

LTAD: What About the Coaches?

Matthew P. Lehrer, M.A and Bruce H. Smith, P.G.C.

Visionary, thoughtful, strategic, critical – these are the words that sport administrators use to describe the importance of a long-term athlete development model (LTAD). However, the same thought and effort has yet to be widely applied to the learning trajectory of coaches. Community Rowing Inc.'s Institute for Rowing Leadership (IRL) is using the LTAD model along with applied research concepts to reinvent the model for coaching education in sport.

Few would disagree that the single most important element for the healthy growth of sport is coaching leadership. It is not enough to just have a long-term development plan for athletes; long-term coach development (“LTCD”) must be a priority to achieve both performance goals for athletes and overall societal goals for sport. The developmental pathway for coaches has a highly leveraged impact on the overall direction of sport and on individual athletes, and the LTCD model must be valued and given the same detailed and proactive attention as the LTAD model.

Many sports have coaching education programs that improve the specific skill set of coaches at any given point in time, but these efforts do not provide the systematic, immersive, and sport-specific education curriculum necessary to bring coaches along the developmental pathway from novice to expert. Typically, coaching education efforts administered by National Governing Bodies (NGBs) must serve a wide range of coaches, from newcomer to Olympic level, and as such they use resources to develop coaches spread over a wide range of abilities and locations. Some universities offer a degree program in sports leadership, and there are several programs that offer a broad-based sports education program. All of these efforts do not pay enough attention to the lifetime trajectory of coaches and the necessity for in-depth, long-term development for coaches in a sport-specific context.

To answer a need for strong leadership, Community Rowing Inc. in Boston created an intensive sport-specific curriculum that addresses the educational needs of coaches who will be leaders in the sport of rowing for the next four or five decades of their lives. These coaching fellows make up the backbone of our sport; they are the contact point for athletes all along the LTAD spectrum. More importantly, they are the cornerstones that embody a passionate commitment to rowing in the communities they work in as the most highly leveraged influencers in the re-development of rowing in the United States. The investment in a sport-specific educational program that focuses on lifetime development prepares coaches to share the life-changing aspects of sport with multiple generations of athletes and ensures the future growth and success of rowing in the U.S. for decades to come.



A Critical Need: Leadership

Community Rowing, Inc., the largest rowing club in the world, moved into the new \$17 million Harry Parker Boathouse in October 2008 and immediately encountered a critical issue: a serious shortage of qualified coaches to serve the enormous demand for rowing in Boston. The lack of professional educational opportunities for career coaches resulted in a staff with widely disparate ability levels, and in turn, a widely various experience for our rowers. As a club with a coaching staff of 50-75 full- and part-time coaches, we recognized that a new approach was needed if we were to meet the potential of our mission of “Rowing for All.” However, we did not have a way to provide support or guidance to improve coaches’ skills beyond occasional conferences that provided tips or fragments of new information; there was no opportunity for systematic improvement. Without very strong coaching leadership, CRI’s capacity to serve would be forever limited by small, incremental improvements as coaches gained experience through the practice of their craft.

To respond to this gap in our operations, we established the Institute for Rowing Leadership (IRL) at Community Rowing, Inc. (CRI) (<http://www.IRLatCRI.org>) in the fall of 2010. The IRL was created with a three-pronged approach to develop coaches: a monthly coaching education series, an annual coaching conference, and a full-time, yearlong, post-graduate level rowing-specific coaching education curriculum. The paradigm we constructed to inform all three levels of the IRL was based on reflective practice and applied research, terms that have gained traction in recent years in fields that benefit from the interaction of professional and academic research with daily practice in real-world situations.

The Existing Models for Coaching Education

In the realm of professional education, there have been three primary models – craft, applied science and reflective learning – over the past century, and these models can be applied to sports education with some accuracy. The traditional model of apprenticeship, where student coaches learn from a master coach by emulating the demonstrated/instructed skills, has served in most sports for the past century (Stones & Morris, 1972). This bespoke method of education depends on many circumstances coming together for the coach to gain knowledge, and is limited by the number and quality of masters. There is considerable value in this method but the gaps – inability to scale, limitations on the uptake of new information, and lack of cross-pollination in the community – make this model less than desirable.

Applied science offers a second model for coach education, in which coaches practicing on the front lines are informed periodically by experts on the latest scientific research (Wallace, 1991). While the expert knowledge is valuable, this methodology leaves the coach continually behind the research on a daily basis. Without a mechanism to impact the learning equation from their position within a dynamic environment as coach, there is a built-in lag in the system until expert researchers vet knowledge. In addition, as Wallace notes, this model does not provide coaches with an experienced professional currently practicing to guide the practical application of research in the field.

The third model, reflective practice, actively integrates the learning process with the daily practice of coaching. The reflective practice approach is based on the integration of acquired knowledge



and implementation of this knowledge immediately into practice. Newly gained applied knowledge actively informs the learning process. The reflective model integrates aspects of the craft model and applied science model. In this model, a master oversees the application of knowledge in the field and topical experts provide information on a daily basis from the leading edge of academic research. The process of reflective learning encourages coaches to acquire new knowledge from scientific study to be guided by current best practices of master coaches, and to encode and apply their knowledge as they develop a deeper understanding on the road to a personal and creative expression of their profession.

Engagement with reflective practice, both during and after an event, is important in the development of expertise in coaches (Gilbert & Trudel, 2001). Farres identifies the five key elements of reflective practice as issue identification, self-awareness, critical assessment, experimentation and evaluation (2004). All five of these elements should be incorporated into the feedback loop of daily coaching practice to actively engage the coach as an active contributor in developing his/her coaching expertise. Further, there is a large body of research demonstrating that incorporating this process into a learning community is essential for long-term retention and coach engagement (Gilbert, Gallimore, & Trudel, 2009). The application of coaching knowledge in complex situation-specific problems that are the reality of a coach's daily life is the dividing line between knowledgeable and effective coaches (Côté & Gilbert, 2009). The greatest impact on athletes and a sport is felt when the education of the coaching community is informed by knowledge contributed to the community from both subject experts and coaches in the field working with athletes across the LTAD spectrum on a daily basis.

Effective coaches working with a community of peers equipped with a reflective skill set in real time application is key to the development of a robust coaching community. Through the intentional design of a community of practice (CoP), with all coaches sharing the same passion to deepen their knowledge of a specific subject matter, a network reinforcing and contributing to the overall pool of knowledge by all members is created (Wegner, McDermott, & Snyder, 2002). Leadership is key in developing these types of communities, as coaches have traditionally tended to view their knowledge as a competitive advantage, and this perspective overrides the development of a CoP unless intentionally built and shaped by a skilled moderator (Gilbert, Gallimore, & Trudel, 2009).

The IRL Model of Coaching Education in Practice

With a mission to inspire, instruct, and equip coaches to achieve excellence in the sport of rowing, the year-long Advanced Certificate in Rowing Leadership program was designed to provide coaching fellows both a robust theoretical framework and a substantial volume of experiential learning guided by the reflective practice model. The IRL curriculum is a multi-disciplinary approach to coaching education with three major academic learning tracks and a coaching practicum to apply the classroom knowledge:

- Coaching Methods – Leadership, communication, and the pedagogy of teaching, focused on the teaching/learning interface necessary to be an extraordinary coach.
- Sports Science – A comprehensive review of the science and application of the physiological



and neurological components of performance specifically focused on athletic development of rowers.

- Rowing Administration – A detailed education about off-the-water non-rowing responsibilities critical to being a successful leader.
- Coaching Practicum - A structured internship, which includes mentoring and on-water coaching experience, to implement classroom knowledge in real time.

The year-long program is divided into four academic quarters with classes from each of the academic content streams throughout the year. The Coaching Methods and Sports Science domains make up 33 percent and 34 percent of contact hours in the program, with the Rowing Administration domain encompassing 14 percent of the total hours. For each class, instructors are selected based on their specific expertise in the subject matter, with the majority also possessing sport-specific knowledge of rowing.

IRL COURSE CATALOGUE MATRIX 2015								
	Term 1: Summer		Term 2: Fall		Term 3: Winter		Term 4: Spring	
	COURSE TITLE	HRS	COURSE TITLE	HRS	COURSE TITLE	HRS	COURSE TITLE	HRS
Coaching Methods	CM 505 Leadership in Coaching	2	CM 500 Education: Coach as Teacher	4	CM 520 Training Program & Assessment	2	CM 509 Coaching Philosophy & Ethics	2
	CM 510 Coaching Novice Athletes & Coxswains	2					CM 515 Coaching Advanced Athletes & Technology	3
							CM 540 Rigging & Fleet Maintenance	2
	CM 550 Critical Thinking I	1	CM 552 Critical Thinking II	1	CM 554 Critical Thinking III	1	CM 556 Critical Thinking IV	1
Sports Science	SS 500 Exercise Physiology I	4	SS 510 Exercise Physiology II	4	SS 525 Strength Training	2		
	SS 515 Biomechanics	2	SS 520 Sports Nutrition	2	SS 529 Applied Sports Medicine	2		
					SS 535 Sports Psychology	4		
					SS 540 Skill Acquisition & Movement	2		
Rowing Administration	RA 505 Sports Marketing & Branding	2	RA 510 Team Management	2	RA 500 Event Management	2	RA 515 Club Administration	2
							RA 520 Sport & Community Development	1
Practicum	CP 500 Practicum I	3	CP 502 Practicum II	3	CP 504 Practicum III	3	CP 506 Practicum IV	3
	<i>Summer total clock hours</i>	16	<i>Fall total clock hours</i>	16	<i>Winter total clock hours</i>	18	<i>Spring total clock hours</i>	14

Running through the entirety of the program is the Coaching Practicum component, which engag-



es fellows in the process of transferring knowledge from the classroom to practical application. While only representing 19 percent of the overall course load, it is the “straw that stirs the drink” by providing fellows a platform to reinforce, implement, and encode their newly acquired knowledge. All of the coaching fellows take knowledge into the field and apply it immediately in their coaching practicum with athletes all along the LTAD spectrum, and they then return to the classroom to share their experience with their classmates as part of a CoP. This amplifies and deepens the learning process for everyone involved.

Coaching Methods

The Coaching Methods stream focuses on leadership, communication, and technical skill development, along with critical thinking and research, and has its roots in a broad base of coaching pedagogy. Encompassing a range of courses that coalesce around relationships and interactions with athletes as well as other members of the coaching and administrative team, the overall theme throughout these courses is improving the communication and relationship between coaches and athletes.

Leadership skills are foundational for all coaches regardless of their coaching context, and are a key focus for this domain of study. In addition, fellows examine the premise that the heart of good coaching relies on the teaching/learning interface. Coaches have the ability to influence their athletes in a myriad of ways as they guide them to physical, mental, social, and emotional growth in the context of sport. The Coaching Methods courses provide fellows with the tools to gain self-knowledge around these aspects of coaching. Each coaching fellow develops a core set of values and ethics that lead to an enduring coaching philosophy they can draw upon throughout their coaching career.

Reflective practice through journaling and guided reflection is essential as fellows pursue their year-long coaching practicum. Throughout the year, the integration of reflective practice into the entirety of the classroom curriculum and application in the practicum knits together the learning process and builds this habit into the coaching DNA of each fellow. To reinforce this learning process, each coaching fellow selects a topic of specific interest to them and explores the concept deeply throughout the process of action research. During this process, they research and then implement their findings in the final quarter of the program with their coaching practicum group. The outcome of this research is a paper shared throughout the sport that serves to advance the knowledge of the larger rowing community as a whole.

Sports Science

With a sport-specific focus on rowing, the collection of classes that comprises this domain of the program establishes and builds on a strong fundamental base of knowledge to highlight specific applications in the rowing context. Coaching fellows enter the program with a wide range of educational backgrounds. Uniting the cohort of fellows with an understanding of baseline exercise physiology through four contact hours per week over the first two quarters sets the table for rest of the courses in the domain.

For coaches, a broad understanding of the many aspects of sports science that contribute to optimal performance for their athletes requires competency in a diverse range of subjects. The Skill Acquisi-



tion and Movement, Biomechanics, and Applied Sports Medicine courses together focus on the understanding and teaching of the cognitive, mechanical, and neuromuscular processes that contribute to the learning, control, and application of skills in relationship to the rowing motion.

Three additional courses in this domain focus on specific aspects of LTAD that are not tied to the rowing motion on the water, but are nonetheless essential knowledge for a coach. Both Sports Nutrition and Sports Psychology have global impacts on how athletes perform. By tuning the course content to address specific critical aspects of performance in rowing such as 2,000-meter racing, the coaching fellows develop a strong fundamental base of knowledge. Strength Training also has a global impact on athlete performance as fellows learn about appropriate exercises and training for different levels of athletes and how to teach these movements in a safe and effective manner.

Rowing Administration

While it only accounts for 14 percent of the total classroom hours, the Rowing Administration domain is a critical aspect of a coach's job. Coaches come to their profession because they love the sport, and becoming an administrator is frequently not a part of their inherent skill set. Consequently, this domain is sometimes the most challenging and time-consuming portion of the job for the many coaches.

Rowing Administration highlights the two main aspects of the administrative side of every coach's job, internal and external communications and management. Externally, specific attention is paid to marketing of the team/sport/individual, event management, and the use of sport as a tool for community development. Internally, team and operational dynamics of rowing programs are examined to equip fellows with the necessary knowledge and skills to successfully navigate the administrative aspects of their role.

Coaching Practicum

Run throughout the entirety of the program, the Coaching Practicum domain is an important differentiator in the learning process for coaching fellows. By providing course credit for the application of knowledge gained in the classroom, this domain ensures that learning engagement extends beyond the classroom to water and land contexts with actual athletes on a daily basis. With a diverse group of coaching fellows practicing this knowledge in contexts all along the LTAD spectrum, and then sharing their insights with the group, the collective learning process is reinforced and coaches gain a depth of insight beyond their own experience as part of a CoP.

Individual coaches also have the experience of applying their knowledge in a coaching context that matches their desired career path. Within the robust rowing community of Boston, coaching fellows apply their knowledge in contexts ranging from middle school through to elite athletes that are competing internationally at the highest level of rowing. Because of the wide range of coaching experience of fellows entering the program, our location, with a diversity of placement options, is critical to finding a fit that is beneficial for both the fellow and the program in which they are placed. In each coaching practicum, a master coach mentors and guides fellows through regular and systematic feedback as a member of their coaching staff.



Further, all coaching fellows are evaluated regularly throughout the year in their coaching practicum by IRL staff to give them feedback on the implementation of their coaching knowledge on the water. Fellows are given a quantitative analysis of their observable coaching behaviors regarding time analysis, practice design/delivery, and coaching interventions, as well as a qualitative analysis of their coaching performance. With multiple opportunities over the course of the year, these systematic observations allow for continued follow-up and tracking of fellow progress and direct assistance in improving the application of their coaching skills in real time.

Structure of Classroom Activities

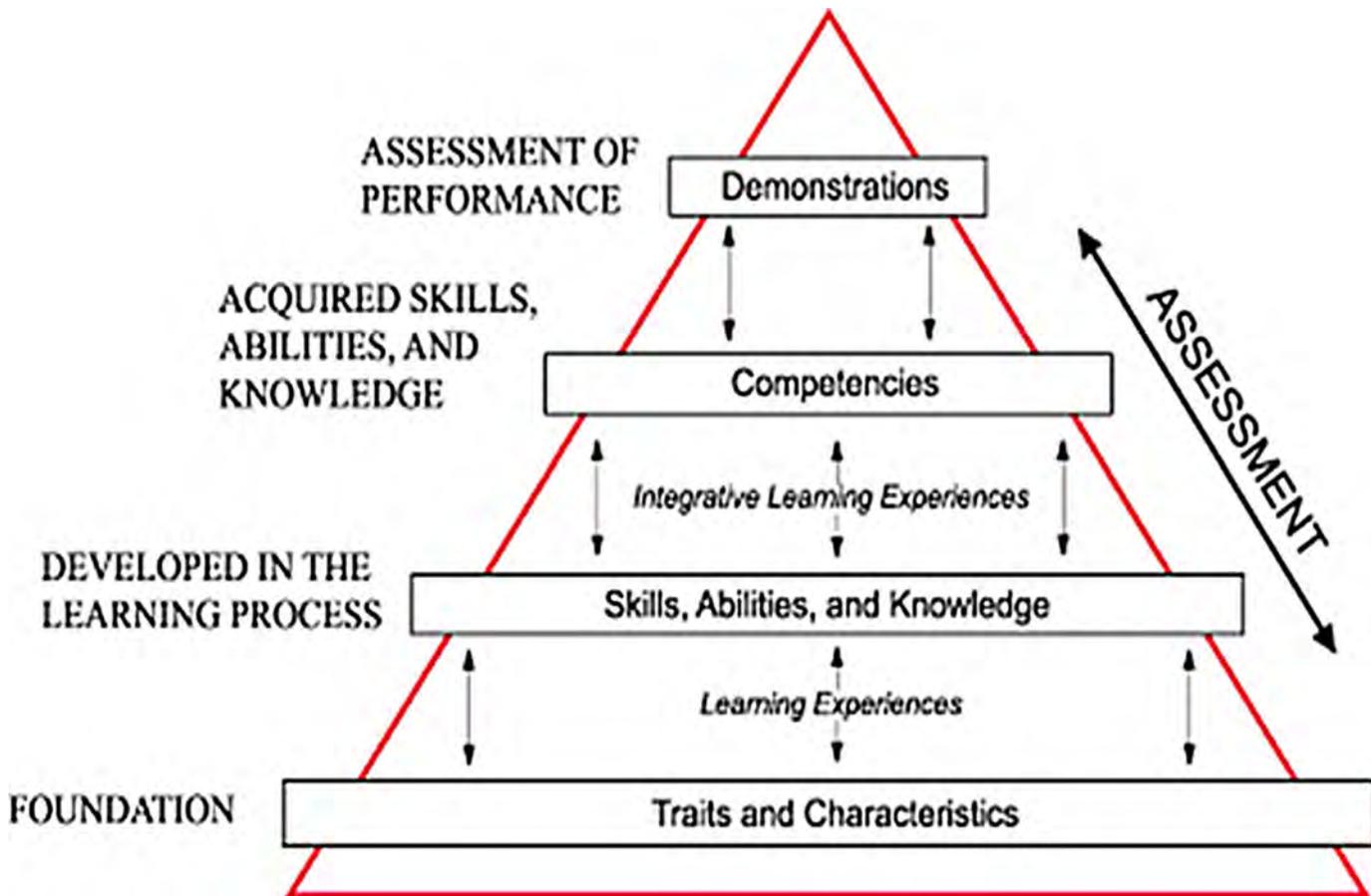
The IRL's Advanced Certificate in Rowing Leadership program uses a small cohort size to enhance learning during daily classroom activity. Cooperative learning is an essential element of daily pedagogical practice. As discussed by Brown & Ciuffetelli (2009), the five basic and essential elements to cooperative learning are:

1. *Positive Interdependence*
 - Fellows must fully participate and put forth effort within their group.
 - Each fellow has a task/role/responsibility and therefore must believe that they are responsible for both their learning and that of the group.
2. *Face-to-Face Interaction*
 - Fellows promote each other's success.
 - Fellows explain to one another what they have learned or are learning, and assist one another with understanding and completion of assignments.
3. *Individual Accountability*
 - Each fellow must demonstrate mastery of the content being studied.
 - Fellows are accountable for their learning and work, therefore eliminating "social loafing."
4. *Social Skills*
 - Skills include effective communication in interpersonal and group settings in:
 - i. Leadership
 - ii. Decision-making
 - iii. Trust-building
 - iv. Communication
 - v. Conflict management
5. *Group Processing*
 - Regularly, the group must assess their effectiveness and decide how it can be improved.

In the application of these principles, certain course curriculum elements and activities lend themselves to cooperative learning activities. By working with all IRL instructors to encourage this process, cooperative learning is built into the classroom structure across the curriculum and allows the richness of the experience of the coaching fellows to enhance the learning process for all in their CoP. In addition, when constructing assessments for their coursework, instructors are encouraged to take



principles of competency-based education into consideration. A hierarchy of outcomes as outlined and defined by the US Department of Education (2002) below is used to guide instructors as the content of courses is built and as evaluations are constructed in the classroom.



Traits and Characteristics are the foundation for learning in each individual on which further experiences are built. Differences in personal traits and characteristics help explain differences in learning experiences and how individuals acquire different levels and kinds of knowledge and skills.

Skills, Abilities, and Knowledge are developed through learning experiences, broadly defined to include school, work, participation in community affairs, etc.

Competencies are the result of integrative learning experiences in which skills, abilities, and knowledge interact to form bundles that have currency in relation to the task for which they are assembled.

Demonstrations are the results of applying competencies. It is at this level that knowledge comes to bear and performance can be assessed.

Next Steps

Maximizing the impact of coaches to have outsized value to the sport can only come through investment in a LTCD model alongside LTAD to ensure future growth and leadership in the sport. We have already seen in our three classes of alumni the ability of IRL coaching fellows to have a life-changing impact on athletes across the LTAD spectrum. The investment made through the Institute for Rowing Leadership will continue to reap benefits for both the individual graduates and for the entire sport of rowing for many years to come.

With a background in the sports industry domestically and abroad, Matt Lehrer is the current Director of Coaching Education at Community Rowing, Inc. and the Institute for Rowing Leadership. Driven by the belief that sports present a unique arena to positively impact lives, his passion for working intensively with coaches to improve their craft is rooted by the profound influence sport has had on his life. His current role provides a myriad of opportunities to engage with coaches at all stages along the pathway of learning and an opportunity to grow the sport by driving positive athlete experiences through long-term coach development.

Bruce H. Smith is a former US National Team Coach and a graduate of McGill University and the University of Chicago. Executive Director of Community Rowing, Inc. since 2008, he has almost quadrupled operating income from \$900,000 to more than \$4 million dollars, increased participation across all programs by more than 100%, and created several innovative initiatives to transform CRI into the largest rowing club in the world. Bruce also founded the Institute for Rowing Leadership, the country's first graduate level program designed to bring coaching to a new level of professional development. With more than 150,000 rowers in the United States, the sport needs trained, well-rounded coaches and leaders, and the IRL provides a yearlong education program to develop that leadership.

Resources

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Appendix A – Course Descriptions

Coaching Methods

CM500 – Education and Instruction: Coach as Teacher

Teaching, and the pedagogical theory that informs it, has tended to lie outside of the traditional domain of coaching. This course challenges that premise and re-conceptualizes coaching based on the notion that at the heart of good coaching lies the teaching and learning interface, and the myriad of ways through which coaches influence athletes to develop and improve. Through an analysis of essential educational pedagogy, the class will bridge the gap between the theoretical and the applied by providing fellows with the tools to necessary to become teachers of sport. 4 clock hours

CM505 – Leadership in Coaching

Development of leadership skills is foundational in becoming a successful coach. In this course, fellows will be introduced to historic and current leadership theory. Additionally, fellows will engage in critical leadership skills such as developing, defining and defending philosophies and concepts, critical self-analysis, productive criticism of others, and collaboration. Fellows will be exposed to rowing-specific leadership challenges in every class, and will be asked to apply the concepts provided in class to solving these concept problems. The most critical element this class will seek to instill in the fellows is the capacity to think more clearly and critically about leadership. 2 clock hours

CM509 – Coaching Philosophy and Ethics

Throughout this course, fellows will develop an understanding of the role sport plays in democratic culture and cultivate a set of values and ethics as it relates to their own personal coaching. Topics will pull from a variety of primary sources, such as leading texts, case studies and personal experiences, as the course examines modern beliefs about competitive sport, its relationship to academics, and the role of the coach. 2 clock hours

CM510 – Coaching Novice Athletes and Coxswains

The instruction and development of novice rowers and coxswains forms the basis of this course, which bridges the gap between theory and on-the-water coaching applications. Fellows will examine approaches to the introduction to, as well as acquisition and refinement of, basic skills and apply research-based instructional techniques related to developmentally appropriate verbal instruction and motor learning strategies, including a purposeful approach to coxswain skill development. Additionally, fellows will examine retention models and consider how the initial experience for rowers and coxswains determines their likelihood of continuing to pursue the sport. 2 clock hours

CM515 – Coaching Advanced Athletes and Technology

Building on the basic instructional methods introduced in CM510, this course leads students through an in-depth study of sophisticated techniques designed to maximize individual potential. The primary objectives of the competi-



tive athlete – team/squad selection, the improvement of sport-specific fitness, acquisition and refinement of advanced/complex skills, acquisition of advanced tactics/strategies, and meeting performance standards – provide the framework for the course content. In the course, there will be a blend of classroom-based analysis and discussion as well as on the water real time analysis of rowers in action out on the river. Additionally, this course also completes a comprehensive survey of technological resources available to coaches, including a study of the newest cutting-edge analytical and instructional tools, giving the most up-to-date coaches a distinct competitive advantage on the water. 3 clock hours

CM520 – Training Program Design and Athlete Assessment

Through this course, fellows will examine the importance of different factors in creating an annual training plan. Specific topics include aerobic, anaerobic and strength training as well as periodization and overtraining. Each fellow will develop his or her own scientifically-informed training plan designed and adapted to athlete age and skill level. This course also provides guidance in the establishment of appropriate criteria for the selection of team members, effective communication behaviors between coaches and athletes, and the art of assembling a crew. 2 clock hours

CM540 – Rigging and Fleet Maintenance

Effective preparation for on-the-water success depends on keeping your equipment in the best shape possible and knowing how to make repairs when necessary. This course will focus on four critical elements: appropriate rigging for crews, boat and oar repair, equipment trailering, and small motor maintenance and restoration. With a mix of classroom sessions and practical application workshops in rigging and repairing boats/motors as well as safe trailer preparation, operation, and maintenance in a hands-on setting, fellows gain the practical skills essential for keeping their crews and equipment in top form. 2 clock hours

Critical Thinking & Research

The Critical Thinking & Research component of the IRL prepares fellows for a professional career sustained through reflective practice. This coaching colloquium is designed as a work in progress with the dual objective of (a) assisting fellows in the development of their action research project and guiding them through the process and (b) helping fellows understand how reflective writing practice can offer a valid insight into the interpretation of sport and coaching.

CM550 – Critical Thinking & Research I

The first quarter of Critical Thinking and Research introduces fellows to various research methodologies, designs, and paradigms. Also, this course assures each fellow has the skill set necessary to utilize online resources effectively. 1 clock hour

CM552 – Critical Thinking & Research II

This course is dedicated to the deconstruction of available research and data relating to rowing. Fellows will demonstrate the ability to analyze various research studies and published articles. 1 clock hour

CM554 – Critical Thinking & Research III

The development and implementation of an action research project forms the basis of this course. Fellows will complete a survey of the relevant literature along with completing a proposal for their action research project. 1 clock hour

CM556 – Critical Thinking & Research IV

In the final course of the Critical Thinking & Research sequence, fellows will put their action research project into practice. A final presentation will be made demonstrating the fellow's findings resulting from their action research project. 1 clock hour

Coaching Practicum

The Coaching Practicum component of the IRL (CP500, 502, 504, and 506) is critical in taking the knowledge and experience gained in the classroom and translating it into direct communication with athletes to enhance their



performance. The definition of coaching should reflect the broad academic content of the IRL program. In addition to on-the-water athlete instruction, this includes experiential learning opportunities in the management of the team, overall organization of the program, study and implementation of technique and strategy, event management, fundraising, and more.

Each fellow will have the opportunity to wear the many necessary hats of the rowing coach – teacher, physiologist, personal trainer, psychologist, fundraiser, and administrator – that compose the aggregate leader the IRL seeks to develop. Through the connection with the IRL program, fellows are matched with local teams that match their eventual desired career path, whether that is to work with collegiate, elite, junior or masters athletes.

CP500 – Practicum I

The first quarter practicum is a complete immersion in the coaching of novice rowers. By learning to build the stroke from the ground up, each fellow learns the necessary skills in methodology and communication to effectively articulate their vision of the rowing stroke to the athletes they are coaching. 3 clock hours

CP502 – Practicum II

The second quarter practicum places fellows with a coaching position that matches their eventual coaching career goals. Fellows will employ both coaching and athlete recruitment skills in working within their coaching assignment to enhance the goals of their program. 3 clock hours

CP504 – Practicum III

The third quarter practicum is a guided preparation of the fellow's action research proposal along with practice in off-season training activities. Additionally, the fellows will gain event management experience in this term through their work with the C.R.A.S.H.-B Sprints Indoor World Championships. 3 clock hours

CP506 – Practicum IV

The fourth quarter practicum is the final installment in the experiential learning component of the IRL, with a focus on instruction and performance of competitive athletes in the spring racing season. 3 clock hours

Sports Science

SS500/510 – Exercise Physiology I & II

This course, taught in two parts over the course of the summer and fall quarters, takes an in-depth approach to understanding the human body's adaptation to acute and chronic exercise. Fellows will begin with a foundational overview of exercise science concepts before exploring a wide range of topics, including the cardiovascular system and response to physiological stress, the ATP-PC, glycolytic, and oxidative energy systems, physiological variables (e.g. age, gender), exercise testing, the psychophysiological factors of health and fitness, over-training, etc. The course is structured to prepare fellows to take the National Strength and Conditioning Association's (NSCA) Certified Strength and Conditioning Specialist (CSCS) Exam. 8 clock hours

SS515 – Biomechanics

This comprehensive course emphasizes the concepts of biomechanics and their application to rowing and sculling. These concepts are numerous and complex, involving basic mechanics, the mechanics of human tissue, kinematics, kinetics, and fluid mechanics. A detailed study of these biomechanical concepts and structural kinesiology is designed to give fellows the ability to apply biomechanical information to rowing-specific movement patterns. 2 clock hours

SS520 – Sports Nutrition

The purpose of this course is to provide fellows with a basic understanding of the relationship between nutrition, health, and athletic performance. This course will apply modern nutritional science research to sports training and competition with a focus on what coaches and athletes need to know about nutrition for optimal performance, specifically in the rowing context. 2 clock hours



SS525 – Strength Training

Each fellow will receive instruction in the principles for development of pre-season, in-season and off-season strength and conditioning programs. Classroom activities in theory and strength acquisition will be taken to the weight room for application where fellows will learn (and do themselves) the proper movement patterns as well as progressions for teaching their athletes proper strength training technique. 2 clock hours

SS529 – Applied Sports Medicine and Injury Prevention

In this course, the role coaches play in appropriate application of sports medicine and injury prevention is addressed. Emergency procedures, acute injuries, overuse and overtraining, NCAA and scholastic rules, problem athletes, common injuries to rowing, and the psychology of injury are key topics discussed. As part of the course, fellows will also take coursework to receive CPR/First Aid certification. 2 clock hours

SS535 – Sports Psychology

Understanding the complex psychological processes involved in maximizing athletic performance forms the core of this course. Through the critical examination of both research and practical experience, fellows will identify the knowledge and skills necessary to a guide practice in the field of sport psychology and the administration of sport psychology interventions with their athletes and teams. 4 clock hours

SS540 – Skill Acquisition and Movement

This course addresses the principles related to learning and control of psychomotor skills through a focus on motor skill acquisition and control. Primary focus is placed on the cognitive and neuromuscular processes underlying acquisition of motor skills and neuromuscular factors related to skilled motor performance. This course converts the fundamental physical education theories and the current research into practical instructional procedures. 2 clock hours

Rowing Administration

RA500 – Event Management

The successful administration of competitions, whether it is the relative simplicity of a dual race or a multi-faceted championship regatta, is critical to providing an effective arena for athletic performance. Additionally, special events, such as fundraisers and community outreach events, are essential tools in the growth and development of the sport of rowing. The focus of the course will be understanding and developing the narrative aspects that go along with the execution of a successful event. Two critical components of this course will be the involvement of fellows in the C.R.A.S.H.-B. Sprints World Indoor Rowing Championship as well as applying their learning by running all aspects of an indoor ergometer race for members of Community Rowing, Inc. 2 clock hours

RA505 – Sports Marketing and Branding

This course examines the role that marketing and branding play in two contexts: the development of a successful rowing club/team and cultivation of each fellow's individual brand. Sports marketing topics include using a strategy-based perspective to establish an appropriate target market, brand positioning, utilization of social media and word-of-mouth, as well as developing relationships with key community partners. On the individual level, fellows will consider how the concepts of marketing and branding apply toward their individual career path. 2 clock hours

RA510 – Team Management

In this seminar-based course, the intra- and inter- personal aspects involved in the successful operation of a rowing club/team are fleshed out. The major focus of the course is administrative theory and practice that leads to more efficient coaching. Competence in administration is a critical marker of job success for coaches. Fellows will discuss the functions of effective task management, management of coach-athlete relations and mentoring, develop a plan for overall team management, address NCAA rules and policies and formulate long-range and intermediate team and individual goals. As part of this course, fellows will also become certified by the NCAA for recruiting of student-athletes. 2 clock hours



RA515 – Club Administration

This course is an in-depth study of the myriad of different practical elements that impact the successful administration of a rowing organization. Through this course, fellows will acquire the skills necessary to develop job descriptions for team personnel, communicate appropriately with personnel concerning performance, evaluate personnel and identify principles of effective time management. Additionally, fellows will discuss factors that influence aid-raising and the typical business functions of different rowing organizations (e.g., youth, club, colleges, universities) associated with athletic programming (e.g., purchasing, accounting, travel reimbursement) with specific focus on understanding best practices in budgeting and finance. 2 clock hours

RA520 – Sport and Community Development

Fellows will get a broad understanding of key concepts of community development theory and practice, as well as the emerging field of Sport for Development. Through readings, class discussion, review of best practices and model programs from the field, fellows will be able to articulate the merits of sport as a viable mode of community development by the end of the course. 1 clock hour



Jill Ellis head coach of the United States looks on prior to the Women's Friendly International match between England and USA. (Photo by Tom Dulat/Getty Images)

On the cover: Hannah Kearney of the USA win the overall globe for the FIS Freestyle Skiing Dual Moguls on March 15, 2015 in Megeve, France.

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USOC Sport Performance Division Resource Staff

Alan Ashley, Chief of Sport Performance
Alan.Ashley@USOC.org

Kelly Skinner, Managing Director
Kelly.Skinner@USOC.org

Chris Snyder, Director of Coaching Education
Chris.Snyder@USOC.org

Leslie Gamez, Managing Director - International Games
Leslie.Gamez@USOC.org

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