

Temperament as a Determinant of Success in Formative Assessment in Engineering Education

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Abstract

Assessment is a vital component of the educational process and formative assessment is a way of ensuring that higher education achieves its desired goals. Different factors influence how students perform in assessments in general and formative assessment in particular, and temperament is one such factor. This article reports on a qualitative case study of four universities in four different countries that examined how the temperamental make up of students either empowers them to perform excellently in formative assessment or incapacitates their performance. These four universities were selected in Cameroon, South Africa, the United Kingdom and United States of America and three students were chosen from each institution, six of which were under graduate students and six postgraduate. Data was generated through qualitative interviews and document analyses, preceded by a temperament test. The study found that choleric who are natural leaders and hence do not struggle to express themselves, often perform excellently in formative assessment while sanguines, who, like choleric, are extroverts, perform relatively well. Phlegmatics and melancholics performed averagely and poorly, respectively in formative assessment because they are naturally prone to fear and dislike such activities because they prefer to keep to themselves. The article therefore posits that temperament is a determinant of success in formative assessment. It also proposes that lecturers need to understand temperaments in order to be able to fully administer formative assessment. Balanced assessment is required so some students are not privileged against others disadvantaged due to their temperamental makeup. Finally, the article suggests that since formative assessment is a process of generating data, it should be contextualised or approached at the level of the individual in order to ensure that trustworthy data is produced.

Key words: temperament, formative assessment, academic success, students

INTRODUCTION

Assessment is a vital part of the educational process without which progress cannot be made. Moving from one level of studies or one class to another, requires some form of

assessment to determine a student's understanding of the materials studied and whether or not the curriculum or syllabus' objectives have been achieved. Black and William (2009) define assessment as the process of gathering or generating information which will subsequently be used in decision making of some sort; whether to advance the student to another class or to determine whether or not to continue teaching a particular topic or area. To this effect, assessment is the life force of education in general and engineering education in particular, since for education to be effective the student has to progress. Andersen, Jensen, Lippert, Ostergaard, and Klausen (2010) add that assessment is vital in engineering education because it provides the means to gather evidence of students' knowledge and understanding. It therefore helps the teacher to pinpoint students' strengths and weaknesses; monitor and support their learning and progress; structure and teach lessons better; monitor their teaching through students' performance; determine the level of competence in the mastered skills; and decide whether students are ready for progression.

Alford and Hibbing (2007) identify two kinds of assessment in education: summative assessment and formative assessment. Summative assessment refers to the process of gathering information to determine if curricular objectives have been achieved by a particular student. This type of assessment takes place after the learning or particular syllabus has been completed, thereby providing feedback or a total judgement which sums up the whole teaching and learning process. Rubrics for such assessment are often formulated around a set of standards or objectives so students know exactly what is expected of them.

According to Heritage, Kim, Vendlinski, and Herman (2009, p. 24), formative assessment refers to "a systematic process to continuously gather evidence and provide feedback about learning while instruction is under way". Bennett (2011) adding to this, clarifies that formative assessment is never accidental, but is carefully planned by the teacher or lecturer. It can thus adopt diverse approaches but the approach must be carefully planned so as to generate the required data. In engineering education where the professional development of the student is more important than his or her final score at the end of the course, formative assessment becomes a great asset. Heritage (2007) adds that formative assessment refers to assessment that

is integrated into classroom learning or activities to gather information so as to track learning. This tracking according to Pinchok and Brandt (2009, p. 2) is “a process in which teachers use various tools and strategies to determine what students know, identify gaps in understanding, and plan future instruction to improve learning”. As such, it is often blended in the learning program and completed as the teacher or lecturer progresses with the syllabus. They conclude that in engineering education these will be instructional materials which are directly linked to current lessons and are geared towards developing particular skills in students. As such, the teacher shapes or determines the assessment to be completed based on specific areas of need or skill and subsequently uses the data to individualize instruction.

Dodge (2009) identifies four major types of formative assessment tasks which aim to achieve different objectives in the engineering classroom: summaries and reflections, lists, charts and graphic organizers, visual representations of information and collaborative activities. Summaries and reflections involve students stopping either during or at the end of the lesson to reflect on and summarize what has been said, thereby developing personal meaning and in turn communicating it to the class for feedback. Such communication can be oral or written depending on the kind of lesson and its objectives. Lists, charts and graphic organizers enable students to make sense of the lesson and express their understanding of it using these mediums to communicate their understanding. With visual representations of information, students use both words and pictures to express their understanding of a particular subject, promoting creativity, classroom diversity, and different ways of knowing and preferred learning styles. Collaborative activities require students to work in groups for oral or written assessment tasks, thereby sharing and comparing their ideas and improving their understanding of concepts.

On the other hand, Heritage (2007) lists three broad approaches to formative assessment: on-the-fly, planned for interaction and curriculum embedded. On-the-fly refers to the teacher changing their course of action in the classroom or during the lesson to correct certain misunderstandings or misconceptions about a particular issue before proceeding. This is achieved by setting a task relating to the issue where students respond and feedback is provided in the form of correction. In planned-for interaction, the teacher decides prior to the lesson how he or she will elucidate students’ understanding of a particular subject or topic during the course of instruction. The third strategy, curriculum-embedded, is the assessment strategy designed as part of the curriculum to generate feedback at specific times during the course of learning and teaching. According to Mkhwanazi, Joubert, Phatudi, and Fraser (2014), this is the most common strategy used in South African universities in general and engineering education in particular. Perry (2013) points out that in most universities, the formative assessment task takes the form of oral presentations, whether

personal or group, as well as class participation. Akom (2010) observes that tests, assignments, quizzes and other forms of formative assessment tasks require students to demonstrate their personal understandings of certain lessons and in engineering education certain skills which they have acquired which proves that learning is taking place. Tsai, Tsai, and Lin (2015) posit that formative assessment in universities favours observation of students’ verbal and non-verbal feedback during and after lectures, and assignments as a review of class discussions. Zheng and Li (2015) concur and add that critical reflections and discussion by students are an important part of formative assessment in universities but personal and group presentations are at the heart of such assessment especially in teacher education institutions. Chen, May, Klenowski, and Kettle (2014) note that question-and-answer sessions, both planned and unplanned; debates and conferences between teachers and students or among students (class activities in which students present their findings on a particular concept or express their thoughts about a subject) and student feedback generated through the periodic answering of questions about instruction and performance are all major components of formative assessment.

It should be noted, however, that how students express what they know is a function of their temperament, behavioural patterns or traits. Since formative assessment in engineering education often involves expressing personal ideas either through personal or group presentations or responding to general questions posed by the teacher, it follows that a student’s behavioural patterns might impact their performance in class. A review of the literature on temperaments sheds light on this issue.

TEMPERAMENTS

The word temperament originates from the Latin word “*Temperamentum*”, meaning appropriate or right mixing. Alford and Hibbing (2007) point out that temperament refers to how an individual reacts to certain things or new challenges, while Keirse (1998) defines it as a person’s behavioural characteristics or emotional propensities. In most cases, this starts manifesting itself several months after birth and as the child grows his or her temperament starts expressing itself more forcefully. Temperament defines an individual’s personality through personal experiences and biological developments. Saucier and Simonds (2006) concur that temperament refers to an individual’s emotional nature, stimulation, strengths and weaknesses, and mood fluctuations, amongst others. They add that, while in most cases, temperament is hereditary, as it passes from one person to another, it might be modified or combined with another kind of temperament to form a different type.

Eory, Gonda, Lang, Torzsa, Kalman Kalabay, and Rihmer (2014) argue that temperament is a blend of inborn characteristics which subconsciously affects our behavioural

patterns. These characteristics which are inherent at birth are passed from one generation to another or are hereditary. An individual can therefore have a combination of temperaments based on his or her family background. Different scholars (DeGeorge, Walsh, Barrantes-Vidal, & Kwapil 2014; Kwapil, Walsh, Brown, & Barrantes-Vidal, 2014) have propounded that six people primarily influence the genetic or temperamental make-up of an individual. These are the four grandparents (from the mother and father's family) and the parents of such an individual. Lolich, Vázquez, Zapata, Akiskal, and Akiskal (2015) add that most people inherit more if not most of their genetic make-up from their grandparents. While not visible, the temperamental characteristics of an individual are therefore as present as the colour of their eyes or hair.

Martin and Bobgan (1992) trace the origins of temperament theory to ancient Greece and the ideas of Greek philosopher Hippocrates (460-377 B.C.E.). Hippocrates developed this theory as a result of his belief in the importance of observing behaviour and using it to forecast future behaviour. The temperament theory was further advanced by Theophrastus, Aristotle's student who developed character sketches or attributes which added more stability and insight to the theory (DeLisi, & Vaughn, 2014). The temperament theory was made up of four basic temperaments, which later became known as Sanguine, Choleric, Melancholy, and Phlegmatic. Researchers subsequently divided these into different sub-groups. While some have identified 12 sub-groups (LaHaye, 2012), others noted nine (Thomas & Chess, 2007) or maintained the four main categories (Okal, Beverlyne, & Deborah, 2012). DeLisi and Vaughn (2014) note that the theory remained dormant until it was reinvigorated by Alexander Thomas and Stella Chess (Chess & Thomas, 1999; Thomas & Chess, 1986, 2007). Thomas and Chess (2007) studied people's temperaments as a fundamental way of understanding human behaviour.

Okal, Beverlyne, and Deborah (2012) state that temperament theory is anchored on emotional and motor differences which are evident in diverse situations and over time. They add that an individual can do very little to change his or her temperament since it is hereditary. However, through rigorous training and diverse influences, s/he can regulate certain aspects of his/her temperament. Psychologists have used temperaments in a wide variety of fields including human behaviour, general medicine, pathology, therapy, criminology, and justice, amongst others (DeLisi, & Vaughn, 2014). Temperament theory or the four temperaments as most researchers refer to it is used by psychologists and other practitioners to understand human nature or the individual characteristics that make people behave the way they do, thereby improving the human condition. Temperaments are thus the sum total of an individual's emotional, social, mental and psychological characteristics that are inborn but are shaped and nurtured to form personality (Thomas & Chess, 2007).

Okal, Beverlyne, and Deborah (2012) identify four main

categories of temperaments. While the Greeks referred to these as hot, cold, dry, and wet, in contemporary times, they are known as Choleric, Sanguine, Phlegmatic, and Melancholy. Barrens (2006) argues that choleric people are active, optimistic, egocentric and extroverted. They are also often impulsive, spontaneous, and restless, and have a strong reserve of energy, aggression, and passion. Choleric often try to transfer or develop their passion, energy and aggression in others and do not react well when the response is not positive. Choleric are also goal oriented and often focus all their attention on completing the task efficiently. As Vorkapić (2011) puts it, they want things done now rather than later. Many are ambitious, strong-willed leaders that are good at planning to achieve practical or tangible solutions. Choleric are passionate front-runners, people of action that are straightforward; don't show emotions easily except anger; are not prone to nervousness; like to express themselves; love debate; and can be defensive and prideful, self-confident, self-reliant, and motivated to accomplish goals. They seek acknowledgment, want to be right, and are competitive. Barrens (2006) concludes that the best way of getting to them is by presenting them with challenges which recognize their potential and enhance their capacity. In a classroom, choleric tend to be active and participative. They express their ideas, whether right or wrong. Their aggressive nature gives them an edge over others since they are dominant in everything including class activities, which partly constitute formative assessment. Van Pelt (2008) also argues that choleric are cold, unsympathetic and insensitive and according to Nhlanhla and Thubelihle (2014), they dominate the classroom, leaving little room for others. Furthermore, since they are good debaters, they will shine at formative assessment tasks that involve group or personal presentations, and debates. Ciroka's (2014) study on Chief Executive Officers (CEOs) and the impact of their temperaments or what he called personality on organisational performance found that most CEOs who were choleric built successful organisations based on their passion, energy and aggressiveness. They effectively led their companies or organisations to glorious heights.

According to Steiner (2008), the sanguine temperament type refers to people who are sociable, lively, light-hearted, verbose, and hedonistic. They are often warm-hearted and enthusiastic. Sanguine people are easy going, make friends easily, have fresh and lofty ideas, and are creative and artistic. Eysenck (1965, p. 56) postulates that "the sanguine person is carefree and full of hope, attributes great importance to whatever he may be dealing with at the moment, but may have forgotten all about it the next minute. Desire to keep promises but fail to do so because they never considered beforehand whether they can or not. They are easily fatigued and bored by work but is constantly engaged in mere games – these carry with them constant change, and persistence is not their strongest characteristic". Childs (2009) adds that many people of the sanguine temperament type are flighty and unstable. They are

unable to stick to a particular project and follow it through to the end. They can be late and forgetful. Sanguines can therefore be effectively reached through their admiration of specific people, love for a particular subject or creativity. They are quick to react, although most of their reactions are short lived. Sanguines are relationship-oriented, don't hold grudges, like to party, enjoy being around people and in groups, are popular, followers, hardly ever embarrassed, enjoy variety, forgive easily, enjoy talking in front of people, are enthusiastic, artistic, spontaneous, and process oriented, and often need help to persevere. Ciroka (2014) also found that CEOs with sanguine temperaments perform relatively better than those that are phlegmatic or melancholic. Their lively nature gives them an important edge over others and makes them easy to work with. Nhlanhla, and Thubelihle (2014) posit that a "sanguine student's compulsiveness which compels him or her to dominate conversations makes him or her a poor listener. He or she enjoys listening to his/her own voice and therefore has a difficult time listening to people's ideas in class. Sanguines are more buoyant and participative because they are not embarrassed to stand up in front of the class". They thus perform well in formative assessment tasks, especially class presentations.

According to Steiner (2008), people with phlegmatic temperaments are reserved, thoughtful, logical, peaceful, enduring, compassionate, and lenient. Phlegmatics like to work in quiet, peaceful environments where they can be alone and be content with themselves. Phlegmatics are very consistent which makes them steadfast and more faithful to their friends and in their relationships. Childs (2009) concurs with Steiner (2008) and notes that people whose temperaments are phlegmatic often appear to be ponderous or clumsy. They are slow to speak or react, do not react in an extreme manner, are tactical, peaceful, and very sensitive to others and their needs, very calm even when under pressure, dependable, have a strong dry wit, enjoy working in structures but require a lot of motivation, and are peacemakers who hate conflict. They are also reserved, stay at home most of the time, polite, enjoy routine, easily hurt though not easily provoked, well respected and behaved, and have a passion for pleasing others rather than self. Ciroka (2014) argued that phlegmatic CEOs ensure that the company remains intact and often avoid taking risks or making serious changes. Phlegmatics are therefore good at maintaining the status quo and solving problems through their analytical skills but seldom voice their opinions. Nhlanhla and Thubelihle (2014) postulate that in the classroom a phlegmatic student would move mountains to avoid confrontation, making group work and other collaborative tasks challenging. Rina (2014) adds that most phlegmatics want to be in agreement or conformity with others. Whether wrong or right, expressing views or ideas in class which do not agree with what others are saying is a herculean task. Responding to questions in class is also very difficult making formative assessment tasks of such a nature a challenge. Rogoff (2014) notes that phlegmatics can

be warmly attentive or sluggishly lazy. According to Junqian (2014), they can be awakened by seeing or experiencing others' interest or liking of a particular subject.

According to Steiner (2008), the melancholic temperament type refers to people who are or appear to be serious, cautious, introverted and suspicious. Melancholics often preoccupy themselves with tragedies and/or cruelties around the world, forgetting their immediate responsibilities. They are also prone to depression and moodiness. Lara, Ottoni, Bisol, and Carvalho (2015) add that people who have this temperament prefer to do things themselves primarily because of their high standards and also because they often lack social skills. Junqian (2014) concurs and argues that melancholics are slow to react to situations although their reactions become more intense over time. They are thoughtful, poetic, spiritual, withdrawn, excessively careful, perfectionists, great thinkers, exceedingly critical, hardly ever prioritize situations and when things don't work out well they sink into self-pity and possibly depression. They can be a valetudinarian who is slow, indecisive and easily hurt. Melancholics are also goal oriented, because they are often detached from their surroundings (Rogoff, 2014). Rogoff (2014) adds that they often exclude others because they like being alone and because they hold grudges easily as a result of injustice which they dislike passionately. They can also be highly motivated by problems or challenges and sacrifice themselves for others since their decisions are often based on principles. Nhlanhla and Thubelihle (2014) argue that melancholics possess exceptional analytical minds or thinking abilities which are groomed by a very inquisitive mind. They pay serious attention to detail and tolerate the views of others. In the classroom a melancholic will pay close attention to every detail of the assessment task but because of their perfectionist and sometimes sluggish nature they often find it difficult to complete a task on time. Rina (2014) concludes that melancholics can be motivated by invoking their sympathy for others or the sufferings of the world.

RESEARCH DESIGN AND METHODOLOGY

Opie (2004) defines research methodology as the methods or approaches employed to generate data and findings to answer a research question. He adds that a study's trustworthiness and usefulness rests on the design and methodology used. This article reports on a qualitative case study of four different countries: Cameroon, South Africa, the United States of America and United Kingdom. A case study was conducted of students from a university in each of these countries. Neumann (2006, 40), define a case study as "an in-depth study of one particular case in which the case may be a person, a school, a group of people, an organization, a community, an event, a movement, or geographical unit". Rule and John (2011) add that a case study is an orderly, comprehensive investigation of a particular example in its context in order to generate data. Cohen, Manion, and Morrison (2011) note that a case study is

often used in qualitative research that aims to investigate every detail about an issue or a case. It thus brings out the quality of what is being researched (Nieuwenhuis, 2007).

In this study, the qualitative approach was employed to obtain rich, in-depth data on temperament as a determinant of success in formative assessment in engineering education. Cohen, Manion, and Morrison (2011) note that qualitative research can be used to recognize and refine fields, topics, foci and questions; present data in its own right for research synthesis; locate and present the outcomes that are of interest in the research; enhance and harmonize data from quantitative research; fill the gaps in quantitative research and data; provide another viewpoint on topics; contribute to decision-making or conclusions on research; and suggest ways of turning results into practice.

Semi-structured interviews and document analyses were used to generate data. Before the interviews, all the participants took a temperament test. Three students from each university were then interviewed to understand how their temperament affected them in formative assessment tasks. Of the total of 12 students, four were choleric, two were sanguine, and three phlegmatic and melancholic, respectively. To corroborate this, their progress reports, test scripts and other documents that demonstrated their performance in formative assessment were analysed. Six of the 12 students that participated in the study were under graduate students and the remaining six were studying at postgraduate level. These students were hand-picked by the researcher based on prior encounters with them and his personal judgement, with the understanding that they possessed in-depth knowledge or experience of the phenomenon under investigation. The participants were informed of their rights and completed informed consent forms. Prior to data analysis, code names were assigned to the participants using the NETO phonetic alphabet; Alpha, Bravo, Charlie, Delta, Echo, Foxtrot, Golf, Kilo, Lima, Mike, Tango and Yankee to ensure anonymity and comply with ethical requirements. The fact that four different countries and universities were selected enhanced the study's level of trustworthiness, and transferability.

FINDINGS AND DISCUSSION

The data analysis revealed trends in the students' performance. Those with similar temperaments, whether in America or Cameroon, performed in a similar manner. The data was thus analysed using the four basic temperaments: choleric, sanguine, phlegmatic and melancholic as themes. The themes are discussed and complemented by using direct quotations from the participants and the documents analysed.

Choleric students

As noted earlier, choleric students are active, optimistic, egocentric and extroverted. They have no problem expressing their mind or

dominating others. They always want to be seen and to lead in whatever is happening in the classroom. Their very nature gives them an edge over students with different temperaments when it comes to formative assessment tasks like individual or group presentations, debates or question-and-answer sessions. Bravo who is choleric performed extremely well in formative assessment as opposed to summative assessment where he was just above average. From the documents analysed it was clear that he was easily able to move from one level or year to another in the university because of his grades in formative assessment. Formative assessment usually requires students to express their thoughts regardless of whether they think it's right or wrong. Bravo believes that he succeeds in formative assessment and school in general because he is choleric. He stated that:

In all my modules, formative assessment tasks constitute about 30 per cent and in some cases 40 per cent of the total mark required to pass the module. And since class participations and presentations make up more than 70 per cent of the 30 per cent allocated for formative assessment I always perform excellently in them. Because I am choleric, I don't fear anything. I can speak and argue in front of thousands but most of the students in my class are scared so I often answer all the questions whether right or wrong and the teacher always rewards me for participation.

Rogoff (2014) argues that choleric students are individuals who are active, forthright, and eager to express themselves and love debate. They are tailored to express themselves and are naturally good at tasks which require discussion and opinions. Thus, they easily succeed at tasks as opposed to others who could spend hours on a task, but are not able to express what they know so that it can be assessed. Their success is thus primarily determined primarily by their temperament.

Yankee also believed that her temperament influenced her success in formative assessment activities. One of the best in her class (students studying for a particular degree in the same year), she pointed out that:

My temperament agrees perfectly with my profession or what I am studying which is teaching. As a choleric I am not afraid of anything or anyone, neither am I embarrassed to share my opinions. Since most of our formative assessment tasks require us to practice being teachers or practice communicating what we know (which is what I do without stress) to others, I excel in it. When we are being assessed, we are assessed primarily on how we transmit the content and not the content itself. This is

the reason I am the best student in my program at our level.

Fomunyam (2014a) points out that for student teachers to successfully complete their studies and develop professionally, they must be able to express themselves appropriately in transmitting what they have learnt to others, whether in class or not. In engineering education, this would mean translating theory to practice and exhibiting it for people to see. According to Lara, Ottoni, Bisol, and Carvalho (2015) choleric students are good orators who have no problem expressing their views. They therefore find it easy to navigate their way through teaching practice and since formative assessment makes up about fifty per cent of the total score in such programs, they succeed easily.

Heritage (2007) argues that formative assessment primarily demands the expression of personal understandings or opinions about certain topics. This might take the form of oral or written presentations. Since this task aims to generate data that is used to improve lesson delivery or to emphasize certain aspects of a lesson, personal understanding is vital as opposed to a regurgitation of the facts or ideas presented by the teacher. This naturally favours a choleric student who enjoys expressing their personal ideas or opinions. Another participant, Golf, stated that:

All our formative assessment tasks be it assignments, test, quiz, or essay writing demands that we reflect critically and express personal opinions about the topic under discussion. Most often the answers required are short but even when it is an essay, most times focus is on your understanding of the topic and not the expression. Though I might have some challenges in succinctly expressing what I am thinking in writing, I often pass in all my formative assessment tasks because I always demonstrate personal understanding which is what is required. I believe if I was melancholic or phlegmatic [I] would probably never finish this degree.

Foxtrot, another choleric participant said that:

As a choleric if a question is asked in class, I am always the first person to answer since my primary school days because I am a born leader who wants to dominate. I respond in a very careful and diplomatic way if I don't know the answer. At times I answer just to challenge others in my class and silence them. In the past and even now this has earned me a lot of marks because my lecturers encourage participation in class and at times I challenge some of their ideas causing them to give me the full marks for

participation. Also I keep my essay short and straight to the point which make them enjoy marking it.

Fomunyam (2014b) postulates that education in the contemporary world requires the use of constructivism where students and teachers construct knowledge together as opposed to the teacher dishing everything out to the student. Students who can express themselves freely stand a better chance of succeeding, especially in formative assessment which tests personal understanding of the lessons. The very nature of education in the contemporary world and the nature of formative assessment tasks in particular favour choleric students as opposed to other kinds of people. Their temperament becomes a primary determinant of their success.

Sanguine students

As noted earlier, sanguines are sociable, lively, light-hearted, verbose, and hedonistic. The data analysis showed that sanguine students obtained better scores in formative assessment than phlegmatic and melancholic students but came second to choleric participants. This is primarily because although like choleric students, sanguines are extroverted in nature, they tend not to follow through on tasks (Steiner, 2008). They are carefree but quick to react to any situation. A sanguine student is therefore quick to react in a classroom to questions or a quiz, but comes second to the choleric student in most cases because they can't sustain their interest or follow through intelligently with a task. Lima, one of the sanguine participants pointed out that:

My temperament has really been my backbone throughout my educational journey. Because I am sanguine I enjoy participating in class/group discussions and I am not shy to express my views and opinions even if they are different to those of others. I am also good at summarising what I have learnt and communicating it. This makes me a star player as far as formative assessment is concerned.

Dodge (2009) identifies summaries and reflections, lists, charts and graphic organizers, visual representations of information and collaborative activities as the four major types of formative assessment. A sanguine is able to perform such tasks with relative ease, making them likely to succeed in formative assessment. Nhlanhla and Thubelihle (2014) argue that a sanguine student's compulsiveness which compels him or her to dominate conversations makes him or her a poor listener. Thus, in the classroom, sanguines would be more buoyant and participative and would do well in formative assessment.

Alpha, another sanguine participant said that:

I struggle when it comes to writing an essay

because I might start writing well but before I get to the end, I no longer make sense. But when it comes to oral presentations or answering questions in class or any other task which (most of which is what formative assessment is made up of) doesn't require prolong attention I naturally excel in them. Almost all my teachers like me and enjoy hearing my views which most often is quite different from theirs or the rest of the class. Formative assessment is my thing, I wish there was no summative assessment.

Perry (2013) argues that in most universities formative assessment tasks take the form of oral personal or group presentations as well as class participation and short write ups. The sanguine who is naturally gifted in these areas finds such tasks easy. Thus, temperament is a determinant of success in formative assessment and an individual's temperament or behavioural characteristics play a significant role in his or her performance.

Phlegmatic students

As outlined earlier, Steiner (2008) describes the phlegmatic as a temperament type that is reserved, thoughtful, logical, peaceful, enduring, compassionate, and lenient. Phlegmatics enjoy working alone in quiet, peaceful environments. As such, they are not fans of group discussions or presentations or expressing themselves in front of other people. A phlegmatic student therefore finds it more challenging to participate in class or take part in group discussions or question-and-answer sessions even if they know the answer. The data revealed that phlegmatic students' performance was average in all formative assessment task. Their very nature as phlegmatics puts them at a disadvantage in the classroom during formative assessment sessions. A phlegmatic participant, Charlie pointed out that:

I find it very difficult to speak in class most of the time even when I know the answer. I just feel like everybody would criticise and embarrass me. Even when we have presentations to do as a group, I find it challenging to express my ideas to them especially when they start debating or arguing. I just write down what I think and give it to the leader of the group to add to what the others have to say.

Echo corroborated Charlie's narrative:

There was a time when I was supposed to do a personal presentation in front of the class. I was well prepared but I just froze in front of the class. I couldn't speak and ended up embarrassing myself. I felt like I should die.

I ended up failing it [the task] because I mixed up everything as a result of fear and anxiety.

LaHaye (2012) notes that although phlegmatics are tactical and thoughtful or diplomatic, they are slow to react and even when they do react, their reaction is short-lived. Phlegmatics therefore face many challenges in formative assessment because they are slow to respond to questions posed in class, enabling choleric and sanguines to answer. When faced with a situation like that in which Charlie found herself they are slow to react and when they do it is short-lived, bringing them back to the same state of anxiety, confusion and fear. Their temperamental make-up incapacitates them for several formative assessment tasks, thereby causing failure or average performance in such tasks.

A phlegmatic participant, Kilo, expressed this point more strongly:

Because of my nature I could not be involved in most formative educational activities. I like to keep quiet and keep to myself all the time. I do not like to answer questions in class of which I know the answers. As a matter of fact I may even decide to ignore anyone who tries to chat with me. On several occasions that I was listed among those to give a debate in my secondary school, I would run away when it is time. This heavily affected my performance in class since I hardly did my oral presentations or take part in any other assessment activity which required me expressing myself. I have only been able to succeed up till now because I do well in summative assessment task which covers up for my poor performance in formative assessment.

Fomunyan (2016) observes that the way students behave or react in class has a significant impact on their performance at the end of the course. Phlegmatic students who are unable to participate fully in class or work with the teacher in the knowledge creation process perform poorly, especially in formative assessment tasks. Rina (2014) adds that phlegmatics find it challenging to disagree with others and always want to conform. Thus, when discussions arise in the classroom which call for different opinions and viewpoints based on experience, phlegmatics are incapacitated, making temperament a determinant of success in formative assessment in engineering education.

Melancholic students

Lara, Ottoni, Bisol, and Carvalho (2015) note that melancholics are cautious, introverted and suspicious. They are often

preoccupied with tragedies and/or cruelty around the world, forgetting their immediate responsibilities. They are also prone to depression and moodiness. Melancholics prefer to do things themselves or be alone primarily because of their high standards and also because they often lack social skills. From the data, it was clear that melancholic students' performance in formative assessments tasks was average or below the norm. The characteristics and traits of melancholic people incapacitate them when it comes to discussions, debates, question-and-answer sessions, and presentations, amongst other things. They like being on their own, whether in class or outside the classroom. Delta's story exemplifies this:

I always panic when I am asked to do anything in front of the class, because I am very sensitive and I am also easily intimidated, as a result I always keep quiet when my opinion is challenged. Since I was a young growing girl, I used to be very shy, and found it difficult to ask questions in a class or afraid to be asked questions for fear of being laughed at or making a mistake due to my perfectionist tendencies. As a result of this I hate formative assessment tasks because they always make me uncomfortable.

Junqian (2014) argues that melancholics are slow to react to situations although their reaction becomes more intense over a long period of time. As such their natural reaction, which is fear, also becomes more intense over time, making it difficult for them to cope in challenging situations. In the classroom when a student who is melancholic begins to panic or is embarrassed the feeling becomes progressively stronger, making it difficult for them to recover and do what they are supposed to do. Melancholics are prone to avoid people or confrontations and encounters that require them to engage with other students.

Another melancholic participant, Tango added flesh to Delta's account:

I once answered a question in class and my friends laughed at me. Since then I felt very uncomfortable to speak in class and these has really affected my performance in class. Even my teachers are complaining but I can't help it. I just don't know how to speak in front [of] people without making mistakes or panicking whether I know what I am talking about or not.

Mike, another melancholic participant said that:

I don't even know why we have to be assessed formatively. I hate it with passion because I always fail. Naturally I am a shy person, so talking confidently in front of

people is a challenge. Also because answering questions in class and making presentations requires courage, which I lack. I always fail in most formative assessment tasks.

Rogoff (2014) states that melancholics like being alone and are often detached from things happening around them. They also hold grudges easily as a result of injustice which they passionately dislike. Their tendency to avoid people disqualifies them from participation in the classroom. Melancholics are also often detached from events around them, making them insensitive to what is happening in the classroom.

CONCLUSION

Temperament is a key determinant of success in formative assessment because a student's make-up determines how he or she behaves in the classroom. The student's temperament therefore influences how he or she reacts to questions posed by the teacher or in class discussions. A student's temperamental make-up primarily influences how he or she performs in the classroom and their behavioural characteristics lead them to behave in a particular way which either favours or incapacitates them.

It is therefore vital to achieve balanced assessment in the classroom in order to ensure that some students do not perform below par in the entire program due to their temperament. It is crucial that teachers understand the temperamental make-up of the class so as to be sensitive about who to ask to do what and how to encourage and respond to their students. Since formative assessment is a process of gathering data to determine understanding and restructure teaching or the facilitation of learning to achieve the desired results, it should be contextualised or individualised to ensure that the right data is generated from students. Temperaments play a vital role in the teaching and learning process in general and formative assessment in particular. It is both the teacher's and the student's responsibility to understand their temperaments in order to determine how best to deal with them and how best to assist them to teach or learn what they need to teach or learn.

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