

## Investigating 21<sup>ST</sup> Century Learning Skills and Students' Inquisitiveness in Online Education towards Competence Acquisition during the COVID-19 Situation

Angsaya Siepong\*, Jorrit Alwin van der Woude, Noppadol Kittikachorn, James Pate  
Stamford International University, Thailand

### Abstract

Due to the Covid-19 pandemic, which started in early 2020 and continued into 2021, all teaching and learning at universities in Thailand were required to shift from a physical classroom on-campus setting, to an online learning platform. Among the many challenges of going online, an acute awareness arose for lecturers: How to adapt teaching methodologies for effective online teaching to enhance inquisitiveness and competence among students? Against this backdrop, this study attempts to investigate the three main 21<sup>st</sup> century learning skills, comprising critical thinking, analytical thinking, and communication and the role of active learning in an online classroom, and how these relate to the acquisition of adaptive competence among students. Data was collected from students enrolled in various business management courses at Stamford International University, Bangkok Thailand, in Trimester 3/2020, (March 2021 – June 2021). This study unravels the findings from data analysis by performing structural equation modelling (SEM). The proposed conceptual framework and the hypothesized relationships were tested. The results reveal significant relationships among the variables of interest. Importantly, the role of active learning was recognized as crucial to reinforce inquisitiveness and acquisition of competence on an online platform. Moreover, this study provides discussion, research implications, and recommendations for future study.

**Keywords:** 21st century skills; active learning; adaptive competence; online teaching; Covid-19 crisis

### 1 Introduction

Given the unpredictable outbreak of the disease which started in December 2019 (WHO, 2021)<sup>1</sup> as a backdrop, the Covid-19 crisis has brought the world into a new normal of living, as well as changes in educational methods in the past two years. In particular, teaching and

---

<sup>1</sup> [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline?gclid=CjwKCAjw wsmLBhACEiwANq-tXKiOdjcEzXFjXfxLtLCV6Q4Bv893c6wCCEf2aoNWxndgGSLhXh1UUBoC9TEQAv D\\_BwE#event-115](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline?gclid=CjwKCAjw wsmLBhACEiwANq-tXKiOdjcEzXFjXfxLtLCV6Q4Bv893c6wCCEf2aoNWxndgGSLhXh1UUBoC9TEQAv D_BwE#event-115)

learning modes have been transformed from a normal classroom setting to an online environment within a few months after the pandemic began. For many in Thailand, the shift from in-class to online began in April, 2020 and has, for the most part, continues as of November, 2021. A consequence of this prolonged situation is that online teaching and learning has been the main delivery mode in all universities in Thailand. University lecturers have been tasked with delivering online courses of equal quality to those that were previously taught on campus and that students achieve the learning outcomes of the courses.

In this difficult time for both teachers and students, teachers have, quite reasonably, questioned the effectiveness of their online teaching; easily noting disinterest or lack of motivation by some students in the virtual classroom. Without the benefit of real interactions in a real classroom, concerned teachers were on the alert for effective strategies and methodologies that could be used online to help students achieve the learning outcomes for their courses. In essence, this study attempts to unpack the concept of “active learning” and relates it to students’ levels of inquisitiveness in the online classroom setting. In addition to that, the researchers emphasize the importance of 21<sup>st</sup> century skills (hereinafter, 21stCs) under the Learning & Innovation Skills concerning: ‘*critical thinking*’, ‘*analytical skill*’ and ‘*communication skill*’ (Trilling & Fadel, 2009). In the development of these three main learning skills, the question arises: is there any relationship with students’ being active in their learning through the online experience that could maintain or even increase their inquisitiveness and competence acquisition?

The rationale for the mastery of such skills is that they will prepare students to function successfully after graduation in a different context other than the classroom. (Greenhill, 2010). To enhance 21stCs, many educational institutions focus on adjusting their instructional methodology towards ‘active learning’ (Kaplan, 2021). Past studies (e.g. Tindowen et al., 2017; Hixson et al., 2012; Bell, 2010) researched skills for the twenty-first century through implementing project-based learning. Other scholars integrated 21stCs with other learning systems, for instance, alternative learning system (ALS) (Tindowen & Bassig, 2017), through learning online courses (Khan et al., 2017) and, in cross disciplinary classrooms (Machemer & Crawford, 2007).

This study seeks to fill a void in the research by proposing a framework to investigate the relationship between active learning and inquisitiveness (or adaptive competence) among students through their learning skills during the Covid-19 situation (3-main skills: critical thinking, analytical, and communication), which is not yet well-researched. In other words, there does not seem to be any real consensus on how students may adapt their competence by transferring their capabilities in critical thinking, analytical thinking and communication skills acquired through active learning. Hence, the research questions are raised: 1) How the *three main learning skills* (critical thinking, analytical, and communication) would help students’

inquisitiveness in the online learning process? And 2) Does ‘*active learning*’ relate to students becoming competent in adapting?

In this paper, the objective is to examine the relationships between the three main learning skills (critical thinking, analytical thinking and communication skills) and student’s inquisitiveness (active learning) which reinforces acquisition of competence (adaptive competence) among students. With these purposes in mind, this paper aims to contribute to two areas of inquiry: First, it is to explain students’ critical thinking, analytical and communication skills and those relationships with active learning. Next, it is to demonstrate the significant relationship between active learning and students’ adaptive competence. This paper is structured as follows: First, the authors review relevant literature and propose a conceptual model towards the development of hypotheses. Next, approaches to the research used for collection of data and analysis are presented. Lastly, the authors discuss their findings and implications and conclusions, limitations of the research, and recommendations for further studies.

## 2 Theoretical review and defining concepts

### 2.1 Defining three main learning skills: critical-, analytical thinking, communication

Scholarly research has widely recognized 21stCs within three spectra: Life & Career Skills, Learning & Innovation Skills and Information, Media & Technology Skills (Battle for Kids, 2019)<sup>2</sup>. As this research is focused on classroom enhancement of learning skills, the researchers identify three crucial skills within ‘Learning & Innovation Skills’: (1) *Critical Thinking skills*. One of these skills is being habitually inquisitive, flexible, orderly in complex matters, and diligent in seeking relevant information (Facione, 1990). (2) *Analytical Skills*. These refer to ability to realize the distinction between hypothesis and fact as well as between relevant and extraneous variables (Bloom, 1956). The concept of ‘analytical thinking skills’ is found in Bloom’s Educational Objectives for Knowledge-Based Goals. Analyzing is placed above Synthesis and below Application. ‘Analyzing’ is described as ‘Separation of a complex idea into its constituent parts and an understanding of organization and relationship between the parts’ (Bloom, 1956). (3) *Communication Skills* refers to the ability to deliver or share ideas and feelings effectively through oral, verbal and non-verbal communication (speaking, writing, reading and listening) skills. (Oya et al., 2004).

### 2.2 Defining active learning

In the broad spectrum of past research, the notion of ‘active learning’ in different contexts within the educational field has been defined. This study utilizes a general definition of active

---

<sup>2</sup> <https://www.battelleforkids.org/networks/p21>

learning as ‘any instructional method that engages students in the learning process’ (e.g. Prince, 2004; Jackson, 2016). In essence, active learning requires students to do meaningful learning activities and think about what they are doing. In extant literature, it is closely related to the concept of collaborative learning, which refers to students working together and interacting in small groups to pursue a common goal and is focused on group-based instructional methods. In addition, active learning is linked to the ‘Cone of learning’ (Jackson, 2016). This model illustrates seven instructional methods in which lecturing is classified as a passive teaching method which results in 5% memory retention after two weeks and; participatory teaching methods, such as “practice by doing” which results in 75% knowledge retention after two weeks. Furthermore, active learning is related to cooperative learning in the sense that it encompasses group work with common goals, although students are assessed individually (Prince, 2004; Jackson, 2016). Other research also highlights that active learning can be demonstrated under circumstances in which Problem Based Learning is implemented and presented to the students at the start of the instruction cycle within a learning context towards self-directed individual learning (Prince, 2004; Jackson, 2016).

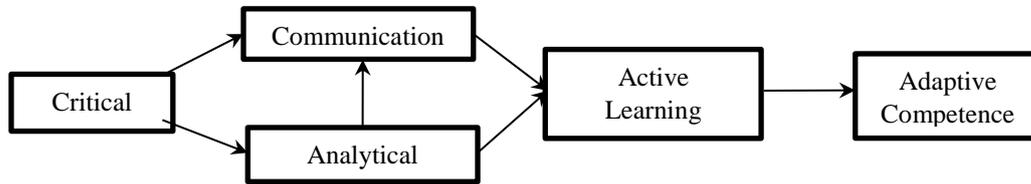
### 2.3 Defining adaptive competence

Literature suggests ‘adaptive competence’ is crucial in preparing students for the workplace (Lizzio & Wilson, 2004). This implies involving students in the learning process to help them develop learning from experience (which is a transferable skill). (Lizzio & Wilson, 2004). This is reinforced by Hager (1998), who states that adaptive competence is more and more becoming the most important skill for professionals in a world that is changing quickly. Within the context of 21<sup>st</sup> century education, adaptive competence refers to ‘enhancement of skills to transferring of knowledge and skills acquired in the classroom in various situations’ (Ntim, 2018). Similarly, De Corte et al (2012) defines adaptive competence as ‘the ability to apply knowledge and skills flexibly in different contexts’. This relates to the learning process by highlighting (stressing) the constructive, self-regulated, contextual and collaborative approaches. In this study, adaptive competence is defined as ‘an enhancement of the skill toward transferring of knowledge and skills acquired in the classroom with different contexts (Ntim, 2018).

## 3 A proposed model and hypothesis development

In this paper, the proposed conceptual framework was developed (see figure#1, a proposed conceptual framework) based on review of extant literature anchored to: 1) the concept of learning skills including ‘critical thinking’, ‘analytical’, and ‘communication’; 2) ‘active learning’, and 3) acquisition of ‘adaptive competence’. In particular, the authors aim to: Firstly delineate the insights that are derived from the literature review and outline the relationships among different concept of interest to formulate the research hypothesis as follows:

*Figure 1 Proposed Conceptual Framework*



Numerous studies such as Hasanaah and Malik (2020), Itatani et al (2017), Crowe (2006) investigate the relationship between critical thinking and communication skills in a blended learning environment, which led to improvement in communication skills in some students. Experts from various fields arrive at the consensus that a critical thinker is one with ‘an inquisitive nature and seeks relevant information’ (Facione, 1990). There is a significant body of literature which identifies the need to improve undergraduates’ critical thinking and communication skills to meet the expectations of employers. Thus, critical thinking and communication skills are significant primary skills needed among students in management courses. Therefore, the hypothesized relationship is formulated as below:

H1. There exists a positive relationship between critical thinking and communication skills.

Various experts in the field of education have defined the concepts of critical thinking and analytical skills in numerous studies. For instance, Facione (1990) describes a critical thinker as one who has an ‘inquisitive nature and seeks relevant information’. Sternberg (2006) defines analytical thinking as ‘abilities to (1) take apart a problem and understand its parts, (2) explain the functioning of a system, the reasons why something happens, or the procedures of solving a problem, (3) compare and contrast two or more things, and (4) evaluate and critique the characteristics of something’. When Analytical skills have been deemed to be a subset of critical thinking skills, there is a substantial body of literature which examines this overlap within the larger circle of critical thinking skills. There is not an over-abundance of literature on this topic involving undergraduate business management students. However, a few studies in the finance and accountancy fields for instance, Park and Ellis (2020) and Benligiray and Onay (2017) highlight that analytical skills are considered discreetly or independently of other critical thinking skills. Thus, it is interesting to examine each of these higher order skills separately and the linkages between the two skills. Thus, the hypothesized relationship is formulated as below:

H2. There exists a positive relationship between critical thinking and analytical skills.

Furthermore, the link between analytical and communications skills is investigated. Past research, for instance, Sternberg (2006) describes analytical thinking as an ‘ability to explain the functioning of a system’. Bullen and Kordecki (2014) provide a very clear example in which analytical skills are satisfactory but communication skills need improvement in their study among accounting students. In essence, communication skills can be defined or described in a number of ways. A useful description for educators is that these are skills ‘related to students’ speaking, writing, reading, listening, and thinking skills’ (Oya et al., 2004). The Oxford

Dictionary (2021)<sup>3</sup> defines ‘communication skills’ as ‘the ability to convey or share ideas and feelings effectively’. However, scant research has examined the relationship between analytical and communication skills as primary drivers of learning effectiveness. After an analysis of evidence has been performed, the analyzer must now employ communication skills to explain the results and any conclusion(s). Hence, the study aims to examine the relationship between the two skills and formulates the hypothesis as below:

H3. There exists a positive relationship between analytical and communication skills.

As discussed earlier, Battle for Kids (2019)<sup>4</sup> points out that how to communicate and the power of effective communication is essential for students to thrive in a dynamic workplace. The necessity for this further comes from feedback from future employers. To convey and share ideas and feelings effectively (communication) the link is made between communication and active learning in setting the practicing ground for students in their preparation for the dynamic workplace. While past research has found that learning activities in even the simplest form like reviewing notes, and among others, blended learning, increases not only scores but also communication skills; further improvement in communication skills in the active learning environment comes from group work based on common goals but assessed individually. With this in mind, the study aims to better understand the relationship between communication skills and active learning. Therefore, a hypothesis is stated as follows:

H4. There exists a positive relationship between communication skills and active learning.

According to Bloom’s Taxonomy, analysis is placed above synthesis and below application and is a subset of critical thinking and includes realizing a distinction between hypothesis and fact. Active learning is focused on engaging students by meaningful learning activities in pursuit of a common goal in a group-based instructional method. It becomes clear that active learning is an integral part of developing analytical skills in students through meaningful learning activities. In this regard, Edgar Dale’s Cone of Learning can be related to Bloom’s Taxonomy. In an active learning setting using Edgar Dale’s Cone of Learning (1960) this relates to the active part of the cone which refers to participation in discussion. Thus, the study aims to better understand the relationship among them, and hypothesis is stated as below:

H5. There exists a positive relationship between analytical skill and active learning.

With regard to adaptive competence, Ntim (2018) describes it as ‘enhancing the skill to transfer knowledge and skills acquired in the classroom in different situations’. Also, Ntim (2018) states that only an estimated 6% of the adult population demonstrate a high level of

---

<sup>3</sup> communication noun - Definition, pictures, pronunciation and usage notes | Oxford Advanced Learner's Dictionary at OxfordLearnersDictionaries.com

<sup>4</sup> <https://www.battelleforkids.org/networks/p21>

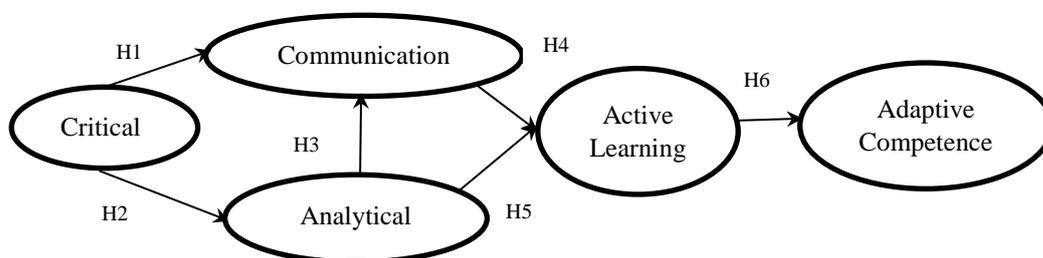
proficiency in problem-solving in today’s economy; further linking this to employability, requiring more and more critical thinking skills and problem-solving skills. In addition, it is further substantiated in a practical sense by Bist et al (2020) in outlining employers’ perception regarding employability skills of management students undergoing internship. While, in the classroom setting, it might be of significance for lecturers to ensure whether or not students have achieved the learning outcomes of the course. Moreover, the online classroom environment could be found as a hindrance to students’ being active in learning. To an extent, online students in this study may not have been able to more fully realize their potential in their active learning and hence, adaptive competence. Based on the aforementioned, for students to be competent to adapt (adaptive competence), active learning is crucial in being competent to adapt, as defined above. Thus, the study aims to better understand the relationship among them, and hypothesizes as follows:

H6. There exists a positive relationship between active learning and adaptive competence.

## 4 Research methods and results

As discussed earlier, the conceptual framework is firstly developed by extant review of literature focusing on multiple theories: 1) the three main skills of 21<sup>st</sup> century in the context of ‘Learning & Innovation Skills’ which concern *Critical Thinking, Analytical, and Communication* (e.g. Facione, 1990); 2) *Active Learning* (e.g. Prince, 2004); and 3) acquisition of *Adaptive Competence* (e.g. De Corte et al., 2012). Particularly, this study attempts to examine students’ adaptive competence against the three main skills including critical thinking, analytical and communication through active learning environment under the Covid-19 crisis. Figure 2 illustrates the research hypothesis.

Figure 2 Hypothesized Relationships



### 4.1 Questionnaire design and data collection

The study developed the questionnaire in three stages. In the first stage, this research combined a list of measures obtained from extant review of literature (e.g. Bergman et al., 2012; De Corte., 2012; Dendir et al., 2019; Zabit, 2010; Dunbar et al., 2006). Next, to improve the face validity, the authors asked three educational experts who are familiar with educational literature to evaluate the constructs and the items. Third, the study pretested the questionnaire

with 25 students. Later, the researchers carefully check wordings and overall comprehensiveness of the questionnaire. Consequently, the questionnaire set was finalized.

Data were collected among students who enrolled in various Business Management courses in the 3/2020 Trimester (March-July 2021) at Stamford International University Thailand. Stamford International University (consisting of three campuses), is recognized as an international university representing diverse nationalities among students within a multicultural environment. Each academic year is divided into three trimesters. The sample is a representation of students from various majors and years of study enrolled in different courses within the curriculum of International Business Management (IBM) at Rama-9 campus Bangkok. The questionnaire was taken by students enrolled in Operations Management, Project Management, International Business Management, Principles of Management and Leadership. There were 227 enrolled students in those courses. The total number of respondents was 144. Thus, the response rate was 63%. Three control variables: gender, batch (year of student's registration at the university), and student's major of study.

The organization of Stamford International University at Bangkok campus is divided into two Faculties: 1) Faculty of Communications and Arts, and 2) Faculty of Business & Technology. For this study and the survey was distributed only among students from the faculty Business and Technology. Within the Faculty of Business and Technology, students are enrolled in the following programs, ranked from largest number of students to smallest number of students as follows: International Business Management, International Hotel Management, Airline Business Management, Marketing, Accounting and Finance, Entrepreneurship, Logistics and Event Management. Students from each of these programs participated in the survey.

## 4.2 Data analysis and findings

Before performing path analysis using structural equation modelling (SEM), the researchers tested the validity or measurement model and the internal consistency reliability using Composite Reliability (CR). The convergent validity is conducted using average variance extracted (AVE). The results reveal that the AVE scores of all variables are larger than 0.5, which confirms the convergent validity. The discriminant validity is also tested by assessing the relationship between correlations among constructs and the square root of AVEs. It is evident that the squared correlation between any two constructs is less than the AVE extracted by the constructs. Also, the CR scores of all latent variables are above 0.75 which are deemed reliable.

This study performed SEM using Amos 22. SEM is a well-known and widely accepted analysis method in the social sciences (e.g. Kang et al., 2015). SEM is considered a powerful multivariate technique that aims to assess multivariate causal relationships among different variables (e.g. Fan et al., 2016). In doing so, the study firstly checks the possibility of common method bias in the data by using Harman's one-factor analysis. The result reveals that the total

variance of the single factor is 38.5% (lesser than 50%) which is against a systematic bias (Podsakoff & Organ, 1986). Next, the structural model was tested, and the model indices exhibited a perfect fit;  $\chi^2/d.f. = 2.11$ , CFI= 1.00, GFI = 0.99, NFI = 0.99, TLI= 1.00, RMSEA= 0.00, PCLOSE = 0.84) (Hu and Bentler, 1999). This confirms that the model developed based on theoretical bases is logically specified and appropriate for use in further analysis. Hence, the hypothesized relationships were examined and reported in both tables #1 and #2.

*Table 1 Report of path analysis and coefficients of all variables*

Hypothesis	Path	Std.coefficient ( $\beta$ )	t-Value
H1	Critical → Communication	.739***	13.07
H2	Critical → Analytical	.864***	20.50
H3	Analytical → Communication	.769***	14.35
H4	Communication → Active Learning	.298*	2.324
H5	Analytical → Active Learning	-.357**	-2.784
H6	Active Learning → Adaptive Competence	.795***	15.63

\* $p < 0.05$ . | \*\* $p < .01$ . | \*\*\* $p < .001$

*Table 2 Summary of hypothesis test results*

#	Hypothesis Statements	Results
H1	There exists a positive relationship between critical thinking and communication skills.	Supported
H2	There exists a positive relationship between critical thinking and analytical skills.	Supported
H3	There exists a positive relationship between analytical and communication skills.	Supported
H4	There exists a positive relationship between communication skill and active learning.	Supported
H5	There exists a positive relationship between analytical skill and active learning.	Supported
H6	There exists a positive relationship between active learning and adaptive competence.	Supported

## 5 Discussion and research implication

This study attempts to unravel the significance of active learning and its relationship with the three main learning skills which are of primary importance to the acquisition of adaptive competence. In essence, the proposed conceptual model was tested to verify the hypothesized relationships among variables concerning the three main learning skills of critical thinking, analytical thinking, and communication, which are regarded as essential skills in students' learning process. Based on the structural equation model, path analysis reveals some insights derived from our data. It shows that along with the students' learning process in the online classroom, the important role of active learning is evident, which could reinforce inquisitiveness to adaptive competence among students.

Firstly, the findings show that the three main learning skills: critical thinking, analytical thinking, and communication are critical to students' inquisitiveness in the classroom. Essentially, different skills for 21stCs, learning skills which involve critical thinking, analytical, and communication are of the foundation, firmly embedded in the learning process. The hypothesis testing supports critical thinking, analytical-, and communication skills are significantly intertwined and recognized as essential skills in learning. Hence, hypotheses #1, #2 and #3 are supported. This was also observed in the classroom when students were actively participating in activities presented to them, they would develop and practice communication and analytical skills through engagement with other students and the lecturer.

Next, it is unsurprising that both communication and analytical skills have positive relationships with active learning. This shows that communication and analytical skills, as expressed in the class through activities among students, promote being active in the learning environment. In other words, active learning would require students to demonstrate their learned/earned knowledge through communication and analytical skills while participating in activities in the classroom. Thus, hypotheses #4 and #5 are supported. This could be observed in the classroom setting when students applied and utilized their acquired knowledge in handling a case study together, mentored by the lecturer. Given the opportunity in this setting, students demonstrated analytical and communication skills.

Lastly, the results reveal that active learning plays a role as a stimulant towards the acquisition of adaptive competence, hence, hypothesis #6 is supported. To illustrate this with a situation in the classroom, adaptive competence is concerned with achieving the expected learning outcome of a course. For lecturers to ensure students' achieving the learning outcomes, would depend on how students could reflect upon the knowledge learned in the classroom through participation in activities. Students' end of term presentations and final exam in which students showcased their adaptive competence to the furthest extent possible in this setting. The researchers; therefore, speculate that for the courses researched in this study, based on an average normal bell curve grade distribution, the students overall accomplished their learning outcomes towards adaptive competence.

The implication of the study can be highlighted based on the pedagogical and program development. Lecturers need to create activities and lessons that contribute to students' learning in order to acquire knowledge effectively. The findings suggest the relationships among the variables, with the three main learning skills (critical thinking, analytical, communication skills) and how these are connected to students, as to where, how and what activities promote active learning and that matches and enhances the acquisition of competence, and thus to achieve learning outcomes of a course.

## 6 Conclusion, limitations and recommendation

To conclude, this study reveals some insights that are derived from the proposed conceptual framework which delineates the relationships among the three main learning skills: critical thinking, analytical-, and communication skills, active learning and adaptive competence. Path analysis reveals the results that demonstrate the significant relationships among variables. Ultimately, active learning plays an important role in the model, connecting the three main learning skills toward the acquisition of adaptive competence.

In this paper, the limitations that can be reported are: (1) This study was executed at an international university in Thailand only; (2) The time-span for this study was one 12-week term; (3) There does not seem to be real consensus on how students may adapt their competence by transferring their capabilities in 21stCs acquired through active learning. Thus, further research on these topics is recommended.

## Acknowledgments

This paper is an output of the funded research project sponsored by the Research and Development Department, Stamford International University, Bangkok Thailand

## References

- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The clearing house*, 83(2), 39-43.
- Benligiray, Serdar; Onay, Ahmet, Analysis of Performance Factors for Accounting and Finance Related Business Courses in a Distance Education Environment, Turkish Online Journal of Distance Education, v18 n3 Article 2 Jul 2017
- Bergman, E. M., Sieben, J. M., Smailbegovic, I., de Bruin, A. B. H., Scherpbier, A. J. J. A., & van der Vleuten, C. P. M. (2012). Constructive, collaborative, contextual, and self-directed learning in surface anatomy education. *Anatomical Sciences Education*, 6(2), 114–124. doi:10.1002/ase.1306

- Bist, S. S., Mehta, D., Harshadbhai Mehta, D., & Meghrajani, D. (2020). Employers' perception regarding employability skills of management students undergoing internship. *Bist, SS, Mehta, N., Mehta, D., Meghrajani, I.(2020). Employers' perception regarding employability skills of management students undergoing internship. International Journal of Work-Integrated Learning, 21(2), 145-161.*
- Bloom, B. S. (1956). Taxonomy of educational objectives. Vol. 1: Cognitive domain. *New York: McKay, 20(24), 1.*
- Bullen, M. L., & Kordecki, G. S. (2014). Model for Efficient and Effective Footnote Disclosure in Pedagogical and Practitioner Application. *Journal of Instructional Pedagogies, 13.*
- Crowe, A. (2006). *Alpha project managers: what the top 2% know that everyone else does not.* Velociteach
- Dale, E., & Nyland, B. (1960). Cone of learning. *Educational Media.*
- De Corte, E. (2012). Constructive, self-regulated, situated, and collaborative learning: An approach for the acquisition of adaptive competence. *Journal of Education, 192(2-3), 33-47.*
- Dendir, S. (2019). Performance differences between face-to-face and online students in economics. *Journal of Education for Business, 94(3), 175-184.*
- Dunbar, N. E., Brooks, C. F., & Kubicka-Miller, T. (2006). Oral communication skills in higher education: Using a performance-based evaluation rubric to assess communication skills. *Innovative Higher Education, 31(2), 115-128.*
- Elder, L. (September 2007). Critical Thinking as Defined by the National Council for Excellence in Critical Thinking, 1987. Available: <https://www.criticalthinking.org/pages/defining-critical-thinking/766>
- Facione, P. (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction (The Delphi Report).
- Fan, Y., Chen, J., Shirkey, G., John, R., Wu, S. R., Park, H., & Shao, C. (2016). Applications of structural equation modeling (SEM) in ecological studies: an updated review. *Ecological Processes, 5(1), 1-12.*
- Garrett, M., Schoener, L., & Hood, L. (1996). Debate: A teaching strategy to improve verbal communication and critical-thinking skills. *Nurse educator, 21(4), 37-40.*
- Greenhill, V. (2010). 21st Century Knowledge and Skills in Educator Preparation. *Partnership for 21st century skills*
- Hager, P. (1998) Understanding workplace learning: general perspectives, in: D. Boud (Ed.) Current issues and new agendas in workplace learning (Adelaide, National Centre for Vocational Educational Research).
- Hasanah, H., & Malik, M. N. (2020). Blended learning in improving students' critical thinking and communication skills at University. *Cypriot Journal of Educational Sciences, 15(5), 1295-1306.*

- Hixson, N. K., Ravitz, J., & Whisman, A. (2012). Extended Professional Development in Project-Based Learning: Impacts on 21st Century Skills Teaching and Student Achievement. *West Virginia Department of Education*.
- Itatani, T., Nagata, K., Yanagihara, K., & Tabuchi, N. (2017, September). Content analysis of student essays after attending a problem-based learning course: Facilitating the development of critical thinking and communication skills in Japanese nursing students. In *Healthcare* (Vol. 5, No. 3, p. 47). Multidisciplinary Digital Publishing Institute.
- Jackson, J. (2016). Myths of active learning: Edgar Dale and the cone of experience. *Journal of the Human Anatomy and Physiology Society*, 20(2), 51-53.
- Kang, J. S., Chiang, C. F., Huangthanapan, K., & Downing, S. (2015). Corporate social responsibility and sustainability balanced scorecard: The case study of family-owned hotels. *International Journal of Hospitality Management*, 48, 124-134.
- Kaplan, A. (2021). *Higher Education at the Crossroads of Disruption: The University of the 21st Century*. Emerald Group Publishing.
- Khan, A., Egbue, O., Palkie, B., & Madden, J. (2017). Active learning: Engaging students to maximize learning in an online course. *Electronic Journal of E-Learning*, 15(2), pp107-115.
- Lizzio\*, A., & Wilson, K. (2004). Action learning in higher education: An investigation of its potential to develop professional capability. *Studies in higher education*, 29(4), 469-488.
- Machemer, P. L., & Crawford, P. (2007). Student perceptions of active learning in a large cross-disciplinary classroom. *Active learning in higher education*, 8(1), 9-30.
- Ntim, S. (2018). Fostering Learners Adaptive Competence: Does Acquisition of Self-Regulation and Metacognition Differentiate between Students?
- Onay, A., & Benligiray, S. (2018). Internal factors affecting student performance in accounting courses at a vocational school. *Sumerianz Journal of Economics and Finance*, 1(3), 82-90.
- Oya, T., Manalo, E., & Greenwood, J. (2004). The influence of personality and anxiety on the oral performance of Japanese speakers of English. *Applied Cognitive Psychology: The Official Journal of the Society for Applied Research in Memory and Cognition*, 18(7), 841-855.
- Park, T., & Ellis, Y. (2020). The Effect of Randomized versus Nonrandomized Data on Accounting Students' Academic Performance. *Journal of Instructional Pedagogies*, 23.
- Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of management*, 12(4), 531-544.
- Prince, M. (2004). Does active learning work? A review of the research. *Journal of engineering education*, 93(3), 223-231
- Sternberg, R. J., & Rainbow Project Collaborators. (2006). The Rainbow Project: Enhancing the SAT through assessments of analytical, practical, and creative skills. *Intelligence*, 34(4), 321-350.



---

## 4th World Conference on Research in EDUCATION

19-21 November 2021

Paris, France

- Tindowen, D. J. C., Bassig, J. M., & Cagurangan, J. A. (2017). Twenty-First-Century skills of alternative learning system learners. *Sage Open*, 7(3), 2158244017726116.
- Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. John Wiley & Sons.
- Zabit, M. N. M. (2010). Problem-based learning on students critical thinking skills in teaching business education in Malaysia: A literature review. *American Journal of Business Education (AJBE)*, 3(6), 19-32.