Table 2: Frequency Table of Equipment

SN	**Equipment**	**Frequency**	**Percentage**
1	Desktop computer	385	100
2	Laptop	385	100
3	Smart phone	385	100
4	Web server	204	53
5	Software	385	100
6	Router	385	100
7	Equipment for networking	385	100
8	Sensor equipment	233	60.5
9	CCTV Camera	356	92.5

Table 2 shows that all the Nepalese private schools running in urban & suburban areas possess Desktop computers, laptops, smart phone, software, Router, Networking equipment. 47 percent schools have not their own web page, 39.5 percent schools have not Senor equipment and 7.5 percent schools have not CCTV Camera. The table disclosed that all the Nepalese private schools located in Urban and Suburban areas of Nepal have sufficient IT infrastructure in their school.

Functional Areas of IT Usages

Respondents of Nepalese private schools located at Urban and Suburban areas were asked the functional areas of their school where Information technology is in practice. Responses of the respondents is presented in Table 3.

Table 3: Functional Areas of IT Usages

SN	Functional Areas	Frequency	Percentage
1	Billing, Accounting	385	100
2	Payroll	329	85.5
3	Examination	357	92.7
4	Administration	330	85.7
5	Library	83	21.6
6	Students and Guardian	385	100
7	Government Agencies	246	63.9
8	Society	219	56.9

Table 3 revealed that billing & accounting, Payroll, examination, administration, and contact with students & Guardians are computerized by Nepalese private schools. Only 21.6 percent schools have computerized their library. Majority of Nepalese private schools interact with government and society through internet of things.

Measurement Model

A measurement model was created through confirmatory factor analysis to test the relationship between latent variable and indicator variable. Five items of IT infrastructure capability, five items of human resource capability and three items of IT capability were included in the analysis. Table 4 shows factor loading of all items included in the analysis.

Table 4: Factor Loading of Items

Constructs	Items	Factor loading
IT Human Resource Capability	The IT team should have knowledge and technical capabilities corresponding to the requirements from the IT system.	0.867
	The IT team requires the ability to lead the process of designing and developing the IT system.	0.897
	The IT team should know how to solve problems related to IT.	0.926
	The IT team should have business understanding compatible with organization requirements.	0.924
	The IT team can evaluate and control IT projects.	0.949
IT Infrastructure Capability	We have good data management services & architectures.	0.901
	We have good network communication services.	0.894
	We have a good enterprise-level application portfolio & service.	0.906
	We have good IT facility operation and services.	0.930
	We have good IT infrastructure to meet the technological needs of the Organization.	0.899
IT Capability	The IT system is used to identify trends, opportunities, and threats in the business environment.	0.968
	The IT system provides in-depth analysis capabilities of the organization's status.	0.979
	Departments in the organization commonly share information and insights generated from the IT system.	0.981

Table 4 shows that the lowest factor loading is 0.867 and the highest factor loading is 0.981. All the individual factor loadings are greater than 0.50 and average loading are also more than 0.70. It seems that no any item included in the study should be avoided from further analysis.

Overall Fit of Measurement Model

Overall fit of measurement model was tested by using absolute model fit, incremental model fit, parsimonious fit indices. Table 5 shows the result of overall fit of measurement model.

Table 5: Model Fit Indices

Fit Index	χ^2	χ^2 / D.F.	RMSEA	GFI	AGFI	CFI	NFI
Acceptable Value	p<0.05	1-5	<0.05	>0.900	>0.900	>0.900	>0.900
Results	P≤0.018	1.431	0.034	0.968	0.950	0.0.996	0.988

Table 5 revealed the model fit indices of measurement model the fit indices are acceptable and model is appropriate for further analysis. In case of RMSEA it was 0.034 and insignificant (0.961) which is good fit model.

Reliability Test

Internal consistency of the items was tested with composite reliability test. The result revealed that the value of composite reliability for IT infrastructure capability with five items is 0.958, IT Human resource capability with five items is 0.962 and IT Capability with three items is 0.984. These values are greater than 0.70 indicate that there is strong internal consistency among the items.

Validity Test

Convergent Validity

Average variance extracted was used to test the Convergent Validity. Average variance extracted of three latent variables are 0.821 for IT infrastructure capabilities, 0.834 for IT human resource capability and 0.953 for IT capabilities. These AVE values which are greater than 0.50 indicates there is good convergent validity.

Discriminant Validity

Square root of AVE explained discriminant validity. The diagonal value in Table 6 represents square root of AVE.

Table 6: Discriminant Validity

	IT Capacity	IT Infrastructure Capacity	IT Human Resource Capacity
IT Capacity	0.976		
IT Infrastructure Capacity	0.152	0.906	
IT Human Resource Capacity	0.151	0.0004	0.913

Table 6 shows that no squared correlation value is higher than the square root of average variance extracted. It indicates that there is good discriminant validity.

Social Desirability Test

Herman's single factor test was conducted to detect whether there is common method bias is existing in the responses of the respondents. The result of Herman's single factor analysis shows 32.27 percent variance explained by a single factor. The total variance explained by a single factor is less than 50 percent indicates that there is no issue of social desirability bias in the study.

Result of Structural Equation Model

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Hypothesis of the study were tested with structural equation model. Imputed data file was created to develop composite variables form Likert scale items of IT Infrastructure Capability, IT Human Resource Capability and IT Capability in Nepalese private schools. Structural equation model was tested to examine whether the model is fit on empirical data collected through questionnaire survey in this study. The test result of the theoretical model is presented in table 7.

Table 7: Model Fit Indices

Fit Index	χ^2	χ^2 / D.F.	RMSEA	GFI	AGFI	CFI	NFI
Acceptable Value	p<0.05	1-5	<0.05	>0.900	>0.900	>0.900	>0.900
Results	P≤0.012	2.558	0.064	0.985	0.955	0.923	0.886

Table 7 revealed that the model seems good fit since RMSEA is 0.064 (insignificant 0.231) and all the fit indices are more than 0.900 criteria. Multivariate normality of the model is 0.027 with critical ratio 0.027 which lies between 1.96 to -1.96. The figure of the model is presented in figure 1.

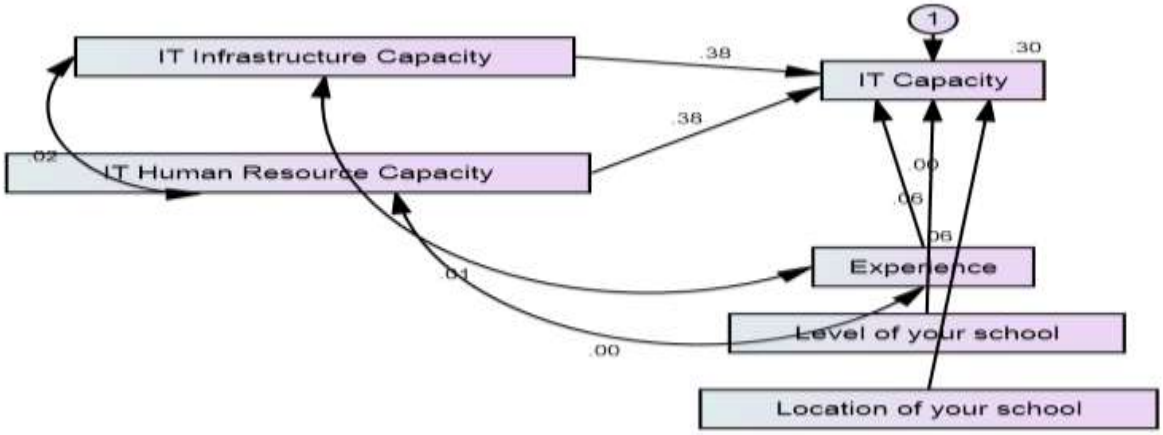

Figure 1: Structural Equation Model

Fig. 1, revealed the path coefficients of independent variables with dependent variable. Path from IT Infrastructure Capacity to IT Capacity is statistically significant (p≤ 0.001). IT Infrastructure Capacity explained 38.1 percent variance of IT Capacity of Nepalese private schools. The result supports the hypothesis of the study - IT Infrastructure Capacity has positive impact on IT capabilities of Nepalese private schools. Path from IT Human Resource Capacity to IT Capacity is statistically significant (p≤ 0.001). IT Human Resource Capacity explained 38 percent variance of IT Capacity of Nepalese private schools. The result supports the hypothesis of the study - IT Human Resource Capacity has positive impact on IT capabilities of Nepalese private schools. Experience, level and Location of school are insignificant (p values are 0.913,0.193 and 0.185).

Descriptive Statistic of IT Infrastructure Capability and IT Human Resource Capability

The descriptive statistics of IT Infrastructure Capacity, IT Human Resource Capacity and IT Capabilities are presented in Table 8. Nepalese private schools below the mean value have poor and above the mean value have good IT Infrastructure Capability, IT Human Resource Capability and IT Capability.

Table 8: Descriptive Statistics

	Min.	Max.	Mean	Std. Dev.	Below Mean %	Above Mean %
IT Infrastructure Capacity	3.43	6.50	5.035	.864	42.6	57.4
IT Human Resource Capacity	1.73	4.43	3.385	.756	75.1	24.9
IT Capacity	2.03	6.95	5.021	1.222	58.2	41.8

Table 8 revealed that majority (57.4 percent) of Nepalese private schools have good IT Infrastructure capability. Majority of Nepalese private schools are poor in IT Human Resource Capability and IT Capability.

Challenges Faced by Nepalese Private Schools on Digitalization of Their Activities

Nepalese private schools were asked to disclose the challenges faced by them to utilize their IT capabilities. The result of their responses is presented in table 9.

Table 9: Challenges of IT Utilization

Challenges	Frequency Percentage	
	No	Yes
Expensive to operate	7	93
Irregular power supply	Nil	100
Lack of skilled manpower	Nil	100
Delay on repair	21.3	78.7
Ignorance of stakeholders	35.6	64.4
Misuse by employee	42.6	57.4

Table 9 revealed the major problems faced by Nepalese private schools on fully utilization of their IT capabilities. Irregular power supply and lack of skilled manpower are the common problems of Nepalese private schools regarding the utilization of IT capabilities. Majority of the Nepalese private schools are agreed that high operation cost, delay on repair, ignorance of stakeholders and misuse of IT Infrastructure by their employee are the challenges faced by them to utilize their IT capabilities.

CONCLUSION AND RECOMMENDATIONS

IT infrastructure and IT human resource determines the IT capacity of Nepalese private schools. The finding is in the line of Kala et al., (2018). IT infrastructure supports Nepalese private schools to develop common platform of information and makes sharing information easy which is supported by the findings of Hadikusuma & Siagian (2022). The major issue of Nepalese private schools for fully utilization of available IT infrastructure is lack of skilled and capable human resource. The finding of the study is similar as Shrestha P. (2021) mentioned the skills base for modern technology is low in Nepal. Poor IT capability of Nepalese private schools is the finding of the study which is in the line of the finding of Koirala S. (2021) as she noted that the potential of data to drive high growth in several sectors of the Nepalese economy remains high yet untapped.

Functional areas of Nepalese private schools are digitalized but there is lack of internal integration. As the respondents of Nepalese private schools argued the information technology is expensive to them indicates that they are unable to exploit the IT resources of their school. It is in the line of Rahman (2025) as he mentioned that infrastructure deficits and financial constraints are the primary obstacles of Nepalese schools. For the successful operation of the school Nepalese private schools should prioritize modifying their organizational culture, adopting big data technologies, and actively engaging stakeholders to promote innovation. Information technology should recognize as one of the important resources by Nepalese private schools as Chaudhary et al., (2023) noted that Information technology enhance the operational efficacy and expand the business prospects. Customization on software and hardware is recommended to the suppliers of IT infrastructure. School management should possess IT literacy and positive attitude towards new technology. Power backup, periodic contract with repair service providers and short-term IT training to the school administrator are the remedies to overcome the challenges of information technology. Policy maker should encourage on digital enrollment, digital library and online registration. Tax rebate on purchase of hardware and software, extra incentives to those private schools who digitalize their activities enhances the practice of information technology.

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Conflicts of Interest Declaration

The authors declare no conflicts of interest.

License

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Appendix

Data Analysis

Multiple Response Analysis of IT equipment(Q5)

Case Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
$Q5[a]	385	100.0%	0	0.0%	385	100.0%

a. Dichotomy group tabulated at value 1.

$Q5 Frequencies

		Responses		Percent of Cases
		N	**Percent**	
$Q5[a]	Desktop computer	385	12.4%	100.0%
	Laptop computer	385	12.4%	100.0%
	Smartphone	385	12.4%	100.0%
	Web server	204	6.6%	53.0%
	Software	385	12.4%	100.0%
	Routers	385	12.4%	100.0%
	Equipment required for network	385	12.4%	100.0%
	Sensor equipment	233	7.5%	60.5%
	CCTV camera	356	11.5%	92.5%
Total		**3103**	**100.0%**	**806.0%**

Multiple Response Analysis of Areas of

Case Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
$Q6[a]	385	100.0%	0	0.0%	385	100.0%

a. Dichotomy group tabulated at value 1.

$Q6 Frequencies

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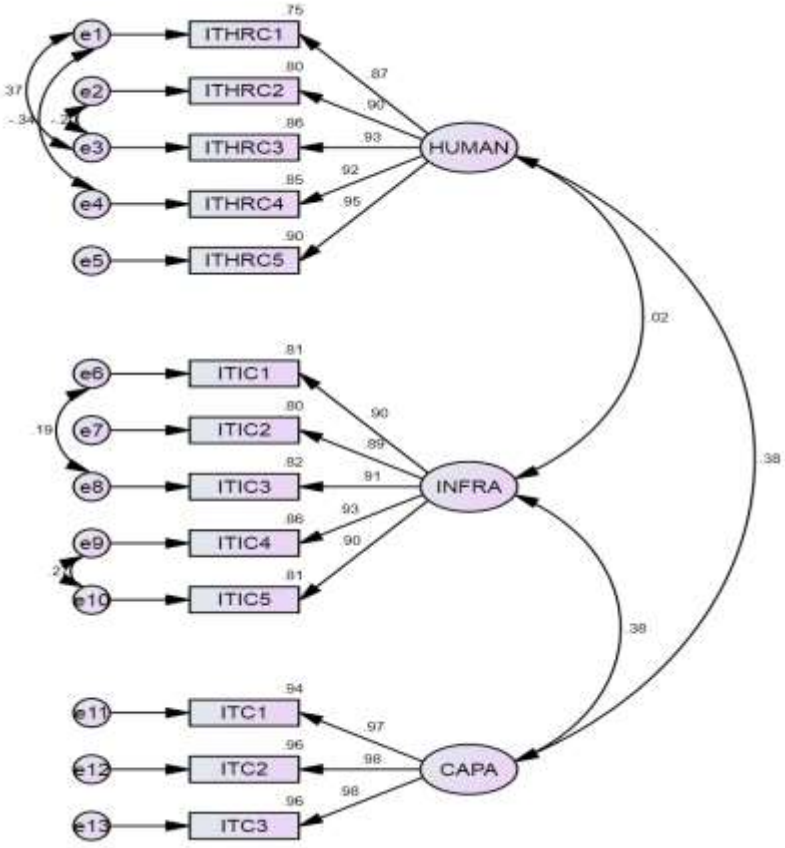
		Responses		Percent of Cases
		N	Percent	
$Q6[a]	Billing, Accounting	385	16.5%	100.0%
	Payroll	329	14.1%	85.5%
	Examination	357	15.3%	92.7%
	Administration	330	14.1%	85.7%
	Library	83	3.6%	21.6%
	Students and guardian	385	16.5%	100.0%
	Government agencies	246	10.5%	63.9%
	Society	219	9.4%	56.9%
Total		2334	100.0%	606.2%

a. Dichotomy group tabulated at value 1.

Measurement Model

CFA Figure



CFA Result

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 91

Number of distinct parameters to be estimated: 34

Degrees of freedom (91 - 34): 57

Result (Default model)

Minimum was achieved

Chi-square = 81.579

Degrees of freedom = 57

Probability level = .018

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
ITHRC1	<---	HUMAN	1.000				
ITHRC2	<---	HUMAN	1.139	.046	24.831	***	
ITHRC3	<---	HUMAN	1.587	.048	33.222	***	
ITHRC4	<---	HUMAN	1.511	.065	23.215	***	
ITHRC5	<---	HUMAN	1.918	.068	28.009	***	
ITIC1	<---	INFRA	1.000				
ITIC2	<---	INFRA	.782	.029	26.807	***	
ITIC3	<---	INFRA	1.031	.033	31.249	***	
ITIC4	<---	INFRA	1.007	.035	28.898	***	
ITIC5	<---	INFRA	1.436	.054	26.489	***	
ITC1	<---	CAPA	1.000				
ITC2	<---	CAPA	.966	.017	57.458	***	
ITC3	<---	CAPA	1.043	.018	58.651	***	

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Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
ITHRC1	<---	HUMAN	.867
ITHRC2	<---	HUMAN	.897
ITHRC3	<---	HUMAN	.926
ITHRC4	<---	HUMAN	.924
ITHRC5	<---	HUMAN	.949
ITIC1	<---	INFRA	.901
ITIC2	<---	INFRA	.894
ITIC3	<---	INFRA	.906
ITIC4	<---	INFRA	.930
ITIC5	<---	INFRA	.899
ITC1	<---	CAPA	.968
ITC2	<---	CAPA	.979
ITC3	<---	CAPA	.981

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
HUMAN	<-->	INFRA	.013	.036	.370	.711	
HUMAN	<-->	CAPA	.360	.054	6.672	***	
INFRA	<-->	CAPA	.411	.062	6.635	***	
e1	<-->	e4	-.072	.013	-5.680	***	
e1	<-->	e3	.081	.018	4.398	***	
e6	<-->	e8	.035	.015	2.336	.019	
e9	<-->	e10	.060	.020	3.005	.003	
e2	<-->	e3	-.042	.012	-3.390	***	

Correlations: (Group number 1 - Default model)

			Estimate
HUMAN	<-->	INFRA	.020
HUMAN	<-->	CAPA	.380
INFRA	<-->	CAPA	.378
e1	<-->	e4	-.340
e1	<-->	e3	.369
e6	<-->	e8	.190
e9	<-->	e10	.273
e2	<-->	e3	-.195

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
HUMAN	.590	.056	10.560	***	
INFRA	.782	.070	11.250	***	
CAPA	1.513	.117	12.983	***	
e1	.196	.018	11.073	***	
e2	.186	.016	11.568	***	
e3	.246	.026	9.602	***	
e4	.231	.022	10.689	***	
e5	.241	.026	9.196	***	
e6	.181	.019	9.793	***	
e7	.120	.011	10.881	***	
e8	.181	.019	9.598	***	
e9	.124	.015	8.262	***	
e10	.383	.039	9.710	***	
e11	.102	.010	10.340	***	
e12	.063	.008	8.208	***	
e13	.065	.009	7.571	***	

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
ITC3	.962
ITC2	.958
ITC1	.937
ITIC5	.808
ITIC4	.864
ITIC3	.821
ITIC2	.800
ITIC1	.812
ITHRC5	.900
ITHRC4	.854
ITHRC3	.858
ITHRC2	.804
ITHRC1	.751

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	34	81.579	57	.018	1.431
Saturated model	91	.000	0		
Independence model	13	6674.383	78	.000	85.569

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.032	.968	.950	.607
Saturated model	.000	1.000		
Independence model	.642	.245	.119	.210

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.988	.983	.996	.995	.996
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.731	.722	.728
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	24.579	4.535	52.629
Saturated model	.000	.000	.000
Independence model	6596.383	6331.571	6867.495

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.212	.064	.012	.137
Saturated model	.000	.000	.000	.000
Independence model	17.381	17.178	16.488	17.884

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.034	.014	.049	.961
Independence model	.469	.460	.479	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	149.579	152.152	283.989	317.989
Saturated model	182.000	188.886	541.745	632.745
Independence model	6700.383	6701.366	6751.775	6764.775

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.390	.337	.463	.396
Saturated model	.474	.474	.474	.492
Independence model	17.449	16.759	18.155	17.451

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	356	399
Independence model	6	7

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Reliability Test (Cronbach's alpha, when EFA is used)

IT Infrastructure Capability

Reliability Statistics

Cronbach's Alpha	N of Items
.949	5

IT Human Resource Capability

Reliability Statistics

Cronbach's Alpha	N of Items
.952	5

IT Capability

Reliability Statistics

Cronbach's Alpha	N of Items
.983	3

Composite reliability (when CFA is used)

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate	SQ A	1-A	ME	sum of lading	C	C+ME	C/(C+ME)
ITHRC1	<---	HUMAN	0.867	0.752	0.248					
ITHRC2	<---	HUMAN	0.897	0.805	0.195					
ITHRC3	<---	HUMAN	0.926	0.857	0.143					
ITHRC4	<---	HUMAN	0.924	0.854	0.146					
ITHRC5	<---	HUMAN	0.949	0.901	0.099	0.832	4.563	20.821	21.653	0.962
ITIC1	<---	INFRA	0.901	0.812	0.188					
ITIC2	<---	INFRA	0.894	0.799	0.201					
ITIC3	<---	INFRA	0.906	0.821	0.179					
ITIC4	<---	INFRA	0.93	0.865	0.135					
ITIC5	<---	INFRA	0.899	0.808	0.192	0.895	4.530	20.521	21.416	0.958
ITC1	<---	CAPA	0.968	0.937	0.063					
ITC2	<---	CAPA	0.979	0.958	0.042					
ITC3	<---	CAPA	0.981	0.962	0.038	0.142	2.928	8.573	8.715	0.984

Validity test

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate	SQ	SUM	N	AVE	sqrt of AVE
ITHRC1	<---	HUMAN	0.867	0.752				
ITHRC2	<---	HUMAN	0.897	0.805				
ITHRC3	<---	HUMAN	0.926	0.857				
ITHRC4	<---	HUMAN	0.924	0.854				
ITHRC5	<---	HUMAN	0.949	0.901	4.168	5	0.834	0.913
ITIC1	<---	INFRA	0.901	0.812				
ITIC2	<---	INFRA	0.894	0.799				
ITIC3	<---	INFRA	0.906	0.821				
ITIC4	<---	INFRA	0.93	0.865				
ITIC5	<---	INFRA	0.899	0.808	4.105	5	0.821	0.906
ITC1	<---	CAPA	0.968	0.937				
ITC2	<---	CAPA	0.979	0.958				
ITC3	<---	CAPA	0.981	0.962	2.858	3	0.953	0.976

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Discriminant validity

Correlations

		CAPA	INFRA	HUMAN
CAPA	Pearson Correlation	1	.390**	.389**
	Sig. (2-tailed)		.000	.000
	N	385	385	385
INFRA	Pearson Correlation	.390**	1	.021
	Sig. (2-tailed)	.000		.685
	N	385	385	385
HUMAN	Pearson Correlation	.389**	.021	1
	Sig. (2-tailed)	.000	.685	
	N	385	385	385

**. Correlation is significant at the 0.01 level (2-tailed).

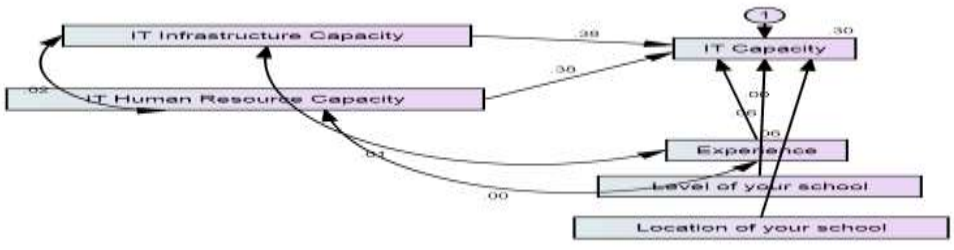
Social Desirability or Common Method Bias Test

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.681	43.698	43.698	4.195	32.272	32.272
2	4.226	32.507	76.205			
3	1.649	12.687	88.891			
4	.275	2.119	91.010			
5	.228	1.757	92.767			
6	.207	1.590	94.357			
7	.198	1.526	95.883			
8	.153	1.179	97.062			
9	.115	.883	97.945			
10	.096	.738	98.683			
11	.079	.607	99.290			
12	.053	.410	99.700			
13	.039	.300	100.000			

Extraction Method: Maximum Likelihood.

Structure equation modeling



Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables

CAPA

Observed, exogenous variables

INFRA

HUMAN

Experience

Level

Location

Unobserved, exogenous variables

et

Variable counts (Group number 1)

Number of variables in your model:	7
Number of observed variables:	6
Number of unobserved variables:	1
Number of exogenous variables:	6
Number of endogenous variables:	1

Assessment of Normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
Location	1.000	3.000	.650	5.207	-1.577	-6.318
Level	1.000	2.000	-2.272	-18.202	3.163	12.670
Experience	1.000	3.000	.248	1.990	-1.307	-5.234
HUMAN	1.733	4.431	-.819	-6.558	-.506	-2.028
INFRA	3.429	6.500	-.344	-2.752	-.893	-3.575
CAPA	2.029	6.948	-.397	-3.177	-.588	-2.355
Multivariate					.027	.027

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	21
Number of distinct parameters to be estimated:	14
Degrees of freedom (21 - 14):	7

Result (Default model)

Minimum was achieved

Chi-square = 17.908

Degrees of freedom = 7

Probability level = .012

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
CAPA	<---	INFRA	.538	.060	8.925	***	
CAPA	<---	HUMAN	.613	.069	8.900	***	
CAPA	<---	Experience	.007	.067	.110	.913	
CAPA	<---	Level	.205	.157	1.301	.193	
CAPA	<---	Location	.073	.055	1.327	.185	

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
CAPA	<---	INFRA	.381
CAPA	<---	HUMAN	.380
CAPA	<---	Experience	.005
CAPA	<---	Level	.055
CAPA	<---	Location	.057

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
INFRA	<-->	HUMAN	.014	.033	.407	.684	
HUMAN	<-->	Experience	-.003	.030	-.085	.932	
INFRA	<-->	Experience	.007	.034	.214	.831	

Correlations: (Group number 1 - Default model)

			Estimate
INFRA	<-->	HUMAN	.021
HUMAN	<-->	Experience	-.004
INFRA	<-->	Experience	.011

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
INFRA	.745	.054	13.856	***	
HUMAN	.571	.041	13.856	***	
Experience	.604	.044	13.856	***	
Level	.109	.008	13.856	***	
Location	.904	.065	13.856	***	
et	1.039	.075	13.856	***	

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
CAPA	.301

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	14	17.908	7	.012	2.558
Saturated model	21	.000	0		
Independence model	6	156.581	15	.000	10.439

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.016	.985	.955	.328
Saturated model	.000	1.000		
Independence model	.121	.894	.851	.638

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.886	.755	.927	.835	.923
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.467	.413	.431
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	10.908	2.048	27.408
Saturated model	.000	.000	.000
Independence model	141.581	105.079	185.545

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.047	.028	.005	.071
Saturated model	.000	.000	.000	.000
Independence model	.408	.369	.274	.483

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.064	.028	.101	.231
Independence model	.157	.135	.179	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	45.908	46.428	101.253	115.253
Saturated model	42.000	42.780	125.018	146.018
Independence model	168.581	168.804	192.300	198.300

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.120	.096	.163	.121
Saturated model	.109	.109	.109	.111
Independence model	.439	.344	.554	.440

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	302	397
Independence model	62	75