

JGB 8838**Gap Analysis of Preferred Training Methods between Organizations and Employees in
Select Energy and Manufacturing Companies***Jonie A. Jumamil Jr. & Adrian Galido**Mindanao State University-Iligan Institute of Technology**joniejr.jumamil@g.msuiit.edu.ph & adrian.galido@g.msuiit.edu.ph***Abstract**

Organizations are significantly investing in enterprise resource planning systems due to their good benefits on the efficiency and effectiveness of the internal process. However, studies revealed that ERP system projects still fail. One of the significant contributors to this is in training end users of the system as companies apply various approaches in training employees towards acceptance of ERP systems. This aims to identify the training method preferences of ERP system end users and how organizations are suggested to implement training methods based on end-user preferences. A research instrument was distributed to 3 HR Managers in manufacturing and 3 in energy companies to validate and evaluate the training methods and their implementation of ERP systems. Another research instrument was distributed to 61 ERP end from 11 companies in the energy and manufacturing industries. Using the averaging method, the preferred training method of end users was acquired through the Likert scale set of the questionnaire. This revealed their preferred training method in terms of its helpfulness in their intention to use the system. The results show that lectures, programmed instruction, and simulation are implemented by all organizations for ERP system training, while the training method that the end user respondents strongly prefer is team training.

Keywords: ERP systems, end-user training, ERP training method preference

Introduction

Background of the Study

An enterprise resource planning (ERP) system is a management technology that advocates an integrated approach to conducting business. Organizations nowadays are significantly investing in complex information systems such as enterprise resource planning systems due to their good benefits, with a focus on the efficiency and effectiveness of the internal process (Rahnavard & Bozorgkhoh, 2014). The software, if implemented fully across an entire enterprise, connects the various components of the enterprise through logical transmission and data sharing (Norris et al., 2000). Implementing ERP systems has proven to have improved business performance of their reliable information, operation efficiency, cost-effectiveness, cycle time reduction, scalability, reach, and ease of use.

Despite their benefits, over two-thirds of ERP system projects fail (Chang, Cheung, Cheng, & Yeung, 2008). Research findings indicate that despite high costs and lengthy timeframes, ERP implementations do not perform to expectation (Davenport, 1998; Tarn, Yen, & Beaumont, 2002; Momoh et al., 2010; Stanciu & Tinca, 2013). This is partly due to a need for more understanding about addressing critical challenges during implementations, which can lead to cancellations, large cost overruns, and project failures (Momoh et al., 2010; Stanciu & Tinca, 2013). Studies have focused on the success indicators in implementing ERP, where successful implementation of ERP is more influenced by user satisfaction supported by the level of use, system quality, information quality, and service quality. (Hermawan, 2019).

Rajan and Baral (2015) revealed that individual, organizational, and technological factors affect the usage of ERP and significantly impact usability among the end user. One of

the key focuses of organizations to address critical challenges in ERP implementation is training end-users before and after using the system (Menon et al., 2019). The people who make or break a system, through their use or disuse of it (McNurlin & Sprague, 1998). Hence, employee acceptance is as important as the process and the technology used to develop and implement an information system, as employees have a high potential to resist system deployment when not appropriately trained (Clark, 1999).

Employee acceptance is as important as the process and technology used to develop and implement an information system. This is related to training employees because if they are not properly trained, there is a high potential for them to resist system deployment (Clark, 1999). Measuring the impact of training on workplace performance and its contribution to organizational results is a matter of great concern for management in all types of organizations (Punia & Kant, 2013). While organizations hope to apply this technology to improve overall performance, they must understand what it takes for their employees to use it. Although the use of ERP systems may not be voluntary, understanding system adoption from the user's perspective helps help organizations prepare their employees to face new challenges and learn how to make good use of the technology (Chang et al., 2008). Organizations strive to equip employees with the necessary skills to execute transactions in ERP systems effectively. Organizations can improve their employees by giving them access to courses, workshops, and self-paced alternatives.

Organizations address critical challenges in ERP implementation, especially in training end-users before and after using the system (Menon et al., 2019). Papasratorn et al. (2013) discuss that end-user training (EUT) is used for training and learning applications or ISs with factors that can be grouped into five categories: individual differences, needs assessments, training goals, training methods, and learning techniques. Hence, it is inevitable to use End-User Training for individuals who learn differently. According to Gupta et al.

(2010), end-user training is an important tool in implementing ERP systems and has a rich research tradition in Information Systems.

There needs to be more research done on the impact of training or education on Enterprise resource implementation and exploitation (Heierhoff et al., 2011). This study will evaluate the employees' end-user experience and identify the learning theories that are most effective in using ERP systems. This research aims to evaluate the effectiveness of ERP training provided by organizations and understand the training preferences of the employees who are new end-users of the system.

The motivation for this study came from the author's direct personal experience with training for ERP systems in his organization, an energy company. This study will benefit employers, employees, ERP vendors, learning institutions, and researchers.

Statement of the Problem

This study evaluates the effectiveness of the select companies' training methods in the actual use of employees of ERP systems. Companies apply various approaches in training ERP system end users.

1. What ERP training methods are provided by organizations to end users, and how do the employees perceive these training methods?
2. Which training methods are preferred by end users for ERP system usage? How can organizations support employees towards effective use of the system?

Objectives of the Study

This paper highlights the criticality of the end-user factor to the success or failure of the ERP venture. This study suggests how organizations can implement training methods more effectively based on end-user preferences. In the future, companies can resort to evaluating employee training preferences toward ERP adoption to implement ERP systems among end-users effectively. This study aims to analyze the gap between the select

companies' training methods and the employees' preferred training methods and recommend training methods to be provided by organizations for the system use of end users.

Scope and Limitations

This paper limits the study to the end users of ERP systems in the select energy and manufacturing industries in Northern Mindanao. All end users with various unique ERP transactions are the target respondents but shall be assessed with their limit on using ERP based on the job/task required. The employees who are end-users of the ERP systems of these five (5) companies from the energy sector and six (6) companies from the manufacturing sector were invited to participate in the study. Also, HR practitioners, three (3) from manufacturing and three (3) from energy companies, were invited to participate in the study.

The identified companies that use ERP systems are mostly in the energy sector, including 1) National Power Corporation; 2) Iligan Light and Power Corporation; 3) National Grid Corporation of the Philippines; 4) Phoenix LPG Philippines, Inc. and 5) Mapalad Power Corporation; and manufacturing sector including 1) Pilmico Foods Corporation 2) Pilmico Animal Nutrition Corporation; 3) Mabuhay Vinyl Corporation; 4) Republic Cement Iligan, Inc.; 5) Slers Industries, Inc. and 6) FSC Metal Corporation.

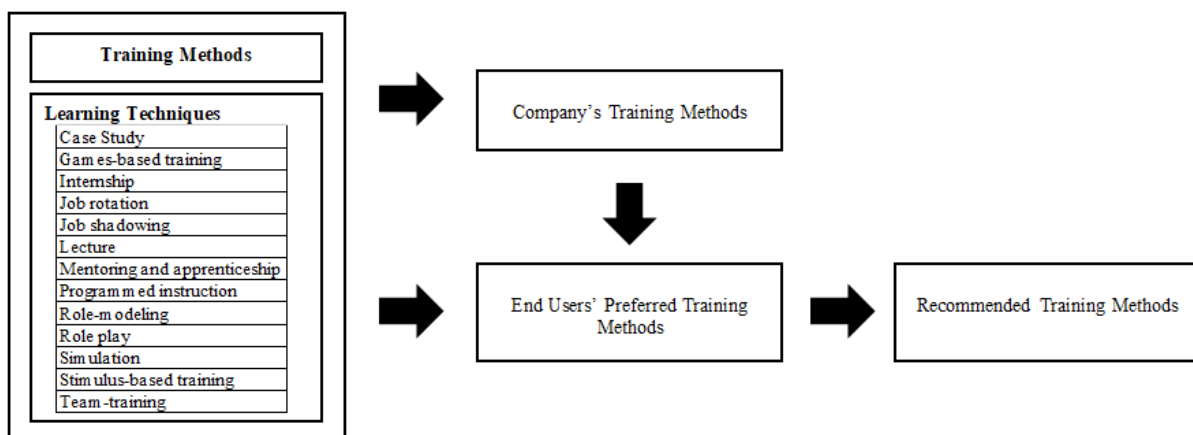
Research Framework

The framework of this study applies the combination of the end-user training framework (EUT) of Gupta et al. (2010) and the Technology Acceptance Model (TAM) of Davis (1989). Despite the other updated versions of the Technology Acceptance Model and Unified Theory of Acceptance and Use of Technology (UTAUT), this study adapts the TAM1 as it is the most simplified and aligned model to use in end-user training. TAM1 facilitates the individual, organizational, and technological characteristics in ERP implementation towards the perceived ease of use and usefulness of end-users about the end user intention to use ERP.

In both IS and Education research, the most prevalent theory used to understand participant learning in end-user training is a social cognitive theory (SCT) (Bandura, 1986). According to this theory, learning interventions affect learning outcomes through reflection on observations. SCT outlines two observational learning methods: 1) observation of others' actions, referred to as vicarious learning or behavioral modeling; and 2) observation of self-actions or enactive learning (Schunk, 2004).

Figure 1

The Framework of the Study



Review of Related Literature

Lack of management support and assistance is a vital risk for a successful ERP implementation. Top management support and involvement are crucial and easy to access to a firm's ERP implementation. (Chang, Kuo, Wu, & Tzeng, 2015). Education and training propagate the acceptance and usage of IS technologies throughout the organization, according to the study of Brancheau & Wetherbe (1987). The technology significantly impacts the organization when proper training is provided (Nelson & Cheney, 1987). According to McNurlin and Sprague (1998), people make or break the system through their use or disuse it. On the other hand, Bostrom et al. (1990) revealed that the attitude of the end users is

directly affected by the system or the training method. Therefore, an ERP system challenges the organization, employees, and training departments (Clark, 1992).

Enterprise resource planning systems are extremely complex and demand rigorous training; therefore, Training is a factor for successful implementation (Bingi, Sharma, & Godla, 1999). Companies apply various approaches in training employees towards practical usage of ERP systems, which aligns with the end-user training method aiming to produce a user who has the skills needed to apply what has been learned job-related tasks (Gupta et al., 2010).

Table 1 below discusses the training Methods used for end-user usage as cited in the systematic literature review conducted by Martin, Kolomitro, & Lam (2013), which identified 13 core training methods in their study. These training methods were the basis of this study in evaluating end-user preference levels and HR most implemented.

Table 1

ERP Training Methods Definition

Training method	Definition	Training method	Definition
Case Study	Develop skills by presenting a problem, without a solution, for them to solve or with a solution as an exemplar of how to solve it.	Programmed instruction	Delivery of training through instruction programs like electronic devices and the presence of an instructor such as a computer, DVD player, CD player, etc.
Job rotation	Training for a job by working for a limited duration while maintaining the original job.	Role-modeling	Involves the live presentation of skill(s) to an audience of trainees.
Internship	Involves supervised, practical training while on the job where the trainee is permitted to work in the position they are training, but with some restrictions and substantially less pay or no pay.	Roleplay	Requires trainees to assume a character and act out the role in a make-believe scenario or series of scenarios; learning comes by way of reflection on the play.

Games-based training	Trainees compete in a series of decision-making tasks which allows them to explore a variety of strategic alternatives and experience the consequences which affect the other players but without risk to the individuals or the org.	Simulation	It involves using a simulator where specific skills are developed through repeated practice with a multisensory experience of imitated Virtual Reality Training in conditions. A special form of simulation, which is gaining, entails total sensory immersion.
Job shadowing	Involves a trainee closely observing someone perform a specific job in the natural job environment to witness first-hand the details of the job.	Stimulus-based training	They use some stimulus (i.e., music, works of art, narratives, etc.) to motivate the learner to learn. The training induces a state of being (e.g., relaxation or awareness) in the participants to achieve learning.
Lecture	Involves the dissemination of training material by a trainer to a group of trainees using verbal instruction.	Team-training	They are intended exclusively for groups of individuals that behave interactively to improve mutual knowledge within a team or train the team on a team-specific skill.
Mentoring and apprenticeship	Involves a one-on-one partnership between a novice employees with a senior employee. Mentorship aims to provide support and guidance to less experienced employees, whereas apprenticeship is for developing job skills.		

These training methods are widely implemented among ERP vendors and trainers in organizations worldwide. While they vary in means of transferring knowledge and skills to end users, employees have different perceptions of these methods. In a 2011 study by Neomi Kaplan-Mor, Chanan Glezer, and Moshe Zviran entitled "A Comparative Analysis of End-user Training Methods," a combination of mentor and simulator was found to be significantly inferior to the instructor-led, simulation, and hybrid method. While ERP end-users prefer instructor-led, simulation, and hybrid methods in the comparative analysis by Kaplan-Mor et al. (2011), the graduate thesis of Clark, Angela (1999) entitled "Employee Preference for

Training Delivery Modes" mentioned that individuals had different preferences on how training is delivered. For individuals who are "technology adverse," the utilization of new training methods could be intimidating. Ockerman (1996) mentioned that one of the drawbacks of training in organizations is being trainer-centered rather than learner-centered, where the training decides what the employee should know instead of the employee deciding what they need to know to get the job done.

The current ERP training uses the ERP methodology-training approach, which is embedded in the ERP implementation methodology (Chayakonvikom et al., 2016). However, as mentioned by Klaus & Blanton (2010), the current ERP training can deliver only 25 percent of ERP knowledge to end users, which is insufficient to encourage end-users to use an ERP system by themselves. The study of Chayakonvikom, Fuangvut, & Prinyapol (2016) on "The Incompatibility of End-User Learning Styles and the Current ERP Training Approach" revealed that most end-users of all learning styles were dissatisfied with the current ERP training in four areas to measure end-users attitudes towards the current ERP training: training method, training content, training and user manual, and training time allocation.

The characteristics of the ERP methodology-training approach are, firstly, instructor-led training. The second is vendor design, which needs more training depth and business relevance in content. Third, there needs to be a better time and quality management because of the conflict between project time and cost constraints (Chayakonvikom et al., 2016). Companies have concerns about the training approaches provided by vendors that offer few options, including a training plan, a training technique, training materials, and others. Usually, vendors offer a training plan according to the implementation methodology. Other kinds of expertise training, for example, extra requirements for training, are usually

expensive and should be included in the training plan during ERP implementation (Ismail et al., 2010).

Methods

A descriptive quantitative research instrument gathered information through Google Forms, administered personally. The Likert scale set of the questionnaire was averaged to get the preferred training method of end users. This revealed their training preference regarding helpfulness in their intention to use the system. Due to unavailable information on the number of end-users in Mindanao, purposive sampling was distributed to 61 end-user respondents and six (6) human resource (HR) personnel with direct engagement in training the employees. Of the six selected companies, three (3) are from manufacturing, and three (3) are from energy companies, namely: (1) National Power Corp.; (2) Iligan Light and Power Inc.; (3) Phoenix Petroleum Philippines, Inc.; (4) Republic Cement Mindanao, Inc.; (5) Pilmico Foods Corp.; and (6) Slers Industries, Inc. The research instrument validated the training methods conducted by their respective organizations and whether or not they consider the training methods in the 13 methods presented in this study to be useful in an end user's intention to use ERP systems. These training methods, validated by the HR personnel, were presented to 61 end users of the selected companies that use ERP systems are primarily in the energy sector through purposive sampling, including 1) National Power Corp.; 2) Iligan Light and Power Corp.; 3) National Grid Corporation of the Philippines; 4) Phoenix LPG Philippines, Inc. and 5) Mapalad Power Corp.; and manufacturing sector including 1) Pilmico Foods Corp. 2) Pilmico Animal Nutrition Corp.; 3) Mabuhay Vinyl Corp.; 4) Republic Cement Iligan, Inc.; 5) Slers Industries, Inc. and 6) FSC Metal Corp.

Results

Table 1 shows the demographic characteristics of the respondents. It reflects that most of the respondents, or 50.7% (31), are in the age range 26-35 years old, 27.9% (17) are 35-45 years old, 13.1% are more than 45 years old, and only 8.2% (5) are 25 years old and below. Regarding gender, 57.4% are females, and 42.6% are males. In terms of education, 72.1% (44) are college graduates, 23.0% (14) proceeded to graduate studies, and 4.9% (3) proceeded to postgraduate. In terms of industry, 50.8% (31) are in the energy industry, and 30 (49.2) are in the manufacturing industry. Lastly, in years of experience in their job, 31.1% (19) are serving between 5 to 10 years, 26.6% (16) are serving more than ten years, 24.6% (15) have less than two years of experience, and 18% (11) has between 2-5 years of experience.

Table 1

Demographics of the End User Respondents

Demographic Characteristics	Frequency	Percent
Age		
< 25	5	8.2
26-35	31	50.8
35-45	17	27.9
>45	8	13.1
Gender		
Male	26	42.6
Female	35	57.4
Education		
College	44	72.1
Graduate	14	23.0
Postgraduate	3	4.9
Type of Industry		
Energy	31	50.8
Manufacturing	30	49.2
Experience		
Less than two years	15	24.6
between 2 and 5 years	11	18.0
between 5 and 10 years	19	31.1
More than ten years	16	26.2
Department		
Accounting	15	24.6

Admin and HR	7	11.5
Health and Safety	4	6.6
IT	4	6.6
Operations	16	26.2
Procurement	4	6.6
Sales and Marketing	4	6.6
Supply and Logistics	7	11.5
Job Level		
Managerial	5	8.2
Supervisory	28	45.9
Rank and File	28	45.9

On the other hand, table 2 shows the demographic characteristics of the HR respondents and practitioners with engagement in training and development in the select manufacturing and energy companies. Regarding age, most respondents, or 67%, are 26-35 years old, while the remaining 33% are 25-45. Regarding gender, 67% are female, while 33% are male. Regarding education, 33% are college, 33% are graduates, and 33% are postgraduate. In terms of industry, 50% (3) are in the energy industry, and 50% (3) are in the manufacturing industry. Lastly, in terms of years of experience in their job, most or 50%(3) are serving between 2-5 years while 17%(1) is less than two years, another 17% (1) is between 5-10 years, and another 17%(1) is more than ten years of service in their organizations and HR field.

Table 2

Demographics of the HR Respondents

Demographic Characteristics	Frequency	Percent
Age		
< 25	0	0%
26-35	4	67%
35-45	2	33%
>45	0	0%
Gender		
Male	2	33%
Female	4	67%
Education		

College	2	33%
Graduate	2	33%
Postgraduate	2	33%
Type of Industry		
Energy	3	50%
Manufacturing	3	50%
Experience		
Less than two years	1	17%
between 2 and 5 years	3	50%
between 5 and 10 years	1	17%
More than ten years	1	17%

Table 3

Training Methods Implemented in Select Organization

Training Method	Scores	Ranking
Lecture	6	1
Programmed instruction	6	1
Simulation	6	1
Mentoring and apprenticeship	5	2
Team-training	5	2
Internship	3	3
Role-modeling	3	3
Job shadowing	3	3
Roleplay	1	4
Case Study	1	4
Stimulus-based training	1	4
Job rotation	1	4
Games-based training	1	4

Table 3 shows the training method preferred by the respondents. Using the averaging method, the training preferences that the respondents strongly prefer are team training (1st), program instruction and mentoring and apprenticeship (2.5th), simulation (4th), and lecture (5th). Also, they prefer the following, job rotation (6th), job shadowing (7th), stimulus based-training (8th), internship (9th), role modeling (10th), roleplaying (11th), case study (12th), game-based training (13th).

Table 4*Training Preferences of ERP End-Users*

Training Method	SD	D	A	SA	Ave	Qualitative Interpretation	Rank
Team - Training	0	1	39	21	3.33	Strongly Agree	1
Mentoring and Apprenticeship	0	1	41	19	3.3	Strongly Agree	2.5
Programmed Instruction	0	1	41	19	3.3	Strongly Agree	2.5
Simulation	1	3	35	22	3.28	Strongly Agree	4
Lecture	1	2	38	20	3.26	Strongly Agree	5
Job rotation	0	3	43	15	3.2	Agree	6
Job Shadowing	0	3	47	11	3.13	Agree	7
Stimulus Based- Training	1	7	40	13	3.07	Agree	8
Internship	1	5	46	9	3.03	Agree	9
Role-Modelling	2	11	38	10	2.92	Agree	10
Role Play	2	15	36	8	2.82	Agree	11
Case Study	4	11	40	6	2.79	Agree	12
Games Based-Training	3	14	38	6	2.77	Agree	13

Table 4 shows the level of training implementation amongst the selected companies. This shows that all organizations for ERP system training implement lectures, programmed instruction, and simulation, while 83.3% of the companies implemented mentoring, apprenticeship, and team training. This is followed by an internship, role-modeling, and job shadowing, with 50% of implementation across these organizations. The least implemented at 16.6% are role play, case study, stimulus-based training, job rotation, and game-based training.

Discussion

The top training method provided by the organizations is lecture, programmed instruction, and simulation, while the most preferred training method by the employees is team training. Based on a focused group discussion with the HR personnel, the criterion of the training method selection is constrained by the availability of the training materials, budget, and trainer. According to a few of the end users interviewed, team training allows

them to collaborate and share insights where they feel a team is going to the training and learning the use of the system.

Summary

Instead of just utilizing the system, managers should aim to increase employee satisfaction, boost productivity, and give them more decision-making authority. Through a longitudinal approach to the subject, additional research can be conducted. This will make it easier to comprehend how the variables change depending on where an ERP implementation is in its development.

End users of ERP systems highly prefer team training over the other training methods of ERP implementation. This reflects the high intention to use the system amongst employees. Individual, organizational, and technological characteristics are significant variables in the perceived ease of use and usefulness of ERP system end users towards their intention to use.

Conclusion

The socio-technical difficulties posed by the complexity of implementation and the variety of end users set enterprise resource planning systems apart from other IT advancements. Both managers and organizations can benefit from this research. The study's conclusions offer managers tips on how to oversee the organization's adoption of the ERP system effectively. When a sophisticated information system, such as ERP or ionization, factors in individual and technology features should be understood and identified. Also, employee preferences in training methods must be considered in implementing ERP systems to maximize the use of the system and see a higher usage rate and acceptability amongst end users.

Based on the results shown in the two tables in section 2.4, the top training method provided by the organizations is lecture, programmed instruction, and simulation, while the

most preferred training method by the employees is team training. Based on a focused group discussion with the HR personnel, the criterion of the training method selection is constrained by the availability of the training materials, budget, and trainer. According to a few of the end users interviewed, team training allows them to collaborate and share insights where they feel a team is going to the training and learning the use of the system.

The study has several limitations. Also, the model called for estimating numerous variables, which necessitates a substantial sample size. However, the study's sample size was small. The number of respondents could go wider to better represent the end-user population in the manufacturing and energy industries. The current study consisted of a cross-sectional survey of participants. At various stages of the implementation process, the impact of specific elements on the intention to use information technology may alter. A larger sample size and a longitudinal strategy should be used in future studies. Future studies can examine how factors related to people, organizations, and technology interact with one another and how it affects how ERP is used.

Recommendation

For future studies, the researcher would like to recommend the possible exploration of using the Technology Acceptance Model and End User Training Model in other industries in the Philippines. Especially in Mindanao, more research is needed in the technological aspect of the organizations. It is also impERP systems sellers how their training methods will on how their training methods will be conducted in the succeeding years.

Furthermore, the researcher is looking forward to having a company base its training methods on the preferences of their employees, even collectively. Given the diversity of employees in different organizations, especially in Northern Mindanao, end users have unique preferences in engaging with training methods. Doing so will allow companies to benchmark an employee-focused training method.

The results of this study are also a basis for understanding training methods for other aspects of the organizations, such as health and safety. Studies on ERP adoption in other industries may also be explored.

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