Available online at ijci.wcci-international.org

International Journal of Curriculum and Instruction 14(2) (2022) 1392–1418

IJCI
International Journal of Curriculum and Instruction

Pre-service teachers' metaphors of the relationship between curriculum and instruction

Oyebode Stephen Oyetoro [a] [1], Adeyinka Oluwaseun Kareem [b]

[a,b] *Obafemi Awolowo University, Faculty of Education, , Ile-Ife, 220282, Nigeria*

Abstract

This study analyzed pre-service teachers' metaphors of the relationship between curriculum and instruction. On analysis, results revealed that PRESETs use diverse metaphors that are related to their everyday lived experiences. On categorizing the metaphors, five themes emerged namely gadgets and equipment; embodied learning; energy; journey, direction and navigation and; artistry. It was also found there is no relationship between the subject-based disciplines and the metaphors given. Lastly, the metaphors revealed that the teachers had fair understanding of the relationship between curriculum and instruction. The implications of the findings for teacher education were discussed.

Keywords: curriculum; instruction; metaphors; pre-service teachers; teacher education

1. Introduction

1.1. Background to the study

The quality of teachers determines the quality of the educational system of a society. The quality of teachers on the other hand, other things remaining the same, depends on the quality of instruction they received during their training period. This latter position has been given credence by several scholars such as Faulkner and Latham (2016) and Palmer (2007). Consequently, teachers are expected to possess diverse twenty-first century skills which transcend and at the same time improve teaching skills and competencies (Faulkner & Latham, 2016; Nyaboke, Kereri & Nyabwari, 2021).

The skills and competencies expected of teachers have been variously classified by different scholars. Oyedeji (1998) identified generic and specific teaching skills where generic skills refer to certain teacher skills that are essential for effective teaching in all

[1] OYETORO Oyebode Stephen ORCID ID.: https://orcid.org/0000-0002-7515-6806
E-mail address: soyetoro@oauife.edu.ng

grades and in all curriculum areas while specific skills refer to skills required for different teachers to be effective under difference circumstances. Maduewesi (2013) identified three broad roles teachers are to perform. These roles are academic role, administrative role and roles in extra-curricular activities. Each of these roles has identified skills which teachers must possess in order to effectively and efficiently utilize them. Apparently in a bid to summarise the wide array of skills and competencies required of teachers, various researchers like Shulman (1986), Mishra and Koehler (2006) and their associates have postulated that teachers require six competencies which are: Pedagogical Knowledge, Content Knowledge, Technological Knowledge, Pedagogical Content Knowledge, Technological Pedagogical Knowledge, Technological Content Knowledge with the seventh being Technological Pedagogical Content Knowledge. Several researches have been carried out to determine the extent to which these competencies are present in different teachers the world over as these competencies have become widely accepted as yardsticks in the development of teacher education curricula (Enqvist, n.d). Yet, according to Boholano (2017) all 21st century skills initiatives must focus on the development of core academic subject mastery and 21st century skills outcomes. The 21st century skills outcomes are: critical thinking, problem solving, communication, collaboration, information and technology literacy, flexibility and adaptability, innovativeness and creativity, global awareness and financial literacy. The realization of these outcomes requires that teachers have mastery of the concepts to be learnt and the skills required to help students learn them. In relation to this, the Pacific Policy Research Center (2010) emphasized that teachers of the 21st century must have variety of skills and competencies which will promote various inquiry and problem-solving mindset. It is expected that the range of skills and competencies expected of teachers will increase and be more sophisticated in response to the burgeoning and dynamic needs of the learners and the society.

In a world educational system that places emphasis on the constructivist approach to learning, thinking and developing ideas from what is being taught becomes an important aspect of knowledge acquisition. It is important that whatever students are going to learn should develop from how they interpret what they are being taught in the classroom and the meanings they give to the learnt concepts in their expressions. These expressions will be generated from how they birth meanings from individual experience. Hence, the most effective determinant of knowledge acquisition is embedded in personal interpretations. This becomes more important for prospective teachers as they are the transmitters of current and future values of the society. The implication of this for teacher educators would be the development and implementation of pragmatic curricula that will aid the acquisition of the aforementioned skills and competencies. This will demand that the curriculum used in the 21st century teacher education be designed in such a way as to improve teachers' acquisition of skills and competence as well as promote the development of such skills and competence in the learners. It is then necessary to have a teacher education curriculum that suits current trends and standards and one that shifts away from previous templates that promote rote memorization. Pre-service teachers are exposed to courses in curriculum and instruction (teaching) in their programme. In most cases, one of these courses teaches

the intersection of the two concepts of curriculum and instruction. Often too, experiences reveal aspersions are cast on these curriculum and instruction courses to the exclusion of other courses in the teacher education programme when pre-service teachers do not show requisite skills and outcomes during teaching practice. Yet without collecting adequate data on their comprehension of the concepts of curriculum and instruction and the nexus between them, such aspersions are unfounded.

One of the means of judging and improving the worth and outcomes of curriculum and teaching related courses is the collection of non-conventional data from the PRESETs that would enable inferences be drawn on their level of understanding of important concepts in those courses. The collection of data on metaphors has since been a means of collecting these non-conventional data. Indeed, the identification and the understanding the metaphorical views of pre-service teachers and how the images formed are reflected in their views of schooling, life, teaching and childhood has been the concern of researchers (Mahlios Shaw & Berry, 2010). Thus, the premise upon which this present study was based was that teacher-trainees' understanding of the nexus between curriculum and instruction as replicated in the metaphors they give is sine qua non to the determination of their comprehension, creation of nexus among the contents of the course and judging the worth of the contents for inclusion in their pedagogical knowledge, pedagogical content knowledge and technological pedagogical knowledge schema. The purpose of his study is therefore to determine among other things, determine pre-service teachers' metaphors used for denoting the relationship between curriculum and instruction and attempt an interpretation of the metaphors as contained in the metaphor entailments.

1.2 Conceptualization of metaphors, their importance in the process of knowledge construction and types

Metaphors are devices that people employ for both poetic purposes and rhetorical elaboration and belong to the realm of extraordinary language (Godor, 2019). Metaphors have been defined as ways and approaches of creating meaning for concepts outside the conceptualized walls. It is a process of human understanding by which we can achieve reasonable meaningful experiences (Johnson, 1975). According to Aykac and Celik (2014), metaphors are defined as the interpretation and concretization instruments which we use frequently in our daily lives both consciously and unconsciously so as to organize cognitive processes in understanding the concepts by analogies. Metaphors are not mere words or expressions but ontological mappings across conceptual domains (Portaankorva-Koivisto, 2012).

Scholars have articulated diverse merits of metaphors. Metaphors can be used as an instrument to reflect the life experiences of individuals and to determine their perceptions. Metaphors are used to connect abstract ideas and information to more concrete experiences, thus making these experiences more familiar and easier to understand. Moreover, metaphors are more than symbolic intellectual processes; they influence the conceptual understanding of our experiences and help define our everyday realities (Godor, 2019). In the educational sciences, they are used in analyzing concepts, making them comprehensible

by providing affinity to life, transferring experiences, sharing feelings, thoughts, and determining the perceptions about a concept or fact (Aykac & Celik, 2014). Metaphors therefore can structure our thinking and understanding of events, and consequently affect our behavior (McEwan, 2007).

Metaphors offer new insights and contextual understanding into relationships among phenomena that embrace social cultural dimensions (Chan & Henderson, 2018) and often reproduces itself in a steadily growing system of concepts (Sfard, 1998). Noyes (2006) in Portaankorva-Koivisto (2012) points out that metaphor could reveal some hidden beliefs of subject disciplines and help teacher educators to create conflict situations that might shift the meaning of subjects. In the sciences, metaphors power scientific insights (Olson, Arroyo-Santos & Vergara-Silva, 2019).

One of the emerging advantages and usefulness of metaphors is their use as data collection instrument. This advantage is however not without its limitations. Some of these limitations are they: hide important details of the discipline; have ongoing vagueness rather than increasing precision; are often taken and interpreted as seeming real rather than figurative (Olson, Arroyo-Santos & Vergara-Silva, 2019). Another limitation of metaphors' use as data collection instrument as highlighted by Chan and Henderson (2018) is discrepancies in metaphorical interpretations as interpretations are dependent on the researchers' socio-cultural background, personal experiences, professional training, languages spoken, and other factors. In fact, some metaphors are too ambiguous and abstract to be interpreted (Sam, 1999). In essence, metaphors have both shares of positive and negative descriptors (Sfard, 1998).

The specific use of metaphors in the education sciences and its growing use as data collection devices from teacher trainees is worthy of mention. The use of metaphors by teacher-trainees which could be a reflection of the personal meaning that they have constructed for relationships among or between concepts could serve many purposes which include: making teacher-trainees' active participants in the teaching and learning process, broadening teacher-trainees understanding of various concepts, concretizing teacher trainees knowledge of relations among concepts in the curriculum field and evaluating their understanding of interrelationships among concepts which could help establish how well future understanding and learning can be created . Metaphors used by teachers reflect their level of understanding as well as their cognitive structure and abilities. In fact, Godor (2019) highlighted that there is an important and relevant practical connection between the metaphors that teachers employ and their beliefs about teaching and classroom practices. Boarth (2009) explained that metaphor is important in the field of education as it plays aesthetics, ornamental and pedagogical roles. This means that the concept of metaphor helps in teaching and learning in a way that is interesting by establishing relationships between target and a source. In the words of McEwan (2007), the language of metaphor can help professors think and act intentionally for the benefit of their students. Briscoe (1991) believed that use of metaphors improves the techniques used by pre-service teachers during their teaching practice programmes. Lakeoff and Johnson (1990) emphasized the importance of metaphor in deconceptualizing various ideas and content areas. This shows

that when metaphors used by teachers depict adequate understanding of subject matter, it only shows a good knowledge of subject matter (pedagogical or content knowledge) by the teachers. For students offering education courses, a good use of metaphors in the field of education depicts adequate pedagogical knowledge while a good use of metaphor in cognate areas will depict of good level of content knowledge.

Apart from their use in teacher education, metaphors have been used in various disciplines and settings such as: counseling (Zatloukal, Zakovsky & Bezdickova, 2018); in health and hospital settings (Petty, Jarvis & Thomas, 2019); in language studies and corpus linguistic analysis as exemplified in Falck (2018) and Veliz and Veliz-Campos (2019); strategy implementation processes of business organizations (Jonczyk-Sedes, 2019); mathematics (Oniccah, 2017); and in Ecology and Evolution (Olson, Arroyo-Santos and Vergara-Silva, 2019).

Boero, Bazinni and Garutti (2009) identified that metaphors could be categorized as *communication metaphors* which are purely used for communication purposes in teaching and learning and could also be *grounding or conceptual metaphors* which relates directly to concepts. Gibbs (2019) highlighted the dynamical-ecological perspective to metaphorical performances. He explained that the revolution in metaphor studies has revealed the motivating presence of underlying conceptual metaphors in people's use and understanding of metaphorical language and gesture. He was apt to specify that embracing a dynamical–ecological approach to metaphor comes with the significant conclusion that metaphor is not a discrete event or activity that is suddenly "there" inside people's minds but is a dynamical constraint on action that is distributed across brains, bodies, and real-world ecologies.

Metaphors used by pre-service teachers are a reflector of various factors such as experience and exposure of the teacher (Eren & Tekinarlson, 2013). Also, Ibrahim (2016) opined that the choice of a metaphor can be influenced by the surrounding culture/nature of the country or the region. Eren and Tekinarlson (2013) explained further that metaphors are generally domain specific as they change from one context to another. They also pointed out that metaphors used by prospective teachers relates to different areas of teaching and as such consists of cognitive (cognitive component in the sense that it generates from thinking) and affective components (affective as it affects how individuals react and behave in the application of the concepts). This might be taken to mean that the same metaphor might have different meanings in different subject areas on one hand and on the other hand, same metaphor might have different interpretations within the same subject area reflecting change in context. Hence, it may be reasonably expected that teacher candidates in different teaching subjects will have different metaphors as it relates to curriculum and instruction and such differences in the subject areas may be employed to impact on the metaphors put forward by teacher candidates.

1.3. Previous studies on metaphors on curriculum

The metaphorical conception of garden for curriculum and curriculum inquiry was expounded on by Baptist (2002). According to her, the garden metaphor enables those interested in the field to conceive of curriculum and of curriculum inquiry as evolving contingencies which could be transformed through each encounter with a new recipient. Six

views of the garden metaphor which were said to be derived from Francis and Hester's work were provided viz.: spirituality and faith, power, ordering, cultural and personal expression and healing. She concluded that garden as a metaphor for curriculum sows new beginnings, new forms and new possibilities for re-imagining curriculum.

In a study by Aykac and Celik (2014) to determine and compare the in-service teachers and pre-service teachers' perceptions of the curriculum through metaphors, the metaphors used by the teachers were categorized under twelve groups which included: a broken out of use object, a system, a good qualified sufficient product, a baby on developmental age and a tool or way used to achieve a goal. It was also found that the metaphors created by in-service teachers mostly include negative perceptions while that of the pre-service teachers have more positive perceptions. Pre-service teachers' metaphorical perceptions regarding the concept of curriculum was of interest in the study by Akinoglu (2017). The study which utilized phenomenology, a qualitative research design, obtained data from 123 pre-service teachers from a teacher training facility in Turkey reported a total of 107 metaphors. These metaphors were categorized under eight categories. The categories are: curriculum as a guide, curriculum as a wide range, curriculum as a source of problem, curriculum as an organizer, curriculum as a source of information, curriculum as a process, curriculum as an indispensable element and curriculum as a means to achieve a particular outcome. The metaphors were considered positive perceptions of the concept of curriculum even though about 16 metaphors were observed as being negative. The negative metaphors are "plate", "zip file", "chewing gum", "life", "a man's own captivity", "food", "gift package", "cliff", "politics", "road", "sewage", "fruit", "handcuffs", "coffee", "elective course" and "frame".

1.4. Previous studies on metaphors of teaching and learning among teachers and teacher candidates

According to Godor (2019), there is an important and relevant practical connection between the metaphors that teachers employ and their beliefs about teaching and classroom practices. This stems from the notion that metaphors guide one's mental framework. The perceived connect between metaphors and beliefs about teaching and classroom practices could be said to account for increasing studies on metaphors that relate to teaching and learning. One of these studies carried out by Martinez, Sauleda and Huber (2001) revealed that majority of the metaphors developed by experienced teachers were based on behaviourist/empiricist ideas while there were few metaphors in the cognitive/constructivist domains. Bullough (1994) called for the use and analysis of personal teaching metaphors as it had both personal and professional benefits for teachers. He observed that the metaphors that often emerge from this process even though contradictory are always compelling. The metaphors that surfaced in his own analysis included the teacher as a counselor and confidant; friend and father; politician and policeman and teacher as an expert. Sfard (1998) identified two metaphors for learning that could guide the work of learners, teachers and researchers. These metaphors are acquisition metaphor and participation metaphor. Sfard gave the implications of adopting these metaphors as mutually exclusive entities and of combining the usage of the two metaphors. Sfard opined that the devotion to a specific metaphor can lead to theoretical distortions and to undesirable practices. A relatively chronological approach to literature on metaphors of teaching and learning among teachers was adopted in this section. Each of these studies presents unique findings that are presented in the ensuing paragraphs.

McEwan (2007) explored and critiqued the underlying foundational assumptions of four metaphors for teaching at the higher education level. These metaphors are the teacher as an artist, the teacher as a coach, the teacher as a tour guide and teacher as a gardener. The metaphors were highlighted to be highly compatible with a morally-based understanding of learning and teaching. It was also acknowledged that the metaphors are selective and only captures a part but not the whole of the phenomena they described.

A seemingly extensive study was carried out by Nikitina and Furuoka (2008) with the intent to determine the images generated by Malaysian students to describe their language teachers; ascertain whether the metaphors produced by the participants aligned with the four philosophical perspectives on education outlined by Oxford et al (1998) viz.: social order (teacher control), cultural transmission (teacher control), learner-centred growth (shared teacher-and-student-control) and social reform (shared teacher-and-student-control); and assess whether the use of metaphors about language teachers are gender-related. The findings revealed that a total of 27 metaphors were generated by the students. It was also reported that metaphors produced reflected three out of the four philosophical aspects (excluding social reform) and also revealed that in the majority of the metaphors, the control process for teaching and learning was shared between the teachers and students. Lastly, content analysis performed on the metaphors revealed gender disparities in the perceptions of language teachers among teachers which were refuted by empirical testing at 0.05 level of significance. In their study on pre-service language teachers' metaphoric perceptions about their English language (a foreign language in this context) teachers, Çetin Köroğlu and Ekici (2016) generated four broad categories for 41 metaphors which were found utilizable out of a total of 118 metaphors that were created. The categories were multi-functional image, caring image, culture-related image and source of knowledge image. Though the study by Nikitina and Furuoka (2008) and Çetin Köroğlu and Ekici (2016) are quite insightful in presenting language students' diverse perception of their teachers, the studies were limited by the use of small sample of students from a single university. However, the use of these small samples has been justified by the qualitative nature of the data. The present study seeks to determine discipline-based differences in the pre-service teachers' metaphors of the relationship between curriculum and instruction.

A little bit away from the use of metaphors to depict general teaching and in depicting teaching English as a second language, the study by Portaankorva-Koivisto (2012) used metaphors as a tool to gain insight about pre-service mathematics teachers' views of mathematics, teaching, and the teacher's role. The findings of the study include robust parallel classifications of the metaphors around the three themes. The results of this study showed that the prospective mathematics teachers' metaphors for mathematics were mostly categorized in "mathematics as a language" category, the metaphors for teaching was in the "overwhelming" category while their metaphors for teaching for teacher's role was in the "self-referential" category. The results were related to the life situations of these pre-service teachers. In a similar study by Oksanen and Hannula (2012) albeit with Finnish 7-9 grade mathematics in-service teachers and with singular focus on beliefs about mathematics teaching expressed through metaphors, it was reported that the frequently used metaphor was *teacher as a didactics experts*. The other four metaphor categories were: teacher as a subject specialist, teacher as a pedagogue, self-referential and contextual metaphors. The study also reported no statistically significant gender and professional-age-groups differences in the metaphors given by the teachers. In relation to this later finding, the

earlier reported study by Nikitina and Furuoka (2008) reported some gender relations in metaphors used through qualitative analysis even though this difference was not statistically significant. Indeed, the implications of the growing contextual metaphors from studies could be overwhelming for teachers at all levels and there are needs for the interpretations of these metaphors in separate studies. This need could have motivated Ibrahim (2016) to explore the implications of Herbert Kliebard (1972) three curriculum metaphors of production, growth and journey for both educators and learners. Ibrahim concluded that it is the responsibility of an organization to adopt a metaphor that suits her purpose as metaphors are personal perceptions and characterization of one's vision.

Mariana (2017) motivated by the unsatisfactory learning outcomes of Italian upper-secondary school students in foreign language learning even in the face of the utilization of teaching strategies and materials that appeared to be grounded on sound methodological choices used metaphor as a tool for probing students' conceptualizations of both the knowledge of foreign languages and the process of language learning. Six hundred and twelve (12) students were asked to respond to the duo items of *"To know" a foreign language is like …* and *Learning of foreign language is like ….* The uniqueness of the categorizations of the metaphors lies in the linking of the metaphors generated to some basic L2 pedagogical frameworks of (the number of representative samples generated in the study are put in brackets): motivation (10), intercultural communicative competence (4), personal cognitive and affective implications (7), mastery of a system (3), equivalence of L2 knowledge and L1 knowledge (5), equivalence of knowing an L2 and any school subject (4); and similarities with other skills or competences other than in terms of concrete items (3) as obtained in previous studies. While the metaphors from the second response item were categorized using the descriptive categories of: a very demanding, even dangerous, but productive experience (9); a very demanding but (nearly) impossible undertaking (8); a game, a pleasant experience (7); learning a language as starting from scratch (4); similarities with other skills or competencies (cf. No. 7 in the first categorization) (9); development and integration of some sort of "language mechanism" within one's mind (4) and; equivalence of learning an L2 and learning any other subject (cf. No. 6 in the first categorization) (3). One of the strengths of this research lies in the author's discussion of the implications of the conceptualizations on students' approach to learning and their response to teaching. Yet, one problem identifiable with the study remains whether the categorization could be tagged metaphors on account of their non-concretization and flimsy ties of the categories with the everyday lives of the students.

Mellado, de la Montana, Luengo and Bermejo (2018) in their study analysed the evolution of the personal metaphors of 31 science graduates enrolled in a Master's degree course in Secondary Education Teaching during the 2012–13 academic year. The instrument used was an open questionnaire that included asking the participants to make drawings representing the roles of the teacher. Four categories of metaphor were considered: behaviourist/transmissive, cognitivist/constructivist, situative/socio-historical, and self-referential. It was found that most of the prospective teachers were indeed able to conceptualize their roles in the form of metaphors. Comparison of the results before and

after the teaching practicum revealed no changes in most of the participants' metaphors and associated models. Instead, these appeared to be firmly set already at the beginning of the Master's course, and remained uninfluenced by either the course or the practicum. Only a minority of the participants showed changes in their metaphors—5 with progressive changes, and 5 with regressive changes.

Bessette and Paris (2019) in their study allowed teachers to explore their professional identities by reflecting on their teaching role(s) and contexts through elicitation of textual (written) metaphors and visual (drawn) metaphors of teaching. Participants created impromptu drawings emblematic of their conceptualized metaphor. Analysis of participants' written metaphors and impromptu drawings suggests participants' preference for action-based (e. g. sports) metaphors to depict their professional teaching roles and identities. The findings further suggested a complementary relationship between textual and visual data although it was motioned that contrasting and oppositional relationships of image and text are also possible. Bessette and Paris found that visual data adds potency to teacher's self-metaphors and ponder the affordances that emerging visual research methods bring to future investigations.

Metaphor analysis for the purpose of exploring the self and professional identity of Taiwanese English-as-a-foreign language student teachers was the intent of a study by Chien (2019). The study which utilized metaphors from eight participants has four major findings. First, metaphor writing was able to reveal important information about student teachers' professional identities. Second, in terms of teaching demonstrations, metaphors written by those who taught and those who observed were different, being seen as variously as an "adventure" or a "carousel", for instance, due to their different teaching and learning experiences. Third, their metaphors or metaphor discussions were not in-depth revelations of their understanding and knowledge of English language teaching. Fourth, the participants held positive attitudes toward metaphor writing, analysis, and discussion as "useful for reflection."

Metaphor use among teachers and students in special education contexts are also gaining grounds in the literature with such studies Godor (2019), Petiot and Saury (2019), Uchida, Cavanagh and Moloney (2019). While these studies offer insights into the use of metaphors for understanding teaching practices of teachers and promoting learning outcomes among the students of this special population, it is instructive to observe caveat that a strict adherence to the use of root metaphor increases the chance for dogmatism in the classroom which can lead to potentially incoherent classroom differentiation and a potential disconnect between classroom practices and the actual pedagogical needs of the gifted learner (Godor, 2019). The limitation of using a single metaphor for teaching students labeled as struggling students in relation to the peculiarities of the learning needs of these exceptional students as observed in Petiot and Saury's (2019) study is also worthy of mention.

A delve into the metaphors used by pre-service teachers to depict contexts or phenomena such as the relationship between curriculum and instruction is expected to bring a better understanding of their cognitive capabilities, affect their attitudes to learning

these concepts and bring about their learning of better teaching procedures. It will as well provide insight as to how well the students understand the concepts of curriculum and instruction so that areas where adjustments, corrections and guidance need to be made could be detected. This study therefore analysed the metaphors given by teacher trainees in a teacher training institution-Faculty of Education of Obafemi Awolowo University, Ile-Ife, Nigeria.

1.5. Research questions

The following research questions have been drawn out to guide the present study:

a. what are the metaphors used by pre-service teachers to depict the nature of the relationship between "curriculum and instruction"?
b. what are the themes that emerged on attempts at categorizing the metaphors?
c. is there any relationship between the subject-based disciplines of the pre-service teachers and the metaphors given?
d. what inferences could be made from the given metaphors as contained in the metaphor entailments?

2. Method

This study adopted the descriptive research method that utilizes content analysis technique. The use of this method allowed the researchers to describe the nature of the various metaphors teacher trainees give to the relationship between curriculum and instruction.

2.1. Population, sample and sampling technique

The population for the study comprised 445 teacher trainees who registered and sat for ASE 202- Curriculum and Instruction examinations during the 2015/2016 academic session at the Faculty of Education, Obafemi Awolowo University, Ile-Ife, Nigeria. The sample for the study comprised thirty-five pre-service teachers who were selected using the simple random sampling technique. The frequency distributions of the pre-service teachers by the teacher training programmes they offer are as presented in Table 1.

Table 1: Frequency distribution table of pre-service teachers by

s/n	Teacher training Programme	Frequency
1.	Education/English (EGL)	8
2.	Education/Economics (ECO)	5
3.	Social Studies (SOS)	6
4.	Language Arts (L.ARTS)	11
5.	Education/Political Science (POL)	2
6.	Education/Biology (BIO)	1
7.	Education/Religious Studies (REL)	2
	Total	**35**

2.2. Instrument for data collection

The instrument for data collection was the pre-service teachers' responses to an assignment that that requested them to freely use metaphors to represent their perceived relationship between curriculum and instruction.

2.3. Procedure for data collection

The teacher trainees were given assignment as stated above. The finished assignments were submitted electronically through Turnitin. The students, as a requirement of the course, have been asked to open e-mail addresses which they used to assess information, lecture notes and submit assignments. The students were given timelines for the submission of the assignment via the Turnitin platform.

2.4. Method of data analysis

Content analysis was used in analysing the responses turned in by the teacher trainees. The processes involved included sorting out the responses to see which of the metaphors were relevant and which were not. This was done in accordance to the work of Eren and Tekinarlson (2013) where the metaphors were interpreted in terms of coherence to see where there was a level of compatibility between metaphor and reason for using the metaphor; relevance which assessed how related metaphor used are to the concept of curriculum and instruction and meaningfulness which assessed if the metaphors used had meaning. The metaphors were then categorized into different domains and then analyzed using frequency distribution and percentage.

3. Results

3.1. Research question one: What are the metaphors used by pre-service teachers to depict the nature of the relationship between "curriculum and instruction"?

Table 2 revealed that pre-service teachers in the study used 47 different metaphors to represent the nature of the relationship between curriculum and instruction. It was also revealed that the most prominent metaphor was that of SIM card and phones. This was followed by metaphors of automobiles and fuels, gun and bullets, book and pens. The next categories of metaphor that were frequently used among the respondents were that of cars and petrol, printers and paper, direction based on what and how, stove and kerosene as well as engine and oil. Other metaphors used include boat and water, head and body, generator and its manual, phone and manual, maps and vehicle, computer and its software, wheel and rim, DVD and CD player and wood and chisel.

Table 2: Pre-service teachers' metaphors on the relationship between curriculum and instruction given by pre-service teachers and their frequencies

S/n	Metaphor	Occurrence
1	Boat and water	1
2	Car and Petrol	2
3	Head and body	1
4	Head and function	1
5	Skeleton and Body	1
6	Generator and its manual	1
7	Phone and manual	1
8	SIM Card and Phone	4
9	Phone and battery	1
10	Location (Destination) and Leaflet of direction	1
11	Location and map	1
12	Map and Vehicle	1
13	Road Map and Instruments to check road maps	1
14	Computer and Software	1
15	Automobile and Fuel	3
16	Gun and Bullet	3
17	Book and a pen	3
18	Blank sheet and Pen	1
19	Pencil and Lead	1
20	Man and his word	1
21	Human body and the spirit or soul	1
22	Human beings and Oxygen	1
23	Body and clothe	1
24	Board field and Tool	1
25	Printer and paper	2
26	Electronic cooker and electricity	1
27	Gas cooker and Gas (cooking)	1
28	Candle and lighter or matches	1
29	Magnet and Iron (no direction identified)	1
30	Design and means	1
31	Direction, what and how	2
32	Design/roadmap and process	1
33	Wheel rim and tire	1
34	Digital Video disc player and CD	1
35	Stove and Kerosene	2
36	Sculptor, wood and Chisel	1
37	Engine and Oil	2
38	Electricity and cable	1
39	Wristwatch and Wrist	1
40	Soup and Recipe	1
41	Components and activities	1
42	Practical or experiment and manual used for it	1
43	What and who	1
44	What is to be taught & How to be taught	1
45	Filling Buckets to Lightning Fire	1
46	Green Plants and Sunlight	1
47	Vehicle/car and Driver	1
	Total	**61**

3.2. Research question two: What are the themes that emerged on attempts at categorizing the metaphors?

Analysis of the metaphors highlighted in Table 3 revealed that five categories emerged. These categories are: (1) gadgets and equipment; (2) embodied learning; (3) energy; (4) journey, direction and navigation; and (5) artistry. The metaphors classified as gadgets and equipment contains those that relate to items of technology that could be used either immediately or progressively by individuals to make life easy for them. The metaphors classified as embodied learning includes metaphors that are connected to the human body. Energy metaphors included metaphors that relate to the generation of energies in various forms in order to accomplish more tasks. The journey, direction and navigation metaphors include metaphors that help in the location of a place. Lastly, artistry metaphor contains those that relate to collating, collecting and designing arts and work/products related to it. It also includes metaphors related to the transformation of a raw material to a finished product. Table 3 also reveals that in a descending order of magnitude, the categorization revealed that metaphors related to energy are the most occurring, with a tie between the metaphors of gadget and equipment and artistry, followed by embodied learning and lastly, the least occurring was the metaphors on journey, direction and navigation.

Available online at ijci.wcci-international.org

International Journal of Curriculum and Instruction 14(2)
(2022) 1392–1418

IJCI
International Journal of Curriculum and Instruction

Table 3: Categorization of the metaphors given by the pre-service teachers on the relationship between instruction and curriculum

Gadgets and equipment (G&E)	Embodied Learning (EL)	Energy (E)	Journey, Direction & Navigation (J, D &N)	Artistry (A)
Boats and water (1)	Head and body	Electronic cooker and electricity	Location (Destination) and Leaflet of direction	Design and means
Generator and manual	Head and function	Gas cooker and Gas (cooking)	Location and map	Components and activities
Phone and manual	Skeleton and body	Candle and lighter or matches	Road Map and Instruments to check road maps	Practical or experiment and manual used for it
SIM card and phone (4)	Human body and the spirit or soul	Stove and Kerosene (2)	Design/roadmap and process	What and who
Computer and software	Human beings and Oxygen	Filling Buckets to Lightning Fire	Direction, what and how (2)	What is to be taught & How to be taught
Printer and paper (2)	Man and his word	Automobile and fuel (3)	Wheel rim and tire	Sculptor, wood and Chisel
Magnet and Iron (no direction identified)	Body and clothes	Gun and Bullet (3)	Vehicle/car and Driver	Book and a pen (3)
Digital Video disc player and CD	Wristwatch and Wrist	Car and petrol (2)		Blank sheet and Pen
Electricity and cable		Engine and Oil (2)		Pencil and Lead
		Phone and battery		Board and tools
		Green Plants and Sunlight		Soup and Recipe

3.3 Research question three: Is there any relationship without between the subject-based disciplines of the pre-service teachers and the metaphors given?

In order to determine the relationship between the subject-based disciplines of the teachers and the metaphors given, a 7x5 contingency table with subject-based disciplines on the row and the categorizations of the metaphor on the column was drawn. Chi-square test statistic was then applied on the table. The results obtained are as summarized in Tables 4 and 5. The χ^2 calculated was 22.75 while the χ^2 table value at 0.05 level of significance is 36.42.

Table 4: Contingency table of the relationship between the disciplines of the pre-service teachers and the metaphors given

English Language	Economics	Social studies	Language Arts	Political Science	Biology	Religious Studies
Boat and Water	Generator and Manual	Location and map	Computer and software	Board field & Tool	Practical Experiment & Manual	Filling buckets to lightning fire
Car and petrol	Phone and Manual	Design & Road map	Automobile & fuel (3)	SIM card & Phone		Book and Pen
Head and Body	Man and his word	Human and Oxygen	Gun and Bullet			
Printer and paper (2)	Location and Map	Component and Activities	Head & function			
Phone and SIM card (2)	Gun and Bullet	Road and map	Wheel & Tyre			
Blank sheet & pen	Body and Clothe	What and who	Phone & battery			
Green plants & Sunlight	Vehicle and Fuel	Car and petrol (2)	Book & Pen			
		Engine and oil (2)	DVD & CD			
			Stove & Kerosene			
			Wood & Chisel			
			Pencil & Lead			
			Electricity& Cable			
			Wristwatch & Wrist			
			Soup & Recipe			
			Map & Vehicle			
			What & How			

Table 5: Chi-square statistics showing the relationship between the metaphors given by pre-service teachers and subject specialization

Variables	EGL	ECO	SOS	L.ARTS	POL	BIO	REL	TOTAL	df	t-tab	t-cal	Remarks
G & E	5	2	0	3	1	0	0	11				
EL	1	2	1	2	0	0	0	6				
E	2	2	4	6	0	0	1	15	24	36.42†	22.75	Not Sig.
J,D & N	0	1	3	3	0	0	0	7				
A	1	0	2	4	1	1	1	10				
Total	**9**	**7**	**10**	**18**	**2**	**1**	**2**	**49**				

† This was evaluated at 0.05 level of significance

This showed that there is no significant relationship between the subject-based disciplines and the metaphors given by pre-service teachers. The result is also valid at 0.001 level of significance (χ^2 table value is 42.98). It therefore means that no definite metaphor could be ascribed to pre-teachers from a particular discipline but that any of the metaphors could be expected to be given by pre-service teachers from any of the disciplines.

Though there was no significant relationship between the disciplines of the teachers and the metaphors they gave, it could be observed that those in English Studies used more gadgets and equipment metaphors while those in social studies and language arts used the energy metaphors more. It revealed that the metaphor of phone and SIM card and car and fuel were the most commonly used metaphors among the various subject disciplines in the study area. It was also observed that students in Social studies were disposed to using the metaphor of road, direction and map. The metaphor of printer and paper was also found among English language students while the Biology students related the metaphor on an aspect of their discipline-*practical*. It could be said that only students in Social studies and those in Biology could use their subject discipline to establish a relational metaphor of curriculum and instruction. Asides these, subject based disciplines could not be said to be related to metaphor used by respondents.

3.4. Research question four: What inferences could be made from the given metaphors as contained in the metaphor entailments?

Based on the metaphors given on the relationship between curriculum and instruction as well as the explanations provided by the pre-service teachers on the reasons for the use of the metaphors, it was observed that they have adequate knowledge that curriculum is operationalized through the help of instruction. Most of these teachers identified the complementary roles of the two concepts. They also established the essentiality of instruction in making curriculum effective. The pre-service teachers agreed that curriculum is the broad concept used to drive home educational objectives while instruction is the tool that assists in driving home these objectives.

One of the respondents who gave the *boat and water* metaphor highlighted that *curriculum is being given a ground for operation by instruction*. According to this respondent;

> *Water propels the boat into action for obviously, a boat cannot float without water just as a curriculum cannot come to live or be presented to students without an instruction.*

Another respondent highlighted the recipe and soup metaphor, the respondent explained the metaphor thus:

> *A curriculum is the "recipe" of education and instructions are the "ingredients" of curricular recipes. As sweetness of a soup is not only hinged on the recipe but also on the way and manner its ingredients are wonderfully prepared, such is the*

> *connective relevance of curriculum and instructions to educational sweetness and success. So, curriculum is an academic recipe which contains a specific system of education at a particular period of time for a set of learners and instruction is the academic ingredients which are the tools, materials, and means of implementing the curriculum.*

The manner of approach of the metaphor on recipe and soup by the respondent however appears not to be that of expressly tagging one of the two concepts as soup or recipe but it explains that both curriculum and instruction are recipe and ingredient respectively for the realization of the sweetness of education goals and objectives. Simply put, the metaphor explains that for proper learning to take place a good teacher must make good use of the curriculum and instructions properly. Generally, the curriculum could be tagged as the recipe from which the soup of instruction is prepared. However, in another and of course a reverse sense, the element of feedback in instruction could serve as one of the ingredients in the recipe for the preparation of the soup of curriculum. This metaphor could be said to explain the intersection of curriculum and instruction in bringing about the realization of educational objectives while bringing out the complexities that may be involved in expressly tagging the concepts as either of the metaphors. Stove that burns kerosene to generate heat for cooking is yet used in Nigeria even though the advent of gas and electric cooking utensils would have reduced its number of consumers marginally. One of the respondents that used the stove and kerosene metaphor explained that*:*

> *Stove being the curriculum while instruction being the kerosene. Instruction being the kerosene fuels the stove (curriculum) to produce heat to get a desired end result. Without the kerosene, the stove can't function effectively and efficiently making it impossible or difficult to achieve desired results; effective and efficient teaching.*

More striking from the above metaphor is that stove produces heat to get a desired result. This heat from the stove which is obtained from the kerosene could be interpreted to mean that instruction is a very essential, powerful catalytic tool that makes the curriculum do what it is expected to do. The most occurring metaphor in the study was that of Phone and SIM card. Four respondents out of 35 respondents gave this metaphor. The first respondent stated that:

> *Phone and SIM card can be used in explaining the relationship between curriculum and instruction. Phone which is (sic) happened to be a device that is used in call making, receiving calls and sending and receiving messages can be useless without a small device called SIM. SIM card is used in storing contacts to the phone and serve as a medium of sending, receiving messages and calls*

The respondent above and the three other respondents likened the curriculum to the phone and SIM card to instruction. This respondent later detailed that the phone which

is the curriculum is to be seen as "the major instrument used to accomplish a task but the SIM card is the instruction that effectively makes the functionality of the phone feasible". The complementarity of the two concepts was emphasized in the entailment drawn from the response of the second respondent on this metaphor:

> *Without a phone or handset, the SIM card is useless and can't perform any function so also is the handset is (sic) useless without the SIM card because it cannot achieve the aim for which it was created. Therefore, the SIM card is likened to instruction while the phone or handset is just like the curriculum.*

Though a phone might not be completely useless on account of the non-availability of a SIM card yet, its functionality is highly limited in the absence of one. The developed curriculum remains the written and enacted curriculum only without instruction. On the activation of the curriculum via instruction it assumes various forms as the implemented curriculum, received curriculum, accessed curriculum, etc. This explanation is emphasized by the entailment provided by the third respondent who stated that:

> *Although a mobile can work without the SIM but this will drastically reduce the amount* (sic) *of tasks the phone can do. The absence of the SIM will make the phone useless in calling and browsing. This is simply applicable to the concepts of curriculum and instruction. There are many instructions which are to be implemented that will help in inculcating good behaviour and manner into the students."*

The summary of the metaphor on phone and SIM as seen in one of the entailments is that *instruction is the enabler of the curriculum***.** Another related metaphor to that of phone and SIM card is that of battery and phone. It was highlighted by this respondent that battery is what gives life to the phone. Without the battery the phone cannot function so without the instruction the curriculum will not come to life.

> *The phone is the curriculum while the battery is the instruction. A phone cannot function without the battery likewise curriculum cannot function or be active without instruction.*

Some of the metaphors presented by the pre-service teachers highlighted the mediating role of the teacher in translating curricula intents through instruction to reality. These metaphors included that of gun and bullet and wood and chisel. The respondents highlighted the roles of the shooter and sculptor (teacher) in directing and shaping the curricula (gun and wood) via the instrumentality of instruction (bullet and chisel).

Some of the entailments to the metaphors could however be considered defective. For instance, the metaphors of generator/manual and the phone/manual have entailments that are problematic. The curriculum is likened to generator and phone while instruction is the manual. Instruction was therefore seen as the tool or guideline that informs how the curriculum will operate. One of the respondents explained:

> *The generator represents the curriculum while the manual represents the instruction which gives us rules and procedure on how to operate the generation (sic) without the manual on the purchase of generator, the operator will not be able to operate it well except he went ahead to call the expert, even the expert will demand for the manual because each generator has its own way of operations.*

The entailment above assumes that the operator of the generator quintessentially requires the manual to operate it (well). Suffice it to explain that there might be no need for the manual to operate the gadgets manufactured in the present as they are easy to operate with most of them coming with friendly graphical user interface. In fact, when a key or a knob is turned, most generators are now turned on. In like manners, some curricula do not require a specialist for the interpretation of their intents but are self-taught and self-implemented. With respect to the phone-manual metaphor, the respondent stated that:

> *When a new phone and others gadgets are bought, it usually come with manual which served as guidelines and rules on how the phone will be use or operated.*

The irony of the above comment is that increasing number of phones and gadgets do not come with manuals and when they do come, they offer no comprehensive guide on how to operate the gadgets. Summarily, the entailments from the metaphors supplied by the pre-service teachers included:

a. curriculum is being given a ground for operation by instruction
b. instruction is what makes the curriculum works
c. instruction operates to make curriculum effective as curriculum is made effective, understandable and useable through the help of instruction
d. instruction is what gives direction or guide to the curriculum
e. instruction was seen as the vehicle, the channel of movement for the final destination which is the curriculum
f. without the Instruction the curriculum will not come to life
g. Instruction is the enabler of the curriculum
h. the role of curriculum and Instruction is the relationship between the two is interwoven
i. curriculum is viewed as the embodiment of a component which is Instruction (reflecting the improvement of the curriculum through the feedbacks provided from instruction)
j. some sees instruction as the spice that gives flavour, life or effect to the curriculum and
k. instruction makes the operations of the curriculum easy and possible.

4. Discussion

The study revealed 47 different metaphors. The prominent metaphors were that of SIM card and phones, automobiles and fuels, gun and bullets, book and pens. The metaphors of cars and petrol, printers and paper, stove and kerosene as well as engine and oil were also used. The study reveals that the metaphors used are in consonance with postulations from previous studies (Eren & Tekinarlson, 2013; Ibrahim, 2016; Godor, 2019) that the exposures and experiences of participants and the understanding they possess of the objects and the relationship among these objects inform their use of metaphors.

Five themes emerged on attempts at categorizing the metaphors obtained from the participants. They are *gadgets and equipment*; *embodied learning*; *energy*; *journey, direction and navigation*; and *artistry*. These themes are consistent with prior determined themes in some metaphor studies. The themes of energy and artistry in this study are somewhat consistent with that of production while that showed that of journey, direction and navigation is consistent with that of journey as used in the work of Kliebard (1972) as cited in Ibrahim (2016). The themes are also consistent with the lifestyles, experiences and exposures of the pre-service teachers who are young adults in a developing nation that evolves with trends in world economy. Also, the themes of gadgets and equipment and energy align with Sfard's (1998) acquisition metaphor while that of embodied learning and journey, direction and navigation are in consonance with his participation metaphor. Again, the theme of journey, direction and navigation as obtained in this study was also observed in the study by Chien (2019) where the metaphor "adventure" was used to denote the professional identities of student teachers. Beyond the necessities of conformity with previous studies, it is imperative to always take the results of metaphor studies as distinct across the studies. The perception and adoption of these themes should be viewed in relation to the position by Sfard that metaphors are mutually exclusive entities, should be combined for the derivation of meaning and that devotion to a specific metaphor can lead to theoretical distortions and to undesirable practices.

The study also showed that no statistically significant relationship exists between the disciplines of the teachers and the metaphors they gave even though some metaphors were consistent with some disciplines. This finds support with Nikitina and Furuoka (2008) and Oksanen and Hannula (2012) which show qualitative disparities by gender in metaphors used by the sampled respondents though the disparities were not statistically significant. This further buttress the fact that the environment and individual experiences rather than mental/cognitive inclinations suggests metaphors for the PRESETs. The metaphors generated by the PRESETs could as such be wholly relied on

as valid conceptions of the relations between (the) concepts devoid of social stratifications.

The metaphors supplied by the PRESETs revealed extant creativity that might be expected of teacher-trainees in their second year of a four-year teacher training and who, going by the curriculum, are being introduced newly to a course on curriculum and instruction. The metaphors supplied are also contextual, revealing the interactions the students have with their immediate environment. The metaphors reflect the conceptual understanding of the trainees' experiences and could help define and refine their schemata (constructed realities) of the relationship between curriculum and instruction (teaching) (Godor, 2019). Some of the metaphors e. g. boat and water and gun and bullet metaphors appear detailed and complex in relation to the stage in training of the teachers. For example, a look at the explanation provided for the boat and water metaphor explains that the curriculum is the boat while instruction is water. The respondent explains the implications of a poorly constructed or faulty boat (sinks) and the need for repair and maintenance of the curriculum (boat) in order to meet the ever-changing needs of students during instruction. The gun and bullet metaphor explains the role of the teacher as the shooter who pulls the trigger that propels "trigger which propels the gun (curriculum) which in turn sends out the bullet (instruction) which later affects the victim (students)". This respondent further explains the effect of aiming rightly or wrongly the gun and the consequence of affecting the victim positively or wrongly or not at all respectively.

The metaphors and the entailments provided revealed also that the PRESETs have a considerably adequate understanding of the relationship between the curriculum and instruction though there are few metaphors that are quite problematic. For instance, the phone and manual metaphor is quite problematic in this era where most phones do not come with detailed manual on how phones are to be operated. The explanation that the curriculum (phone) cannot function well without instruction (manual) may not hold water in advanced curriculum classes as there are self-taught, self-paced, self-directed curricula that do not require the mediation of teachers qua teachers. Yet, when curricula do not require the intervention of instruction, this could be an instance of *hidden*, *societal* curriculum. The challenge so highlighted here has been captured by Chan and Henderson (2018) who pointed out the challenge of discrepancies in metaphorical interpretations as interpretations are dependent on the researchers' socio-cultural background, personal experiences, professional training, languages spoken, and other factors. The metaphors used to conceptualize the relationship between curriculum and instruction could change in the process of changing roles and progress in the acquisition and mastery of vital concepts during training. It is thus expected that these teachers can explore and reconstruct new metaphors of the relationship between curriculum and

teaching as a transformative way of teacher development which leads to improvements in practice (Tobin, 1990 in Oksanen & Hannula, 2012).

5. Conclusions

The study concluded that metaphors are important in conceptualizing and concretizing the understanding of the relationship between curriculum and instruction. It is expected that teacher educators use them to clarify and refine PRESETs understanding of these two concepts and such other concepts in the curriculum field.

References

Akinoğlu. O. (2017). Pre-service teachers' metaphorical perceptions regarding the concept of curriculum. *International Journal of Instruction 10* (2), 263-278. http://www.e-iji.net/dosyalar/iji_2017_2_17.pdf

Aykac, N. & Celik, O. (2014). Comparison of metaphoric perceptions of teachers and pre-service teachers about curriculum. *Education and Science 39* (173), 326-339.

Baptist, K. W. (2002). The garden as metaphor for curriculum. *Teacher Education Quarterly, Fall 2002,* 19-37.

Bessette, H. J. & Paris, N. A. (2019). Using visual and textual metaphors to explore teachers' professional roles and identities. *International Journal of Research and Method in Education.* **https://doi.org/10.1080/1743727X.2019.1611759**

Boero, P., Bazinni , L.& Garutti, R. (2009). Metaphors in teaching and learning mathematics: A case study concerning inequalities. *The International Conference of Psychology of Mathematics Education Proceedings- PME XXV. Vol.3,* 9-16.

Boholano, H. B. (2017). Smart social networking: 21st century teaching and learning skills. *Research in Pedagogy, 7*(1), 21-29.

Botha, E. (2009). Why metaphor matters in education. *South African Journal of Education. EASA. 29.* 431-44.

Briscoe, C. (1991). The dynamic interactions among beliefs, role metaphors, and teaching practices: A case study of teacher change. *Science Education, 75* (2)*, 185-199.*

Bullough, R. V. (1994). Personal history and teaching metaphors: A self study of teaching as conversation. *Teacher Education Quarterly 21*(1),107-120.

Chan, Z. C. Y. & Henderson, S. (2018). Metaphorical interpretations of the educator-student relationship: An innovation in nursing educational research. *Nursing Education in Practice, 28,* 46-53. **https://doi.org/10.1016/j.nepr.2017.09.012**

Chien, C. (2019). Creating pathways to developing a "Teacher Self" through metaphor analysis. *Research in Education.* **https://doi.org/10.1177/0034523719883663**

Daane, A. R., Haglund, J., Robertson, A. D., Close, H. G., Scherr, R. E. (2018). The pedagogical value of conceptual metaphor for secondary science teachers. *Science Teacher Education.* **https://doi.org/10.1002/sce.21451**

Ehindero O. J. (2014). *Intellectual foundations of curriculum development, implementation and innovation*. Ogun: Melrose Publishing Company Limited.

Enqvist, J. (n.d.). *Pedagogical content knowledge.* Last accessed from www.hamk.fi/aokk on September 9, 2020.

Eren, A. & Tekinarslan, E. (2013). Prospective teachers' metaphors: Teacher, teaching, learning, instructional material and evaluation concepts. *International Journal of Social Science and Education 3*(2), 435-445.

Falck, M. J. (2018). From ecological cognition to language: When and why do speakers use words metaphorically? *Metaphor and Symbol, 33* (2), 61-84. **https://doi.org/10.1080/10926488.2018.1434937**

Finlay, L. (2015). Sensing and making sense: Embodying metaphor in relational-centered psychotherapy. *Humanistic Psychologist, 43*(1), 338-353. **https://doi.org.10.1080/08873267.2014.993070**

Flake, L. H. (2017). A look at the relationship of curriculum and instruction and the art and science of teaching. *Asian Journal of Education and Training. 3*(2)*, 82-86.*

Faulkner, J. & Latham, G. (2016). Adventurous lives: Teacher qualities for 21st century learning. *The Australian Journal of Teacher Education, 41* (4).

Gibbs, R. W. Jr. (2019). Metaphor as dynamical-ecological performance. *Metaphor and Symbol, 34* (1), 33-44. **https://doi.org.10.1080/10926488.2019.1591713**

Godor, B. P. (2019). Gifted metaphors: Exploring the metaphors of teachers in gifted education and their impact on teaching the gifted. *Roeper Review, 41* (1), 52-60.

Ibrahim, A. M. (2016). Curriculum metaphors. *The Eurasia Proceedings of Educational and Social Sciences (EPESS) 4*, 385-390.

Johnson, C. C. (1975). Effect of behavioural objectives on students' achievement in ISCS. *Science Education, 59(2), 177-180.*

Jonczyk-Sedes, C. (2019). Mind your metaphors: Early morning warning signals when rolling out strategy. *Journal of Business Strategy, 41* (3), 10-17. **https://doi.org/10.1108/JBS-12-2017-0190**

Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A new framework for teacher knowledge. *Teachers College Record,* 108 (6), 1017-1054.

Çetin Köroğlu, Z. & Ekici, G. (2016). English language teacher candidates' perceptions of language teachers: A metaphor study. *International Journal of Languages' Education and Teaching 4* (2), 387-398. **https://doi.org/10.18298/ijlet.579**

Lakoff, G. & Johnson, M. (1990). *Metaphors we live by.* Chicago: University of Chicago Press.

Maduewesi, E. (2013). *Introduction to teaching.* Enugu, Nigeria: ABIC Books and Equip Limited.

Mariana, L. (2017). Exploring Italian high school students metaphors of language learning. *Learner Development Journal 1* (1), 44-61.

Martinez, M. A., Sauleda, N. & Huber, G. (2001). Metaphors as blueprints of thinking about teaching and learning. *Teacher and Teacher Education*, *17*(8). 965-977.

McEwan, A. E. (2007). Do metaphors matter in higher education. *Journal of College and Character 8* (2), 1-8.

Mellado, L., de la Montana, J. L., Luengo, M. R., & Bermejo, M. L. (2018). Evolution of the personal teaching models of prospective secondary school science teachers as expressed through metaphors. *Cultural Studies of Science Education, 13,* 957-982. **https://doi.org.10.1007/s11422-018-9856-2**

Mildenhall, P. & Sherriff, B. (2018). Using multiple metaphors and multimodalities as a semiotic resource when teaching year 2 students computational strategies. *Mathematics Education Research Journal, 30* (4), 383-406. **https:// doi.org.10.1007/s13394-017-0212-8**

National Universities Commission (2007). *Benchmark minimum academic standard for undergraduate programmes in Nigerian universities education*. Abuja Nigeria.

Nikitina, L. & Furuoka, F. (2008). A language teacher is like… 'Examining Malaysian students' perception of language teachers through metaphor analysis. *Electronic Journal of Foreign Language Teaching 5* (2), 192-205.

Nyaboke,R., Kereri, D. & Nyabwari, L. K. (2021). Competence-based curriculum (CBC) in Kenya and the challenge of vision 2030. *International Journal of Education, Technology and Science 1*(4), 155–169.

Oksanen, S. & Hannula, M. S. (2012). *Finnish mathematics teachers' beliefs about their profession expressed through metaphors.* In M. S. Hannula, A. Laine & L. Naveri (eds.), Current state of research on mathematical skills XVIII: Proceedings of the MAVI-18 Conference, September 12-15, 2012, Helsinki, Finland, Publications in Subjective Didactics 6, pp.315-326.

Olson, M. E., Arroyo-Santos, A. & Vergara-Silva, F. (2019). A user's guide to metaphors in ecology and evolution. *Trends in EcoFlogy and Evolution, 34* (7), 605-615. **https://doi.org/10.1016/j.tree.2019.03.001**

Oniccah, T. (2017). Metaphors for learning mathematics: An interpretation based on learners' responses to an exploratory questionnaire on mathematics and learning. *International Journal of Secondary Education 5* (6), 70-74. **https://doi.org/10.11648/j.ijsedu.20170506.11**

Oyedeji, O. A. (1998). *Innovations for teaching.* Ibadan: Lade-Oye Printers.

Pacific Policy Research Center (2010). *21st century skills for students and teachers.* Honololu: Kamehameha Schools, Research & Evaluation Divisions.

Palmer, S. (2007). PRACTICE: A model suitable for coaching, counselling, psychotherapy and stress management. *The Coaching Psychologist, 3* (2), 72-77.

Petiot, O. & Saury, J. (2019). 'Swim like a knife slipping on fresh cream' The role of metaphors in struggling students' engagement with learning physical education. *Physical Education and Sport Pedagogy, 24* (5), 478-490. **https://doi.org/10.1080/17408989.2019.1628933**

Petty, J., Jarvis, J. & Thomas, R. (2019). Using parent metaphors for learning about the neonatal care experience: An interpretive perspective. *Journal of Child Health Care.* **https://doi.org/10.1177/1367493519875853**

Portaankorva-Koivisto, P. (2012). *Preservice mathematics teachers' metaphors for mathematics, teaching, and the teacher's role*. In M. S. Hannula, A. Laine & L. Naveri (eds.), Current state of research on mathematical skills XVIII: Proceedings of the MAVI-18 Conference, September 12-15, 2012, Helsinki, Finland, Publications in Subjective Didactics 6, pp.303-314.

Quinn, F., Charteris, J., Fletcher, P., Parkes, M., Reyes, V. (2019). Professional knowledge landscapes in online preservice teacher education: An exploration through metaphor. *Australian Journal of Teacher Education,* 43 (10). **https://doi.org.14221/ajte.v43.n10.4**

Sam, L. C. (1999). Using metaphor analysis to explore adults' images of mathematics. *Philosophy of Mathematics Education Journal 12,* http://people.exeter.ac.uk/PErnest/pome12/article9.htm

Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Educational Researcher 27* (2), 4-13.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15, 4-14.

Simon, S. E. (2013). The weaving of a tapestry: A metaphor for teacher education curriculum development. *Australia Journal of Teacher Education 38* (8). **http://dx.doi.org/10.14221/ajte.2013v38n8.5**

Uchida, M., Cavanagh, M., & Moloney, R. (2019). "A casual teacher is a gardener": metaphors and identities of casual relief teachers in the Australian primary school context. *Educational Review*. **https://doi.org.10.1080/00131911.2019.1622511**

Veliz, L. & Veliz-Campos, M. (2019). A socio-semiotic analysis of Latino migrants' metaphorical conceptualizations of language learning. *Journal of Latinos and Education.* **https://doi.org.10.1080/15348431.2019.1630285**

Zatloukal, L., Zakovsky, D. & Bezdickova, E. (2018). Utilizing metaphors in solution-focused therapy. *Contemporary Family Therapy, 41* (1), 24-36. **https://doi.org.10.1007/s10591-018-9468-8**
