CLINICAL TRAINING OF UNDERGRADUATE COMMUNICATION PATHOLOGY STUDENTS IN NEONATAL ASSESSMENT AND NEONATE-CAREGIVER INTERACTION IN SOUTH AFRICA

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ABSTRACT

Developing an undergraduate clinical training module in Early Communication Intervention (ECI) that provides sufficient opportunity for students' learning experiences, and that allows contextually relevant and ethically accountable services to clients, as well as the dissemination of the latest scientific findings to both students and clients, poses a significant challenge. The article describes the development of a clinical training block and the development of an appropriate instrument for the assessment of neonatal communication skills that was used in this student practical. A qualitative research approach, employing a series of formative assessments, was used to refine the instrument. The results indicated changes in the content and use of the neonatal assessment instrument regarding the approach to infant and caregiver risk assessment; caregiver beliefs about neonatal capabilities; newborn state observation; caregiver training; language, cultural and age barriers; collaboration with nurses; kangaroo mother care; involvement of caregivers during the assessment; and adolescent mothers. The results confirmed the need for the ongoing refinement of an instrument to ensure quality training of students in the difficult field of neonatal assessments and neonate-caregiver interaction. The results also highlighted to the importance of initiating ECI services before birth in communities at risk for infant neglect and abuse, and the close relationship between ECI service delivery and student training.

INTRODUCTION

Early Communication Intervention (ECI) has evolved as an important and new field within Speech-Language Pathology and Audiology internationally. The field was introduced to Speech-Language Pathology curricula in South Africa following the South African Speech-Language Hearing Association (SASLHA) position statement on ECI (Louw, 1997) and decisions taken by the different departments at the universities which offer Speech-Language Pathology and Audiology programmes. The University of Pretoria started formal clinical training in ECI in 1990 when the Clinic for High Risk Babies (CHRIB) was established (Kritzinger & Louw, 2002).

Since the introduction of ECI in South Africa, its training has been influenced by changes in the profession that were prompted by the political and societal transition in the country. During the past decade, various authors within the field of Speech-Language Pathology and Audiology in South Africa have advocated a transformation in tertiary teaching programmes in order to meet the demand of providing speech-language services to all those who require intervention (Kritzinger, Louw & Hugo, 1995; Moodley, Louw & Hugo, 2000; Pillay, Kathard & Samuel, 1997). In this regard, the importance of tertiary education as the only basis for effective and high standard services (Uys, 1993), and the ideal that teaching should anticipate and react to the needs of clients, was emphasized (Uys & Hugo, 1997). Furthermore, the implementation of appropriate service delivery models based on community needs and resources (Fair & Louw, 1999; Tuomi, 1994) and a strong emphasis on prevention and early intervention was proposed (Hugo, 1998; Louw, 1997).

ECI training has also been influenced by changes in tertiary level teaching approaches, characterized by learner-centredness, relevance, integration, critical and creative thinking, and a holistic approach to learner assessment (Gultig, Lubisi, Parker & Wedekind, 1998). The new education approach moved away from formal lectures to outcomes-based education, and represents a radical departure from a rigid separation between a content-based education component and a training arena that involves the gaining of skills (Le Grange & Reddy, 1998). The implications for ECI curriculum design are that the traditional dichotomy of theoretical knowledge and its application in practice should be viewed as an integrated process, attempting to create authentic learning experiences both in the classroom and in clinical settings. Consequently, the outcomes of authentic learning experiences in ECI involve considerably more than the accumulation of knowledge, and include the achievement of relevant skills, as well as shaping learners' attitudes and values regarding families requiring ECI, their communities, the collaborators in the process and the advancement of the field of ECI in South Africa.

Since learning, teaching and assessment are inextricably linked in an outcomes-based education curriculum, the centrality of learners and their knowledge, experiences and needs should also be reflected in the assessment procedures that are selected (Gultig et al., 1998). Although several components of a coherent assessment system are described in outcomes-based education, the element of formative assessment appears to be particularly advantageous for curriculum design in ECI. Formative assessment can be conducted while the learning process takes place and may be used to influence and inform both the learning process as well as the teaching process. The learner is provided with

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guidance in the form of self-assessment and feedback through peer-assessment and teacher-assessment. Since learners themselves are regarded as sources of knowledge, this kind of assessment also guides the teacher's planning and allows for the critique of outcomes, methodology and materials (Gultig et al., 1998; Le Grange & Reddy, 1998). Formative assessments can therefore be used to develop an ECI curriculum responsive to the needs of the learners as well as the needs of the clients requiring ECI services, which can increase the standard and effectiveness of ECI training and the services that are provided.

Since many infants and young children in South Africa are at risk for developmental delay, neglect and abuse due to low birth weight and poverty related factors (Central Statistical Services, 1997), the newborn period offers a unique opportunity to intervene early in order to prevent adverse developmental outcomes in infants. Whilst the mothers and their newborn infants are still in hospital after delivery and in the beginning stages of postnatal attachment, the first few days of an infant's life are important to provide information to caregivers and to possibly prevent neglect, abuse and delayed development. By demonstrating the remarkable communication interaction capabilities and listening skills of newborns to the caregivers, they may also be alerted to the importance of responsive interaction to facilitate the infants' early development. At the same time, students can be trained in the complex field of neonatal assessments and neonate-caregiver interaction by applying a neonatal assessment instrument upon which inferences of a newborn infant's communication behaviour can be made and demonstrated to the mother in order to enhance the infant's communication development.

Developing an undergraduate clinical training module in ECI that provides sufficient opportunity for students' learning experiences in contexts of increased complexity, that allows the provision of contextually relevant and ethically accountable services to clients, as well as the dissemination of the latest scientific findings to both students and clients, poses a significant challenge to curriculum developers. The main aim of the article is to describe how a specific clinical training block was developed as part of a module in the ECI curriculum. Central to the development of the clinical block was the design of an appropriate clinical tool for the assessment of neonatal communication skills by undergraduate students. The sub-aim is therefore to describe the process of clinically training undergraduate Communication Pathology students in a public hospital outside Pretoria in neonatal assessment and neonate-caregiver interaction by using the *Neonatal Communication Assessment Instrument* (Kritzinger, 1994; See Appendix A).

METHOD

A phenomenological approach was employed as a qualitative research strategy to develop and refine the *Neonatal Communication Assessment Instrument*. In addition, a naturalistic method of study was used to describe the meaning of experiences recorded by students during their practical training (Fouche, 2002). Students' written reports on the clinical application of the assessment instrument during their annual practical training were analysed by means of a series of formative evaluations (Fouche, 2002; Gultig et al., 1998; Mitchell, 1991). As the aim of the research was to evaluate processes, practices and outcomes in order to decide on modifications of the *Neonatal Communication Assessment Instrument*, a formative evaluation process was used.

The formative evaluation process involved comparing the students' reports with the stated outcomes of the training module in order to identify limitations in the assessment instrument (Le Grange & Reddy, 1998). Since the initial design of the instrument in 1994, the neonatal assessments carried out annually by each cohort of students in the same public hospital was followed by a formative evaluation process and the application of changes to the instrument, thereby creating a continuous feedback loop in order to refine the *Neonatal Communication Assessment Instrument* and its clinical application.

PARTICIPANTS

Neonatal assessments have formed part of an ECI practical block at the Department of Communication Pathology, University of Pretoria since 1995 (See Appendix B). The formative evaluation process was conducted during the period of 1995 to 2002 and between 6 and 40 second year students were annually involved as participants in the study (See Table 1).

The students were informed that their written reports on their learning experiences with neonatal assessments would be used in a research project in order to refine the assessment instrument and to improve the authenticity of the learning experience. Students who gave individual informed consent to participate in the research were requested to submit their reports once marks had been allocated following completion of the module. The average age of second year students was 20 years. While all the second year students were required to participate in the compulsory training module, which required them to learn and gain experience in the use of the *Neonatal Communication Assessment Instrument,* but only some students agreed to participate in the study (See Table 1).

Table 1. Numbers of students completing the training module and participating in the study.

Year	Students completing the module	Students acting as participants
1995	36	7
1996	30	6
1997	36	8
1998	34	9
1999	39	10
2000	43	9
2001	47	42
2002	44	39
Total	**309**	**121**

MATERIALS

A comprehensive neonatal communication assessment instrument which includes the following components, was compiled (See Appendix A):

- *Prenatal, perinatal and environmental risk factors* (Kritzinger et al., 1995). A checklist was used to determine the mother-infant dyad risk profile. This particular risk assessment is intended for neonates born *at term,* and although the perinatal risks associated with infants born preterm and with low birth weight are not expected, it is still important to identify prenatal and perinatal conditions that may possibly increase an infant's risk for communication delay (Rossetti, 2001).
- *Mother-infant communication interaction* (Klein & Briggs, 1987). Since the earliest interactions between a mother and neonate set the stage for communication development (Billeaud, 1998), the quality of neonate-caregiver interaction should be assessed in order to intervene as early as possible.
- *Neonatal states* (Brazelton, 1984). A neonate's state of alertness depends on physiological and environmental factors that should be utilized as a lens through which samples of behaviour obtained during the assessment are interpreted (Rossetti, 2001).
- *Feeding behaviour* (Wolf & Glass, 1992). Sine early feeding difficulties have been found to be predictive of later communication development (Kritzinger, 1994) and are considered to be one of the risk factors for communication disorders (Rossetti, 2001) an assessment of the manner and quality of the feeding process is imperative.
- *Precursors to language content, form and use.* Early interactive abilities and listening skills of newborns suggest that they are "prewired" for communication, and are related to the neonates' future communication development in content/form/use interactions (Lahey, 1988; Owens, 2001). These neonatal abilities should be assessed as they enable infants to participate actively in reciprocal interaction with their mothers. The absence of these typical behaviours in term newborns should be investigated further in order to identify risks for communication disorders and hearing impairment as early as possible.
- *Precursors to cognition.* Since cognitive and communication development are closely related, it is important to assess the early adaptive behaviours displayed by neonates (Owens, 2001) in order to obtain a comprehensive sample of neonatal communication skills.

The assessment instrument was designed for neonates from birth to 28 days old, and their mothers, and the assessment was based on the presence or absence of neonatal and caregiver behaviours, observed or elicited by the examiner.

The instrument was used to assess the communication skills of neonates born at term, to assess the mother-infant interaction and to provide the mother with feedback on her infant's communication capabilities and readiness for communication interaction. The mothers and their newborn infants resided in the 40-bed maternity ward of Kalafong Hospital, a large tertiary care hospital situated on the outskirts of Pretoria. The hospital is utilized by the University of Pretoria as a training site for students from different disciplines. The students' training block in the maternity ward of this hospital formed part of a prevention programme for speech-language and hearing problems in neonates.

VALIDITY AND RELIABILITY

In order to enhance the face validity of *the Neonatal Communication Assessment Instrument* the tool was structured in such a way as to measure the different aspects of neonatal communication behaviours accurately (Kritzinger, 1994). Based on a literature review and the careful consideration of different theoretical models, content validity was adhered to by including an adequate sample of items that represent the concept of neonatal communication abilities and ensuring that all the items actually describe this central concept. The assessment instrument appeared to be reliable since independent administrations over the years by students yielded consistent results of neonatal communication behaviours (De Vos & Fouche, 1998).

DATA COLLECTION AND ANALYSIS

The written reports of each cohort of students were collected every year and the data was analyzed and interpreted using the Huberman and Mile's approach to data analysis in qualitative research (Poggenpoel, 1998). The reports contained written descriptions of observations and reflections on the learning experiences. Using the different components of the *Neonatal Communication Assessment Instrument* and the outcomes of the training module as guidelines, the large volumes of data were condensed, clustered and displayed according to themes. As a result of this process the assessment instrument was continually adapted and the latest version is presented in Appendix A.

Since the first author was also the on-site clinical instructor during the training module, her own observations and theoretical guidelines served as multiple methods of data collection in order to increase the reliability of observations (De Vos, 1998). Although the first author became part of the process, care was taken to avoid influencing the participants' opinions written in their reports. After the practical brief on-site discussions were held with the students in order to facilitate reflection on the theoretical and clinical implications of their learning experiences. The discussions were conducted by eliciting comments from the students and responding to their remarks and not by informing them what they were supposed to have gained from the practical.

In order to interpret the participants' reports accurately, careful analysis of the data was necessary. This process involved close scrutiny of the participants' use of terminology and language that often revealed their inexperience with the subject matter. The displayed data was interpreted according to themes by means of inductive abstraction and generalization (Poggenpoel, 1998).

RESULTS AND DISCUSSION

The results indicated the need for changes in the content and use of the *Neonatal Communication Assessment Instrument* regarding the following themes:

- ***THE APPROACH TO INFANT AND CAREGIVER RISK ASSESSMENT***

Risk assessment has traditionally been the starting point for the early identification of communication disorders and hearing impairment (Rossetti, 2001; Kritzinger, 2000). Initially, only biological risk factors in the mother and infant were considered in compiling a risk profile of the caregiver-infant dyad. The most prevalent biological risk factors identified over the years were adolescent mothers, multiparous mothers with four or more children, maternal HIV/Aids and low birth weight in the infants. All of these risk factors may be associated with poverty conditions that can negatively impact on the mother's ability to care for the infant or to stimulate the infant's development sufficiently (Rossetti, 2001).

The identification of these four biological risk factors in the mother-neonate dyads, led to the inclusion of environmental risk factors, such as maternal educational level, employment, and quality of housing (Samerhoff, Seifer, Baldwin & Baldwin, 1993) in the assessment instrument (See Appendix A). It became clear that an integrated approach to the risk assessment of the caregiver-infant dyad should be followed, since the different risk factors are interrelated (Garbarino & Ganzel, 2000).

Furthermore, it became clear that positive neonate-caregiver interaction and the mothers' enthusiastic responses to the information they received should be viewed as protective factors for further development of the infant (Osofsky & Thompson, 2000). Although long-term predictions based on early assessment results of infants are not possible (Rossetti, 2001), it is important to identify risk and protective factors in order to support and encourage parents to continue to enhance their infants' development, especially when an asset-based approach to intervention is followed (Ammerman & Parks, 1998).

As a result of the increased awareness of the multiple risk factors and the complexity of interactions between risk factors and protecting factors affecting the communication development of newborns in Kalafong Hospital, the need for a long-term prevention programme became clear. In order to design such a contextually relevant programme, caregiver views on neonatal behaviours needed to be considered.

- ***CAREGIVER BELIEFS ABOUT NEONATAL CAPABILITIES***

Understanding caregiver perceptions regarding neonatal capabilities is crucial if they are to be successfully incorporated in ECI. The ECI client base at Kalafong Hospital consists mostly of women living in a nearby township and surrounding areas, and who utilize the state-subsidized health care services provided at the hospital.

Many of the caregivers, even though they were multiparous mothers, believed that their newborn infants were not able to see and hear at birth and that they acquire these abilities only after a few months. The implications of these perceptions could be that mothers are not responsive to their infants or that they may not attribute meaning to their young infants' early communicative signals. Louw and Avenant (2002) identified beliefs and perceptions regarding infants, communication interaction styles in families and child rearing patterns in different cultures in South Africa as factors influencing caregivers' responses to early intervention services. Since these beliefs represent the reality for the mothers and their communities, it is important to deal with the beliefs in a sensitive manner and not to judge the mothers or their perceptions.

The finding that mothers were unaware of their newborns' capabilities led to the active involvement of the mother in the assessment process (Brazelton, 1984) and demonstration to her that the infant had a preference for her voice instead of the assessor's voice, responded to all kinds of sounds, made eye contact and imitated facial movements. Depending on the students' skills to elicit and demonstrate responsive interaction with the neonates (Salmon, Rowan & Mitchell, 1998), the mothers usually responded with surprise, and their increased interest in their infants could still be observed at the end of an afternoon's session.

Although the long-term benefits for the neonates' communication development was beyond the scope of the current research project, the prevention programme for speech-language and hearing problems in neonates in the maternity ward of Kalafong Hospital, suggested the need for a multilevel framework for ECI public service delivery in South Africa. Consequently a conceptual framework was developed, incorporating community-based and institution-based models of service delivery, with a strong focus on prevention of communication disorders in young children.

The framework, illustrated in Table 2, includes the basic components of an early intervention service delivery system (Fair & Louw, 1999) but also indicates the different contexts *where* caregivers and their young infants may be identified, *what* the various professional functions in these contexts may entail and *who* are the different collaborative partners for information exchange. Lastly, the framework makes provision for the long-term follow-up of young children and their caregivers at different levels of care, beginning in the antenatal period, where expectant mothers may be alerted to the importance of their unborn children's future communication and literacy development, and advancing through the neonatal and postnatal periods to the toddler years. As indicated in Table 2 the shaded portion highlights the neonatal period when the practical block described in this article is undertaken every year in the maternity ward of Kalafong Hospital.

- ***LANGUAGE, CULTURAL AND AGE BARRIERS***

South Africa's multicultural and multilingual populations lead to barriers in service delivery, and present a challenge to ECI clinicians to communicate effectively with their clients.(Louw & Avenant, 2002). The students and mothers often did not share the same

Table 2. Conceptual Framework for Early Communication Intervention Public Service Delivery in South Africa

Service delivery model according to child's age	Context where caregivers can be reached	Functions of professional involvement	Collaborative partners for information exchange
Before infant is born: Community-based	Antenatal care clinic at primary health care centre	Raising awareness of: - Normal communication and literacy development - Importance of stimulation	- Pregnant mothers - Community nurses - Speech-language therapists / early interventionists
Neonatal period: Institution-based	- Maternity ward in hospital - Neonatal Intensive Care Unit	- Determine neonate's risk profile - Screen neonate's communication and hearing abilities - Facilitate interest in neonatal communication abilities and developmental needs - Train mother to stimulate early development	- Mothers and fathers - Extended family members - Nurses in maternity ward - Speech-language therapists / early interventionists - Audiologists
Postnatal period: Community-based	Immunization clinic at primary health care centre	- Serial screening of communication skills - Identify risks and provide intervention - Reinforce interest in stimulating infant's communication and early literacy development - Advocacy for education	- Parents / secondary caregivers - Community nurses - Speech-language therapists / early interventionists - Audiologists
Toddler years: Community-based	- Day care centre - Nursery school	- Provide intervention for children with communication delays - Train parents for ongoing stimulation of child's communication development - Facilitate the implementation of a language and literacy-based preschool curriculum to ensure school readiness	- Parents - Secondary caregivers - Nursery school teachers - Speech-language therapists / early interventionists - Audiologists

language, or presented with limited language proficiency of a shared language and no interpreters were available in the maternity ward. The caregivers often presented with low functional literacy as well. The age difference between some of the caregivers and students was often a communication barrier as people from certain cultural traditions are accustomed to impart knowledge from the old to the young, and not vice versa. These aspects remain challenges, but as the student-caregiver interaction relied on the *demonstration* of the newborn's capabilities, which invariably elicited positive reactions from the caregivers, an atmosphere conducive to improved communication could be created. The advantage for further ECI training in a multicultural and multilingual context was that students had already been exposed to some problem-based learning experiences in clinical situations early in their curriculum.

- ***KANGAROO MOTHER CARE***

Kangaroo mother care is currently viewed as best practice for all neonates in all contexts (Power, 2002). Although Kalafong Hospital runs a very successful kangaroo mother care programme for premature infants (Van Rooyen, Pullen, Pattinson, & Delport, 2002), the practice did not include the full-term neonates in the maternity ward. As a result of the students' previous exposure to kangaroo mother care in another module, and having seen its application with premature infants in the Kangaroo Mother Care Unit of the same hospital, it was clear that the benefits of this neonatal care technique could not be ignored in communities where abandonment and neglect of infants occurs. This technique has proven to benefit the health of the neonate, lactation and mother-infant attachment, which forms the basis of communication development (Hann, Malan, Kronson, Bergman & Huskisson, 1999; Kritzinger & Louw, 1999).

In collaboration with the nursing staff, kangaroo mother care was introduced to the mothers of term neonates, especially those with low birth weight and/or small for gestational age infants, and to adolescent mothers in the maternity ward. The training advantage was that students were able to identify a need and apply their knowledge of recent scientific findings in order to find a practical solution in a real world clinical context.

- ***NEWBORN STATE OBSERVATION***

Identifying the six different newborn states (Brazelton, 1984) is a basic skill to be achieved when conducting neonatal assessments. Since healthy newborns are mostly in an alert state during the first 60-90 minutes after birth, and then mostly in a sleeping state (Rossetti, 2001), it proved to be difficult to find the infant in a quiet alert state to conduct an interactive communication assessment.

Since the students were not experienced in eliciting and maintaining alert states in the infants, it was often not possible to administer the complete

assessment instrument. In order to improve the students' skills in identifying the neonatal states, additional time was allocated to prepare for the practical block and to watch video material on neonatal behaviour in clinical seminars.

- ***COLLABORATION WITH NURSES***

Since an orientation to teamwork represents one of the principles of practice in ECI, the aim was to include the contributions of multiple disciplines (Guralnick, 1997). To integrate and sustain the ECI services initiated by speech-language therapists in the activities of the maternity ward, the value of building trusting relationships between nurses and therapists was shown to be beneficial to the prevention programme. The students commented on the nurses' willingness to offer assistance and to introduce them to the mothers. The implications of these positive interactions with the nurses were that students were introduced to collaborative work with members of the health team at an early stage in their training (Briggs, 1997; Moodley et al., 2000).

- ***ADOLESCENT MOTHERS***

Since the prevalence of adolescent pregnancies in South Africa is high (Department of Health, 1997) this group of caregivers deserves special attention in ECI. The students became acutely aware of the parenting risks for adolescent mothers (Osofsky & Thompson, 2000; Rossetti, 2001) as they shared the same stage of life with these mothers. It was clear that there were personal gains as well as academic advantages for the students in training adolescent mothers who were often disinterested in their infants and lacked basic knowledge about infant development. The students reported that the adolescent mothers often communicated more spontaneously with them than some of the older mothers.

- ***TRAINING OF CAREGIVERS DURING THE ASSESSMENT***

Caregiver training is the cornerstone of ECI (Rossetti, 2001) and should be a priority skill to be achieved in student training. Since the students were still at a junior level of training (second year) and a fair amount of academic preparation was involved in the application of the assessment instrument, a caregiver-training package was developed which they could use with their beginner's skills. The training package consisted of a poster translated into three languages, namely English, Setswana and Afrikaans, and a brochure which could be used to reinforce information about newborn auditory, visual, feeding and communication interactive capabilities, and developmental needs. The training package may be used to facilitate the process of ECI or serve as a model that can be adapted to suit different contexts.

The application of the caregiver-training package acted as one of the underpinnings for the students' further clinical training in providing family-centered ECI services and learning experiences where increased learner responsibility was required.

PRACTICAL BLOCK IN NEONATAL ASSESSMENT AND NEONATE-CAREGIVER INTERACTION AS PART OF A MODULE IN THE ECI CURRICULUM

The results of the study led to the development of a learner-centered practical block in neonatal assessment and neonate-caregiver interaction in which the *Neonatal Communication Assessment Instrument* was an integral component. The practical block, supported by three preparatory clinical seminars, was a small component of the entire ECI curriculum, where the outcomes allowed for a gradual increase in the students' responsibility to manage their own learning experiences, from the protected environment of the classroom to the various clinical settings. Simultaneously, the outcomes of the ECI curriculum facilitated a systematic decrease in supervisor support and clinical instruction over the four years of study (See Appendix C). The shaded area indicates the scope, essential knowledge and outcomes of the practical block in the second year of study, which was described in the article. The content and clinical training component of the practical block in neonatal assessment and neonate-caregiver interaction was dynamic and was adjusted annually in response to student assessment of the learning experiences, new developments in the field and new texts that were published.

The outcomes of the practical block were based on a set of characteristics relating to the practical training in the ECI curriculum at the Department of Communication Pathology, University of Pretoria, and these features are presented as follows:

1. Outcomes are demonstrations of competence and students are expected to use essential knowledge and carefully planned learning experiences in clearly defined performance contexts to achieve the desired competencies for each learning unit/module.
2. Learning tasks and outcomes become increasingly more complex as students progress over the four years of study.
3. The outcomes of the junior years of study act as enabling outcomes or stepping-stones to the ultimate outcomes in the final year of study.
4. Students accumulate learning experiences during every year of study and use all the prior knowledge, skills and developing professional conduct in each new learning task, resembling a spiral of learning.
5. The scope of praxis increases over time to include different service delivery contexts, and provides various opportunities for rich learning experiences.
7. There is a gradual increase in learner responsibility for managing own learning experiences with a gradual decrease in supervisor support and clinical instruction over the four years of study.
8. The ultimate goal is for students to use their knowledge, skills and professional conduct to be innovative, competent, adaptable and self-motivated in ECI service delivery in South Africa.

(Based on Killen, 1999; Spady, Killen & Rand, 2000)

Figure I was compiled to demonstrate that authentic learning experiences in ECI clinical training depend on a carefully designed curriculum as well as a contextually appropriate service delivery model, as presented in Appendix C and Table 2. Since the aim of clinical training was carefully designed learning experiences in a real world context, an interdependent relationship existed between the curriculum and service delivery that anticipated and responded to ECI client needs.

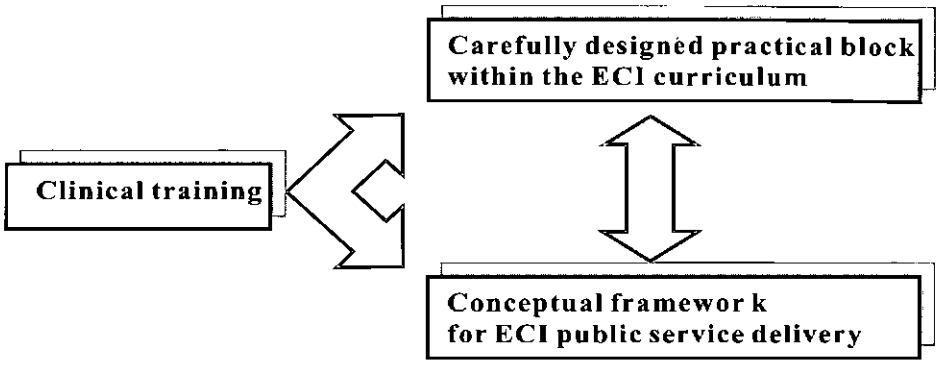

Figure I: Interdependent components of authentic learning experiences in ECI clinical training

CONCLUSION

The results confirmed the need for the ongoing refinement of an instrument to enhance the quality training of students in the difficult field of neonatal assessments and neonate-caregiver interaction. It appeared that it was not only essential to design a valid and reliable assessment instrument, but also to develop appropriate strategies and techniques to administer the assessment tool in specific contexts. There is a dearth of clinical training instruments with relevant procedures in ECI that can be used in the South African context. The development of the content and procedures of the *Neonatal Communication Assessment Instrument* was an attempt to bridge the gap between theory and practice in learning, and to present a clinically proven tool in an accessible format.

The development of the training block represented one of the enabling steps in the spiral of learning created by the entire ECI curriculum over four years of study.

The results also emphasized the importance of the relationship between clinical teaching in ECI and the needs of the communities that provide these rich learning experiences. In order to maintain a prevention focus, it is most important to initiate ECI services not only from birth onwards, but also from before birth in those communities at risk for infant neglect and abuse. Therefore, authentic learning experiences for students should be comprehensive, contextually relevant, ethically accountable and disseminate the latest scientific findings appropriately. Such learning experiences must be supported by a carefully designed curriculum and guided by a conceptual framework of service delivery.

This report illustrated how state of the art and advanced theory on neonatal development could be translated to practical applications in a clinical block in order to make a difference at the level of mothers and their newborn infants in Kalafong Hospital.

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Appendix A

Neonatal Communication Assessment Instrument
Kritzinger, 1994 revised 2003
Department of Communication Pathology University of Pretoria

Name	Date of birth
Gender	Age

Risk Assessment

Feature	Description	Risk	Protection
Prenatal conditions			
1.1 Age of mother (18-37years ideal)			
1.2 Gravida (number of pregnancies)			
1.3 Parous (number of children)			
1.4 Smoking, alcohol, drug use			
1.5 Antenatal care			
1.6 Pregnancy: Multiple/single birth			
1.7 Duration of pregnancy*			
1.8 Problems: Emotional, STORCH infections, HIV/Aids, other			
1.9 Family history of sensory-neural hearing loss, speech, language problems			
1.10 Pre-eclampsia / placenta problems			
Perinatal conditions			
1.11 Birth: Normal / ceasarian section			
1.12 Presentation at birth: Normal / breech			
1.12 Instruments used			
1.13 Cord around neck			
1.14 Birth weight*			
1.15 Small-for-gestational age*			
1.16 Apgar score*			
1.17 Infant born at home / in hospital			
1.18 Oxygen received			
1.19 Cranio-facial anomalies			
1.20 Other conditions			
Family circumstances			
1.21 Employment			
1.22 Maternal educational level			
1.23 Marital status			
1.24 Means of transport			
1.25 Health			
1.26 Living conditions			

Remarks:

Assessment of Neonate

2.1 Neonatal state during the assessment						
Sleep: Deep / Light	Drowsy	Alert: Quiet / Moving	Crying			
Stress cues: Yawning, sneezing, splay fingers / toes						
2.2 Oral peripheral examination: Structures						
Lips	Tongue	Palate	Uvula	Cheeks	Jaw	Ears
Oral reflexes: Rooting	Suckling	Swallowing				

2.3 Feeding			
Breast	Bottle	Cup	Naso-gastric tube
Duration:	Quantity: ml	Demand / 3/4 hourly	
Coordinate suckling, swallowing and respiration			
Sucks bottle or breast sufficiently to feed			
2.4 Communication skills			
2.4.1 Precursors of language use			
- Alerts in response to examiner's interaction			
- Makes eye contact: Momentarily / maintained			
- Imitates a person: Eyes widen, opens mouth, protrudes tongue			
- Synchronized interaction with a person			
- Stops crying when picked up			
- Reflexive smile			
- Accepts cuddling			
2.4.2 Precursors of language content			
Reflexive responses when exposed to sound (e.g. high frequency rattle):			
Startle	Eye movement	Moves	Stops moving / Starts sucking
- Attract neonate's attention by vocalizing			
- Neonate shows preference for mother's voice			
- Calmed by a voice			
- Listens to speaker			
2.4.3 Precursors of language form			
- Birth cry			
Cries frequently	Undifferentiated	Differentiated	Responds to other's crying
- Discomfort sounds			
- Vegetative sounds: Suckling, swallowing, yawning, hiccups, sneezing, winds, snoring, coughing			
- Non-reflexive vocalizations			
- Vocalizes in response to interacting			
2.5 Precursors of cognition			
- Attends to red ring: Momentarily / maintained			
- Looks around			
- Protective responses to cloth over face			
- Adapting behaviour following repetitive stimuli			
- Self comforting behaviours: ____ hand to mouth ____ sucks hand ____ uses visual and auditory stimuli from environment			
2.6 Mother-neonate communication interaction (Adapted form Klein & Briggs, 1987)			
- Provides tactile and kinesthetic stimulation			
- Demonstrates enjoyment during interaction with infant			
- Responds to infant's crying			
- Positions herself and neonate for eye contact			
- Smiles contingently at neonate			
- Varies prosodic features of voice when talking to neonate			
- Encourages conversation			
- Responds contingently on neonate's behaviour			
- Modifies interaction in response to neonate's negative cues			

Equipment required: Pen light, red ring, rattle, mobile

General impressions:

Risk factors:

Protective factors:

Key to risk factors

1.7 Duration of pregnancy (Lubchenko, 1987)		
- More than 42 weeks: postmature		
- 38 - 41 weeks: Full term		
- 37 - 38 weeks: Minor prematurity		
- 31 -36 weeks: Moderate prematurity		
- Less than 30 weeks: Extreme prematurity		
1.14 Birth weight (Turner, Douglas & Cockburn, 1988)		
- 3 200g - 3 600g (3 400g) : Average birth weight		
- 1 500g - 2 500g: Low birth weight		
- Less than 1 500g: Extremely low birth weight		
1.15 Small-for gestational-age: Consult Rossetti, 2001, 17		
1.16 Apgar score (Rosenblith, 1992)		
Serious asphyxia: 0 - 3	Moderate asphyxia: 4 - 6	Normal: 7 - 10

Appendix B

Department of Communication Pathology, University of Pretoria
Practical Block in KMP module 223
Neonatal assessment and neonate-caregiver interaction

Clinical activity to be carried out by students
To participate in a prevention programme for speech-language and hearing disorders in neonates in the Maternity Ward at Kalafong Hospital.

Aim
- To screen the hearing and communication skills of full-term neonates by using the *Neonatal Communication Assessment Instrument* (Kritzinger, 1994) and demonstrate the remarkable communication interaction capabilities and listening skills of newborns to their mothers, in order to alert them to the importance of responsive interaction to facilitate the infants' early communication development.

Specific outcomes
At the end of the clinical training you will be able to:
- Apply and integrate the theoretical principles of neonatal development as presented in the Modules KMP 121 and 122 in a clinical context (Owens, 2001; Rossetti, 2001).
- To make a mobile as an example of an appropriate technology, and demonstrate its use as an infant's first toy to a mother.
- To administer and interpret the *Neonatal Communication Assessment Instrument* under supervision.
- To observe and interpret the mother-neonate communication interaction (Klein & Briggs, 1987).
- To develop skills and sensitivity in intercultural communication with mothers.
- To conduct parent training in order to convince the mothers of neonatal communication interaction capabilities and listening skills, and demonstrate the effect of responsive interaction on neonatal behaviour.
- To describe and evaluate a) the different components of the prevention programme for speech-language and hearing problems in the Maternity Ward of Kalafong Hospital and, b) the use of the parent training package (poster and brochure).
- To recognise the importance of teamwork in an early communication prevention programme and collaborate with the nursing staff in the maternity ward.
- To describe the risk factors influencing the communication development of neonates in Kalafong Hospital.
- To understand the importance of planning a pregnancy and the responsibility of parenthood in order to prevent teenage pregnancies.
- To write a report and reflect on your learning experiences.

Study material for the module

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