

## **Strategies for enhancing student learning experiences in higher education**

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This study examined the use of differentiated instruction as a viable teaching and learning approach for enhancing student learning experiences at a higher education institution. This approach is characterised by strategies that use assessment of each individual student for readiness, interest, and learning preference to modify instruction in one of three ways: by content, process or product. Findings of the study revealed that the majority of participants in the study reported higher levels of intellectual growth as a result of exposure to differentiated instruction. If properly applied, differentiated instruction can enhance not only adult learning but also provide a workable alternative to the pedagogy/andragogy dichotomy.

**Key words:** student learning experiences, higher education, differentiated instruction

### **Introduction**

Twenty-first century learners are quite different from the students we taught fifteen or twenty years ago. Today we utilise a range of Web 2.0 Tools, Learning Management Systems and interactive media as important teaching and learning support to supplement and sometimes replace the traditional teaching aids of the past. Since students do not all learn the same thing on the same day in the same way, educators are increasingly faced with the challenge of knowing students well enough to cater to their varying needs in the classroom (Gregory & Kuzmich, 2004). One way to accomplish this is by exploring differentiated instructional strategies to enhance student learning experiences. While differentiated instruction is quite popular in many elementary and secondary schools internationally, very little is written about this practice in institutions of higher learning (Santangelo & Tomlinson, 2009). Attempting to implement differentiated instruction, therefore, is a new approach to teaching and learning at international higher education institutions as well as institutions of higher learning in the Caribbean region.

Carol Ann Tomlinson (2001) describes differentiated instruction as a deliberate and conscious method of planning and teaching to address student variance. She argues that as a teaching philosophy, differentiation focuses on teaching essential content in a way that addresses the varied learning needs of students with the view of maximising the potential of each learner (Tomlinson,

2001). This approach is characterised by strategies that use assessment of each individual student for readiness, interest, and learning preference to modify instruction in one of three ways: by content, process or product. Differentiation is strongly contrasted to traditional practices that use whole-group lecture format where student learning and participation are more passive and unresponsive to individual needs (Gibson & Hasbrouck, 2008; King-Shaver, 2008).

Any attempts at implementing differentiation must be done with the understanding that there is no one way to differentiate instruction. At the tertiary level, the notion of differentiation becomes problematic since this is not generally the traditional mode of instruction used by professors. Tulbure (2011) posits that differentiating instruction in higher education poses a challenge both for teachers as well as researchers. She argues that since a great deal of empirical proof is needed to demonstrate the superiority of differentiated instruction over the whole-class instructional approach, a combination of both approaches might be the way to go.

Notwithstanding some of the challenges associated with differentiation, research by Ernst and Ernst (2005) reveals that university students generally responded favourably to the differentiated instructional approach, when professors differentiate the instruction. As contemporary higher education evolves, university professors will need to develop teaching strategies that take into consideration learner variance in readiness, interest, and learning profile. Today's educators, therefore, no longer have the legitimate choice about whether to respond to academically diverse student populations in most classrooms; rather, they can only decide how to respond (Sizer, 1985; Stradling & Saunders, 1993).

### **Situating the study**

Recent research highlights various challenges teacher education institutions face in effectively teaching the concept of differentiated instruction to prospective teachers (Joseph, 2013). A follow-up study addresses this issue by exposing teachers in Trinidad and Tobago to differentiated instruction through classroom teaching and modelling (Joseph, Thomas, Simonette & Ramsook, 2013) which points to government's growing interest in greater inclusion of all students with special needs and the importance of addressing the question of learner variance in classrooms of the nation's schools.

This current study makes a case for the application of differentiated instruction as a promising approach for supporting the diverse needs of the learner at the tertiary level. The study was conducted at the University of Trinidad and Tobago (UTT), Centre for Education Programmes, where the government provides scholarships for teachers to pursue Bachelor of Education degrees in primary education, early childhood care and education, as well as special needs education. The Centre for Education Programmes also caters for students pursuing the Bachelor of Education degree in secondary education. Over the last seven years, approximately 1000 in-service teachers have benefitted from Government scholarships. As a national university, UTT does not only subscribe to the academic

concept of education for its own sake, but more importantly, it concentrates largely on the preparation of manpower to assist in national development.

Participants for the study comprised 220 students pursuing a compulsory second-year general education course in Curriculum Studies. The purpose of this course was to engage prospective teachers beyond the mechanics of curriculum planning and development to the point of tackling questions such as: What is education? What should be taught? Why should some activities be chosen and others not? Who decides what should be taught? The major learning outcomes of the course included: a critical assessment of various approaches to curriculum; an evaluation of the impact of educational philosophies, learning theories and sociological positions on curriculum planning, development, and design; development of curriculum guides applying relevant curriculum design principles; and an evaluation of existing curriculum at the primary and secondary school level. Students were also expected to demonstrate understanding of the role of politics and centralised decision-making in curriculum planning, development, and implementation as well as develop solutions to major problems involved in curriculum implementation.

### **Theoretical framework for the study**

The theoretical framework for this study draws on principles of adult learning (andragogy) as enunciated by Knowles, Holton, and Swanson (2005). It is also built on Vygotsky's (1978) theory of learner readiness as well as the works of Carol Ann Tomlinson (2005) who writes extensively on differentiation as a deliberate and conscious method of planning and teaching to address student variance.

#### *Andragogy/pedagogy paradigms*

Knowles, Holton, and Swanson (2005) posit that since adults learn differently from children, a different kind of education is required. In contrast with pedagogy, where orientation to learning is subject-centred, adult learning theory is based on the assumption that an adult's orientation to learning is problem-centred, and that adults learn best when new knowledge, skills and attitude are presented in the context of real-life situations (Ozuah, 2005). The literature suggests that traditional pedagogical models and methods of teaching are generally teacher-centred and apply to children (Minter, 2011). The andragogical model, however, operates on the premise that adult learners are self-motivated, and that their readiness to learn is dependent on an appreciation of the relevancy of the topic. Karge, Phillips, Jessee and McCabe (2011) suggest that the use of engagement strategies such as *think-pair-share*, *tell-help-check* and *problem based learning*, provide support to any teaching environment and encourage inquiry among adult learners.

Theoretically, the principles of pedagogy and andragogy seem to operate on two different paradigms. As such, one may assume that what works for teaching children under the pedagogical model, will not be suitable for the adult learner (Minter, 2011). Knowles, Holton and Swanson (2005) argue that unlike children

who are extrinsically motivated, adult learners are intrinsically motivated and have a readiness to learn; and that they learn best by participation in relevant experiences and practical information. However, the general weakness in the pedagogy/andragogy debate is the assumption that individuals learn the same thing in the same way. As a result, many professors at higher education institutions continue to teach and assess every student in the same way using the same material without paying attention to learner variance. If properly applied, differentiated instruction can enhance not only student learning at the tertiary level, but also provide a viable alternative to the pedagogy/andragogy dichotomy.

#### *Addressing student readiness*

Theory and recent research support the position that teachers should consciously adjust curriculum and instruction in response to students' readiness, interest, and learning profiles. Vygotsky's (1978) theory relating to learner readiness, for example, suggests that teachers should teach within a child's zone of proximal development – the difference between what a child can do alone without guidance and what the child can do with scaffolding or support. If the teacher can push the child into his/her zone of proximal development, coach with a task slightly more complex than the child can manage alone, then the child, through repetition, will master new skills and eventually learn to become an independent thinker and problem solver. Byrnes (1996) suggests that if material is presented at or below the mastery level, then no growth will occur. In like manner, if material is presented well above the zone, children will be confused and frustrated. Teachers, therefore, must pay attention to student readiness as an important component of differentiated instruction.

Tomlinson and Imbeau (2010) caution, however, that readiness is not a synonym for ability, and the two terms should not be used interchangeably. For them, *readiness* suggests a temporary condition that should change regularly as a result of high-quality teaching; whereas *ability* refers to a fixed state based on some form of innate or inborn trait. Tomlinson (2005a, 2005b) posits that the concept of student readiness encompasses student knowledge, understanding and skills in relation to the instruction a teacher is planning. The goal of readiness differentiation is to ensure that all students are provided with appropriately challenging learning experiences (Santangelo & Tomlinson, 2009).

#### *Addressing student interest*

Student interest refers to "that which engages the attention, curiosity, and involvement of a student" (Tomlinson & Imbeau, 2010, p.16). Therefore, when teachers differentiate instruction according to a student's existing interests, such students are motivated to connect what is being taught with things they already value. Interest-based differentiation also encourages students to discover 'new interests' (Santangelo & Tomlinson, 2009). In a classroom setting, for example, teachers may choose to differentiate key skills and materials to be learned by aligning them with particular students' interests in several areas such as music,

sports, or current affairs. Interest-based differentiation is directly linked to studies in motivation which show enhanced student engagement with the task, greater evidence of student creativity and productivity, as well as higher level of intrinsic motivation when instruction is modified to cater to student interest (Amabile, 1983; Bruner, 1961; Sharan & Sharan, 1992). As classrooms become more diverse, teachers can no longer think in terms of *how* students might be motivated. Rather, classroom teachers must consider *what* motivates individual students and how learning can be designed appropriately to meet these varying interests (Schlechty, 1997).

#### *Addressing the student learning profile*

In addressing the student learning profile, attempts must be made to provide students with opportunities to learn in ways that are natural and efficient. As such, consideration should be given to student preference for working alone, with partners, or as a group. Opportunities should also be provided for students to choose work spaces that are conducive to various learning preferences – a quiet place or with music playing, in a dark room or one with bright lights, work spaces with tables instead of desks (Anderson, 2007). Key factors in the student learning profile include learning environment preferences, group orientation, cognitive styles, and intelligence preferences (Santangelo & Tomlinson, 2009).

#### *Differentiating content*

Tomlinson (2005a; 2005b) explains that content comprises not only *what* is taught, but *how* students access the material taught. She suggests that to a large extent, *what* is taught should remain relatively constant across learners, with teachers varying *how* students get access to specified content to address learners' needs. Differentiating content, therefore, requires teachers to either modify or adapt how they give students access to the material they want the students to learn. And all this must be done in response to students' readiness levels, interests, or learning profiles. Heacox (2002) recommends that one way teachers can differentiate the content or curriculum they teach is by providing students with the opportunity to choose a subtopic within a main topic or unit. As each student presents the information on their sub-topic, the whole class learns more about the topic in general. Anderson (2007) suggests that teachers may choose to differentiate content by using flexible grouping where students can work in pairs, small groups or alone, using books or tape or internet as a means of developing understanding and knowledge of the topic or concept. Whatever strategy is used to differentiate content, all students must be aware of their responsibility for meeting specified deadlines for class projects.

#### *Differentiating process*

Like content differentiation, process can also be differentiated in response to readiness, interest and the learning profile (Tomlinson, 2005a; 2005b). According to Anderson (2007, p. 50), differentiating the process within a lesson refers to "how

the learners come to understand and assimilate facts, concepts, or skills". When differentiating the process, a teacher selects activities that match the students' learning styles. These activities are referred to as 'sense-making' activities that allow students to increase their understanding of the topic being taught (Tomlinson, 2005a). It is important to note that the process is differentiated not only by how the teacher decides to teach (lecture for auditory learners; PowerPoint and video clips for visual learners, small group and whole group), but by the strategies the teachers encourage students to use to facilitate thorough exploration of the content taught. This can be done by way of higher-order thinking, open-ended thinking, discovery, reasoning and research (Bailey & Williams-Black, 2008).

#### *Differentiating product*

Product differentiation allows students to demonstrate what they have learned in a variety of ways. Tomlinson (2005a; 2005b) suggests that products are culminating assessments that allow students to demonstrate how much they understand and how well they can apply their knowledge and skills after a significant segment of instruction. Product differentiation should offer students multiple pathways to show mastery of common learning goals. Effective product differentiation assignments should offer students clear and appropriate criteria for success; focus on real-world relevance and application; promote creative and critical thinking; allow for varied modes of expression. Bailey and Williams-Black (2008) suggest that differentiating the product allows students to self-select a way to show they have learned the material that was taught. They argue that when students self-select their product, they normally choose a method that will provide them with success which most likely will coincide with their own learning profiles.

#### *Pedagogy/Andragogy nexus*

If differentiation is to be of value to the adult learner, then professors must make a conscious effort to address learner variance by paying attention to student readiness, interest, and learning profile. Similarly, those who teach children must also come to terms with a new student-centred pedagogy which deviates from traditional pedagogical norms of teacher-centred, subject-centred instruction. This new student-centred pedagogy also incorporates key elements of content, process, and product differentiation.

#### **Purpose of the study**

The purpose of this study was to determine the extent to which differentiated instruction had a positive impact on university student learning experiences during the period of one semester. Two research questions served to focus this investigation:

1. What are the strategies used for differentiating content, process and product in a curriculum studies course for second year undergraduate students?



## 2. What is the impact of differentiated instruction on student learning?

### Methodology and analysis

The study employed a mixed-method research design aimed at triangulating quantitative and qualitative data obtained from questionnaires, classroom observations, teacher and student interviews, and student reflections. The total population comprised four teachers/facilitators and 220 undergraduate students.

Questionnaires were used to obtain student information about differences in readiness, interests, and learning profiles. This information was important for arranging students into appropriate groups for classroom instruction and learning. Teacher and student interviews provided additional information about student willingness to experiment with differentiated instruction in their classrooms while on practicum. All interview sessions were audio-taped and information from the recording was reviewed several times to obtain verbatim accounts from participants. Techniques used to ensure credibility or validity of the interview process involved verbatim accounts of interviews, use of recording devices to capture data, and participants' review of the researcher's synthesis of interviews. All students who participated in the interview were exposed to the same questions to facilitate consistency in analysis.

During the semester, facilitators of the Curriculum Studies course conducted classroom observations which were also used as part of the data analysis exercise. Students were also asked to engage in reflection on their learning. These reflections were posted on Blackboard (the learning management system used at the teacher education institution), and later used for data analysis. Procedures for data analysis included sorting or organising the data; generating themes and patterns; checking the emerging theories, inferences and postulations against the data; and searching for alternative explanations (Marshall & Rossman, 2010). Frequency tables were developed for recording and tabulating demographic responses with the aid of the Statistical Package for the Social Sciences (SPSS) software. These demographic responses included questions related to gender, teaching experience, specialisation, and learning profile.

### Findings

Any attempt at differentiating instruction should start with the recognition of students' varying interests, readiness, and learning profiles. In this study, students completed a questionnaire that provided information on student interests as well as learning preferences. Responses from 220 participants revealed that 53% of respondents were visual learners; 28% described themselves as kinaesthetic learners; 11% of the participants were auditory learners; and 8% viewed themselves as verbal learners.

When asked about group preferences, the majority (49%) indicated preference for working in groups, while 27% preferred to work alone. Only 6% of the respondents indicated interest in working with the whole class.

Based on the information obtained from the questionnaire, the following strategies were developed for differentiating according to student readiness, interests, and learning profiles:

- gathering pre-assessment readiness data by allowing students to complete an activity relating to definitions of curriculum, and major philosophical foundations of curriculum. This information was important to determine what type of initial scaffolding might be necessary for student understanding of key foundation concepts in the course
- allowing choices in various activities (asking students to choose an assignment for completion at the next class)
- grouping students by common interests
- varying the instructional formats over the semester period e.g. sometimes offering the same experience for all students and sometimes purposely matching the students' preferences with particular activities
- varying student groupings e.g. using homogeneous and heterogeneous groups with students occasionally selecting their own groups
- using a combination of individual, small group and whole class instruction throughout the semester.

#### **Strategies used for differentiating content (topic)**

Different strategies were used to differentiate the content of the Curriculum Studies course taught during the semester. These include:

- using a variety of texts and resource materials for handling differences in reading interests
- grouping students according to interest levels and learning profiles
- giving different groups of students a different task related to the topic under discussion
- using the University's learning management system (discussion board) for students to review concepts and share additional information with peers
- allowing students to work alone or with peers
- using whole-class instructional approach to introduce new modules and concepts.

#### **Strategies used for differentiating process (activities)**

Strategies for differentiating process included:

- use of independent learning strategies
- use of flexible grouping, peer teaching, whole group teaching
- providing various levels of scaffolding for students
- use of graphic organisers to assist students in understanding concepts
- engaging students in writing journal reflections via the University's learning management system.



**Strategies used for differentiating product (assessments)**

The following strategies were used to differentiate product:

- providing students with a variety of assessment choices such as:
  - (a) either writing an article review or presenting a critique to the class
  - (b) making a presentation on a curriculum topic of interest either in groups or as individuals
  - (c) debating a curriculum issue
  - (d) choosing a final project or a written final examination.

**Experiences of four university teachers**

The following is an account of the experiences of four university teachers in differentiating instruction over the period of one semester:

After several years of teaching Curriculum Studies, the decision to differentiate instruction came as a breath of fresh air as it provided greater opportunities for all four university teachers to meet the varying needs of learners in their classes. They first collected pre-assessment data using a student interest inventory questionnaire to understand student readiness, interest, and learning profile. This information was important for planning meaningful activities as well as grouping students in a variety of ways based on interest, readiness, and learning profile. Strategies used for differentiating content included the use of a range of relevant textbooks for the course; assigning different tasks to students for presentation of a topic under discussion; and the use of the student learning management system (Blackboard) to encourage discussion and the sharing of ideas on the course. They found that whole group teaching worked particularly well for introducing a new topic for discussion.

Differentiating content allowed students to use a variety of real life examples, anecdotes and simulations to make the content more meaningful. Generally, there was a high level of interaction throughout the sessions. Some students admitted that they had been immersed in the traditional classroom setting and practices for so long, that it was initially challenging to freely explore different learning preferences. Even the habitually passive and introverted members of the class were able to share in the contributions and appreciate different points of view. All four university teachers observed that differentiated instruction provided opportunities for students to build relationships of sharing, trust and cooperation, which are vital in creating an effective learning community.

The use of flexible grouping and peer teaching also worked well for process differentiation. Except for one or two isolated cases, all groups worked harmoniously in their planning and delivery of oral presentations. Based on observation, it was quite clear that the visual learners preferred visual representations of their work as was evident in the nature of their presentations, which included charts, pictures, videos, and the use of other forms of visuals. The auditory learners used dramatic presentations, poems, and in one case, a song to convey information to their peers.

The use of small groups of students with similar characteristics proved to be an excellent instructional strategy. In most instances, students willingly remained after class to plan, discuss, and to assign roles and responsibilities for their future presentations. These sessions provided the opportunity for students to engage in cooperative learning activities. As the students met and planned, it was quite evident that their similarities far outweighed their differences.

On the question of product differentiation, one university teacher found that a few students were sceptical at first about the notion of differentiating assessments for the course. However, when presented with the prospect of showcasing their best efforts, students readily agreed to explore the option of either writing an article review or presenting a verbal critique the article before the class; choosing a final project over a final written examination; choosing drama, music or poetry to present various aspects of the course content. In the end, class sessions were generally lively and engaging with optimum student participation in what might have been otherwise three hours of drudgery.

While all four university teachers shared similar success stories, they identified time constraint as a major challenge when attempting to differentiate instruction at the tertiary level. They found that differentiating instruction is a very time consuming exercise which requires long hours of planning, organising, and scheduling individuals and groups in a large classroom setting. What proved to be particularly challenging was the idea of catering to individual needs and preferences especially those students who prefer to work alone. The examination culture of a written final examination also seemed to have some impact since several students questioned the fairness of the examination process when assessments were differentiated.

### **Impact of differentiated instruction on student learning**

Students in the Curriculum Studies class were asked whether the use of a differentiated instructional approach had stimulated their interest in Curriculum Studies. Findings of the study revealed that the majority of respondents (90%) reported that the differentiated instructional approach stimulated their interest, while 10% disagreed.

When asked whether they experienced higher levels of intellectual growth in the Curriculum Studies course as a result of exposure to differentiated instruction, the majority of respondents (91%) reported higher levels of intellectual growth, while only 9% disagreed.

During the semester, several students utilised the discussion board forum on Blackboard as a means of sharing ideas about their understanding of the Curriculum studies course. Other students preferred to communicate privately with the course teachers/facilitators through journal entries. The following Blackboard posts reveal students' perceptions of the use of differentiated instruction in the Curriculum Studies course:

**Post 1:** *"This is the first time I'm ACTUALLY enjoying a class. This is the first class in which I've felt free to be myself and although I'm very much an introvert, the atmosphere in the classroom lends to participation... There seems to be a fallacy between teaching and learning, especially as it pertains to adults. It is often the view that because we are adults we should be already wired to sit and pay attention and most of all understand everything we learn. Or because we should be intrinsically motivated, no effort should be put forth to cater to the differences in our learning capabilities. Nothing could be further from the truth! If our educators bypass the simple things that make us learn, it becomes more difficult for us to appreciate those little things when we ourselves become full-fledged educators."*

**Post 2:** *"I like that this class is so relaxed, it seems that it helps take our minds off of the many other assignment driven courses and relaxes the entire body. This is just how I feel because I started off with headache and ended feeling fine."*

**Post 3:** *"Personally, I found yesterday's class to be very interesting and exciting. I'm not sure if it was because of the content we covered or the way in which the class was engaged. Usually, I am afraid to speak in classes. However, I think I can be free to express my views in this class. I wish I was brave enough from the start of this course."*

**Post 4:** *"Well I am really enjoying this curriculum studies class more and more and I really am pleased and happy about the presentation we did last Thursday.... after everyone's hard work and dedication to the assignment, it all fell into place and it was a pleasure working with the people of my group...."*

**Post 5:** *"Differentiated instruction is instruction which caters for students who learn in different ways. In this approach, students are exposed to multiple ways to doing the same topics. This is a great idea and it ensures that no one is left out of the teaching and learning process."*

## **Conclusion**

This study explored the use of differentiated instruction as a means of enhancing student learning experiences at the higher education level. It examined various strategies for differentiating content, process, and product in response to student readiness, interests, and learning profiles. The study also highlighted the impact of differentiated instruction on student learning of Curriculum Studies during the period of one semester.

A close examination of the strategies used to differentiate instruction revealed the use of choices as an important component of differentiation. When students are given choices about materials, activities, and assessments, they feel a sense of empowerment which serves to heighten student interest in the

course. Jensen (1998) also points out that when choices are provided, there is a corresponding increase in intrinsic motivation and learner engagement.

While differentiated instruction is generally used more frequently at the primary and secondary levels, the study showed that adult learners at the tertiary level can also benefit from this teaching/learning philosophy. This may be because many of the andragogical principles of self-motivation and student readiness are in fact rooted in the differentiated instructional approach. According to Knowles, Holton, and Swanson (2005), adult learners have a readiness to learn and an orientation to learning that is problem-centred, task-centred, or life-centred. They argue that adults are most driven by internal pressure, motivation, and the desire for self-esteem and goal attainment.

Findings of the study showed that the majority of students in the Curriculum Studies course (91%) reported higher levels of intellectual growth as a result of exposure to differentiated instruction. This resonates with findings from Ernst and Ernst (2005), which show a favourable response by university students to differentiated instruction at the tertiary level. In this present study, 90% of students indicated that differentiated instruction stimulated their interest. This was further reinforced by student comments posted on the University's learning management system during the course of the semester. These comments all highlighted student willingness to work in groups, while exploring their individual learning preferences.

Implementing differentiated instruction is not necessarily easy; but it can work well if an incremental approach is adopted. Rather than attempt to differentiate content, process, and product all at the same time, it is recommended that university teachers focus on one aspect of differentiation before experimenting with others. This will make the exercise less time-consuming and more attractive to first-time users. A good place to start, therefore, is to first understand students' readiness, interests, and learning profiles.

## References

- Amabile, T. (1983). *The social psychology of creativity*. New York: Springer-Verlag.
- Anderson, K.M. (2007). Tips for teaching: Differentiating instruction to include all students. *Preventing School Failure*, 51(3), 49-53.
- Bailey, J.P., & Williams-Black, T.H. (2008). Differentiated instruction: Three teachers' perspectives. *College Reading Association Yearbook* (29), 133-151.
- Bruner, J. (1961). The act of discovery. *Harvard Educational Review*, 31, 21-32.
- Byrnes, J. (1996). *Cognitive development and learning in instructional contexts*. Boston: Allyn & Bacon.
- Ernst, H.R. & Ernst, T.L. (2005). The promise and pitfalls of differentiated instruction for undergraduate political science courses: Student and instructor impressions of an unconventional teaching strategy. *Journal of Political Science Education*, 1(1), 39-59.
- Gibson, V. & Hasbrouck, J. (2008). *Differentiated Instruction: Grouping for success*. McGraw- Hill Higher Education.

- Gregory, G. & Kuzmich, L. (2004). *Data driven differentiation in the standards-based classroom*. Corwin Press.
- Heacox, D. (2002). *Differentiating instruction in the regular classroom: How to reach and teach all learners, grades 3-12*. Minneapolis, MN: Free Spirit Publishing.
- Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, VA: Association for Supervision & Curriculum Development.
- Joseph, S. (2013). Differentiating instruction: Experiences of pre-service and in-service trained teachers. *Caribbean Curriculum*, 20, 31-51.
- Joseph, S., Thomas, M., Simonette, G. & Ramsook, L. (2013). The impact of differentiated instruction in a teacher education setting: Successes and challenges. *International Journal of Higher Education*, 2(3), 28-40.
- Karge, B.D., Phillips, K. M., Jessee, T. & McCabe, M. (2011). Effective strategies for engaging adult learners. *Journal of College Teaching & Learning*, 8(12), 53-56.
- Knowles, M.S., Holton, E.G. & Swanson, R.A. (2005). *The Adult Learner* (6<sup>th</sup> edition). New York: Elsevier.
- Marshall, C. & Rossman, G.B. (2010). *Designing qualitative research* (5<sup>th</sup> ed). Thousand Oaks, CA: Sage.
- Minter, R.L. (2011). The learning theory jungle. *Journal of College Teaching & Learning*, 8(6), 7-15.
- Ozuah, P.O. (2005). First, there was pedagogy and then came andragogy. *The Einstein Journal of Biology and Medicine*. 21, 83-87.
- Santangelo, T. & Tomlinson, C. (2009). The application of differentiated instruction in post-secondary environments: Benefits, challenges, and future directions. *International Journal of Teaching and Learning in Higher Education*, 20(3), 307-323.
- Schlechty, P. (1997). *Inventing better schools: An action plan for educational reform*. San Francisco: Jossey-Bass.
- Sharan, Y. & Sharan, S. (1992). *Expanding cooperative learning through group investigation*. New York: Teachers College Press.
- Sizer, T. (1985). *Horace's compromise: The dilemma of the American high school*. Boston: Houghton-Mifflin.
- Stradling, B. & Saunders, L. (1993). Differentiation in practice: Responding to the needs of all pupils. *Educational Research*, 35, 127-137.
- Tomlinson, C.A. (2001). *How to differentiate instruction in mixed-ability classrooms*. Alexandria, Virginia: ASCD.
- Tomlinson, C.A. (2005a). *How to differentiate instruction in mixed-ability classrooms* (2<sup>nd</sup> ed.) Upper Saddle River, NJ: Pearson Education, Inc.
- Tomlinson, C.A. (2005b). *The differentiated classroom: Responding to the needs of all learners*. Upper Saddle River, NJ: Pearson Education, Inc.
- Tomlinson, C.A. & Imbeau, M.B. (2010). *Leading and managing a differentiated classroom*. Alexandria, Virginia: ASCD.
- Tulbure, C. (2011). Differentiating instruction upon learning styles in higher education: A controversial issue. *Bulletin of the Transilvania University of Brasov*, 4(53), 79-84.
- Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.