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The UWI is proud of the work of its researchers and of the high esteem in which the institution is held as a result. It comes as no surprise, therefore, that the high quality output of the university continues to attract extraordinary scholarship which allows us to boast the best intellectual infrastructure anywhere in the region.

Research for Development 2011 creates opportunities for our researchers to collaborate with faculty internally, regionally and internationally, in order to encourage information exchange. As we disseminate information about our research through multiple media, researchers worldwide seize the opportunity to build sustainable partnerships with us and become involved in joint innovative research projects. This booklet is one of the means we have chosen to share the research with everyone, including the ‘man in the street’. The wide readership this booklet series has enjoyed over the last few years is an indication of the interest and respect our research has generated.

As each reader turns the pages of this publication s/he ought to observe, very quickly, the breadth of intellectual endeavour evident in the number, quality and relevance of the research being pursued. Our researchers are answering the call to engage in multidisciplinary collaborations and partnerships with industry to ensure that our research has purpose and meaning beyond the walls of the university.

The UWI remains committed to sharing its expertise and guidance with those who stand to benefit; to increasing public knowledge and enriching the intellectual community. Our stakeholders can rest assured that the UWI will never falter in its efforts to promote rigorous research that is relevant to the region and to the wider society.
F A C U L T Y  O F

HUMANITIES & EDUCATION

Dr. Susan Anderson  Dr. Beverley Bryan  Dr. Rose Davies

Dr. Halden Morris  Dr. Kathleen Monteith

Dr. Carol Hordatt Gentles  Dr. Mairette Newman  Dr. Marceline Collins-Figueroa  Mrs. Vileicha Davis-Morrison  Dr. Lorna Down  Prof. Verene Shepherd
The sphere of disabilities and the rights of the disabled are areas which do not readily attract the researcher, in much the same way as the disabled as a group are often neglected in the march towards development. It is therefore interesting that the research undertaken by Dr Susan Anderson addresses the plight of this category of Jamaicans within the context of their potential contribution to social and economic development; and perhaps more importantly, in their own right to the achievement of personal excellence and a satisfying life.

Lack of Equal Opportunity

The study critically examines some of the underlying factors that have served to put the disabled at a disadvantage. It is not surprising that this inequity has its root in the very educational system which ought really to be the great leveller of opportunities. At both the primary and high school levels, the number of persons with disabilities entering educational institutions is greatly under-served. This has clear repercussions for registration and admission of such students at the tertiary educational level.

Perhaps not surprisingly, negative attitudes towards persons with disabilities seem to underlie many of the problems faced by such persons. Yet, according to the researcher, those who gain access to tertiary education, though limited in number, clearly demonstrate that they are the equals of their non-disabled counterparts in academic competence and are no less successful in significantly impacting society at large. No doubt a most revolutionary discovery and statement of the possibilities open to such students when educational barriers, opportunities and negative experiences are removed, allowing them access to a level playing-field!
Nine Students with Disabilities Chosen
The research sample involved students with disabilities at the secondary and tertiary levels of the educational system, although the focus was on the latter. Getting to know the particular circumstances of the nine students in the original sample was important. Biographical information - birthplace, when they acquired their disabilities and whether there were any noticeable changes in these disabilities, parents' occupations if still alive, [whether parents were still alive and if so their occupations] and their reaction to the disabilities; siblings, whether there were other family members with disabilities - were therefore all significant for further analysis.

Parental responses were interesting, ranging from “shock, then denial/disbelief, anger, sadness and then adjustment to the reality” and even a “positive stance over time”.

How Does the Community React?
Community responses, like those within the home, were very telling: “Well, I know... I remember explicitly that people within the community gave me a lot of “stick” (teasing) because I could not walk on the street. I remember a boy putting a piece of wire across the road for me to bump into. I saw it and stepped over it and everybody began to laugh and say ‘How ‘im say him can’t see’ ”?

No less intriguing were social experiences: “What really galls me is the fact that these people would even invite me to a function with no thought of how I was going to enter the building ... take my example of going to accept a university award...and my being hoisted upon the platform...how embarrassing! Mmm” ... disgust.

Cultural pressures and experiences born out of ignorance made the disabled feel isolated; coloured their selection of partners and influenced relationships in different ways. “Yes, people think that blindness is “catching” and they used to say “see the blin’ one deh!” “Here comes the blin’ one!” pointing or referring to him. Intimacy is very important to disabled people and this might seem very revealing to the “ordinary person”.

Disabled are Their Own Advocates
It is sometimes their own agitation and advocacy which get matters affecting them addressed.
not the support of the non-disabled: “All this talk about awareness and such things, yet, you don’t hear people demonstrating about the open manholes and trenches that we face on a daily basis.”

With respect to academic/educational needs, the researcher, Dr Anderson, found that the need for academic achievement was as compelling for disabled individuals as for the non-disabled: “I feel the same need for achievement [as non-disabled], based on the expectations of others (teachers and siblings). They were happy when I was accepted to go to high school...I felt good to be attending high school although I knew I would face challenges.” It was therefore not surprising that some “felt the need to try harder. You see, I knew it was only a matter of time before I would lose it even though I tried hard to hide my ...ahm blindness.”

At the high school level, inclusion/mainstreaming served to make each individual more aware of others with differences and encouraged working together - though restricted to academic interaction. At the university level, the attitudes of both staff and students were more positive on the whole, though not without instances of insensitivity. The experiences of students with disabilities were cases in point to the extent that certain Orientation practices were banned, following the negative impact on one particular individual. Dr Anderson’s research also showed that social interaction tended to be restricted to academic involvement although there was obvious respect shown for the achievement of disabled students. “It was only when they (students and teachers) saw that I could manage my work (academic) that they started to show me respect... I was encouraged by their behaviour to work even harder”.

Support Services Inadequate
With respect to the physical dimension, Dr Anderson focused on special support services, which were sadly lacking in developing countries such as Jamaica, thus placing students with disabilities at a tremendous disadvantage. This was so even in the matter of counselling: “I was really amazed that the counselling service was not equipped to handle my case,” said a student who claimed he was mentally
and physically traumatised by “ragging” (which greatly affected his academic performance). Disabled students had to contend with challenging library facilities; only one student had anything positive to say about these.

Policy Issues
Dr Anderson examined the categories of the policy dimension at both levels of the educational system – high school and university. At the secondary level, a lack of awareness among some administrators permitted inequitable processes to be embodied in the educational programmes, and the learning environment militated against inclusion. At the university level, lack of awareness and equity was evidenced in tutorial services, decision-making issues, funding, financial aid and support. Barriers to an inclusive education were real and may even have been unwittingly supported by the disabled themselves. Dr Anderson recognised the need for inclusion/integration to be fostered, starting with early childhood, through primary as well as secondary and tertiary levels of education.

Implications and Recommendations
It was clear that the Jamaican educational system had failed in its efforts to truly educate all who could benefit from such education. Further, it was implied throughout the study that the psycho-social needs faced by students at the secondary and tertiary levels required close attention and solutions. There was an amazing revelation regarding the needs of persons with disabilities, namely, that those things that ‘ordinary people’ have taken for granted have been handicapping the functioning of persons with disabilities. The level of indifference confronting the disabled also transcends social class barriers, a fact that is more pronounced in developing countries such as Jamaica. The study also showed that inclusive settings are important for academic training. Though mainstreaming has its own challenges, students who are mainstreamed are capable of holding their own and redirecting attention away from their differences. Also, the built environment can be disabling for certain kinds of disability (visual and orthopaedic) as their best interests are not taken into consideration at the design stages of facility construction. Finally, the factors that shape national policy interact in complex ways and not necessarily to the benefit of students with disabilities.

The recommendations emanating from these implications are directed, not only to educators, parents and administrators, but also to persons with disabilities, particularly in the Kingston Metropolitan Area (KMA) where the research was conducted.

The study presents a robust attempt to place the problems of disabled students at the forefront of policy considerations, in the attempt to ensure a level playing field for all (disabled and non-disabled alike), in their pursuit of excellence.

Susan Anderson is a lecturer in the Department of Education.
susan.anderson@uwimona.edu.jm
Teaching Jamaican Creole speakers, with a goal of competence in English, means teaching between two grammars. This is so because learners and teachers operate in a space where two languages, English and Jamaican Creole, co-exist and sometimes overlap as boundaries are blurred.

**The Problem Exists Far and Wide**

Dr. Beverley Bryan had a concern about the challenges facing teachers of English in Jamaican classrooms and set about to identify some of the core problems. As a Language Educator, she has encountered Jamaican Creole speakers, initially from her experience of teaching adolescents and adults in the UK, and more recently from teaching and conducting research in Jamaican schools. Essentially, these are students who have struggled with demonstrating language proficiency at the level that would meet the requirements of high-stake public examinations. Their failure has underscored real inequity in an education system that demanded so much but did not provide the resources for success. What was always an issue for her was that this failure was often mired in a debate about language and identity that gave Burgess’ statement “Language is an arena rather than a subject” such resonance.

**Understanding the Problem**

Through her own practice, she began to develop an interest in understanding the language background of Jamaican Creole speakers: the nature of the language they used; the context of its use and application in classrooms.
The questions remained constant: what kind of language do the participants in these classrooms speak? Where do these ideas and perceptions of the language come from? What is the historical background to the choices made about language teaching? What is the socio-cultural context that the teacher needs to understand, to connect the society’s language goals with the individual’s needs? What is the socio-cultural context that the teacher needs to understand, to connect the society’s language goals with the individual’s needs? What does good practice in this context look like?

Dr Bryan sought the answers to these questions in conducting her own research and reviewing that of Caribbean and international practitioners. The research was conducted over a number of years in several different projects, focused on secondary schools. It draws on historical sources, observations, interviews and surveys. However, Dr Bryan has taken into account the ideas and practices of classroom teachers, because in this way the professional knowledge and expertise that underpins good classroom practice is recognised.

**Publishing the Research**

Dr Bryan wanted to share her findings with English teachers who were confronted with the challenges presented by the Jamaican Creole/English speaking students. She documented all her findings in a book entitled Between Two Grammars: Research and Practice for Language Learning and Teaching in a Creole-speaking Environment. It is towards enriching the practice of these teachers of English in secondary schools that a substantial part of this book is addressed. The first aim is to present an enriched view of the multiple meanings of language and English in teaching in the Caribbean, considering the different ways language is viewed - in particular the language that secondary students are acquiring. It is understood that teachers need to be provided with the tools to navigate the arena, so that they can interrogate their responses to language.

So once the findings are examined, the aim in the second half of the book is to go beyond the presentation of one single method for achieving proficiency in English. Apart from knowledge of subject, teachers need an understanding of the principles of knowledge and learning that would allow them to make theoretically sound and rigorous pedagogical decisions about what they offer to students. Principles are strands of curriculum thinking, drawn from second-language research and practice that are robust enough to generate teacher action at more than one level: they spiral through the curriculum and offer guidelines to the teacher in approaching her practice.

To apply the principles, teacher preparation must deepen teacher expertise; development of teacher language awareness (TLA) is required for language and literacy teachers of English. Many teachers come with a facility with language generally expressed in a love for and achievement in literature. What is more important, or as important, in this Creole-speaking environment, is TLA. Dr Bryan’s research suggested that some intuitive understandings were already there. After all, most teachers have been involved in the linguistic struggles their students face. But the objective is to make that knowledge explicit to the teacher and enrol her in the project of language teaching.

**No Single Solution**

Different approaches are reviewed in this book, based on the research carried out in classrooms. The approaches cover teaching language as communication; the use of literature in the language classroom; and the central value of language study. The implementation of these approaches is analysed in relation to the principles outlined, so that teachers can make theoretically sound pedagogical decisions about what they offer students. Finally, what is offered to the teacher is ways of working that she, as empowered professional, can take and own. Ultimately, the goal is to empower teachers to develop a critical reflective perspective on their practice that allows them to see such practice in a wider system of meaning-making.

Thus, while the difficulties of language teaching are recognised, it is also appreciated that the findings, discussions and solutions suggested are multi-faceted.

Beverley Bryan is the head of the Department of Educational Studies

beverley.bryan@uwimona.edu.jm
This was the view expressed by the principal of an inner city Primary and Junior High School in Kingston, Jamaica, during an interview with Dr Rose Davies, Senior Lecturer and Head of the Institute of Education, UWI, Mona. Dr Davies was collecting data for a case study research on the principal’s teacher deployment initiative aimed at improving the standard of teaching and learning in grade one.

The principal had embarked on an initiative to place teachers trained as early childhood education specialists in all his grade 1 classrooms. Why? He explained that in his first years as principal he became increasingly concerned about the low performance levels of children coming into grade 1 from the community and their failure to demonstrate satisfactory progress by the end of grade 1. This was particularly acute in the area of literacy development and he was seeking for some way to improve this situation. He acted on an idea that came to him after observing a new teacher he had employed for a special grade 1 class of slow learners.

“Based on how I see these early childhood teachers teach and the methods they use, the children must learn.”

Who Should Teach at the Lower Primary School Grades

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Rose Davies

RESEARCH FOR DEVELOPMENT 2011
This teacher was an early childhood trained specialist who demonstrated special skills in so motivating the children to learn, that by midway through the academic year these children were performing as well as or better than children in the regular classes. He stated, “Most of these children in the special class had come into school not ready, but by the end of the school year had shown immense improvement.” The principal believed that it was the teacher’s training in early childhood education that made the difference and decided to experiment with employing and deploying early childhood specialist teachers to replace all the primary trained teachers in all grade 1 classrooms. He reasoned that the teaching methods demonstrated by the early childhood trained teachers were more suitable for children entering grade 1 and would be more effective in motivating and interesting children in learning.

The principal’s opinion as to which teachers are more appropriately trained to teach in the lower primary school and grade 1 in particular, are supported by an extensive body of conceptual and empirical literature on early childhood education. It must be noted that although in Jamaica children begin formal primary education when they enter grade 1 at age six, it is internationally acknowledged that the stage of early childhood spans the age range birth to eight years (or grade 3 primary). The literature points to the character of children in the early years, when learning is constructivist in nature and involves much exploring, discovery and “hands-on” experience for understanding of the world. Early childhood scholars assert that if young children have an abundance of pleasurable first-hand experiences with books and a wide range of other appropriate materials, they will develop more positive dispositions to learning. These scholars also suggest that pre-primary and primary education have “distinctly different histories, traditions, perspectives, expectations, practices, values and school culture” – hence the less formal and more play-centred approaches of early childhood education compared to the more rigid and conforming structures of primary education.

The case study was undertaken by Dr Davies to investigate how the principal’s redeployment initiative had influenced the grade 1 students’ achievement in the area of literacy development as well as to ascertain the views on the initiative – of the principal, a sample of grades 1 and 2 early childhood and primary trained teachers, as well as a sample of grades 1 and 2 students. Data were collected from these groups through individual and focus group interviews. Relevant school records, viz. end of term examination scores, were examined and compared for two random samples of grade 1 students (39 boys and girls in each sample); one in the year before the initiative commenced and the second, two years into its implementation. Analysis of the data showed that whereas the group average of three end-of-term test scores for the students of the pre-initiative group was 57 percent, the post initiative group’s average was 72 percent, a difference of 15 percentage points. The principal reported that the trend of improved scores of children leaving grade 1 to enter grade 2 had continued, and over the period of five years, the school’s literacy rate on the national Grade 4 Literacy Test had moved from 65 percent in 2003 to 87 percent in 2008. He attributed to the fact that children were increasingly leaving grade 1 better prepared for grade 2 and in his opinion, the placement of early childhood teachers in grade 1 had contributed to these outcomes.

The interviews with the principal and the early childhood and primary trained teachers indicated a strong agreement that early childhood trained teachers are more appropriately placed at the lower primary grades than primary trained teachers. All the early childhood and the primary trained teachers expressed the view that the content of the early childhood teacher preparation programme enabled teachers to better meet the readiness needs of children entering primary school. The principal shared his view that the early childhood teachers displayed certain characteristics, for instance presenting information in stimulating and interesting, hands-on ways, that would allow children to have meaningful learning experiences in an atmosphere of fun and play. Some of the grade 1 students interviewed, gave reasons for liking their grade 1 experience such as “my teacher makes me dance and we have lots of fun”; “my teacher do things that I like to do such as play games”; “she play with us and read stories like Jack and the Beanstalk and she do the action and talk in a voice like a man and if they dancing, she dance too”.

This small case study draws attention not only to the nature of learning at the early childhood stage but also to the matter of training and deployment of teachers in the lower primary grades. Further large scale research might yield findings that provide justification for consideration of policy initiatives that require early childhood trained teachers to be placed in grade 1 classrooms. The findings of this research were presented to the Senior Policy Group of the Ministry of Education, Jamaica, as both advocacy and support for any such policy measure that might be considered by the Ministry of Education in the future.

Rose Davies is head of the Institute of Education
rose.davies@uwimona.edu.jm

Rose Davies is head of the Institute of Education
rose.davies@uwimona.edu.jm
A primary objective of all educational programmes is to prepare persons to be engaged in various aspects of the society. A significant portion of these persons are for the workforce. A major concern of technical and vocational educators is the perceived lack of involvement of industrial organizations in the planning, development and implementation of the curriculum at various levels of the educational system. The result is a failure of the educational institutions to meet the expectations of industries. Since 2006 Dr Halden Morris, senior lecturer in the Institute of Education, UWI, Mona has been conducting research to determine the extent to which industries interact with educational institutions in Jamaica and the benefits of the interaction.

The Problem
A perceived lack of involvement and interaction of commercial and Industrial organizations in curriculum development and implementation at the secondary and post secondary levels in Jamaica.

Getting to the Root of the Problem
Data were collected from a wide variety of educational institutions on their interaction with industry. Twenty-two institutions grouped in five categories were included: technical high schools (7), secondary schools (8), HEART/NTA training institutions (4), traditional high schools (2), and one tertiary level institution. The industries and commercial entities targeted were bauxite and mining firms, consumer goods manufacturing, automobile and service industries/corporations.
Industries’ Commitment to Education

Data from this investigation revealed that industrial organizations contribute resources to educational institutions not just for the sake of philanthropy but also to satisfy their commitment to education, which is an underpinning philosophy of the industry. The industrial/commercial organizations strongly believed that they have an important role to play in preparing students for employment in industry. They confirmed the belief that they should be involved in the curriculum implementation process, especially in the areas where they may have direct benefits.

Factors which Influence Industries to Contribute to Educational Institutions

In addition to philosophy, there are specific key factors that influence each industrial organization in contributing to educational institutions. Factors indicated by industries surveyed included the leadership of the institution, proximity to the industry, high visibility of school in sports, crime level, government policy, establishment of standards and the need to prepare a smart competent workforce.

Concern about Existing Curriculum

Some industry personnel were particularly concerned about the current content and structure of the curriculum because many of the values, attitudes, skills and competencies required by industry were not evident. Several indicated that the curricula in the educational institutions are in many instances outdated and are not engaging the students in modern practices. This manifests itself in the lack of appropriate persons available in the community from which the industries could benefit.

Work Experience Opportunities Inadequate

All educational institutions involved in the survey employed a work experience programme as part of their curriculum. However, the experience was not tied to any specific training needs of the student but merely focused on the student making a connection with the world of work. While expressing appreciation for the opportunities provided by the industrial organizations, they claimed that in many instances, the opportunities provided were not directly related to the training needs of the students.

Types of Contributions Made by Industries to Educational Institutions

All industrial organizations surveyed focused primarily on providing material assistance to the educational organizations. Fifty-five percent (55%) of the industries surveyed provided direct financial assistance for the educational institutions with which they interact. Fifty percent (50%) provided opportunities for work experience of students. Approximately 60% of the industries provided scholarships for either excellent or needy students. A similar percentage provided books, materials, tools and equipment for the educational institution. Not surprisingly, a large percentage (68%) provided job opportunities for the students from the institutions with which they interact. Approximately eighteen percent (18.20%) provided assistance of a general nature which included curriculum development.

Management of Interaction between Industries and Educational Institutions

Both educational and industrial respondents indicated that there was need for improvement in the management of their interaction to facilitate industries’ involvement in the curriculum development and implementation. All respondents in the study indicated that the principal or the chief executive officer of the educational institution should be given the responsibility to administer and coordinate the interaction, but that personnel from both organizations should participate in managing that interaction.

Future Plans

All educational institutions and industries surveyed supported the concept of industries interacting with educational institutions. While not making specific commitments, more than seventy-five percent (75.50%) of persons from industrial organizations interviewed pledged to give continuous support to these programs, however, most were concerned about its sustainability because this interaction requires continuous sourcing of funds to maintain the programmes. Two industries were less concerned about sustainability since they had established Foundations through which these engagements are managed.

Economic Benefits

The economic benefit of the formal interaction between the industrial organization and educational institutions is no doubt important and can be a significant engagement. One major benefit is the level of confidence that both industry and the educational institution will have in their programmes. Another benefit is the reduction of frustration of determining curriculum content, especially in the determination of content which is truly relevant for both instructional and occupational settings. Industries expressed that a major benefit is the reduction of the training that they have to provide for the graduate when employed. The student will graduate with a good understanding of the demands of industry. Lack of interaction may result in pressures from business, industries, professional organizations, unions and other entities that rely on the curriculum for their development.

Halden Morris is a senior lecturer in the Institute of Education. halden.morris@uwimona.edu.jm
Kathleen Monteith

Researching Jamaica’s Business History since Independence

A rich body of work concerning the history of Jamaica’s business activity and business development exist, primarily through the pioneering efforts of historians such as Douglas Hall, and Richard Sheridan. Their work, and that by others who followed them, is understandably largely confined to the agricultural sector, usually to the large-scale production units of the plantation, or to the small-scale peasant farming, both in terms of capital and labour and the related sectors of trade and commerce. Much of this work, again understandably, is on 18th and 19th century Jamaica, but there are a few works that have begun to include the early to mid 20th century. Much remains to be researched in the 19th to the mid 20th century, but there are sufficient grounds to begin to shift the focus to include the second half of the 20th century. First, the Jamaican economy has undergone tremendous changes beginning in the mid 20th century, when the Puerto Rican model of development was adopted, resulting in expansion and significant diversification. Since the 1950s and beyond, Jamaica has seen rapid expansion and development in business activity in the area of tourism and hotel sector, mining, manufacturing, construction, trade and commerce, and other related service sector industries such as in finance, retail and wholesale establishments.
That we are about to enter the 10th year of the 21st century, provides added grounds for fast-tracking to begin documenting the history of business activity in the 20th century.

The second and perhaps more important rationale for this project, is that many of the principal players who were at the helm of businesses that began in the mid 20th century, and which went on to become substantial entities throughout the course of the century, are now in their senior years.

**Oral Testimonies**

An important aspect of the research project is recording the personal experiences, views and opinions of business persons who were integral to the companies they established and led for posterity. The memories of their experiences, views and opinions are vital primary sources for a proper understanding of the course of business development in 20th century Jamaica.

Business persons in the following areas of industry have been identified for interviewing:

- Agriculture/Dairy
- Banking and Insurance
- Construction & Real Estate development
- Commerce – Wholesale and Retail establishments
- Manufacturing
- Mining
- Publishing (newspapers, magazines, books)
- Advertising
- Restaurant and Fast Food
- Shipping and customs brokerages
- Travel & Tourism

**This Study is Important**

This study will become a valuable source of the history of individual businesses and will help further the advancement of the business history and business development studies programmes at the University of the West Indies, Mona campus. It will also provide models of enterprise for researchers and industry practitioners and provide the foundation for the establishment of an Archives of Business at the University of the West Indies, Mona campus.

Kathleen Monteith is head of the Department of History and Archaeology. kathleen.monteith@uwimona.edu.jm
In the current context of educational transformation, policies tend to focus on accountability, quality assurance, and improved educational quality. International research suggests that there is a strong link between quality in education and how teachers view and conduct themselves as professionals. The professionalization of teachers’ work is therefore a key concern.

Towards a Shared Vision of Teacher Professionalism in Jamaica

Unfortunately, in Jamaica and the wider Caribbean, how teachers think about their work as professionals and the effect of this on their actual teaching is not a subject that has been well-researched. In other words, we do not know how our teachers conceptualize professionalism. We do not know what principles and norms are guiding their practice. We do not know what motivates their commitment to the teaching profession or what factors influence this commitment. It seems therefore that there is an urgent need to find out from teachers what their thinking is in regard to their practice, their level of commitment and standards for teaching. This type of information is needed to improve our understanding of teacher professionalism and can be very helpful for giving teachers a voice in the process of developing standards for teaching and the work of teachers.
In keeping with its remit to facilitate professional development of teacher educators, a team of researchers from the Institute of Education set out to:

1. Explore how prospective, beginning and experienced teachers in Jamaica understand the concept ‘teacher professionalism’
2. Identify the norms and ideals they associate with professional behaviour
3. Examine the sources of their views
4. Examine how and why their conceptualizations develop and change over time

Led by Professor Hyacinth Evans (now retired), the team designed a three-stage, five-year longitudinal study. The study aimed to provide new knowledge about how prospective, beginning and experienced teachers in Jamaica develop and modify their concepts of professionalism and professional practice over time.

How Prospective Teachers Understand Teacher Professionalism

The research team used concept maps and semi-structured interviews to explore how 52 prospective teachers from three teachers’ colleges in Jamaica think about professionalism and how their college experiences influence their understandings. Findings from Stage 1 have been organized around four themes related to understandings of professionalism. Most predominantly, prospective teachers described the professional teacher as a good person. They defined ‘goodness’ as a set of personal attributes - trustworthiness, honesty, modesty, and helpfulness, among others. Added to these were professional attributes - a set of ideas of what a good teacher should be - confidential, accountable, committed and respectful. These prospective teachers also saw the professional teacher as someone who understands the complexity and demands of teaching. As part of this understanding of complexity, the professional teacher was seen as someone who can manage the tensions and challenges associated with teaching and being a teacher. Finally, several prospective teachers explained how their college experience had played a central role in influencing their concepts of what it is to be a professional teacher.

Preliminary findings suggest that although some beginning teachers have positive induction experiences, many do not benefit from the type of professional learning and support that they need to help them develop good teaching habits and practices. The research team found that these new teachers face a variety of challenges - instructional, management, institutional and psychological - that can make or break their ability to become good teachers and make meaningful contributions to their schools and the teaching profession.

Next Steps

The team will conduct follow-up interviews with participants for up to five years after graduation to explore how their understandings of professionalism are changing and developing over time. The qualitative data from these first two stages will inform the design of the third stage - a cross-sectional survey of experienced teachers. This research project is expected to benefit educators, policymakers and the wider community by providing knowledge about what it means to be a teacher in Jamaica, the development of professionalism among beginning teachers, and factors that influence this development and teacher commitment to the profession.

Carol Hordatt Gentles is a lecturer in Education with the Institute of Education. cagentles1@yahoo.com

Lorna Down is a senior lecturer in the Institute of Education. lornadown@yahoo.com

Marceline Collins-Figueroa is a lecturer in science and environmental education in the Institute of Education. mcolfig@yahoo.com

Mairette Newman is a lecturer with the Institute of Education. mnewman@uwimona.edu.jm

Vileitha Davis-Morrison is a lecturer in Social Studies/Citizenship and Geography Education in the Institute of Education. vildm@yahoo.com
We all know that Caribbean populations are multi-ethnic and multi-cultural. That is, they are made up of people from different ethnic groups and cultural origins. That diversity has given rise to national mottos such as Jamaica’s “Out of Many, One People.” But how did the Caribbean become so diverse in its population make-up? The answer lies in migration studies. Indeed, the study of population movements into and out of the Caribbean has engaged the attention of scholars for some time now and is the scholarly pre-occupation of several at the University of the West Indies. Migration studies form an essential aspect of the field called “Atlantic Studies.” In fact, immigrants made the Atlantic World function, making places like England, Scotland and France rich.
The population movement that has attracted most attention is the transatlantic trade in African captives. It is now well-known that well over 15 million Africans were forcefully transported to the Americas. But white immigration from Europe was also a vital feature of the Caribbean colonial system, which required settlers, managers, artisans and a governing elite. Immediately before and after slavery was abolished, Caribbean landholders sought additional labourers from Africa, Asia, Europe and North America. After 1930, the voluntary migration to and settlement in the Caribbean of entrepreneurs and professionals from many parts of the world, a large percentage Asian (Chinese and Indian) and Middle Eastern, further cemented our role as a recipient of diverse populations.

But migration is not only confined to the historical past. The current pre-occupation with the spate of refugee migration, in particular the migration of Cubans and Haitians to the USA and the Caribbean, the continuing global debates over trans-national identities, human trafficking, new and stringent immigration rules and the relationship of so-called resident and non-resident aliens to border security, are all indications that migration does not only lie at the centre of modernity, but continues to characterise the post-modern age.

In this post-modern age, however, scholars are more interested in the human face of migration rather than in counting people. In fact, for too long, the study of slavery was dominated by the numbers game, the futile attempt to count how many black people were involved in the mafia or African holocaust. Even the most recent database on the transatlantic trade in African captives is all about numbers: of ships, of voyages; of people of mortality rate etc. Post-slavery migration studies were equally preoccupied with quantitative analysis: how many were imported; how many repatriated; how many acreages did they make productive? What was the male/female ratio? How many re-migrated? How many merchants and doctors arrived? What percentage of the population are Indians, Chinese, Lebanese, Portuguese, Jews, indigenous peoples? And on and on – counting, counting.

Of course statistics are important. They provide an idea of the magnitude of population loss or gain, of gender disparities, of changes in residential patterns etc. But the history of migration is more than statistics; and happily the field has changed to take on board social experiences, memories of migration (using oral history to learn about migrants’ experiences in their own voice); and the socio-economic and political legacies of migration – forced and free – especially the issue of “ranking” (scholars urging host societies to treat cultural differences in an egalitarian manner, rather than hierarchically).

Gender and migration is a growing research field, scholars asking the question: did men and women, boys and girls, experience migration in the same way or differently? The forthcoming publication Engendering Caribbean History: Cross-Cultural Perspectives, being edited by Verene Shepherd, will shed some light on this matter, a whole section being devoted to “Gender, Migration & Identity.”

Verene Shepherd is Professor of Social History, University Director of the Institute for Gender & Development Studies and Host of “Talking History” on Nationwide 90 FM.

verene.shepherd@uwimona.edu.jm
UWI, acknowledging the growing importance of an ageing population, awarded a New Initiative Grant to the Department of Community Health and Psychiatry (Mona Ageing and Wellness Centre), which, under the leadership of Professor Denise Eldemire-Shearer, conducted a survey of older persons living in the St. Andrew communities of August Town and Mona Heights. The study, which was done over six months in 2010, obtained a wealth of data on the mental and physical health of older people, and on their social and economic situations. The initial report from the study focused on dementia and determined the proportion of persons with this condition and factors associated with it.

Dementia is a brain disorder that causes problems in memory, thinking, and overall functioning, which worsen with time. It mainly affects elderly people and occurs at increasingly higher rates as ages increase, though not every older person develops the condition. It is a highly disabling disease which causes dependency and loss of productivity in affected persons. Frequently family members who have to care for them suffer financial and emotional strain, and lose productivity themselves as needs for caregiving mount. Additionally, dementia is costly to the public health sector and the national economy as a whole, due to the expense of treatments, the high levels of care that are necessary, as well as the aforementioned losses in productivity.

When results of the study were related to the Jamaican population we found that approximately one in twenty people aged 60 years and over has dementia.
Compared with studies of dementia in other countries, our results showed that the Jamaican community sample would rank fairly low in the global proportion of elderly with dementia. Reasons for Jamaica's low prevalence can be found in certain health-related trends. The primary trend is the rapid growth in size of the elderly population due to persons living longer; greater numbers of older people means more people at risk for the disease. A second trend is the rising numbers of people with chronic illnesses such as hypertension and diabetes; these diseases increase the risk of affected people developing dementia. A third trend is the increasing number of people with obesity, owing to people changing their diet to that more typical of industrialized countries; obesity predisposes affected persons to many chronic illnesses. These trends - changes in patterns of ageing, chronic diseases and nutrition - are at early stages in Jamaica, so dementia rates are currently low, but as the trends progress, rates will rise to those seen in industrialized countries.

There are further implications: if retirement patterns remain the same, with the growing proportion of elderly people there will be a smaller proportion of persons in the workforce to meet the increased demand for health services due to dementia; hence a serious national economic strain can be expected.

Given the projected future rise in numbers of people with dementia and the major economic burden associated with the disease, research on dementia in Jamaica is vital at this time. UWI will be expected to continue providing the necessary leadership. Information from this and future local studies can be used in a timely manner to plan interventions which will reduce the impact of dementia on society.

Specifically, data from this study could be used as the basis for decision-making and budget allocations regarding the needed government subsidy of medications used in the treatment of dementia. Our data can inform the allocation of personnel and financial resources for the training and employment of health care workers, the development of nursing care facilities, and the development of social services for patients and caregivers. Information from this study can also aid social planning regarding workforce levels, retirement and pensions.

Other results from the study can be used to prioritize treatment and preventative care for the chronic diseases and lifestyle factors which increase dementia risk in the Jamaican population. Our results also suggest the need for research beyond the scope of dementia studies into these risk factors, research that could be undertaken by our colleagues in other medical disciplines.

It is hoped that our research will help improve the lives of older persons and their families and aid national development. More reports from this study will be published in the near future.

Susanne Neita conducted this study as her thesis for the degree of Doctor of Medicine in Psychiatry at the University of the West Indies.

neita10@hotmail.com

When results of the study were related to the Jamaican population we found that approximately one in twenty people aged 60 years and over has dementia.
Why Adolescents?

In the Caribbean, adolescents (youths 10-19 years) comprise a quarter of the population, while in Jamaica they account for one-fifth of the national figures (according to the World Health Organization and the Statistical Institute of Jamaica). As adolescents grow they become vulnerable to health conditions, especially as they engage in risky behaviours. Despite negative experiences, however, adolescents can be resilient; they are dependent on their peers and responsible adults for support to bring out the best in them. In order for us to give this support it is important to understand some factors that influence their decision-making and behaviour. In this way, we can be more equipped to use a preventative approach in preserving and protecting the health of adolescents.
Music as a Social Influence on Their Health

There is no doubt that music is an important part of adolescents’ life and changing this is not an option. Understanding the music of adolescents and the role this medium may play in shaping values about sexual and reproductive health (SRH) is important and worth investigating. In view of the many concerns in Jamaica about the content of dancehall music, this matter demands not only an understanding of how adolescents perceive sexuality related messages conveyed through dancehall but also whether these messages are more valued than those contained in public education campaigns on the topic. We used a mixed research method approach to understand these issues among Jamaican adolescents, with a view to providing data that can inform how best to use the music media to reach adolescents in a positive way.

A Peep into their World

We spoke to adolescents considered as leaders among their peers to find out what were some of the songs they listen to. We then found these songs, looked at the words and listened to them and short-listed those having lyrics about sexuality issues for further exploration. Next we visited dance sessions frequented by some adolescents to observe dance moves and other responses to favourite songs. The information gleaned through these sources was then used to develop questions used in discussion groups with adolescents to further clarify their perspectives on sexuality issues in the music.

The results show that Jamaican adolescents love dancehall music and are receiving a lot of instructions about life from this source. But some messages portrayed through songs and music videos contain explicit and graphic expressions of sexuality that may be misleading. Without the support of responsible adults in discussing and clarifying some of these issues, they are likely to be influenced by messages that conflict with those advocated by family life educators.

How does this Information Help to Solve the Problem?

Media literacy sessions and discussions on sexuality issues are important activities from which adolescents can benefit. Discussions with parents, health care providers, peer leaders and adolescents themselves about issues of sexuality and how the music media can influence decisions, are part of our community outreach activities. Persons in the target group are being reached through community interventions and discussion forums to help clarify values and develop support systems for adolescents to make practical but safe choices in the area of sexual and reproductive health. A community intervention in St Ann, ‘Real Potentials of Rural Youths’, is one means through which high risk adolescents are being reached to build media literacy skills while addressing other social and learning needs.

Desmalee Holder-Nevins is a lecturer in Health Promotion in the Department of Community Health & Psychiatry, Faculty of Medical Sciences.

desmalee.holdernevins@uwimona.edu.com
FACULTY OF
PURE AND APPLIED SCIENCES

Dr. Camille Bowen-Forbes
Dr. Dayne Buddo
Dr. Rupika Delgoda

Prof. Simon Mitchell
Members of the Mathematics Dept.

Prof. Mitko Voutchkov
Prof. Dale Webber & Mr. Carlton Campbell
It is a well-known fact that the place we call home, Jamaica, is rich in medicinal plants. Go to any community - rural or urban - and ask someone about a possible treatment for cold or fever, and it will become clear that the use, or at least the knowledge, of traditional medicines is quite prevalent. Among the parts of these plants that are most frequently used are the leaves, roots, and bark. Fruits are less often employed as medicines, and when they are, it is usually the unripe fruits that are used. It has always been known that fruits are good for health. However, over the last few decades, there has been significantly increased interest and focus on fruits and their role in prevention of various diseases, such as cancer, arthritis, cardiovascular disease and Alzheimer’s disease. Jamaica is among the most fruitful countries of the world, and many of our edible fruit species are not known by the masses. As a result of this, their inclusion in the diet, cultivation, and use in research and food product development has not been exploited.

Promising Results from Jamaican Fruits
The research has revealed that the Jamaican berries possess high antioxidant activities and levels of anthocyanins, which are comparable to those found in similar commercial varieties sold in the USA. Anthocyanins are the compounds responsible for the orange, red, blue and purple colours of most flowers, fruits and other plant parts. They protect cells from oxidative damage and possess anti-inflammatory, anti-cancer, anti-diabetic and other properties. The Jamaican berries demonstrated superior anti-inflammatory and anti-cancer properties when compared to their overseas counterparts. Additionally, compounds isolated from the red raspberries showed anti-cancer activity.
It was discovered, after carrying out a comparative study on the common and strawberry guavas, that the strawberry guavas are significantly superior to common guavas with respect to their vitamin C content, antioxidant activity and total polyphenolic content. Polyphenols are compounds that are known for their high antioxidant activity. Many of the health benefits of vegetables and fruits are attributed to the presence of these polyphenols, which include the anthocyanins. Strawberry guavas were also found to possess only slightly lower levels of crude fibre than their counterparts, and therefore may be classified as antioxidant dietary fibre (ADF), as is the case for common guavas. ADF can be defined as a product containing significant amounts of natural antioxidants associated with the fibre matrix. A diet high in fibre has been associated with reduced constipation, haemorrhoids, coronary heart disease, diabetes, and cancer.

Potential Application of the Research
These studies are proof that our under-utilized edible fruits are valuable natural resources. Positive findings like these can and should lead to productive exploitation of this resource. Cultivation of the fruits and further conversion to value-added food products such as jams, jellies, purees, juices and tarts would have a positive effect on our food and agricultural industries. Consumption of these as well as the fresh fruits would have a positive health impact. Product development is an area of interest of the research group.

Camille Bowen-Forbes is a lecturer in the Department of Chemistry with a keen research focus on the nutraceutical properties of underutilized Jamaican fruits, and their potential applications.
camille.bowen02@uwimona.edu.jm

Kayanne McCook-Russell is a postdoctoral research fellow working with Dr Bowen-Forbes.
kayanne.mccook@uwimona.edu.jm
The lionfish belongs to a group of venomous fishes and is related to the scorpionfish which is found regularly in Jamaica. It is a “sit-and-wait” predator, capable of consuming large quantities of fish and shellfish daily and can negatively impact the fish stocks in a country. Its venomous spines protect it from itself becoming prey for other fish, and these spines are also capable of inflicting a very painful sting to humans. There have been documented envenomations in Jamaica.
The lionfish (Pterois volitans and Pterois miles) is native to the Indian and Pacific Oceans. In the late 1980s and early '90s, marine aquaria enthusiasts mainly in the USA imported these flamboyant and spectacular fish for their homes and offices. However, for many reasons, these fish were released into the canals and seas, and "set free". Since then, they have made their way along the east coast of the USA, the Bahamas, Hispaniola, Cuba, Jamaica, and many other countries throughout the Caribbean.

Already they have been showing signs of impact on juvenile fish and shellfish, and many countries now are reporting staggering numbers of lionfish on their reefs and other marine environments. The lionfish reproduces all-year round in the Caribbean (every 4 days). A female lionfish is capable of producing 2 million eggs each year. Lionfish in Jamaica have been found in very shallow sea-grass areas as well as in areas 335m (1100ft) deep below the surface. They have been recorded in Jamaica to lengths of 51cm (20 inches).

The lionfish has been described as highly invasive in the Caribbean, due to its negative impacts on the reef ecology, economy and public health.

The National Lionfish Project
The National Lionfish Management Project in Jamaica is being led by the University of the West Indies (UWI) through the recently formed Marine Invasive Species Lab at the Discovery Bay Marine Lab (DBML) in St. Ann. This project is funded mainly by the Global Environment Facility, the Government of Jamaica and the University of the West Indies, for a total project budget of 431,000 USD.

Dr. Dayne Buddo is the Principal Investigator, with support from Dr Karl Aiken and other members of the Centre for Marine Sciences, UWI. The project is administered by the National Environment and Planning Agency (NEPA) and forms part of a larger regional project on invasive species in general, involving 5 countries.

The project aims to track the invasion through underwater surveys island-wide, document the impacts through predation of native fish, design a trap capable of catching lionfish and formulate a management plan for Jamaica and the rest of the Caribbean region.

Research Programme on Lionfish in Jamaica
Marine Invasive Species Lab – UWI Discovery Bay Marine Lab
The Research Programme on the Lionfish is the primary focus of the Marine Invasive Species Lab, along with ballast water management. Under the Lionfish Programme, the following elements of research are being done:

- Underwater surveys of reefs island-wide for lionfish - by personnel from the UWI-DBM and other agencies
- Examination of stomach contents for the fish that are being consumed by the lionfish
- Design of special traps for lionfish – these must be put out to sea to catch the predators
- Analyses of the genes of the lionfish to determine the origin and features of the species, to assist with management in the Caribbean
- Examination of the features of the lionfish larvae, its spread, and the food being consumed by the larvae

This research programme, along with other research being done throughout the region, will be used to develop a strategy to manage the lionfish in the Caribbean. The Programme on Lionfish Management seeks to strengthen partnerships among government and non-government agencies in Jamaica, as well as to promote regional cooperation. This is done by a series of training exercises - integral to capacity-building and public education – carried out by the UWI-DBML and its partners.

It is expected that this programme will evolve from year to year, and remain relevant to the current needs of the country. It is very unlikely that the lionfish will be totally eradicated from Jamaica or the region, and therefore it is increasingly important to learn how to manage this species effectively.

This programme underscores the UWI's commitment to serving the country and the region through teaching, scientific research and outreach. Dayne Buddo is one of the leading researchers on marine invasive species in the Caribbean. dayne.buddo@uwimona.edu.jm
Natural products, i.e. chemicals found in naturally occurring organisms - whether plants, fungi, marine creatures - can be extremely valuable for multiple purposes, including use as medicinal products. The University of the West Indies, Mona campus, particularly the Department of Chemistry, has a long history of isolating new natural products. However, the biological and medicinal worth of most of these isolated compounds either remain untested or sent overseas for activity testing. The aim of this research group at the Natural Products Institute has been to establish and carry out biological activity testing of local natural products. Among such tests - which include anti-tuberculosis and potential drug-herb interactions - has been the test for compounds with chemoprevention (preventing the formation of cancer) and anti-cancer (treatment of cancer) properties.

Causes and Experiments on Prevention of Cancer
Cancer, a disease that impacts millions around the world, has attracted numerous research groups attempting to understand the many factors that underlie the commencement and the progression of the disease.
Often, the ultimate carcinogen is formed within the body via biochemical processes following the exposure to pollutants found in the environment, such as cigarette and industrial smoke, food additives, dyes and other chemicals (see figure 1 below). A powerful enzyme system found mainly in the liver is responsible for the formation of many known carcinogens, as illustrated in the figure below; this is the target used in our research.

Blocking or inhibiting the action of these enzymes has been directly linked with preventing the formation of tumours and we have thus searched for natural products that are capable of inhibiting such enzymes. Several classes of natural products from the plants Picrasma excelsa, Amyris plumieri, Castela macrophylla, Eisenbeisia pentaphylla and Spathelia sorbifolia, most of which are endemic to Jamaica, have shown potent inhibition properties to suggest that they may have cancer preventive potential.

Studies on Anti-Cancer Properties
In addition, the impact of natural substances from Jamaican plants on the survival of liver, colon and breast cancer cells has been investigated by the researchers. In the case of colon cancer, one of the identified compounds was favourably lacking impact on normal colon cells, which is an attractive feature to hold for a potential anti-cancer compound. The colon cancer medicine, 5-fluorouracil has an impact on normal colon cells similar to the impact on normal cells of many known cancer medicines, which can explain the side effects of cancer treatments. Compounds with selective potency toward specific cancer cells will make attractive options as medicines. Jamaican natural products thus hold potential for a new line of treatments with dual properties of cancer prevention and cancer treatment.

Nature of the Studies and Further Investigations
Both types of experiments were conducted on cells cultured in the laboratory or on subsections of the cells maintained in suitable media. They are thus termed in-vitro experiments. Like most in-vitro experiments, they provide an insight into potential, in an efficient and economical manner. Since they are not conducted on whole, living animals (in-vivo experiments), nor on human beings, the full biological relevance and scope is yet to be gathered.

Scientists at the Natural Products Institute will continue their work towards identifying effective natural ingredients useful in the fight against cancer.

Work conducted up to now has been published in several international journals and presented at local and international scientific meetings.

Rupika Delgoda is a lecturer specializing in Biochemistry; rupika.delgoda@uwimona.edu.jm

Simone Badal is a PhD candidate; simone_badal@hotmail.com

Sheena Francis is a post doctoral researcher; sheena.francis@yahoo.com

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The Highway 2000 Mount Rosser Bypass is set to link the Linstead bypass to Moneague, and cut out the steep, winding road that passes through Ewarton, Mount Rosser and Faiths Pen on the way to Moneague. The alignment for the road was selected and Bouygues won the contract to build the road. While the first stretch (about 4 kilometres) and final stretch (about 11 kilometres) have been constructed the section joining these two stretches remains incomplete due to unforeseen problems. The problem is directly related to the rocks on which the road is being built – are they solid ‘bedrock’ or landslide deposits. In order to understand this Bouygues contacted Prof. Simon Mitchell in the Department of Geography and Geology at the University of the West Indies for help.
Mapping the Area
A major aim of the geological investigations in the Department of Geography and Geology at UWI is to understand the distribution of different rock types around Jamaica and the detailed age, order and thickness of the different rock units. This research has involved a series of M.Phil. and Ph.D. students who have undertaken geological mapping as part of their studies as well as extensive geological mapping programmes by Prof. Simon Mitchell. One such project saw Mr. Ian Brown map the main part of the Benbow Inlier (an inlier being a series of older rocks, in this case of Cretaceous age, surrounded by younger rocks) which occupies parts of the parishes of St. Ann, St. Mary and St. Catherine. When Mr. Brown had completed the area of the inlier that he mapped, Prof. Mitchell, with the aid of Mr. Richard Coutou, extended the mapped area westwards to Mount Rosser including the area on which the future Highway 2000 Mount Rosser Bypass would be constructed.

Studying the Rocks
Bouygues had drilled a series of core holes in the area they were concerned about and contracted the Department of Geography and Geology to interpret the geological successions in the core holes. Rock samples can be identified using a hand lens, but many details (many minerals and most microfossils) cannot be determined at low magnifications. To identify these, chips of rock are mounted on glass and ground down to a thickness of 32 microns (about the thickness of a human hair). These ‘thin sections’ of rocks are transparent and can be studied under a microscope allowing the minerals to be identified and various microfossils to be determined. The results indicated that the majority of the rocks in the cores belonged to the White Limestone Group (the main limestone unit in Jamaica), and that this rested on Cretaceous (about 140 million years old) volcanic rocks. This is not the standard succession one would expect in this area where the Cretaceous should be overlain by more than 100 metres of Yellow Limestone followed by the White Limestone. Clearly, the succession in the boreholes is not a natural succession and indicates either the presence of a fault or that the White Limestone is part of a landslip.

Landslide Material Identified
The laboratory investigation was followed up by site visits to understand the position of the boreholes and to investigate the rocks found along the new road cuts along the highway. The new field data was integrated with the borehole data from Bouygues to refine the geological map of the area. The revised geological map shows a thin block of Cretaceous rocks extending east west and separated from the White Limestone to the south and north by faults. The steep terrain coupled with the faults has led to the development of major landslide deposits - large to very large blocks that have been cemented together by calcium carbonate (dripstones or travertine) deposited by water flowing between the blocks. The result is a very thick deposit of landslide material that overlies the volcanic rocks.

Valuable Geological Maps
Now that the geological research problem has been satisfactorily resolved, it is now on to finding a suitable engineering solution that will allow the completion of this part of Highway 2000. The application points to the importance of understanding the geology of Jamaica, and particularly the value of accurate up-to-date geological maps. The new series of geological maps being produced by the Department of Geography and Geology will have many more applications related to construction of Jamaica infrastructure, the search for valuable minerals, and the pressing problems of water supply on the island.

Simon Mitchell is Professor of Sedimentary Geology and has been researching the geology of Jamaica for the last 15 years; he has published more than 100 refereed papers.
simon.mitchell@uwimona.edu.jm
At present the most developed part of the research activity of the Department of Mathematics can be characterized as “Mathematics and Modelling”. It comprises such fields as stochastic analysis, physiological fluid dynamics, and mathematical physics.

The Department of Mathematics Helping the Health Sector and Others

At present the most developed part of the research activity of the Department of Mathematics can be characterized as “Mathematics and Modelling”. It comprises such fields as stochastic analysis, physiological fluid dynamics, and mathematical physics.

Stochastic Differential and Difference Equations
Stochastic equations are used to model real-world systems that are subject to interference in the form of random external perturbations or feedback noise. This interference can have a dramatic qualitative effect on these systems and should therefore be included in any analysis of their behaviour. For example, population models may be designed to reflect the unpredictable effects of disease and environment, as well as classical predator-prey, birth-death dynamics. The Stochastic Dynamics group presently includes Professor Rodkina, Dr. Kelly, a PhD student and several international collaborators.
Physiological Fluid Dynamics
Physiological fluid dynamics involves the study of idealized model problems (either experimental or theoretical) that characterize the key features of flows in the body. Being an interdisciplinary subject, its development is due to the close interaction between engineers, mathematicians, physicists, biologists and physiologists. Mathematical models have proved to be powerful tools for understanding not only the normal, but also the diseased conditions of the physiological systems. The information gained from such studies has contributed to the improved efficiency in
• the diagnosis of various arterial diseases,
• the appraisal of newly found treatment procedures,
• designing of artificial organs.

Some of the models that have gained interest in understanding the physiological systems are
1. Modelling of flow in stenosed arteries;
2. Modelling of flow in catheterized vessels;
3. Modelling of Dispersion/Transport phenomena in cardiovascular system;

The objective of these models is to understand the physiological process through mathematical models and fluid dynamic principles and the results obtained from these mathematical models compare with the experimental or measured results. This research is led by Dr Ponakala and includes a PhD student and several international collaborators.

Mathematical Physics
Mathematical physics is a discipline concerned with the application of mathematics to problems in physics, and with the development of mathematical methods suitable for such applications and for the formulations of physical theories. The term mathematical physics denotes research aimed at studying and solving problems inspired by physics within a mathematically rigorous framework. For this reason mathematical physics covers a very broad area of topics having the common feature that they blend pure mathematics and physics. Research activity is mainly focussed on
1. General Relativity, Differential Geometry, and Noncommutative Geometry inspired solutions of Einstein field equations;
2. Quantum Field Theory in curved space times;
3. Spectral theory of Schrödinger, Dirac and Klein-Gordon operators;
4. Quantum Gravity:

and is led by Dr Davide Batic. This is a collaboration with Dr Piero Nicolini (University of Frankfurt, Germany), Dr Marek Nowakowski (Universidad de los Andes, Colombia), Dr Monika Winklmeier (Universidad de los Andes, Colombia) and Prof Gian Michele Graf (ETH, Switzerland).

Davide Batic’s research interests lie predominantly in the area of Mathematical Physics, particularly with respect to the interfaces Differential Geometry/General Relativity and Functional Analysis (Spectral Theory of unbounded self-adjoint operators)/Quantum Field Theory in curved space-times.

Nagarani Ponakala’s research interests focus on Physiological Fluid Dynamics, Differential Equations and Numerical Methods. nagarani.ponakala@uwimona.edu.jm

Conall Kelly’s research deals with qualitative properties of stochastic difference equations; stochastic numerical analysis; stochastic functional differential equations and discrete-time phenomenological models of stochastic phenomena.

Alexandra Rodkina is head of the Department of Mathematics and is interested in stability, stabilization and control of stochastic dynamical systems, asymptotic behaviour of solutions of nonlinear stochastic functional-differential and difference equations, stability of numerical methods for nonlinear stochastic equations, applications in mechanics, engineering, Mathematics of Finance, Risk Theory, Credibility Theory, and Modelling of Biological Systems.

alexandra.rodkina@uwimona.edu.jm
Why Study Health Effects of Mobile Phone Radiation

Mobile or cellular phones have become an integral part of our modern society. Currently there are over 4.6 billion mobile phone subscriptions worldwide. Given the large number of mobile phone users, it is important to investigate, understand and monitor the potential health risk associated with the mobile phones’ radiation exposure.

Mobile phones communicate by transmitting radio waves through a network of fixed antennas called base stations. Radiofrequency waves are electromagnetic fields, and unlike ionizing radiation such as X-rays or gamma rays - cannot break chemical bonds or cause ionization in the human body. Thus the long-term effects of exposure to electromagnetic radiation still remain unclear. While some studies have found a connection between cell phone use and cancer, more research is clearly needed to develop a better understanding of how electromagnetic radiation affects the human body.

Measuring Absorption of Cell Phone Radiation of the Human Body

The best way of measuring the quantity of radio frequency energy that is absorbed by the body is by measuring the specific absorption rate (SAR). A cell phone that passes the F.C.C. certification must have a maximum SAR level of less than 1.6 W/kg (watts per kilogram) in the USA and Canada. In Europe, the level is limited to 2 W/kg.

Exposure Levels

Mobile phones are low-powered radiofrequency transmitters, operating at frequencies between 450 and 2700 MHz with peak power in the range of 0.1 to 2 watts. The handset only transmits power when it is turned on. The power (and hence the radiofrequency exposure to a user) falls off rapidly with increasing distance from the handset. A person using a mobile phone 30-40 cm away from the body (texting, Internet/email services or using a “hands free” device) will have a much lower exposure to radiofrequency fields than someone holding the handset against his/her head. Exposure is also reduced by limiting the number and length of calls. Using the phone in areas of good reception also decreases exposure as it allows the phone to transmit at reduced power.
Health Effects of Cell Phone Radiation

A large number of studies has been performed over the last two decades to assess whether mobile phones pose a potential health risk. These can be classified as short or long term effects. Short-term effects primarily manifest themselves as tissue heating. At the frequencies used by mobile phones, most of the energy is absorbed by the skin and other superficial tissues, resulting in negligible temperature rise in the brain or any other organs of the body. While for adults this may not be a significant effect, evidence suggests that children may be at greatest risk of effects from such tissue heating. Potential long-term effects of cell phone radiation are being examined; these include brain tumours and their relationship to mobile phone use. However, because many cancers are not detectable until many years after the interactions that led to the tumour, and since mobile phones were not widely used until the early 1990s, epidemiological studies at present can only assess those cancers that become evident within shorter time periods. However, results of animal studies thus far have shown no increased cancer risk for long-term exposure to radiofrequency fields.

While an increased risk of brain tumours is not established from INTERPHONE data, the increasing use of mobile phones and the lack of data for mobile phone use over time periods longer than 15 years, warrant further research of mobile phone use and brain cancer risk. In particular, with the recent popularity of mobile phone use among younger people, and therefore a potentially longer lifetime of exposure, WHO has promoted further research on this group. Several studies investigating potential health effects in children and adolescents are underway.

Mobile Phone Research

Medical physics students have been carrying out interviews with students from the University of the West Indies, high school and primary school children (age range 26-10 years) to assess the current use of cell phones and exposure levels. Over 750 students from UWl, Mico Practising & Junior High School, Alpha Primary School and Bridgetown High were interviewed, [face to face] using standardised questionnaires. Exposure to radiation was calculated using the Time, Distance, and Shielding factors and SAR values of the cellular phones used.

The Study Results were as Follows:

Cell Phone Usage
Statistics have shown that primary and high school students use about 45% of their time mainly to talk and 45% to text on their cell phones; whereas the university students highly use their cell phones for internet services.
The primary and high school students share 90% of their cell phone time between talking and texting, while the university students use their mobiles primarily for internet and email.

Types of Cell Phone Used
The cell phone brands most commonly used by primary and high school students were Nokia, Samsung and Motorola; for university students the most common cell phone was Blackberry.

Cell Phone Accessories
Only 10% of the respondents reported the use of their cell phones with hands free head sets, blue tooth or on speaker mode.

Carrying the Cell Phone Around
The results have shown that 70% of the participants keep their cell phones in their skirt or pants pockets.

Age for a First Cell Phone
The survey results have shown that school children first own a cell phone as early as age 3, with gradual increase to age 12. In addition, over 80% of these respondents were between 10-12 years old. Most of the students over 12 own at least one mobile phone.
Signal Strength
Approximately 85% of the participants reported a good signal strength from their service providers.

Cell Phone Safety
Speculation as to the safety of cell phone use has been common in the media in recent years. Some of what has been written about cell phone safety has been balanced and well-informed. However some of it has had no scientific basis.

In the short-term, therefore, it seems wise to take steps to minimise one’s exposure to cell phone radiation where possible. Those who wish to minimise the risks that they run in using their cell phones therefore need to do two things: minimise the amount of radiation emitted by their cell phones and minimise the proportion of that radiation that they absorb.

The following steps are recommended for safer use of your cell phones:

**Five Steps to Safer Cell Phone Use**

**Step 1:** Buy a Cell Phone With a Low SAR Rating.

**Step 2:** Join the Cell Phone Network With the Best Coverage in Your Area.

**Step 3:** Only Use Your Cell Phone When You Have a Strong Signal.

**Step 4:** Don’t Obstruct Your Cell Phone’s Antenna.

**Step 5:** Use a Land-Line for Long Conversations.

**The Bottom Line: Who is at Risk?**

Children are biologically more vulnerable and are at higher risk from cell phone use. Pregnant women should also minimise the exposure to cell phones because of potential effects to the developing embryo. People with frequent and prolong use of cell phones as well as those already suffering from degenerative conditions should aim to reduce their exposure. Finally people that are nutritionally compromised should be aware that their body’s ability to repair damage from cell phone radiation may be hindered.

Mitko Voutchkov is a professor in Applied Nuclear & Health Physics at the Department of Physics and a leader of the Materials & Medical Physics Research Group. 
mitko.voutchkov@uwimona.edu.jm

Tamar Richards is a final year student majoring in Medical Physics.
UWI researchers are interested in checking the air and water quality and noise levels in an area approximately 5 km (≈ 3 miles) south of Old Harbour and approximately 48 km (≈ 30 miles) west of Kingston, the capital of Jamaica. The area being studied is a mixture of residential, industrial, agricultural and commercial. There are approximately 28,538 persons residing there.

UWI is particularly interested in this area because of the existence and operations of the power generating station, Jamaican Energy Partners facility, located at Old Harbour Bay. This facility comprises two power generating barges (Doctor Bird I and Doctor Bird II), which have a combined generating capacity of 124 MW or approximately 15% of Jamaica’s electrical power supply. Doctor Bird I was commissioned in 1995 with a generating capacity of 74 MW, while Doctor Bird II was commissioned in 2006 with a generating capacity of 50 MW.

The Potential Environmental Impact from a Power Generating Facility on a Rural Jamaican Town
Jamaica’s Increasing Demand for Electricity

With Jamaica’s increasing demand for electrical power, there is always need to install additional generating capacity. There are three main reasons why additional generating capacity is needed:

1. Load growth
2. The need for more efficient power generation to replace old and inefficient units on the grid
3. The need for generation in or close to major load centres.

The proximity of this facility to residential areas and the reasons given above mean that there is a strong possibility that additional generating capacity will be sited in that area. Therefore this study will concentrate on assessing the potential impacts of noise, air and water pollution from the facility on the communities within the area – in the present and in the future.

To conduct this assessment, baseline information (pre barge scenario) where possible will be collected from literature research, and compared with data collected when Doctor Bird I was commissioned and operational and when Doctor Bird II was commissioned and operational. This spans a time-frame of over 15 years. Additional modelling will be conducted to determine what, if any, will be the potential impacts on the environment and population, in relation to the three main areas above.

Noise
Noise pollution in proximity to the generating barges is not only as a result of their operation, but also from some impacts that can be attributed to the JPSCo Old Harbour Plant and from cultural activities such as street dances. While the barges generate noise, measures are in place to minimize their impacts, such as sound proofing and silencers on the stacks.

Noise data are collected at twelve locations continuously over twenty-four hour periods (24hr) annually, by using Quest Technologies SoundPro DL Type 1 metres with real time frequency analyzers placed in outdoor monitoring kits. These locations are spread on the facility and communities within proximity.

At the end of each 24-hr period the data are downloaded and analyzed for noise levels and frequencies, and statistical analyses are conducted. The noise climate at each station is thus determined and is compared to that of previous years to see what changes there may be, and to determine the contributory causes of such changes.

Air
Air pollution is minimal when placed in context of the background values and other sources. One of the ways in which the power barges minimize the amount of sulphur being generated is by the selection of fuel with low sulphur content. Ambient air quality stations are set up at two locations. These monitor PM 10, SOx, NOx, wind-speed and direction. In addition, three Tisch hi vol PM10 samplers running 24 hours are set up, in or close to the communities.

Water
Power generating barges appear to have greatest impact in the surrounding waters where water temperature is the key factor. The design of the cooling water discharge (pipe length and depth) has minimized the extent of potential impacts from elevated water temperatures. Water quality sampling is conducted at 20 locations. In situ readings are conducted by using a YSI 556 MPS and Hydrolab DSS multi parameter sampler. Parameters collected in situ include temperature, salinity, conductivity and pH.

Whole water samples are collected in bottles and sent to the Environmental Technical & Analytical Lab to be analysed for heavy metals.

Temperature is important, as the barges utilize sea water for cooling; there are two cooling water discharge points.

Nearby communities are at minimal risk and no residential developments are recommended in close proximity to the barges.

Dale Webber, supervisor of the project, is the James S. Moss-Solomon, Senior, Professor of Environmental Management, Head of the Environmental Management Unit and Director of the Centre for Marine Sciences in the Department of Life Sciences at the University of the West Indies, Mona Campus. webber@uwimona.edu.jm

Carlton Campbell is a PhD candidate in the Environmental Biology programme in the Department of Life Sciences at the UWI Mona Campus. He is Managing Director of CL Environmental Company, a Council-certified Indoor Environmental Consultant with the American Council for Accredited Certification, and a member of the Jamaica Institute of Environmental Professionals. clemenviro@cwjamaica.com
SOCIAL SCIENCES

Dr. Gillian Mason

Dr. Lila Rao

Mr. Gavin Daley, Dr. Lloyd Waller, Mrs. Shakira Maxwell, Dr. Kevon Rhiney, Darron Thompson (missing)
There is a known history of abuse in many intimate relationships in Jamaica. However, it is only in the last few decades that public efforts have been made to address this social problem. Part of these efforts focus on providing services to women in abusive relationships (WARs). It is important from various angles (e.g. psychological, economic, social) to identify appropriate and effective services for these women. Therefore it is imperative that policymakers as well as organisations that seek to provide services understand the nature of intimate partner violence (IPV) in Jamaica. This includes understanding how WARs seek help for the abuse and what type of help has or has not worked for them. This book reports on a study which is the first to examine these topics in depth, and which focused on understanding WARs’ decision to seek help, to whom they turned for help and what influenced those choices.
Data collection was mainly through extensive interviews with 20 mostly low-income Jamaican WARS. These interviews provided data to help identify factors from various sources (e.g., the abused woman herself, the couple, the woman’s immediate surroundings and the wider Jamaican society) that affect the help-seeking process. Analysis of the data led to the development of a theory of the help-seeking process, which was subsequently assessed with data garnered through interviews with eight other low-income WARS.

One main finding from the study was identifying participants’ motives for help-seeking, namely, severity of the abuse and feelings of frustration associated with the abuse and/or the abuser. Overall, severe abuse prompted women to seek help, but over time, feelings of frustration became the dominant motivator. In addition, as time passed and feelings of frustration increased, WARS sought help from a wider range of sources and increased their intentions to end the relationship. Recognising these motives and their relationship to time can help organisations as they determine strategies for providing assistance to WARS.

Other key findings directly concern the Jamaican context. First, frequent exposure to community violence sensitizes physically abused WARS to seek help. Second, within some communities there is an expectation of IPV that negatively affected participants’ decisions to seek help, as well as the response of those from whom help was sought. Many participants experienced dismissal of their cries for help from those persons who saw the abuse as a normal occurrence in intimate relationships. Some WARS also delayed their help-seeking efforts as they either accepted the abuse as natural and/or expected potential helpers to be unsupportive. This information indicates other issues that should be considered when planning how to challenge IPV.

The data showed that informal systems - namely, family and friends - are the persons most often turned to for help, with the police the most frequently contacted formal system. Participants consulted various other types of helpers such as medical professionals, co-workers, pastors, the court system, counselling organisations such as Woman Inc. and the Victim Support Programme, and neighbours. Among formal services, counselling organisations most consistently received positive ratings, while participants rated the criminal justice system poorly for the inconsistent quality of its services.

The wide range of helpers appealed to by participants suggests a need to provide education to the public in general about IPV, so our society does not continue to contribute to the occurrence of abuse. In addition, more training should be given to formal service providers on how to respond to WARS. Finally, natural informal supports exist in low-income communities, wherein residents will offer help without WARS asking. This phenomenon, which appears to be a by-product of the Jamaican context, suggests an existing custom that researchers and practitioners should investigate further, as it may be a viable means for providing support to those in need.

Gillian Mason studied Community Psychology and Prevention Research at the University of Illinois in Chicago.

gillian.mason@uwimona.edu.jm
An ontology is a formal description of a domain, which can be shared among different applications and expressed in a language that can be used for human and automated reasoning. It provides a common language that can be used to reduce ambiguity in communication between stakeholders. Ontologies have been identified as important components of various information systems including knowledge management systems, e-business applications and data warehouses.
The research conducted by Dr. Lila Rao and collaborators presents an approach for the development, representation and evaluation of high quality formal ontologies, with a focus on the coverage/completeness quality dimension. This quality dimension has been defined as the extent to which the ontology covers the domain of interest, or alternately as the difference between what is required of the ontology and what is available in the ontology. Our method is an extension of the approach proposed by Gruninger and Fox, and includes the following steps:

1. The development of an Initial Ontological Structure (see Figure 1) using a hybrid approach that combines the Laddering knowledge elicitation technique with prior results on ontologies relevant to the domain of interest.
2. The development of a set of informal competency questions that will be used to help create and evaluate the formal ontology.
3. The translation of the Initial Ontological Structure to the vocabulary of a sorted logic. This provides part of the language for the formal ontology.
4. The specification of a set of axioms describing the concepts and relationships between them. The competency questions will be used to help specify these axioms.

An important application of this method is for the development of disaster recovery plans (DRPs), particularly for Small Island States such as exist in the Caribbean. A DRP focuses on ensuring the speedy restoration of services for critical organizational processes in the event that there are operational failures due to natural or man-made disasters. It aims to minimize potential loss by identifying, prioritizing and safeguarding those organizational assets that are most valuable and that need the most protection.

A comparison of the characteristics of ontologies and the requirements of a DRP shows that an ontology can support the development of an effective DRP in a number of ways, thus:

1. It provides a common language for all stakeholders, thus reducing confusion and ambiguity that may arise when different groups of stakeholders come together to make decisions as is common in disaster recovery planning.
2. The use of a common language in the development of a DRP would facilitate the sharing of DRPs among organizations.
3. If the quality dimensions for DRPs can be addressed through the use of an ontology, it is likely that, if the quality of the ontology is high, then the quality of the DRP will be high. Additionally, as the ontology is a formal description, the evaluation can be automated, which makes the evaluation process more efficient and is likely to lead to improved quality of the ontology.

This method could applied to other regionally-relevant domains, including Healthcare, Sports Management, Tourism Management and Criminal Investigation Management.

Lila Rao is the Academic Director and a lecturer at the Mona School of Business at The University of the West Indies, Mona.

lila.rao@uwimona.edu.jm
In today’s Jamaica it has become very important to know where businesses are and can be located. In order to adequately plan we need to know where the best location for our farms, manufacturing and agro-processing plants are. In order to do this, we must create a map of all that there is there now, so that those in Government can develop a strategy to increase our levels of productivity.

This report is based on data collected over a period of four weeks - from November 06, 2009 to December 04, 2009 - from over five hundred and seventy (570) companies located across Jamaica’s 14 parishes. Businesses were grouped into three sub-sectors: manufacturing (metal and non metallic); mining; and agro-processing. Data were collected using both questionnaires and interviews, with a team of persons from the University of the West Indies, Mona Campus.

The study made note of several interesting findings:

• Industries in Jamaica are very unevenly distributed, being centred only in a few parishes, namely Kingston and St Andrew with the highest number of production processing plants, St Catherine with the second highest number of industrial plants, followed by St James and St Thomas.

• The large majority of companies in the island were involved in manufacturing activities, followed by agro-processing and mining, and most produce goods which are sold locally.

• Business owners told of several problems and challenges with operating in Jamaica. These include the high price of electricity, bad roads, limited access to capital and unavailability of raw materials.
• The majority of businesses stated that they have good access to storage space, adequate and reliable water and power supplies, adequate waste management systems, low cost raw materials, retailers and distributors and skilled labour.
• Crime however, particularly extortion, was reported as having a big impact on businesses, especially those located in Kingston, St Andrew and St Catherine.

Based on the key messages arising from the findings, we propose the following:

1. The setting up of new businesses/industrial parks in sub-regional areas and district centres in order to increase employment opportunities to these places and reduce the levels of internal migration being experienced in some parts of the island. Some areas have also been identified for the establishment of specific industries in Jamaica that will function as complements to the existing mix of industrial enterprises currently in operation.

2. Increasing the number and quality of support services currently being offered to existing businesses, which will help with employment opportunities and the problems of crime and violence, which serve as a big deterrent to investing and doing business in Jamaica.

3. Measures must be put in place to preserve the natural environment and its limited resources. This is in keeping with the goals of the Vision 2030 Master Plan for Jamaica. The project therefore proposes a spatial strategy that can incorporate what the nation needs to promote economic growth and industrial development without compromising the quality of the natural environment.

Lloyd Waller is a lecturer in Research Methods as well as Electronic Governance the Department of Government, UWI and current Director of the Centre for Leadership and Governance, UWI, Mona. lloyd.waller@uwimona.edu.jm

Gavin Daley is an assistant lecturer in Research Methods, the Department of Government, UWI and Research Fellow, Centre for Leadership and Governance. gavin.daley@uwimona.edu.jm

Shakira Maxwell works with the Institute for Gender and Development Studies, UWI and is also a Research Fellow with the Centre for Leadership and Governance. shakira.maxwell@uwimona.edu.jm

Kevon Rhiney is a lecturer in Urban Geography and Urban and Regional Planning, Department of Geography and Geology, UWI. kevon.rhiney02@uwimona.edu.jm

Darron Thompson is a lecturer in the Department of Economics darron.thompson@uwimona.edu.jm