

TEACHERS' EXPLORATION ON CRITICAL AND CREATIVE INQUIRY IN CHILD EDUCATION: CHALLENGES FROM DIGITAL DISRUPTION IN 21ST CENTURY LEARNING

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Article history

Received: 5 April 2023

Received in revised form: 27 June 2023

Accepted: 28 June 2023

Published online: 30 June 2023

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ABSTRACT

Using critical inquiry in teaching while living in the impact of digital disruption is a complex undertaking and challenging for teachers. This paper dives into teachers' thoughts and experiences on how the drastic changes in education trends impact their classroom teaching and the influence of blended IT in their teaching methodology. The findings also proposed the possibility of teaching child education shifting from implementing pedagogy into practicing andragogy. With the introduction of analysis of life experience and self-directed learning, it enables teachers to accept the new challenges and actively seek or request for the new perspective and new understanding which are fundamental to the process of change.

Keywords: *critical inquiry, digital disruption, pedagogy, andragogy, child education*

1.0 INTRODUCTION

Living in the era of digital disruption where the fundamental change in the way things are traditionally done, students are highly anticipated to acquire a major in essential soft skills equipping them with the requisite knowledge, skills, and dispositions in order for them to be the makers and leading forces of the society. As teachers, it is our duty to motivate kids to learn so they can acquire the knowledge and skills necessary to thrive in the modern world and become agile learners. Creativity and invention, critical thinking and problem-solving, teamwork and leadership, media literacy, communications-information literacy, self-awareness, self-management, responsible decision-making, interpersonal skills, and social awareness are among the primary necessary skills. Those major essential skills are creativity and innovation, critical thinking and problem-solving, collaboration and leadership, communications-information and media literacy, self-awareness, self-management, responsible decision-making, relationship skills, and social awareness. To achieve these, one of the most teaching practices is inquiry-based learning which has been practiced throughout these years of transforming educational practice in supporting students to become thoughtful, motivated, collaborative, and innovative learners capable of engaging in their own inquiries and thriving in a world of constant change. It is one pedagogical strategy for teaching and learning that centers the learning process on the questions, concepts, and observations of the students. Teachers take an active part in the process by creating an environment where concepts

are respectfully tested, redefined, and perceived as improvable. This helps kids move from being inquisitive to acting out their understanding and asking more questions.[1].

Although the goal to reach every student seems simple, achieving this goal is complex. With the impact of digital disruption in education and the trend towards informal learning, for instance, online learning has become greater practical in the education system, especially during the pandemic of COVID-19. Initially, digital solutions in Education play a limited supporting role in face-to-face and in-person instruction. Most schools use a learning management system for online coursework and access to the recorded lesson. However, these basic learning management systems do not fundamentally change the way lessons are delivered and cannot view as a disruptive movement. Today, digital disruption addresses a wide range of topics including lesson delivery methods, curriculum design and objectives, and data analytics. Such circumstance impulse educators to work together in inquire about their student's learning and engagement, they embrace this complexity as an opportunity for further understanding rather than something to simplify. Contradicting conventional education, inquiry-based learning encourages teachers to accept the critique of practice challenge and critical awareness. This paper thus explored the teachers' thoughts and challenges of current teaching practice while taking them to reflect on the direction of their teaching to enhance learners' development that is in line with their needs and interest while proposing the learning framework of critical inquiry and creative design in digital disruption that shifts teaching methods from pedagogy to andragogy.

2.0 CONCEPTUALIZING CRITICAL INQUIRY IN CHILD EDUCATION

Inquiry is defined as seeking truth, information, or knowledge seeking information by questioning. Learners need to be motivated on a personal level [2]. The process of critical inquiry helps children in uncovering social injustices, examine social and political realities, and not accept prevailing conditions unthinkingly and without question [3]. It is related to the way power, position, and privilege play out in the relationships children have with peers, teachers, and other adults. Previously, critical inquiry in schools has traditionally been limited to upper elementary and secondary classrooms [4]. However, recent work by early childhood educators demonstrates that young children are curious about power structures and question unfairness [5]. Teachers can take questions and experiences from the lives of young children for critical inquiry.

Children's daily interactions and connections are ideal places for critical inquiry. This strategy has been described in a variety of ways, from teachers observing children and using questions and topics from local communities to inspire inquiry to read books about social issues to children with the purpose of igniting conversation [6]. Practices that frequently start as placed and special to a certain setting are too often characterized as a collection of actions to take or a specific set of questions, just like many terminologies and methods of teaching [7]. To address the needs of students by involving them in rich, personally relevant learning is the main goal of any inquiry within the context of instructional practice. Accurately defining student learning becomes an anchor for the process when the learning process is placed at the center of inquiry. Assessment for learning is therefore essential to doing professional research.

The primary source of information for the investigation is the student's learning process and its results. A professional discussion that concentrates on genuine student-centered issues raises further hypotheses and/or queries about how students could learn most effectively in a particular situation. Here, description and analysis conducted in the classroom contribute to the creation of fresh information and understandings that could have an immediate and long-

term impact on teaching and learning.

2.1 Child education in 21st century: shifting teaching method to andragogy

The conventional method of education, pedagogy, places more emphasis on "spoon-feeding" knowledge to younger students. The Greek words for "child" and "leading" are the roots of the word "pedagogy," which refers to the science and art of educating children. The 'andragogy' approach to adult education recognizes the differences between ordinary pupils' and adults' Pedagogy vs. Andragogy [8]. Child education frequently relies on others to determine what is important to learn, accepts the information being presented at face value, expects what they are learning to be useful in their long-term future, has little to no experience, and has little ability to serve as an informed resource to the teacher or other students. Adult learners, on the other hand, make the decision about what is crucial to learn for themselves, need to validate the information based on their beliefs and experience, and expect what they are learning to be immediately useful. They also have a wealth of experience to draw from, which may have fixed viewpoints, and have a significant capacity to serve as a knowledgeable resource to the trainer and fellow learners [9].

Table 1: Comparison of Pedagogy and Andragogy [10]

Criteria	Learning method of teacher as Leader (Pedagogy)	Learning method of student as Leader (Andragogy)
Concept	Formal and authoritative climate Traditional classroom environment	Self-directed, diagnosis of needs, Collaboration
Experience	Acquire experience more than using experience	Use experience as the learning source
Learning Readiness	Increasing according to the growth, evaluation measured by teacher	To solve real life problem, evaluation measure mutual discussion
Learning Methods	Subject centered delivery of information	Problem solving approach to deliver information
Motivation	Extrinsic motivation	Intrinsic motivation

As the transformation of education involves the process of critical questioning that enables students, this paper suggests that andragogy indeed is a powerful learning tool for young students in learning in the 21st century. Making sense of learning and refining practice to the early stage of the student learning process without restriction to a certain age level. It becomes an active and meaningful process, particularly when embedded in a community of practice and allows a person to make their own decision and judgment and thus motivate us to better understand the meaning of their experience as their own pace of readiness and cognitive development.

2.1.1. Maker space: a critical-creative inquiry for child education in 21st century

Literature on critical inquiry suggests the notion of creating space, a safe place in the curriculum for children to talk about experiences that make them uncomfortable. This approach advocates children's ability to adopt multiple perspectives related to the injustices explored [11]. Most children are naturally curious about their surroundings, the school must capitalize

on children's natural curiosity and their desire to make sense of their environment. Teachers started to use inquiry-based learning to build on children's spontaneous desire for exploration and to gradually guide them to become more focused and systematic in their observations and investigations. By doing so, teachers can provide children with opportunities to plan, observe, and gather information, and then to compare, sort, classify, and interpret their observations. Often it comes in the form of play-based learning. They provide a rich variety of materials and resources, and interact with children to clarify, expand, or help articulate the children's thinking. They then encourage children to share their findings with one another through oral and/or visual representations. Involving creative design in learning process, the content creation cycle needs to consider factors such as student-centered, students own their learning, and students create learning content and resources, and such practice that allows for created resource by senior for junior. Maker education in Thailand [12] has been proposed in the book building future skills with makerspace STEAM design process in which by engaging creative design in their child critical inquiry, it greatly facilitates the active learning and learner as maker through critical inquiry and creative design enhancing the self-directed learning, innovative of IT process and collaboration.

This also corresponding to the idea of ACTIV UKM [13] of learning framework in 21st century where learning is immersed in the usage of IT applications (reality composer, keynote, GarageBand, clips, iMovie, Pages) in the concept 2 curriculum where everyone can create and everyone can code. The 3 main areas are Pedagogy, technology, and space as provided in the following figure

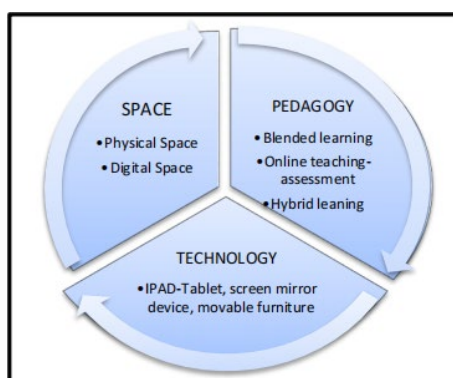


Fig. 1: ACTIV UKM of 21st century learning framework [13]

2.1.2. Teacher development of inquiry and creativity in student's learning

There are seven characteristics of teacher inquiry [14]; first is relevant. Student learning is the anchor for the teacher inquiry process in which students' learning processes and the products of their learning form the essential material of the inquiry. The second is collaborative. Teacher inquiry is a shared process and the collaborative nature of inquiry is what enables the learning to go deeper. Reflective teachers will also guide actions that are reformed by reflection, as a result of ongoing inquiry to inform understanding that supports further student learning. Next is interactive. The progressive understanding grows from cycles of inquiry that facilitated by regular and consistent analysis of what and how students are learning. First the teacher must understand what knowledge and skill do the students need? Then proceed to ask what knowledge and skills do the teachers need? Next is deepen professional knowledge and refine skills. Third is engage students in new learning the students need? The The reasoned inquiry

teacher will use inductive, deductive, and adductive analysis to drive for deep learning. The sixth character is adaptive. An inquiry shapes practice and practice shapes inquiry, teachers continually adapt and apply knowledge and pedagogical approaches in response to their work in the classroom. The last character is reciprocal when a theory and practice connect dynamically engaging in what others have discovered about the phenomena under study.

Therefore, the purposes of this study are (1) to explore teacher's experiences and challenges in relation to critical inquiry in child learning with the impact of digital disruption; (2) to propose the framework for critical inquiry in children that adapts to the impact of digital disruption that shifts teacher from implementing pedagogy to the practicing andragogy. Thus, the research questions are 1) What are teachers' experiences and challenges from their teaching, related with critical inquiry and creative learning design in child education? 2) What is the conceptual framework of critical inquiry learning process with the integration of IT proposed in this study?

3.0 RESEARCH METHODOLOGY, FINDINGS AND DISCUSSION

This paper was conducted through qualitative method through a case study of an Islamic Primary school teacher in Thailand. Six teachers who teach in primary classes, varied in subject teaching, were chosen purposively. In order to explore teachers' experiences and challenges in implementing critical inquiry in their teaching method, with the encounter of digital disruption, interview and discussion are conducted using interviewing steps of Bryman & Bell [15].

After the interview and non-participant classroom observation, a discussion between research and teachers regarding the teacher role of critical inquiry and creative design through self-checklist based on 7 characteristics of teacher inquiry and the community inquiry by Lipman [16]. During these face-to-face discussions, the researcher reviewed the lesson plan, classroom activity, assignment, rubrics, and the teachers' work to evaluate the creative design process. And based from the findings, the researcher proposed with the learning framework of critical inquiry and creative design process with usage IT in 21st child education. The transcriptions were analyzed and the teachers' answers were classified regarding the two main reflective constructs of the interview questions as; experiences, challenges and understanding on critical inquiry and creative design in child learning, their role of practicing critical inquiry and creative design, and the inquiry and creativity process of IT integration.

3.1 Teachers' experience, challenges and understanding on critical inquiry

Teacher interviews showed that by living in 21st century, critical and analytical thinking are more common terms used for child learning development, but as they perceived, it is only practical to secondary and university students. It may not fully be applicable for primary children because they are too young for higher order of thinking and the some students are different in terms of financial support. All informants shared the same ideas of class activities that they still relied on lecturing and doing exercise, although at some point they started to involve in problem-based and project based in the student learning process. The majority of assessments were on lower order of thinking such as memorization and test for they require simple evaluation process. Another significant finding from teachers' interview revealed the challenges for inculcating inquiry process from their teaching experience. There are consisted of distinct dimensions found in classroom management, managing the individual difference,

lacking of resource and skills for teaching materials, and the unrealistic contents of syllabus.

Teachers also expressed that during COVID-19 they experienced difficulty in implementing IT in teaching. Despite, the lack of supports by school in providing sufficient resources and IT access for teaching, they managed to IT for teaching and learning application, whereby some of them admitted the lack of skills and knowledge to create their own IT teaching materials.

The findings from interview suggested that in order to develop critical inquiry skills in primary students, teachers must first understand and develop the inquiry skill and critical thinking skills in themselves, develop the sense of growth mindset in handling the challenge. Not only that, they must know how to inculcate the IT application skills in their teaching and improve the lesson plan and class activities which promote learner life-long learning.

3.2 Teacher role in critical inquiry and creative design process

To identify teacher's role in critical inquiry process learning, the researcher based on Coburn & Stein guideline in this study. From rounds of discussion among six teachers who teach primary level (in various subjects), the research asked to display their current lesson plan, assignment worksheet, and other forms of evaluation. While examining the researcher looked across the various samples using the method of constant comparison and recursive analysis identify patterns between and among the sources [17]. First, the researcher examined the content [18] of the teachers' projects to identify how teachers made decisions about specific instructional practices. After the discussion and reflection on the materials, the teachers were asked to create the alternative lesson plan from the existing one using six inquiry processes. Their reflections and reports have also indicated that they learned the importance of;

1. Centering students' needs and interests by the selective learning topics;
2. Increasing students' responsibility and fostering independence in innovative skills from task assignment;
3. Promoting opportunities for students to develop an enjoyment for learning through the creative design process in the class tasks;
4. Collaborating PLC through teacher-to-teacher common planning;
5. Valuing students' critical inquiry skills when facilitating lessons and developing activities;
6. Using explicit participative instruction consented to by students
7. Engaging and valuing students in questioning, reasoning skills, and problem-solving;
8. Naturally entitled IT application as a means for finding the information to solve problem

3.3 Inquiry processes in child learning

During the classroom observation and the discussion, the researcher identified inquiry processes in child learning based on Lipman's checklist which can be demonstrated through Participation, Shared cognition, The quest for meaning, Deliberations, Impartiality, Thinking for oneself, and Challenge as procedure. (Table 2). After teachers have re-write the alternative lesson plan in their classes, they were asked to identify the children inquiry processing their initial engagement; exploration; investigation; communication, reflection and possibility to achieve them. Four out of seven elements were strongly identified whereby the impartiality

and thinking for oneself were moderately identified in the alternative lesson plan. With the limited resources and unfamiliar strategic questioning, students were not fully able to express their critical inquiry skill.

Table 2: The element of community inquiry process by Lipman

Elements	The students are able to:	Result
Participation	-listen to others -express themselves (verbally and non-verbally) - articulate their agreement or disagreement -answer question individually and in group	Strongly identified
Shared cognition	-take turn to say something -let others finish their sentences -offer creative and unique solution	Strongly identified
The quest for meaning	-ask questions -ask their friends question voluntarily -correct each other with sensitivity -express their ideas explicitly using precise words - show sensitivity to context (being able to identify specific characteristics which make a difference in judgement formation)	Strongly identified
Deliberations	-see views from multiple perspectives -beginning to understand the perspectives of others	Strongly identified
Impartiality	-accept mistakes in their reasoning -display open-mindedness -accept verbally other peoples' arguments if their views are better than theirs	Moderately identified
Thinking for oneself	-willingly change their minds -be self correcting of their own views	Moderately identified
Challenging as a procedure	-still forward their argument even when the majority are of opposing stance -express their disagreement if they think there are weaknesses in others	Not identified

Moreover, after recursively reviewing all teachers' reports, all informants concluded that allowing students to pose questions outside of class has a positive impact on students'

inquiry skills, learning outcomes, and motivation. The way teachers interact in class is divided into responding, challenging, and extending. Some teachers posted the possibility of limitation which is due to the limited time frame. However, the group has shared that using the IT application through the teacher group, would effectively manage the time frame in encouraging children to explore, observe, and peer interaction.

3.4 A Learning framework for critical and creative inquiry

Through structured opportunities for professional dialogue, teachers have opportunities to share and reflect on growing practical knowledge. New structures and technologies application are also being used to mobilize knowledge and tap into learning communities that move beyond classroom walls. The inquiry-based approach is a creative way of combining the most effective forms of instruction, such as explicit instruction, small groups, and guided learning, so that students' interests and ideas are built on, ultimately leading them toward intellectual understanding and curiosity.

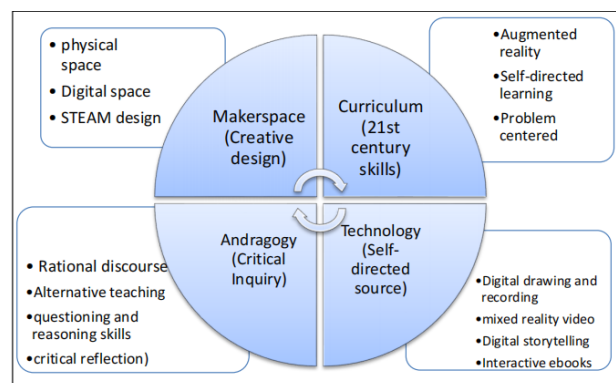


Fig. 2: Proposed Learning Framework of Critical and Creative Inquiry of child education

According to this framework, students are often required to conduct open-ended investigations into a question or problem, including evidence-based reasoning as well as creative problem-solving and "problem finding." Education involves responding to students' learning needs, as well as knowing when and how to introduce them to ideas that will help them advance in their inquiry. Students and educators collaborate to design learning experiences, accepting mutual responsibility for planning, teaching, and assessing learning as well as advancing individual and class understanding.

4.0 CONCLUSION

It can be challenging for educators to accept unexpected events and changes in perspective. These instances, brought on by children's critical thinking and problem-solving, feel like an opening to new learning pathways [19]. When a teacher does self-study and inquiry to analyze his or her practice, the results are shared with a larger group of people for further investigation through group reflection. Children in the 21st century can utilize technology to discover societal inequalities, examine social and political realities, and question the status quo rather than blindly accept it. This is made possible through the critical inquiry process [20].

Future research in this area can unite teacher-educators action research based on the

proposed learning framework. Furthermore, engaging in self-study can be a significant benefit for teachers and teacher educators who wish to gain insight into practice through teacher research. These include investigating the teacher journal, student critical thinking skills through action research, and the effectiveness of using IT applications to foster creative design thinking.

ACKNOWLEDGEMENT

This paper and the research behind it would not have been possible without the exceptional supports of teachers team from Islam Wittayanukroh school. Their enthusiasm and participation in this study have been an inspiration and kept this work completed. The young students also put great impressive responses to colour the findings of this study and give a new insight to enhance learning inquiry using IT. I am so grateful to the generosity and contribution of one and all have improved this study in innumerable ways.

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