Applied Cognition Approach: A Key Factor for Authentic Learning

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Abstract

Learning-by-doing is generally considered the most effective way to learn. A variety of resources and emerging visualization and simulation make it possible to offer students authentic learning experiences through cognitive application ranging from experimentation to real world problem solving.

This paper assessed the preference for cognitive application as an approach for authentic learning of the students of College Arts and Sciences in Batangas State University. More specifically, the study aimed to describe the profile of the students in terms of age, sex, course, and to determine the authentic learning experiences as to authenticity, engagement and learning motivation as determinants for the responsiveness of the students. Descriptive type of research was utilized in the study.

The results showed favorable responses that applied cognition through authentic learning is more preferred and have a greater impact in learning. It also revealed more inclination of the students from older year levels in applied cognitive methods for gaining authentic learning, given that they are getting ready to transverse the path in their career lives. In terms of sex profile, female respondents tend to be more affiliated with the psychomotor domain showing a little difference with the response of male participants. Female respondents are motivated further to devote more efforts to real professional practice. Respondents from BS Development Communication used their active orientation to relate with customized strategies in order to know the applications necessary for their course education. However, BS Psychology students gave emphasis on the theoretical and abstract education as shown in the lower mean results. In order to have an effective education setting, an authentic learning environment requires students to reflect upon a broad base of knowledge to solve problems, and to predict, hypothesize, and experiment to produce a solution.

Keywords: Applied Cognition; Authentic Learning; Engagement and learning motivation

1. Introduction

Over the last decade, there has been an increasing interest in strategies that encourage students to take a more active role in the management of their own learning (Nicol, 2002). A student who automatically follows the diagnostic prescription of a teacher without understanding of its purpose will not learn. The purpose of formative learning should be to equip students gradually with the problem-solving skills that are needed in applying knowledge on real life basis. An over-emphasis on conventional form of teaching might increase students' dependency on books rather than develop their ability to rely on their own skills and talents.

Students say they are motivated by solving real-world problems. They often express a preference for doing

rather than listening. At the same time, most educators consider learning-by-doing the most effective way to learn. Learning that is outside a social and physical context such as abstract exercises in a book would be criticized as unreal, leading to learning which cannot be effectively applied in the real world. This applicability to the real world is a prime goal of almost all kinds of learning.

Educational researchers have found that students involved in authentic learning through applying knowledge or cognition learned from theories are motivated to persevere despite initial disorientation or frustration, as long as the exercise simulates what really counts, the social structure and culture that gives the discipline its meaning and relevance. The learning event essentially encourages learners to compare their personal interests with those of a working disciplinary community

One learning theory that points to the value of experimentation and meaningfulness is experiential learning theory. Experiential learning (Rogers, 2007) refers to knowledge that is applied, and that addresses the needs and wants of the learner, such as knowledge gained through application play. Experiential learning is particularly applicable to application play. The theory proposes that learning is facilitated when the learner is completely involved in and has control over the nature and direction of the learning experience, and when learning is primarily based on problem solving. Application can meet both of these criteria. When performing with an application the learner is participating fully, and is fully involved in directing and controlling the learning experience.

Applied cognition approach provides a holistic model of the learning process and the process whereby knowledge is created through the application of knowledge in real life context. It also emphasizes the central role that experience plays in the learning process, an emphasis that distinguishes the approach from other learning process. The term " applied cognition " is used therefore to emphasize cognition over affect, and behavioral learning theories that deny any role for subjective experience in the learning process.

Moreover, it is usually important that learning is transferable and applicable to a variety of contexts, including new and innovative ones. As Sweller (2003) argues in her discussion of Brown et al.' s (2000) paper on situated learning, effective learning requires not only the learning of concepts and procedures, but knowing when to and when not to apply those concepts and procedures, and why they are to be applied. Researchers are not necessarily arguing that transferability is impossible, but that it requires that a variety of example contexts are used in learning and that incorporating these multiple contexts is one of the key challenges for good teaching or learning practice.

Using the keyword search to re-engineer and inculcate adequate research and professional competences in knowledge generation and application, the study of Osiki and Oparah (2010)., in a four week intervention teaching-learning interactive period, with 589 Distance Learners drawn from three academic sessions hybrid type, was subsumed in the psychotherapeutic programme. It was therefore part of the conclusion that for adequate research and professional behaviour in Open Distance Learning, opportunities for powering regular knowledge generation, creation and application through keyword search should be encouraged by harnessing the benefits of the multi-model or blended learning technology.

Similar to this line of research, Byl (2007) used the Embedded Authentic Serious game-based Learning Experiences (EASLE) architecture which has been developed to assist in the definition of games based applications. The motivation behind the design of EASLE is to keep game specifications as simple and focused as possible for educators attempting to create serious games as current available game design methodologies and

templates are complex and extensive. Furthermore, it is revealed that games created with EASLE reduce the amount of game development work to be done by the educator allowing for deeper collaboration between students.

Crist et al. (2004) describes experiences working with two student-led team projects: an internship project and a volunteer project. Both projects involved the design, development, and implementation of a database management system. In these projects, the researcher tried to simulate as much as possible the development of a database system in the real business world. Both projects followed a constructivist theoretical framework in which emphasis is placed on learning that is active, constructive, cooperative, authentic, and intentional. The result proved these projects have helped students see themselves as professionals as well as develop business skills difficult to simulate in classroom. It also helped students realize their relationship with society and develop a greater sense of community responsibility.

In the study of Spiro, et al. (2009), a theoretical orientation to learning and instruction in ill-structured knowledge domains is presented. The theory is especially concerned with the application of knowledge in new situations, rather than the mere reproduction of knowledge in the way that it was originally learned. Data from two experiments using high school subjects have been analyzed. Both experiments produced results that conformed to the theoretical predictions wherein suggestion that there is a fundamental choice in methods of learning and instruction was revealed. Conventional methods seem to produce superiority when measured by conventional tests that stress reproductive, fact-retention types of memory. The methods developed from Landscape Criss-Crossing Theory are not as successful at producing mindless, imitative recall. However, if one agrees that the goal of learning and instruction should be the acquisition of generative knowledge with wide application in novel but partially related contexts, then it would seem that the methods utilized are far preferable to the conventional ones.

The main objective of the modern popular teaching method of authentic learning has been to provide students with everyday-life challenges that develop knowledge and skills through problem solving in different situations. However, there are few studies that have been discussed the sense of authenticity and characters in scene and how students interact with the characters involved in the task. Chang's (2010) study designed a system, RoboStage, with authentic scenes by using mixed-reality technology and robot to investigate the difference in learning with either physical or virtual characters and learning behaviors and performance through the system. Robots were designed to play real interactive characters in the task. The experiment of the study conducted with 36 junior high students. The results indicated that RoboStage significantly improved the sense of authenticity of the task and also positively affected learning motivation. Learning performance was conditionally affected by RoboStage.

Authentic learning engages students in the multidisciplinary problem solving and critical thinking researchers and experts use every day. Gulikers et al., (2005) explores a study that provides insight in the effects of an authentic electronic learning environment on student performances and experiences. Participants were 34 higher education students, 20 students studying psychology at the University of Maastricht and 14 students studying technology at the Institute of Higher Education in Heerlen. It is expected that learning in an authentic learning environment results in more active and deep learning and improves intrinsic motivation of students. The results of this study showed, contrary to what was expected, that student who worked in an authentic environment did not perform better than students who worked in a less authentic environment. Moreover, the

experiences with the learning environment did not differ between both groups.

Gordon (2003) illustrates several of the principles of effective feedback in his study that examines a method of improving feedback to 55 final year Accounting and Finance honors students. Using grade-related criteria together with self-assessment and a bank of feedback statements, students received a feedback report including guidelines from a tutor via email in real time as the tutor was assessing the work. The outcome of this study were detailed evaluation against specified criteria which increases an opportunity for students to reflect on their learning and evaluate their own performance against the specified criteria and lastly, to compare their evaluation against the tutor's evaluation.

In a paper published in the Journal Science in 2006, Thornton and McAuliffe investigated if and how teaching occurs in the wild, noting that there is only equivocal evidence of teaching behaviour in any species other than humans. They observed that wild meerkats in South Africa taught their young to collect and eat prey safely (Thornton & McAuliffe, 2006). They have come up to the conclusion that the learning environment described in the meerkat research is perhaps more akin to the apprenticeship model that has recently been examined in more depth in relation to situated learning theory.

The greatest shortcoming in education these past few years has been the tendency to ignore the brain research that is richly available which affirms that implementing multi-sensory activities, pursuing meaningful tasks, exploring a variety of skills with real world applications is optimal learning and that it needs to be practiced regularly. Instead of vicariously discussing topics and regurgitating information in a traditional industrial age modality, authentic learning provides a learner with support to achieve a tangible, useful product worth sharing with their community and their world.

In the present study, letting the subjects experience the activities that enable them to have contact with the real environment of what they are being taught, the process let them compare the effects of this approach with respect to their gaining of knowledge. This study aimed to recognize the possible innovations of traditional education style into a more congruent system to the elevating world of knowledge and ideas.

II. Objectives of the Study

This study aimed to assess the preference for cognitive application as an approach for authentic learning of the students of College Arts and Sciences in Batangas State University and to describe the profile of the students in terms of age, sex, course, and to determine the authentic learning experiences as to authenticity, engagement and learning motivation as determinants for the responsiveness of the students.

III. Method

3.1 Research Design

The researcher opted to make use of the descriptive research method that attempts to provide a systematic description of the cognitive application approach as a key factor for authentic learning. This research aimed to provide the implication of other variables such as demographic profile of the respondents and the three aspects of authentic learning experience: authenticity, engagement, and learning motivation.

3.2 Participants

The research data were secured from forty college students (N=40) of Batangas State University, subdivided into twenty eight students of Bachelor of Science in Psychology and twelve students of Bachelor of

Science in Development Communication. The total population of BS Psychology students is 278 and the BS Development Communication is 122. The researcher used 10% of the total population of 278 BS Psychology and 122 BS Development Communication students as for the respondents of the study. The ages ranged from 17 to 21 years old, sixteen males (40%) and twenty four females (60%). In this procedure, the researcher utilized random sampling in which the researcher chose whoever participant is available at the time the research is being conducted.

3.3 Instruments

The researcher utilized a questionnaire known as "Cognitive Application Toward Authentic Learning Scale". This refers to the authentic learning assessment proposed by Gulikers, Bastiens and Kirschner (2005). The questionnaire measures student's preference toward experiential method of learning, consisting of 10 Likert-type items created around five scales that examine the three aspects of the authentic learning experience: authenticity, engagement, and learning motivation. The responses were subdivided into five scales: 5=Strongly Agree, 4 = Agree, 3 = Neither Agree nor Disagree, 2 = Disagree and 1 = Strongly Disagree.

3.4 Procedures

In order to obtain necessary data, the researcher used a survey questionnaire. A letter of request to conduct the study together with the two-part questionnaire was sent to College of Arts and Sciences at Batangas State University. Questionnaires were distributed and retrieved from respondents. Part I used to determine the demographic profile of the respondents. Part II was aimed to know the respondents' preference for cognitive application measurement of the students.

3.5 Data Analysis

The data gathered from the respondents were analyzed through descriptive statistics whereas frequency, percentage were used to describe the distribution of respondents in terms of age, sex and course , and mean responses were utilized to determine the respondents' preference for applied cognition approach as a key factor to the authentic learning of the students.

IV. Results and Discussion

Profile of Respondents and Authentic Learning Experiences Table 1 presents the distribution and mean responses of the respondents in terms of age. The highest mean response evaluated as the highest preference for cognitive application was garnered from 21 year old respondent while the lowest preference was from the middle age group, 19 years old composed of 13 respondents equivalent to 32.5%.

Participants from 17 years old group shows the lowest learning experience in terms of authenticity with a mean response of 3.17 while 21 year old respondents obtained the highest mean response equivalent to 4.65.

Table 1. Distribution and Mean Responses of Respondents in Terms of Age (N = 40)

Age (years)	Frequency (f)	Percentage (%)	Mean Response (x)			
			Authenticity	Engagement	Learning Motivation	Total Mean Response
17	4	10	3.17	3.06	3.28	3.17
18	6	15	4.31	3.22	3.5	3.67
19	13	32.5	3.85	3.54	3.03	3.47
20	9	22.5	3.33	3.78	3.12	3.41
21	8	20	4.65	3.53	3.94	4.04

Older student, with the age of 21 showed consistent high responses in authentic learning specifically in terms of engagement to gaining knowledge. On the other hand, group of 17 year old students showed the least commitment with their authentic learning experiences proven by the lowest mean response of 3.06.

Mean result with the highest learning motivation came from the respondent aged 21. The interest and attitude shown by the participant were constantly higher than the others while 20 year old participants were less motivated in their learning experiences. The comparison of mean results showed the relationship in terms of ages and authentic learning occurrence between the groups.

Oldest age range participants are more open and fond of the learning styles which use the genuine and actual style of teaching. This could be explained by their mind set preparation for entering the career world wherein all academic learning would be put into application.

Middle age range students are more interested in traditional ways of education in which students are still on the mid-process of absorbing the fact that they will face the real world of learning. Otherwise, students of this stage are still preoccupied with the conventional methods and they have not been used to this technique.

Furthermore, Huang (2002) states that adult learners learn best when a real life problem is presented in a real life context and stress the importance of the distinction between an authentic task and an authentic environment. It was argued that in order to stimulate students to develop relevant competencies that they need in their future professional lives, an authentic task as well as an authentic context is required.

Table 2. Distribution and Mean Responses of Respondents in Terms of Sex (N = 40)

Sex	Frequency (f)	Percentage (%)	Mean Response (x)			
			Authenticity	Engagement	Learning Motivation	Total Mean Response
Male	16	40	3.89	3.14	3.32	3.45
Female	24	60	4.42	3.89	3.76	4.02

Table 2 showed the sex demographic profile distribution and mean responses among the respondents. The female distribution is 60% which showed a higher mean response of 4.02. On the other hand, 40% male respondents got a lower mean response of 3.45.

Authentic learning preference was more perceptible on females with the mean value of 4.42 compared to male with a mean response of 3.89. It also shows that females are more engaged in real learning occurrence than men are. However, learning motivation was more observable in males compared to the mean value gathered from females.

The reason behind the higher result of female group was due to gender related mental development and maturity. There is evidence that the maturation of the brains of males lag behind the brains of females of corresponding age by three years, leading to a lag of three years in the emotional maturation of the males. In addition, females were found to have significantly higher emotional intelligence as compared to males; the dimensions of the emotional intelligence being maturity, compassion, morality, sociability, and having calm disposition in life (Westenberg, 2008).

Likewise, males and females are different academically and socially. Sax (2009) advocate of gender-based classes, said that boys and girls need a separate learning because of pure biology. In authenticity of learning, most cases exhibit that females hear better than males; therefore, males need to be with a teacher that speaks more loudly. Females, on the other hand, are better at seeing texture and color, whereas females see action

better.

Table 3 contains the mean responses and distribution of respondents with respect to the courses of the respondents, whether they are Bachelor of Science in Psychology or Bachelor of Science in Development Communication students. BS Psychology students outnumbered the BS Development Communication students with a ratio of 28:12.

Table 3. Distribution and Mean Responses of Respondents in Terms of Course (N = 40)

Course	Frequency (f)	Percentage (%)	Mean Response (x)			
			Authenticity	Engagement	Learning Motivation	Total Mean Response
BS Psychology	28	70	3.54	3.29	3.38	3.4
BS Dev. Communication	12	30	3.82	3.38	3.46	3.55

From the data presented in Table 3, it is evident that 30%of BS Development Communication students obtain higher total mean value of 3.55 in their authentic learning response, while 60% BS Psychology students got 3.4 mean result.BS Development Communication students show higher authenticity in learning experiences represented by the mean value of 3.82 while BS Psychology students obtain 3.54 only.

BS Development Communication students are more engaged in genuine education when compared against the mean scores of Psychology students. Consistently, they are also highly motivated   in   authentic   learning as shown by the mean response of 3.46 against other group's weighted mean of 3.38.

The higher mean result of the participants from BS Development Communication course were more inclined with action-oriented education for as their future jobs were related with activities with more dynamics. As cited in the curriculum program of BS Development Communication (see Appendix F) students of Batangas State University, they are compelled to undertake Media Internship and Interpersonal Communication and Participatory Development Communication with Immersion for developing existing skills and acquiring higher level competencies in the field of broadcasting and communication.

On the other hand, Psychology students tend to be more theoretical with their academic background; these theories will be their foundations in the application for their future careers and professional practice. In accordance with the curriculum of BS Psychology of Batangas State University, an emphasis to the demonstration of an in-depth understanding of principles, concepts and skills in the academic learning of the students should be provided. These could be manifested specifically with the subjects included in the prospectus such as comprehensive teachings of Theories of Personality, Developmental Psychology and so forth. Students have individual learning style preferences including visual like learning from graphs, charts, and flow diagrams, auditory or learning from speech, read-write or learning from reading and writing, and kinesthetic or learning from touch, hearing, smell, taste, and sight. These various factors might be considered from the obtained   result difference between BS Development Communication and BS Psychology students. Both courses have their own ways of coping mechanisms in applying cognition to learning authentically.

Authentic learning is a modern method of learning, hence, different students with various interests and courses can relate target learning effectively through the concrete experience and collaborations. Additionally, authentic learning activities often involve environments and characters that could influence or motivate them. Many learning opportunities in school are provided when students are given an opportunity to reflect upon and

consolidate their learning.

Table 4. Proposed Plan of Action

Specific Objectives	Activities	Persons / Office In Charge	Target Date
To sustain academic needs of the students based on teaching methods found to be effective in enhancing authentic learning of the students	Conduct of a Curriculum development program	Curriculum and Syllabus Committee	Every June of first semester and November of second semester
To monitor and improve students grades and performance in authentic education	Continuous coordination with faculty members regarding students grades or GPA	Faculty members of College of Arts & Sciences	Continuous year round monitoring
To give focus on students' interests and learning methods preference	Follow up and continuous administration of student survey and counselling about educational method preference	Test and Admission Office, Guidance and Counseling Department	Continuous year round activity
To improve educators knowledge and skills on how to teach with authenticity	Conduct seminar workshops for Faculty members focusing on proper teaching pedagogies especially on preparing students for real life education on career pathway	University Management, College of Arts and Sciences and other colleges	Every June for first semester and November for second semester

V. Conclusion

The students from older year levels show more inclination in applied cognitive methods for gaining authentic learning, given that they are getting ready to transverse the path in their career lives. Lower and middle aged groups of respondents from freshmen to junior college are in the process of getting used to the kind of learning whereas the exposure to real problem solving and genuine environment seems to be a different level compared to their conventional ways of learning.

In terms of sex profile, female respondents tend to be more affiliated with the psychomotor domain which shows a little difference with those of male participants. They are more enthusiastic in the approach of experiencing solving real world problems compared to being theoretical of the male participants. The result among female respondents shows that they are motivated to exert more effort to be ready to real professional practice.

It is important that students understand the essence of an authentic task, and this is what the BS Development Communication students are focused on. They use their active orientation to relate with customized strategies in order to know the applications necessary for their course education. However, BS Psychology students give emphasis on the theoretical and abstract education as shown in the lower mean results. In order to have an effective education setting, an authentic learning environment requires students to reflect upon a broad base of knowledge to solve problems, and to predict, hypothesize, and experiment to produce a solution.

VI. Recommendations

The researchers of College of Arts and Sciences of Batangas State University to have a curriculum development program that will sustain the education needs of the students based on the pedagogy found effective in enhancing authentic learning.

The guidance counselors of Batangas State University may have vicarious knowledge in helping students

who have difficulty in coping up with the lessons. They may propose behavioural coping mechanisms for students to help improve attitudes toward genuine learning.

The educators of the university may contemplate on the findings of the study and use more methods of teaching that could develop genuine knowledge for the students. Research-based decisions regarding the most beneficial approaches of teaching in terms of authenticity, engagement and learning motivations maybe done through proposals and dry run method.

Further researches may be administered to substantiate the findings and investigations used in this study. They may utilize other determinants or variables that might affect the authentic learning of students.

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